But with new Microsoft Works 3.0, there's no telling where he'll go next.

In the last few years, Frank's business has come a long way. So has Microsoft® Works. Coincidence? You won't think so when you see how far new Works 3.0 can take your business. And this holds true whether you're working on Star Trek: The Motion Picture (like Frank) or something a little more down-to-earth.

That's because new Works comes with an enhanced word processor, database, spreadsheet—with charting, of course—drawing and communications tools. All of which have been redesigned to work even better together. But wait! There are still more features.

Like built-in business templates. You just plug in the information, and Works does the rest: income statements, payroll, and just about anything else you can think of. Perhaps this is the reason why Microsoft Works has been the industry's leading integrated product.

By the way, you'll even have a handy set of Avery® label forms online. When it comes to sending out flyers or bills, they make printing mailing labels just as easy as licking the stamps. And with its online Help, tutorial, and the Getting Started booklet, absolutely everything about Works is easy.

But don't let that fool you.

Works is powerful enough to grow with your business. To see how far, call (800) 541-1261, Department X43, for the closest Macintosh® reseller.
FRANK SERAFINE, A MICROSOFT WORKS USER SINCE 1986, ALSO DESIGNED SOUND EFFECTS FOR POLTERGEIST II: THE OTHER SIDE.
Frank has been under the sea, into the afterlife, and to the end of the universe.
Features

The Right Word Processor
BY TED LANDAU
Which word processor is best for you? It all depends on what kinds of words you process. From business letters to long documents to page layout, we evaluate how suitable six word processors are for five different kinds of writing tasks. .......................................................... 100

The Third Dimension
BY DAVID BRENNY
Artists: Get real! The world is not flat, and your graphics software shouldn’t be either. Here are 12 sophisticated 3-D tools that let you render lifelike illustrations and animations. ...................................................... 114

New Life for Old Macs
BY DON CRABB
Before you turn your aging Mac into a doorstop, take a look at these tips on the care and feeding of older Macs, from Mac consultant and new MacUser columnist Don Crabb. .............................................. 132

PowerPC: Where No Mac Has Gone Before
BY HENRY HORSTMANN
Apple, IBM, and Motorola are collaborating to build tomorrow’s desktop computer. Here’s what it will be like — and when you’ll see it. .................................................. 142

The MacUser Shareware Awards
BY GREGORY WASSON
And the winners are .... Presenting 34 almost-free utilities, add-ons, and plug-ins that prove that you don’t have to sacrifice quality for price. ...................................... 152

PostScript Printing That Won’t Break the Bank
BY BRUCE FRASER
PostScript printing for the rest of us: MacUser Labs tests 21 personal PostScript laser printers that cost less than $3,000. ................................................................. 160

Big-Screen Monitors
BY JEFF PITTELKAU
Sharp, bright, and versatile, the NEC MultiSync 6FG and the Radius PrecisionColor Display/20 work with Macs and PCs. ................................................. 186

Du Pont PPI 600
BY PAUL YI
There’s a new ruler in the realm of high-end high-resolution laser printing. ................................ 196

Inkjet Printers
BY HENRY HORSTMANN
Two low-cost inkjet favorites, the Apple StyleWriter and the Hewlett-Packard DeskWriter, go printhead-to-print-head, with new features and improved speed. ........................................ 198
Get Real!

With MenuFonts
The Real Font Menu!

See the real fonts in your font menus. See what a font looks like before you select it. MenuFonts draws menus using the real typefaces (instead of the real typefaces). MenuFonts draws icons on the menu, marking each font as TrueType™, Postscript™, or Bitmapped. System-compatible!

Dramatically shorten the font menus. MenuFonts makes it easier to quickly find fonts on the menu by conveniently grouping fonts families together on submenus.

Get timely information about your fonts, and locate frustrating font ID conflicts. MenuFonts' FontShow Box displays a font's ID number, file name, printer file name, and kind (distinguishes between TrueType, Postscript 1 or 3, and bitmapped).

Choose the right font size. MenuFonts lets you preview fonts in various sizes from MenuFonts FontShow Box—built right into the font menu.

Turbocharge font menus with Keyscroll™. Pull down the font menu, and type the first letter of the font you want. MenuFonts instantly scrolls to select it. Or press the ‘return’ key, and scroll directly to the currently selected font.

Configure font menus to suit your needs. Have it your way. From the Control Panel, you can choose the font, size, style, and color of every font on the menu. You can even rename fonts, and change the order in which each appears on the menu.

Font Menus are alphabetical again! MenuFonts automatically eliminates unnecessary font name prefixes (like B, I, UL). So fonts are again in alphabetical order.

Upgrade to MenuFonts and really save! For a limited time, Adobe® TypeReunion™. New menu fonts; and Eastgate Fontina™. MenuFonts users can upgrade to MenuFonts for just $29.95 (x5 $90). Call us for details: 1 (800) 226-9525.

Just $69.95. (But Maczone is cheaper!) Call the Maczone for current pricing. 1 (800) 226-9525.

MacUser Labs

MenuLab

MacUser Labs Director: Rick Mylewski

Associate Director: Jeffrey S. Pittkau

Project Leaders: Mark Bien, Tony A. Bujarowicz, Jeffrey K. Mistleid

Lab Technicians: Reman Victor Leyola, Sean Safreed

Lab Administrator: Anthony Stoltz

Network Administrator: Stephen Somogyi

Design

Art/Design Director: Lisa Orsini

Associate Art Director: Diane Dempsey

Associate Technical Art Director: Peter Allen Gould

Art Production Manager: Jan McKenzie Reigers

Technical Illustrator: K. Daniel Clark, Mark W. Sweeney

Advertising/Sales

Advertising Coordinator: Elizabeth McGinnis

Production

Production Director: Carlos Lugo

Production Manager: Brenda Falco

Assistant Production Manager: Monique Rizzo

Marketing

Marketing Manager: Laurel Skillman

Events Manager: Stacy Reiling

Marketing Coordinator: Renee Weems

Operations

Group Business Manager: Rosemarie Carbone

Assistant Account Representative: Doris Ashman

Assistant to the Associate Publisher: Christine Pruski-Paimer

Assistant to the Publisher: Karen J. Ohlson, Elisa M. Welch

Assistant to the Associate Publisher: Janet Ryan

Associate Publisher: Jonathan A. Lane

Editor

Executive Editor: James S. Bradbury

Managing Editor: Nancy Groth

Technical Director: Henry Bartman

Senior Editors: Aileen Abernathy, Russell Ito, Rik Mylewski, Victoria von Biel

Technical Editor: John Rizzo

Associate Managing Editor: Claire Hamilton

Chief Copy Editor: Eva Langfeldt

Associate Editors: Mark Frost, Susan Janus, Mark W. Sweeney, Rik Myslewski, Victoria von Biel

Copy Editor: Mary Cole

Editorial Assistant: Rhonda Simmons

Editorial Assistant: Darryl Chan, Michele Hasson

Executive Assistant: Nancy Peterson

Assistant to the Publisher: Amanda Michael

Contributing Editors: David Biedny, Steven Bobker, Bruce Fraser, Andy Imakawa, Ted Landau, Bob LeVitus, Michael Swaine, Kurt VanderSluis, Gregory Wasson

Contributing Editor: John C. Dvorak

Assistant to the Editor-in-Chief: Teresa Campbell-Molina

MacUser Labs

MacUser Labs Director: Rick Mylewski

Associate Director: Jeffrey S. Pittkau

Project Leaders: Mark Bien, Tony A. Bujarowicz, Jeffrey K. Mistleid

Lab Technicians: Reman Victor Leyola, Sean Safreed

Lab Administrator: Anthony Stoltz

Network Administrator: Stephen Somogyi

Design

Art/Design Director: Lisa Orsini

Associate Art Director: Diane Dempsey

Associate Technical Art Director: Peter Allen Gould

Art Production Manager: Jan McKenzie Reigers

Technical Illustrator: K. Daniel Clark, Mark W. Sweeney

Advertising/Sales

Advertising Coordinator: Elizabeth McGinnis

Production

Production Director: Carlos Lugo

Production Manager: Brenda Falco

Assistant Production Manager: Monique Rizzo

Marketing

Marketing Manager: Laurel Skillman

Events Manager: Stacy Reiling

Marketing Coordinator: Renee Weems

Operations

Group Business Manager: Rosemarie Carbone

Assistant Account Representative: Doris Ashman

Assistant to the Associate Publisher: Christine Pruski-Paimer

Assistant to the Publisher: Karen J. Ohlson, Elisa M. Welch

Assistant to the Associate Publisher: Janet Ryan

Associate Publisher: Jonathan A. Lane

Editor

Executive Editor: James S. Bradbury

Managing Editor: Nancy Groth

Technical Director: Henry Bartman

Senior Editors: Aileen Abernathy, Russell Ito, Rik Mylewski, Victoria von Biel

Technical Editor: John Rizzo

Assistant Managing Editor: Claire Hamilton

Chief Copy Editor: Eva Langfeldt

Associate Editors: Mark Frost, Susan Janus, Mark W. Sweeney, Rik Myslewski, Victoria von Biel

Copy Editor: Mary Cole

Editorial Assistant: Rhonda Simmons

Editorial Assistant: Darryl Chan, Michele Hasson

Executive Assistant: Nancy Peterson

Assistant to the Editor-in-Chief: Teresa Campbell-Molina

MacUser Labs

MacUser Labs Director: Rick Mylewski

Associate Director: Jeffrey S. Pittkau

Project Leaders: Mark Bien, Tony A. Bujarowicz, Jeffrey K. Mistleid

Lab Technicians: Reman Victor Leyola, Sean Safreed

Lab Administrator: Anthony Stoltz

Network Administrator: Stephen Somogyi

Design

Art/Design Director: Lisa Orsini

Associate Art Director: Diane Dempsey

Associate Technical Art Director: Peter Allen Gould

Art Production Manager: Jan McKenzie Reigers

Technical Illustrator: K. Daniel Clark, Mark W. Sweeney

Advertising/Sales

Advertising Coordinator: Elizabeth McGinnis

Production

Production Director: Carlos Lugo

Production Manager: Brenda Falco

Assistant Production Manager: Monique Rizzo

Marketing

Marketing Manager: Laurel Skillman

Events Manager: Stacy Reiling

Marketing Coordinator: Renee Weems

Operations

Group Business Manager: Rosemarie Carbone

Assistant Account Representative: Doris Ashman

Assistant to the Associate Publisher: Christine Pruski-Paimer

Assistant to the Publisher: Karen J. Ohlson, Elisa M. Welch

Assistant to the Associate Publisher: Janet Ryan

Associate Publisher: Jonathan A. Lane

Editor

Executive Editor: James S. Bradbury

Managing Editor: Nancy Groth

Technical Director: Henry Bartman

Senior Editors: Aileen Abernathy, Russell Ito, Rik Mylewski, Victoria von Biel

Technical Editor: John Rizzo

Assistant Managing Editor: Claire Hamilton

Chief Copy Editor: Eva Langfeldt

Associate Editors: Mark Frost, Susan Janus, Mark W. Sweeney, Rik Myslewski, Victoria von Biel

Copy Editor: Mary Cole

Editorial Assistant: Rhonda Simmons

Editorial Assistant: Darryl Chan, Michele Hasson

Executive Assistant: Nancy Peterson

Assistant to the Editor-in-Chief: Teresa Campbell-Molina

MacUser Labs

MacUser Labs Director: Rick Mylewski

Associate Director: Jeffrey S. Pittkau

Project Leaders: Mark Bien, Tony A. Bujarowicz, Jeffrey K. Mistleid

Lab Technicians: Reman Victor Leyola, Sean Safreed

Lab Administrator: Anthony Stoltz

Network Administrator: Stephen Somogyi

Design

Art/Design Director: Lisa Orsini

Associate Art Director: Diane Dempsey

Associate Technical Art Director: Peter Allen Gould

Art Production Manager: Jan McKenzie Reigers

Technical Illustrator: K. Daniel Clark, Mark W. Sweeney

Advertising/Sales

Advertising Coordinator: Elizabeth McGinnis

Production

Production Director: Carlos Lugo

Production Manager: Brenda Falco

Assistant Production Manager: Monique Rizzo

Marketing

Marketing Manager: Laurel Skillman

Events Manager: Stacy Reiling

Marketing Coordinator: Renee Weems

Operations

Group Business Manager: Rosemarie Carbone

Assistant Account Representative: Doris Ashman

Assistant to the Associate Publisher: Christine Pruski-Paimer

Assistant to the Publisher: Karen J. Ohlson, Elisa M. Welch

Assistant to the Associate Publisher: Janet Ryan

Associate Publisher: Jonathan A. Lane

Editor

Executive Editor: James S. Bradbury

Managing Editor: Nancy Groth

Technical Director: Henry Bartman

Senior Editors: Aileen Abernathy, Russell Ito, Rik Mylewski, Victoria von Biel

Technical Editor: John Rizzo

Assistant Managing Editor: Claire Hamilton

Chief Copy Editor: Eva Langfeldt

Associate Editors: Mark Frost, Susan Janus, Mark W. Sweeney, Rik Myslewski, Victoria von Biel

Copy Editor: Mary Cole

Editorial Assistant: Rhonda Simmons

Editorial Assistant: Darryl Chan, Michele Hasson

Executive Assistant: Nancy Peterson

Assistant to the Editor-in-Chief: Teresa Campbell-Molina

MacUser Labs

MacUser Labs Director: Rick Mylewski

Associate Director: Jeffrey S. Pittkau

Project Leaders: Mark Bien, Tony A. Bujarowicz, Jeffrey K. Mistleid

Lab Technicians: Reman Victor Leyola, Sean Safreed

Lab Administrator: Anthony Stoltz

Network Administrator: Stephen Somogyi

Design

Art/Design Director: Lisa Orsini

Associate Art Director: Diane Dempsey

Associate Technical Art Director: Peter Allen Gould

Art Production Manager: Jan McKenzie Reigers

Technical Illustrator: K. Daniel Clark, Mark W. Sweeney

Advertising/Sales

Advertising Coordinator: Elizabeth McGinnis

Production

Production Director: Carlos Lugo

Production Manager: Brenda Falco

Assistant Production Manager: Monique Rizzo

Marketing

Marketing Manager: Laurel Skillman

Events Manager: Stacy Reiling

Marketing Coordinator: Renee Weems

Operations

Group Business Manager: Rosemarie Carbone

Assistant Account Representative: Doris Ashman

Assistant to the Associate Publisher: Christine Pruski-Paimer

Assistant to the Publisher: Karen J. Ohlson, Elisa M. Welch

Assistant to the Associate Publisher: Janet Ryan

Associate Publisher: Jonathan A. Lane

Editor

Executive Editor: James S. Bradbury

Managing Editor: Nancy Groth

Technical Director: Henry Bartman

Senior Editors: Aileen Abernathy, Russell Ito, Rik Mylewski, Victoria von Biel

Technical Editor: John Rizzo

Assistant Managing Editor: Claire Hamilton

Chief Copy Editor: Eva Langfeldt

Associate Edito...
Introducing 3 New Choices At Prices That Are Hard To Lick.

Quadralink DMA
Add four serial ports to any Mac II with the Quadralink and Quadralink DMA NuBus boards. More serial ports on one card means no more reaching behind your Mac to unplug one serial device and plug in the next. Break through the serial port bottleneck with Quadralink! And maximize Quadralink performance with ShadowLAN Networking software. ShadowLAN makes your connected serial devices available to any user on the AppleTalk network.

PlusDrive
Enhance your Mac with our 3.5" external floppy drive with built-in SuperDrive compatibility. Reads 400K, 800K, and 1.44Mb disks even on older Mac 512K, Plus and SE models. Works with DOS Mounter and Apple File Exchange to provide compatibility for 720K and 1.44Mb MS-DOS disks. This top-of-the-line drive is part of our full family of floppy drives for all Macintosh models.

TransWarp 040
Turbocharge any configuration of your Mac II with our TransWarp 040 NuBus board, the fastest accelerator card anywhere. Rated at 25 or 33 MHz and powered by an out-of-sight 68040 processor, the TransWarp 040 will boost your Mac II up to Quadra speeds! One of many fine accelerator and cache products from Apple’s oldest and largest developer.

1-800-554-MACS Ext.556
(6227)
Call for a free product guide

Dip into our booth at MacWorld for a Ben & Jerry’s free ice cream coupon. Bayside #1701
# Projects

- **FastTrack Schedule™** gives you the power to schedule anything, fast. Create custom Gantt charts for presentations that include graphics, labels, notes, titles, borders and real dates!

Walk away from tedious and old fashioned scheduling techniques. Fast Track Schedule offers a modern day solution for busy managers who need to get the project underway, and review progress quickly. Forget the frustration, scheduling doesn’t have to be a nightmare.

Order your FREE Fast Track Schedule demo kit now and we’ll ship it out within 24 hours!

(800) 346-9413 or (703) 450-1980

**How to Reach Us**

The editors of MacUser want to hear from you. Send questions, complaints, and compliments to MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Send electronic mail to MCI Mailbox 424-4936 or to ZiffNet/Mac (see below). MacUser’s general number is 415-378-5600. We are unable to look up stories from past issues, recommend products, or diagnose your Mac problems by phone.

**Information Exchange**

If you have a question or problem or a tip to share, write to Help Folder or Tip Sheet, respectively, on MacUser, at the above address. For more help, you can take advantage of local user groups. Call Apple toll-free at 800-538-9696, ext. 500, for user-group information.

**Subscription Inquiries/Change of Address**

If you want to subscribe to MacUser or have a question regarding a subscription, call 800-627-2247 (U.S. and Canada only) or 303-447-9330 (all other countries) or fax 303-443-3080 (international subscribers only) or write to MacUser, P.O. Box 56986, Boulder, CO 80322-6986. New subscriptions and address changes take six to eight weeks. For back issues (subject to availability), send $7 per issue, $8 outside the U.S., to Back Issues Dept., Ziff-Davis Publishing Company, P.O. Box 53131, Boulder, CO 80322. MacUser (ISSN 0884-0997) is published monthly by Ziff-Davis Publishing Company, a division of Ziff Communications Company, One Park Avenue, New York, NY 10016. Editorial Offices: 950 Tower Lane, 18th Floor, Foster City, CA 94404. Telephone: 415-378-5600. U.S. subscription rates are $27 for 12 issues, $45 for 24 issues, and $62 for 36 issues. Additional postage for Canada: Add $1.60 per year to the U.S. rates for surface mail. Single-copy price is $2.95 (Canada, $3.95). Canadian GST registration #R-123669673. POSTMASTER: Send address changes to MacUser, P.O. Box 56986, Boulder, CO 80322-6986, and at other mailing offices.

**ZiffNet/Mac: MacUser On-Line**

Follow these steps to join ZiffNet/Mac: Call 800-635-6225 (voice) to find your local access number. Set up your telecom software with these settings: 8 bits, 1 stop, and no parity. Dial the local access number. When connected, press Return. At the following prompts, type in the responses printed in bold:

- **Host Name:** CIS.
- **User ID:** 177000,5200.
- **Password:** Z*MAC.
- **Agreement Number:** Z12D9014.

CompuServe users can just type GO ZMAC at any ! prompt.

**Complaints About Advertisers**

MacUser’s editors are not responsible for the content of the advertisements in the magazine. However, if you bought a product advertised in MacUser, are dissatisfied, and can’t resolve the problem, write to Doris Ashman, Ad Department, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Include copies of relevant correspondence.

**Permissions and Reprints**

Material in this publication may not be reproduced in any form without permission. Send permission requests to Chantal Lavelanet and reprint requests to Claudia Crichlow, Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016.

**Writing for MacUser**

If you have an idea for an article you’d like to write, we’d like to hear about it. Send a query letter with samples of your writing (published, if possible) to James S. Bradbury, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Allow four to six weeks for a reply.

**Product Announcements and Updates**

Please send press releases to Michele Hasson, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

---

**Schedule**

- **Phase 1:** Design, Conceptual Planning, Feasibility Study, Evaluations, Research, Tending, Analysis, Pre-Planning, Documentation, User Testing, Post-production, Implementation, Delivery
- **Phase 2:** Development, Material Delivery, Prototyping, Construction, User Testing, Post-production, Implementation, Delivery

---

**In Memory of**

- John J. Anderson 1956 - 1989
- Derek Van Abstyn 1967 - 1989

---

**MacUser SoftAire**

- Free Demo Kit

---

**How to Reach Us**

The editors of MacUser want to hear from you. Send questions, complaints, and compliments to MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Send electronic mail to MCI Mailbox 424-4936 or to ZiffNet/Mac (see below). MacUser's general number is 415-378-5600. We are unable to look up stories from past issues, recommend products, or diagnose your Mac problems by phone.

**Information Exchange**

If you have a question or problem or a tip to share, write to Help Folder or Tip Sheet, respectively, on MacUser, at the above address. For more help, you can take advantage of local user groups. Call Apple toll-free at 800-538-9696, ext. 500, for user-group information.

**Subscription Inquiries/Change of Address**

If you want to subscribe to MacUser or have a question regarding a subscription, call 800-627-2247 (U.S. and Canada only) or 303-447-9330 (all other countries) or fax 303-443-3080 (international subscribers only) or write to MacUser, P.O. Box 56986, Boulder, CO 80322-6986. New subscriptions and address changes take six to eight weeks. For back issues (subject to availability), send $7 per issue, $8 outside the U.S., to Back Issues Dept., Ziff-Davis Publishing Company, P.O. Box 53131, Boulder, CO 80322. MacUser (ISSN 0884-0997) is published monthly by Ziff-Davis Publishing Company, a division of Ziff Communications Company, One Park Avenue, New York, NY 10016. Editorial Offices: 950 Tower Lane, 18th Floor, Foster City, CA 94404. Telephone: 415-378-5600. U.S. subscription rates are $27 for 12 issues, $45 for 24 issues, and $62 for 36 issues. Additional postage for Canada: Add $1.60 per year to the U.S. rates for surface mail. Single-copy price is $2.95 (Canada, $3.95). Canadian GST registration #R-123669673. POSTMASTER: Send address changes to MacUser, P.O. Box 56986, Boulder, CO 80322-6986, and at other mailing offices.

**ZiffNet/Mac: MacUser On-Line**

Follow these steps to join ZiffNet/Mac: Call 800-635-6225 (voice) to find your local access number. Set up your telecom software with these settings: 8 bits, 1 stop, and no parity. Dial the local access number. When connected, press Return. At the following prompts, type in the responses printed in bold:

- **Host Name:** CIS.
- **User ID:** 177000,5200.
- **Password:** Z*MAC.
- **Agreement Number:** Z12D9014.

CompuServe users can just type GO ZMAC at any ! prompt.

**Complaints About Advertisers**

MacUser's editors are not responsible for the content of the advertisements in the magazine. However, if you bought a product advertised in MacUser, are dissatisfied, and can't resolve the problem, write to Doris Ashman, Ad Department, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Include copies of relevant correspondence.

**Permissions and Reprints**

Material in this publication may not be reproduced in any form without permission. Send permission requests to Chantal Lavelanet and reprint requests to Claudia Crichlow, Ziff-Davis Publishing Company, One Park Avenue, New York, NY 10016.

**Writing for MacUser**

If you have an idea for an article you’d like to write, we’d like to hear about it. Send a query letter with samples of your writing (published, if possible) to James S. Bradbury, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Allow four to six weeks for a reply.

**Product Announcements and Updates**

Please send press releases to Michele Hasson, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.
THE MOBIUS 030 DISPLAY SYSTEM is the simplest, most reliable, and most economical way to pump major new life into your trusty Mac SE: a combination 25 MHz 030 accelerator and video card, plus a top-rated Mobius One or Two Page Display. All starting at just $899, including tilt/swivel base, cabling, software, and a complete installation kit (which, by the way, is a snap). It's no wonder MacWeek called it "THE BEST UPGRADE VALUE WE'VE SEEN YET FOR THE SE."

The Mobius 030 Display System increases the speed of your SE sixfold, making it just as fast as the IIci, and for one third the cost of buying one. That means blazing recalc's on your spreadsheets, and speedy redraws on your page layouts. Your entire document will always appear razor-sharp and rock-solid on the "THE MOST VISUALLY APPEALING" display, according to MacWorld. The Mobius 030 Display System is a complete solution that not only comes with your choice of monitor, but can be expanded for even greater performance. Want more speed? Just add our math coprocessor. More memory? There's room on the card for up to 16 MB of memory*. At Mobius, we're dedicated to providing the best service and support in the industry. So give us a call now to place an order or to get more information. We'll give you all the ins and outs.

$899
MOBIUS ONE PAGE 030 DISPLAY SYSTEM
19" monitor w/ 030 accelerator/video card.
16 MB virtual memory option**: $200
Mobius 030 accelerator card only: $399

$1099
MOBIUS TWO PAGE 030 DISPLAY SYSTEM
19" monitor w/ 030 accelerator/video card.
16 MB virtual memory option**: $200
Mobius 030 accelerator card only: $399

* With 16 MB virtual memory option.** Includes PMMU and Connectix™ Virtual 3.0™. In Canada call (416) 886-2326. ©1992 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., 5835 Doyle Street, Emeryville, CA 94608, Tel (510) 523-7900, Fax (510) 523-8452. Pricing subject to change without notice.

CIRCLE 174 ON READER SERVICE CARD.
A company of firsts.
Not only was NEC the first to introduce the fastest-spinning CD-ROM readers, we also introduced the first monitor color control system and the first active-matrix color notebook.

Call 1-800-NEC-INFO. (In Canada: 1-800-343-4418.) Or via fax, call NEC FastFacts™ 1-800-366-0476. Request 23766 for CD-ROM. *Single session disc only.
Looks like someone just discovered CD-ROM with MultiSpin™

The fastest-spinning readers ever. The InterSect™ CDR-74 and 84, only from NEC. Now they not only have the ability to access large amounts of information quickly and easily, but they provide you with endless Multimedia possibilities as well.

In fact, our MultiSpin technology can transfer data at a rate of 300 kb/sec. That’s double the speed of any other CD-ROM reader. And, we have designed our readers to play back video without any pauses or lapses in motion.

But what happens to audio? Do human voices sound more like beings from another planet? Does music sound like a record being played at the wrong speed? Absolutely not. The amazing thing about MultiSpin technology is its ability to transfer data at twice the speed, while maintaining the standard 150 kb/sec rate for audio tracks.

Simply put, NEC’s InterSect™ CDR-74 and 84 with MultiSpin™ are the speed champs of CD-ROM. What’s more, our CD-ROM readers cover a full range of price and performance needs.

Choose from our external CDR-74 or internal CDR-84, with double dust doors and socketed firmware features. Or, if portability interests you, choose our CDR-37. All meet MPC Marketing Council guidelines for Multimedia computing, are Photo CD capable* and fully QuickTime™ compatible.

So next time you hear the words CD-ROM, think MultiSpin™ And remember: it’s hot, it’s fast, it’s only from NEC. And you don’t want to be the last on your block to get one.

Because † is the way you want to go.

CIRCLE 144 ON READER SERVICE CARD.

NEC
Word Processing

Compare Nisus® Compact with WriteNow® 3.0 and see for yourself in black and white why less is more.

Sometimes less is more.
More word processing power for less money.
The best alternative when you only want to buy what you need.

<table>
<thead>
<tr>
<th></th>
<th>Nisus Compact</th>
<th>WriteNow 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested Retail Price</td>
<td>$150</td>
<td>$245</td>
</tr>
<tr>
<td>Toll-Free Tech Support</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Uses Claris® XTND to Read/Write MS® Word</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

POWERBOOK FEATURES:
- Battery Status & Clock Display: Yes
- Sleep Command Within Program: Yes
- Battery Conservation: Yes
- Thick Cursor & Insertion Point Preference: Yes

EDITING FEATURES:
- Headers/footers: Yes
- Paragraph Style: Yes
- Footnotes: Yes
- Custom Keyboard Equivalents: Yes
- Unlimited Undos: Yes
- Noncontiguous Selection: Yes
- Rectangular (vertical) Selection: Yes
- File Management & Retrieval System: Yes
- Graphics Layer: Yes

SPELL CHECKER:
- Words: 135,000
- User Dictionary: Yes
- Skip All: Yes
- Replace All: No
- Auto Hyphenation: Yes
- Thesaurus Words: 1.4 Million
- FIND/REPLACE FEATURES:
- Find All: Yes
- Wild Cards: 5
- Font, Size, Style, Color Sensitive: Yes
- Phonetic Find: Yes

OTHER FEATURES:
- Editable Clipboard: Yes
- Electronic Bookmarks: Yes
- Swap Paste: Yes
- Append Copy: Yes
- 32 Bit Addressing: Yes
- Virtual Memory: Yes
- System 7 Compatible: Yes

"...best new PowerBook product I’ve seen."
Steven Bobker, MacUser 6/92

FREE DEMO!

NISUS Software Inc.
192 S. Cedros Ave.
Solana Beach
CA 92075

Phone (619) 481-1477 ext. 72
Fax (619) 481-6154 ext. 72

See us at MACWORLD Boston, Booth # 5220

If you may already know MacUser’s new consumer columnist, Andy Ihnatko, as one of those public-spirited Help Folder guys who risk life, limb, and/or dignity every month just to answer your questions.

“I really get my kicks,” says Andy, “when I see a letter that gives me a chance to look like a total idiot. [See photo. – Ed.] When someone asked whether airport X-ray machines hosed data, I had an excuse to badger a Logan International security person into letting me ruin package after package in her machine at 11 P.M. When someone asked how to prevent insects from infiltrating his hardware, I ran out to buy a dozen pairs of panty hose, at almost certain risk to my local reputation, to devise a mosquito-netting scheme.”

Andy’s biggest challenge so far — or at least his best excuse for hanging out in tropical-fish stores — was his recent conversion of a Mac 512K into a fully functioning aquarium. It all started when a reader casually asked, “What’s the best way to upgrade a Mac 512K?” and Andy answered with a throwaway remark about turning it into a fish tank. But when requests for copies of the plans for the Macquarium™ started pouring in, Andy began a year-long quest to deliver the goods. It says something about Andy — and we’re not sure what — that he felt honor-bound to satisfy these requests.

“After taking endless measurements, building prototypes, and sacrificing three fishy lives, I completed the Macquarium™.” Andy brags, “Not only is it completely functional but it also makes a handsome addition to any office.”

Andy says building your own Macquarium™ will set you back around $30 — not including the 512K (or comparable-form-factor) Mac. His kit — including directions, patterns, and a complete parts list — is available from ZiffNet/Mac’s MacUser Forum (filename MACQUA.SIT) or the Boston Computer Society (617-625-7080).

No question is too tough or too fishy for consumer advocate Andy Ihnatko, who developed a working Macquarium™ after a reader asked what a 512K Mac was still good for.

---

About MacUser

MacUser

Something Fishy

You may already know MacUser’s new consumer columnist, Andy Ihnatko, as one of those public-spirited Help Folder guys who risk life, limb, and/or dignity every month just to answer your questions.

“I really get my kicks,” says Andy, “when I see a letter that gives me a chance to look like a total idiot. [See photo. – Ed.] When someone asked whether airport X-ray machines hosed data, I had an excuse to badger a Logan International security person into letting me ruin package after package in her machine at 11 P.M. When someone asked how to prevent insects from infiltrating his hardware, I ran out to buy a dozen pairs of panty hose, at almost certain risk to my local reputation, to devise a mosquito-netting scheme.”

Andy’s biggest challenge so far — or at least his best excuse for hanging out in tropical-fish stores — was his recent conversion of a Mac 512K into a fully functioning aquarium. It all started when a reader casually asked, “What’s the best way to upgrade a Mac 512K?” and Andy answered with a throwaway remark about turning it into a fish tank. But when requests for copies of the plans for the Macquarium™ started pouring in, Andy began a year-long quest to deliver the goods. It says something about Andy — and we’re not sure what — that he felt honor-bound to satisfy these requests.

“After taking endless measurements, building prototypes, and sacrificing three fishy lives, I completed the Macquarium™.” Andy brags, “Not only is it completely functional but it also makes a handsome addition to any office.”

Andy says building your own Macquarium™ will set you back around $30 — not including the 512K (or comparable-form-factor) Mac. His kit — including directions, patterns, and a complete parts list — is available from ZiffNet/Mac’s MacUser Forum (filename MACQUA.SIT) or the Boston Computer Society (617-625-7080).

After this, we felt we had no choice but to make Andy our consumer columnist.

“I see myself as a cross between Darkwing Duck and Poor Richard. Eager as I am to cast the light of truth upon the shirking ooze of malfeasance, I also want to share loads of neat info that’s hard to come by elsewhere,” Andy explains.

Apparently going on the theory that a consumer columnist should be an expert consumer, Andy bribed us to say that he’s desperately seeking an original Apple I. Anyone wanting to unload one — or to fink on someone for the consumer-affairs column — can reach Andy c/o MacUser or via E-mail.
When You Need Power
Call the Utility Company

"The best hard disk optimizer on the market"
Steve Costa—MacWeek

"Power Utilities from ALSoft
is a stunner. It's based on well accepted, solid
programs and adds new programs of great value"
Steven Bobker—MacUser

At ALSoft™, Mac utilities are our only business. As a result, each ALSoft utility represents the ongoing efforts of our best and brightest...Mac experts with many years of experience dating back to the inception of the Macintosh. And it's a powerful company-wide commitment to quality, customer satisfaction and innovation that shines through on every utility that carries the ALSoft name.

Optimize Your Hard Disk For Power You Can See

Only ALSoft DiskExpress™ II has the power to truly accelerate your hard disk and keep it that way forever. And it’s power without the price. In fact, patent-pending ALSoft technology makes DiskExpress II so amazingly convenient and intuitive, it works the way you work. You'll never have to worry about your hard disk slowing down again. Even your busiest file servers. Hot new enhancements make DiskExpress II even easier to use. Like Quick Optimization of just the files you want and ALSoft’s incredibly innovative Optimization Index Analysis which lets you control how slow your hard disk can get before DiskExpress II transparently accelerates it again. Now that’s power you can use.

Optimize Your Mac And Save Big

ALSoft Power Utilities™ gives you a powerhouse of 7 performance enhancing utilities engineered to be uniquely powerful and efficient from the moment you plug them in. In addition to the highly acclaimed DiskExpress II, you’ll get the enlightening MasterJuggler™ font suitcase and applications manager, a powerful disk partitioner for flexible information management, a convenient System 7 Apple menu enhancer, a disk activity indicator plus the power to save your screen from damaging burn-in and give all your disks and directories a thorough check-up. ALSoft Power Utilities is so power efficient, it uses significantly less memory, less disk space and less of your Mac’s processing time—just a tiny fraction of other utilities. For power, performance and efficiency, call ALSoft, the Macintosh utility company.

MACINTOSH SYSTEM SOFTWARE

USA SALES 1-800-257-6381 or 1-800-ALSOFT1 • FAX 713/353-9868 • INTERNATIONAL SALES 713/353-4090

CIRCLE 171 ON READER SERVICE CARD.
PUT MORE POWER INTO YOUR POWERBOOK

Introducing Connectix PowerBook Utilities: the first software utility created exclusively for the PowerBook

The world's best selling notebook computer just got better. Now, you can get even more productivity out of your PowerBook® with Connectix PowerBook Utilities (CPU).

CPU extends your battery life! It gives you control over power consumption, and displays accurate battery status, time remaining and other key information in the menu bar. That keeps your PowerBook up and working longer.

CPU protects your sensitive data. Whenever your PowerBook is unattended, all your files are secure, whether your PowerBook is running, shut down, or asleep.

CPU provides much more. Instant sleep and wake, LCD screen saver, keyboard shortcuts, cursor finder, mouseless menu control and over a dozen other enhancements make your PowerBook more effective.

Order Connectix PowerBook Utilities from your favorite software supplier, PowerBook RAM vendor, or direct from Connectix. You can order from Connectix by calling 800-950-5880 toll-free, or faxing 415-571-5195.

Get the power of CPU and put more power into your PowerBook today.

$59 SPECIAL LIMITED TIME INTRODUCTORY OFFER - SAVE $40!

☐ YES! Please send me Connectix PowerBook Utilities (CPU) for only $59. Please add $4 for standard shipping and handling. California residents, please add $4.87 for California state sales tax. This offer expires September 15, 1992.

Name _________________________________________ Company _______________________________________
Address _________________________________________ City _______ State _______ Zip _______
☐ Check enclosed or ☐ VISA ☐ MasterCard ☐ American Express Card # __________ Signature _______
Day phone _______ Exp. Date _______ Signature _______

© 1992 Connectix Corporation. CPU is a trademark of Connectix Corporation. PowerBook is a trademark of Apple Computer, Inc. All other trademarks are the property of their respective holders.

CIRCLE 61 ON READER SERVICE CARD.
Letters

Practicing Without a License

The opening to “A Mac Color Primer” (May ’92, Buyer’s Guide page 4) hit a raw nerve. I strongly object to the notion that desktop publishing “is relatively easy these days: Just buy a Mac, a page-layout program, and a laser printer, and you’re in business.”

As a professional designer and desktop publisher, I’ve spent six years and thousands of dollars perfecting my craft. Because I work alone, I’m an artist, typographer, editor, and power user all rolled into one. It’s insulting to insinuate that a sales slip from an Apple dealer is a license to get into “the desktop-publishing game.”

If you owned a stethoscope, would you call yourself a doctor?

Marcy Poulos
Sparta, MI

Words from the Wise

The letter “Key Words” (June ’92, Buyer’s Guide page 18) perpetuates the common assumption that Microsoft Word’s feature set is the correct one and compares all other products with it. Notice how only Word has all items checked in the features table? The fact that Nisus has numerous features that Word can’t touch — including a full graphics layer, contrary to your features listing — or that WordPerfect deals well with QuickTime and many languages, or that WriteNow can exist in an incredibly small amount of RAM all fall by the wayside when it is assumed that Word is the pinnacle of word-processing prowess. Adam C. Engst via ZiffNet/Mac

I disagree with Sharon Zardetto Aker’s broadbrush statement that color is a useless feature in word processors. Aker is too narrowly limited to paper; color can often supply an additional dimension of information.

As an attorney, I find that colored text is invaluable not only in writing a long appellate brief but also for identifying and organizing the summary of evidence culled from thousands of pages of testimony. If anything, I need more than the eight colors Microsoft Word provides.

More important, a magazine that’s heralding future technology should realize that word processors aren’t limited to black-and-white paper output. Readers can view the text on-screen or use a color printer. Then again, each member of a workgroup might edit a document on-screen, using a different color.

Jay R. Giusti
Chicago, IL

Color is very useful for differentiating text that needs further work. That the color doesn’t print is a major plus for me, because I can print draft copies without weird formatting.

Dear Mr. Sculley ...

In May we asked whether you had switched to System 7 yet. The 2-megabyte-plus RAM requirement came in for its share of abuse. Jeffrey Goldader, of Honolulu, Hawaii, complained, “Why does Apple require System 7 on machines that come with only 2 megabytes of RAM? Get real!” He hacked his PowerBook 100 to run System 6.0.7, which uses less than 1 megabyte of memory. But Mike Gondek, of Chicago, Illinois, thinks the memory argument is pretty silly. “Sure System 7 uses more RAM, but you can buy a 1-megabyte SIMM for $35.”

Lee E. Fischer, of Cambridge, Massachusetts, appears to need a reality check. After being frightened away by the Compatibility Checker’s report, he says, “Apple should bring System 7 into compatibility with users’ existing programs, so that the only expense is for System 7 itself.”

But Deborah L. Alpi, of Pacifica, California, is fed up with the whiners. “I’m tired of complaints about System 7 when there are more than a year’s worth of articles about it as well as several System 7 books. If you upgrade programs on a regular basis, cost and compatibility problems are minimal. I’m always appalled when people insist on using ancient versions of applications and then complain when their systems crash. “System 7 is far more stable than MultiFinder is under System 6. Memory management is more efficient, especially with System 7 Tune-Up. All those whiners should get themselves a PC. My father bought his six months ago, and he still hasn’t installed MS-DOS.”

This month, we want you to show us your shelfware — that piece of software (or hardware) you own but never use. Maybe it didn’t work as advertised, maybe your company thrust it upon you, or maybe you just outgrew it.

Speak Up:
What products are gathering dust on your shelves, and why?

Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.
that is distracting to read. I wish THINK Pascal and THINK C supported color so I could use it to denote new code.

Laurence Harris
Chapel Hill, NC

I can think of several reasons why integrated drawing features are useful in a word-processing program. You can create simple graphics, such as organizational charts, without having to open a second application. Applications with built-in drawing tools often have a separate drawing layer, which means that you can not only place graphics in the text but also over, under, and around it.

Most Mac word processors handle imported graphics abominably. WordPerfect for the Mac is an exception. It distinguishes among several types of graphic boxes, allows you to anchor graphics to a page location, and can automatically assign figure numbers and update them (and their captions and cross-references) if you move the art somewhere else. These capabilities are invaluable to technical writers and are lacking in the current versions of Word and MacWrite.

James W. Horswill
Minneapolis, MN

You play up obscure advantages of Word and ignore real strengths of WordPerfect. Consider these overlooked-but-important features:

• Powerful and easy-to-use macros (not in Word 5.0).
• Complete graphics tools. (Some of us don’t have $400 for FreeHand.)
• Compatibility with other platforms. Many businesses mix PCs and Macs, so compatibility is essential.
• QuickTime movies, along with easy-to-change text and background colors, which make WordPerfect a potential presentation program.
• Friendly, toll-free customer support, with a real person answering the phone (try calling Microsoft).

WordPerfect is not without its faults. One feature you didn’t discuss is typing speed. There’s often a noticeable lag in on-screen text display when I type on my Mac IIX.

Henry F. Domke
New Bloomfield, MO

Contrary to your article, WordPerfect 2.0 does do tables. The Table command is available as a macro that can be run on a full page, creating a table spanning the width of the page or within a text box. The text box can be resized and anchored to other text, which will wrap around it.

WordPerfect 2.0 also contains an outlining feature, and what you describe as a glossary sounds very similar to WordPerfect’s powerful macro capability, which allows me to make stationery and address-label forms and create hanging indents. In light of these revelations from a dedicated, albeit casual, user, it seems that you need to update your features table.

Leland S. Cogan
Lansing, MI

Word 5.0 remains the only word processor with a true Table function. WordPerfect’s “tables” are actually specialized columns and there’s no concept of cells, so working with WordPerfect pseudotables is much harder than working with tables in Word. And all WordPerfect’s “outliner” does is create the look of an outline. You can’t collapse headings or reorganize your work by dragging, as you can with a true outline function. If all you want is the appearance of a table or an outline, WordPerfect may be enough, but if you really need to work with those formats, you should use Word.

Printer Mismatch
You misled readers by comparing our tabloid-sized ColorPoint PSX Model 14 with letter-sized printers from other manufacturers (“Thermal-Wax-Transfer Color Printer,” May ‘92, Buyer’s Guide page 42). Our letter-sized version, the Model 4, would have been 30 seconds per page faster than the Model 14 in your tests, and the former’s $7,999 price compares very favorably with that of the other rated printers.

Using a single-page presentation file to test performance does not give an adequate indication of throughput for printers in a shared environment. The ColorPoint PSX can download multiple-page files as well as multiple files, freeing up the host faster and making users more productive.

Finally, Tektronix’s new Phaser II PXe is not a serious competitor to our Personal ColorPoint PS printer. For $4,999, the Personal ColorPoint PS includes 6 megabytes of RAM and 39 resident fonts. The $4,995 Phaser II PXe has only 4 megabytes of RAM and 17 resident fonts. The Personal ColorPoint PS also provides SCSI hard-drive support and four-color
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 productivitiy. With Canvas, you won't need to hop around as you work, passing your piece from program to program to get things done. And you won't find yourself face to face with significant built-in compromises, either. Because Canvas puts every tool and effect you'll need for just about any design job together in a single coherent package. It's all there. And it's all good. • How good? • Good enough to generate a slew of rave reviews and positive comparisons with programs costing much more. • And good enough to capture virtually every significant industry award there is - from a MacUser Eddy for Best Drawing Program to an Infoworld Buyers Assurance Seal. • Canvas 3. No fat. No side effects. No shin splints. Just supreme drawing satisfaction.
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 fonts, color, internal fonts, custom paper sizes, etc. for most printers.
- Reduction and enlargement from 20% to 400% in 1% increments.
- Smooth rotated text.
- 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™ II, II, and LQ. Also provides powerful enhancements for StyleWriter™ and DeskWriter™ users.

capability, neither of which is available on Textronix’s Phaser II PXe.

Dale Richmond
Director of Marketing
Seiko Instruments USA
San Jose, CA

As a supplier of PostScript-compatible imaging software to Seiko Instruments, GCC, and Pacific Data Products, we were dismayed to read Rik Myslewski’s statement “the performance of PostScript clones rarely matches that of the real thing.” This is not true. I’m sure MacUser has tested enough of today’s PostScript-capable printers to realize that some PostScript “clones” have come along way.

Tom Spillane
Marketing Manager
Phoenx Technologies
Cambridge, MA

Off the Charts

DeltaGraph Professional is good, but it’s not a five-mouse program (see review, June ’92, page 50). The program has at least one major bug: The Option-key characters don’t print in PostScript. This is an obvious coding error and would be forgivable except that it was also present in DeltaGraph 1.5 and DeltaPoint promised that the problem would be fixed in DeltaGraph Professional.

William K. Dolen
Denver, CO

DeltaPoint acknowledges the problem and plans to fix it in version 2.02, a free update that was scheduled for release in August. — AA

Swing Shift

We are appalled at the review given ShiftWorker (June ’92, page 57). Where did your reviewer get the idea that you can schedule employees only in one-hour increments? ShiftWorker can schedule work shifts in increments as small as one minute. In addition, you can schedule virtually any number of employees for any number of shifts. Further, version 1.04 has been shipping for more than a year, although your review listed 1.0 as the current version.

Kenneth J. Wiley
President
Expert Systems
Melbourne, FL

Our reviewer was indeed in error regarding ShiftWorker’s shift-scheduling flexibility. Accordingly, we have raised the product’s rating to 3.5 mice. — KJ

Database Debacle

As longtime developers of custom relational databases for the Mac, we take issue with several assertions in “Database Strategies: Relational Databases” (June ’92, Buyer’s Guide page 60). The four products reviewed are all excellent application generators, but the description and comparison of ACIUS’ 4th Dimension was seriously flawed.

The 4D feature set is the clear leader in capabilities for casual as well as experienced users. Many features listed as new or “on the horizon” for FoxBASE+/Mac and Omnis Seven have long been standard in 4D. In addition, 4D’s many add-on modules provide full-function spreadsheet, drawing, word-processing, and graphing capabilities that the competition only dreams about. Its ability to access data from mainframe and minicomputer systems turns multiplatform and large-application discussions into nonissues.

Your article said that “speed is only a single facet of database management,” yet a significant portion of the article graphically illustrated performance issues that unfairly portray 4D as taking “close to 200 times as long as FoxBASE+/Mac.” We have installed many large 4D systems, including one that has nearly half a million records but still operates satisfactorily on a Mac SE!

Jim Collar and John Andrews
Salt Lake City, UT

Keep in mind that before you can get anywhere with database software, you first have to program it! Therefore, programming time should be just as important a consideration as the speed of the finished application. Programmers charge $40 to $120 an hour, so the ability to code a database in an hour with 4th Dimension looks very attractive next to the day or more required to do the same thing with FoxBASE+/Mac.

You also failed to show how 4D would perform with its 4D Compiler software. I wonder how many people who have databases with more than 100,000 records — which is when 4D first shows a degradation in speed — would hesitate to pay the $889 street price for the compiler, which ACIUS says speeds up 4D by as much as 3,000 times!

John W. Marshall
Naples, FL

Several independent consultants and developers have been unable to duplicate
3,000,007 reasons to upgrade to System 7.

1. Rave reviews.
MacUser gave System 7 its Editors' Choice award. Byte named it the World of Excellence. Software Publishers Association named it a Best New Business Software Product of the Year.

2. One-step installation.
The "Before You Install" disk confirms the compatibility of your software (including NTFS). Then, simply click the icons to install System 7. Any questions? 90 days' toll-free phone assistance included.

3. It's developed quite a following.
Developers have shipped thousands of applications that take advantage of System 7's power. Microsoft, Claris, Lotus, Aldus, Adobe and many more.

4. Runs on your Macintosh today.
System 7 works on all Macintosh computers. To run multiple programs, four megabytes of memory are recommended. Two megabytes are required.

5. Powerful software utilities.
System 7 will let you run the latest software utilities from Apple, including Macintosh PC Exchange, QuickTime and AppleTalk Remote Access.

6. More power out of the box.
Macworld says, "The new Finder is worth the cost alone." System 7 improves the way you organize, view and work with your information. Built-in file sharing lets you share files over a network, simply and easily.

7. Keep your investment current.
The best way to keep up with the latest technology is to stay ahead with System 7. You'll need it to take full advantage of today's applications, hardware and software. And it will help you grow with the future as new technology innovations come along.

Macintosh System 7. If the first seven reasons didn't convince you to upgrade, just ask the three million Macintosh users who have already discovered the power of System 7. Call us at 1-800-538-9696, ext. 185. We'll give you the name of an Apple software reseller near you. And you'll discover the power of System 7. The power to be your best.
the performance degradation you reported for 4th Dimension with large numbers of records in a data file. MacUser owes its readers the courtesy of providing the information needed to duplicate the results or, better, a reevaluation and possibly a retraction of the report. The inaccurate results have not only resulted in confusion among developers and users but have also damaged the reputation of a powerful and flexible product.

Rich Gay
via ZiffNet/Mac

During our testing, MacUser Labs technicians inadvertently used an early prototype of our 4D test database (with compiled code) instead of the final database intended for the benchmark testing. This version-control error caused significant degradation in 4D’s performance.

During our internal investigation, and in discussions with our consultants and representatives of AC/US, other questions were raised regarding the equity of the test suite. Accordingly, we have revised the ratings of the four products as follows: Double Helix, 4 mice; 4th Dimension, 4.5 mice; FaxBASE+/Mac, 4.5 mice; and Omniss Seven, 4.3 mice.

Finally, the article does not reflect the views of Michael Miley, inadvertently bylined as the primary author. We regret the difficulties our errors may have caused Michael, our readers, consultants, and manufacturers and users of the products reviewed. — RM

**The Run-Time Mac**

John C. Dvorak’s notion of the run-time Mac (“Take the Money and Run,” May ’92, page 328) contradicts the metaphor of Macintosh use. Using a Mac as a simple automobile-testing station or cash register belittles the machine’s image. The Mac was created to be a multipurpose tool that is well integrated into the user’s life, a machine on which you can perform a variety of tasks, both professional and amateur, without being constantly reminded that you’re in front of a computer. Dvorak’s run-time Mac would scrap this entire ideal. Macs would be like a throw-away technology found in cheap VCRs, televisions, and calculators.

I’ve seen Macs running cash-register programs sitting almost dormant in ticket booths at cinemas and in computer stores. One thought always pops into my mind: What a waste of a perfectly good Mac.

If IBM had better focus and imagination, instead of making meat scales and clocks, it would have the computer with the perfect interface.

Robert Dewhirst
Lawrence, KS

It’s time for a complete rethinking of the Mac models. Purchasing a computer shouldn’t require extensive computer-assisted data analysis. I offer the following as a first draft of the Mac Simplification Act of ’92:

- Macintosh Run-Time, a component for use in other products.
- Macintosh Classic, an all-in-one low-cost unit for family, student, and part-time business use.
- Macintosh Notebook, a model that’s light in weight, cost, and features — truly for taking notes on the road.
- Macintosh Professional, a notebook computer that’s also the heart of a desktop system.
- Macintosh Desktop, a box that can be configured at the point of sale for any business or educational use.
- Macintosh Poly-Tech, a unit for high-end graphical, scientific, and engineering applications.

With this simple product line in place, Apple will be free to concentrate on my proposed marketing plan: Build ‘em good, price ‘em right, and sell ‘em like crazy.

Wayne W. Higdon
Albany, NY

**Guy’s Job Strategies**

I loved Guy Kawasaki’s article on job hunting (“Get a Job,” June ’92, page 29). It was heartening to read information with an adult perspective that was not condescending, and his comparison of a graduate to a can of Alpo was a gem.

Guy’s point seems to be that no matter what you plan, plot, hope, and dream, you might find yourself doing something far different and definitely surprising 20 years later. I’ve had three or four distinct careers since college, and what I do now thrives because of completely different experiences a generation ago.

Barry E. Cohen
via ZiffNet/Mac

Guy’s advice to potential Apple employees should certainly succeed in reducing the company’s contemptible 10,000-resume-per-month track record. With definitive career counseling such as “Take the shotgun approach” and “Don’t take the shotgun approach,” I realize/
The shortest distance between a Macintosh and a PC.

DOS files on Macintosh.

Now you can work with files stored on 3.5- or 5.25-inch DOS and Microsoft Windows-formatted floppy disks. Just pop the disk in your Apple SuperDrive disk drive or compatible floppy disk drive. The Macintosh desktop displays the disk's icon automatically. (5.25-inch disks require a third-party drive.)

Macintosh ease of use.

Contents of DOS disks are displayed in a window on the Mac desktop just like any Macintosh disk. Files and subdirectories appear as standard Mac documents and folders. Open, save, rename, move, copy or delete them. You can even format DOS floppy disks.

Double-click and go.

The customizable control panel lets you create links between DOS files and Macintosh applications. Then, simply double-click on the file's icon to launch the application. (DOS Lotus 1-2-3 file launches Lotus 1-2-3 for Macintosh, for example.)

Unlimited exchanges.

With Macintosh PC Exchange, any DOS file can be brought into any Macintosh application which reads that DOS file's format. In fact, files created by DOS Windows applications like Microsoft Word, WordPerfect or dBase PageMaker convert instantly to their Macintosh counterparts. Likewise, Mac files can be saved to DOS disks for use with compatible DOS/Windows applications.

Apple Utilities for Macintosh

Macintosh PC Exchange. Finally, moving files between a Mac and a PC is as easy as moving them between two Macintosh computers. So if you'd like the name of an Apple software reseller near you, call us at 1-800-538-9696, ext. 180. They'll tell you more about Macintosh PC Exchange and show you how to bring the Macintosh and PC worlds closer together.
You Saw It Coming!

The First & Only State-of-the-Art, Bulk Mailing Software for the Macintosh!

Enter in all or the beginning of any city and state in the U.S., and AccuZip will add the proper Zip+4, Carrier Route & Postal Bar Code groups allowing you to have many mailing lists within one database. AccuZip can store up to 4GB of data.

AccuZip is CASS Certified by the U.S.P.S.

AccuZip is a Registered Trademark & Software System Inc.

Count of the Year Award Winner

(800) 233-0555

CIRCLE 68 ON READER SERVICE CARD.

LETTERS

Guy Kawasaki recommends that young people go to work for Procter & Gamble because of their training programs. But if they don’t take time to learn how to spell the company’s name properly, they will likely not get past the first interview. It’s Procter with an e. Also the company name has an ampersand, not the word and. This may not be a big deal to most folks, but we P&Gers are kind of sensitive about it.

Gerry Saddlemire
Cincinnati, OH

Contrary to the information on Buyer’s Guide page 14 of the July ’92 issue, in “Pocket Opticals: 3.5-Inch Magnetooptical Drives,” MacProducts’ Magic 128REM drive ships with FWB’s Hard Disk ToolKit.

The correct toll-free number for DeltaPoint, maker of DeltaGraph Professional 2.0 (“Chart Stars,” July ’92, page 92), is 600-387-4304.

The telephone number for information about Hayes Connect 3.0 (Power Tools, May ’92, page 213) is 404-840-9200.

Clarifications

Peter Talbot
Calgary, AB

Canada

Inadvertently followed some of Guy’s advice last year when I got a temporary receptionist job at Apple. I chatted with John Sculley each morning, but I’m sure he has no idea who I am, although I was tempted to include on my résumé “John Sculley loves the way I arrange mail.”

During that time, I interviewed with well-connected people at big, slow-moving companies such as Hewlett-Packard, Informix, Ingres, and Borland. None of them offered me a job, but one woman gave my name to her favorite headhunter, who ended up finding me my current position at a high-tech public-relations firm with really cool clients doing noteworthy things.

Pamela Laurence
Palo Alto, CA

Guys advise young people to work for Procter & Gamble because of their training programs. But if they don’t take time to learn how to spell the company’s name properly, they will likely not get past the first interview. It’s Procter with an e. Also the company name has an ampersand, not the word and. This may not be a big deal to most folks, but we P&Gers are kind of sensitive about it.

Gerry Saddlemire
Cincinnati, OH

Clarifications

Contrary to the information on Buyer’s Guide page 14 of the July ’92 issue, in “Pocket Opticals: 3.5-Inch Magnetooptical Drives,” MacProducts’ Magic 128REM drive ships with FWB’s Hard Disk ToolKit.

The correct toll-free number for DeltaPoint, maker of DeltaGraph Professional 2.0 (“Chart Stars,” July ’92, page 92), is 600-387-4304.

The telephone number for information about Hayes Connect 3.0 (Power Tools, May ’92, page 213) is 404-840-9200.
We’ll show you how to play the media better than Bush, Clinton and Perot put together.

QuickTime Starter Kit. How well you communicate has never been more important. That’s why Apple created QuickTime. The ability to paste digital video, animation and sound into your presentations as easily as pasting graphics into text. So if you’d like the name of an Apple software reseller near you, call us at 1-800-538-9696, ext. 175. They’ll tell you more about the QuickTime Starter Kit and show you how to communicate your ideas more powerfully than ever.
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.

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

There's more. So pick up the phone. Dial 1-800-666-2904.

And tell everyone to stand back.

FIFTH GENERATION SYSTEMS, INC
Asante™, the leader in Macintosh networking introduces an array of messaging tools that bring the personal touch back to inter-office communication.

Tools that make this the only sure way to get your message delivered.

With PersonToPerson™ software, you can now send voice mail messages across the network, check whether a co-worker is in or out of the office, or use the electronic Post-it™ Note window to leave someone a message. You also get a built-in calendar with timed reminders for appointments. And the personalized screensaver lets you leave messages on your screen while you’re away from your desk.

It’s all done without the added expense of a dedicated Macintosh® server. And our simple, one-button installation loads the program as an INIT.

And because PersonToPerson automatically sends messages when you attach your Macintosh to the network, it’s a great tool for PowerBook users who create and send messages when out in the field.

So now your company or departmental work group can interact the best way there is—PersonToPerson.

Resellers: Asante products are available from Ingram Micro, Tech Data and Macamerica.
The Fifth Mouse

Vanished! The missing mouse was nowhere to be seen. Where did it go — and what would it take to bring it back?

The rain made a noise on the cheap tin roof like — well, like rain on a cheap tin roof. It was late. I was ready to call it a night when the phone pierced the darkness with its familiar darkness-piercing ring.

"One of our mice is missing," cried the agitated voice at the other end.

"I'll get right on it."

I recognized the voice right away; it was Phil "Eep" Icon, the brilliant, peripatetic president and founder of Mouse Trap Software.

As I drove down to Mouse Trap Plaza, the rain drove down on the windshield like — well, like rain on a windshield. I went over the facts as I saw them and started formulating a game plan.

Fact: Mouse Trap had built its global software empire from its humble origins in a Silicon Valley garage, based on a philosophy of innovation, consumer-oriented pricing, and quality technical support. "We didn't just build a better Mouse Trap," Icon was fond of saying. "We price it right, and we keep our customers happy."

Fact: Icon was proud of his track record with reviews in MacUser, the premier product-picking publication of the Macintosh industry. Every one of his products had received a four-and-a-half-mouse rating or higher. But now, judging by his urgent plea on the phone, things were different.

"Mouse Works, from Mouse Trap, gets three and a half mice." As I read from the review, Icon paced the floor anxiously, like a — well, like an anxious floor-pacing software-company executive whose product had just received three and a half mice.

"Mouse Works does it all, according to its ads. And although this latest entry in the integrated-spreadsheet/word-processor/slicer/dicer category may indeed do it all, it lacks some of the ease of use that . . . ."

"Looks like a fair review," I said, after finishing "The Bottom Line." "But how'd they find out about the Maltese Easter egg?"

"Forget the egg!" shouted Icon. "Where's the missing mouse? We've always gotten at least four and a half mice. So what's wrong with Mouse Works? Or," he said, as his eyes narrowed to two suspicious slits that had the look of — well, of two suspicious narrow slits. "Or . . . is there something wrong with MacUser?"

"Look, Icon, times are changing. Software's getting better. It takes more to keep up with the competition these days. And, besides, three and a half mice isn't a bad rating at all.

Deflator Mouse

"Look at it this way, Icon. Remember your first product, Mouse Write, way back in 1984. You got five mice for that one, remember? Worked with your choice of two fonts, as long as they were Helvetica and Courier, remember?"

"Yeah, I remember. So?"

"Well, so nowadays Mouse Write wouldn't even rate a zero on the MacUser mouse scale. Times change. You just gotta keep up — or your mice are gonna drop like flies."

"Icon was still alarmed. "But . . . three and a half mice?"

"Relax — even three mice ain't so bad."

"Oh yeah?"

"Yeah. Here's how mice are handed out. Five mice — well, that's a product you just gotta have. Can't go wrong with this one. Four mice — not a bad little product at all. Maybe the MacUser editors were disappointed by a feature or two, maybe the competition's ahead here and there. But if you get a good deal on this guy, or if the one badly implemented feature is something you don't use anyway, go for it. Three mice: Well, three mice is the cutoff. Anything three mice or above is generally worth your money. Maybe there's something better out there — more features, better support, lower price. But if you particularly like something about a particular three-mouser, don't hold yourself back."

Icon was relieved. But then a new wave of concern drifted across his face: "What about . . . what about two mice?"

"You don't want a two-mouser, Icon. And neither do your customers. Two mice means
trouble: Something’s cheesy in the state of Denmark. A two-mouser product doesn’t work the way it’s supposed to. Or it has nasty bugs that can destroy your data or even interfere with other products.”

“And... one mouse?”

“Stay away. Don’t touch. Keep out. A one-mouser means there’s some kind of fatal bug. If you’re lucky, it’ll just be fatal to your data or your Mac.”

“I get the picture. But three mice...”

“Three mice is fine. And you’ll be seeing lots more products getting three mice. It’s just a shift in the scale. And an overdue one at that.”

“How do you figure?”

“Look, given a choice, MacUser would rather cover a good product than a lousy one. They’d rather cover an innovative, cutting-edge product than a me-too one.”

“Yeah... so?”

“So this: What do you get when you cover more good products than bad ones, more innovators than copycats? You get a lot of highly rated products. You get a lot of mice. So you need to recalibrate from time to time to make sure there’s enough room at the top of the scale. But as long as you still measure all the competing products on the same yardstick, it’s still a fair game.”

Dances with Mice

“OK, OK. So three and a half mice isn’t so bad. But, listen...” Icon’s voice suddenly became hushed: “We gotta get that mouse back. What’s it gonna take? What’s left to invent?”

“Gee, Icon. I dunno. That kind of research is kinda expensive.”

“Name your price,” said Icon as he pulled out his checkbook.

“Cash only,” I said.

“Cache only? That’s the secret to the fifth mouse? I should have figured it was something like that.” Icon was already mentally redesigning the architecture of his software to accommodate a new RAM-caching scheme.

“Now listen to me, Icon. Forget the cache — and the cash. There’s no mystery to getting five mice. Your customers just want products that get the job done. You don’t have to reinvent the wheel to get that fifth mouse; you just have to make it spin more smoothly.”

“Take word processors. Even a simple feature — like counting words — never seems to work quite right. It can vary by as much as 10 percent, depending on which word processor you’re using.”

“Or printers — you know the ‘rated engine speed’ most manufacturers cite in their product literature? That’s got about as much to do with how fast the printer’ll go as the top speed painted on your car’s speedometer.”

Icon’s mind was already spinning, and so was my head. My job here was done, while Icon’s was just beginning. Outside, the rain had cleared up — and so had the case of the missing mice.
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 breathtaking 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 8MB 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.)

©1991 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. Thunder/24 is a trademark of SuperMac Technology. All other brands and product names are trademarks of their respective holders. This ad was produced using SuperMac's color displays and graphics cards on Macintosh computers.
If you think the only way to avoid running out of memory is to avoid running a couple of your favorite applications, think again. Think about all those memory-hogging fonts and sounds you've got stuffed into that bulging System File. Then do what over 200,000 resourceful Mac users do every day. Instead of closing your applications, open a Suitcase.

Suitcase is the award-winning utility that lets you park your growing collection of fonts, DAs, FKEYs and sounds outside your System File. Thereby giving you the maximum amount of memory for running more applications, building bigger documents and doing other useful things.

What's more, Suitcase compresses your screen font and sound files by up to 60%. Thereby giving you that much more precious disk space to work with. It even lets you put your screen and printer fonts on a server for all to share. Thereby making each disk on the network that much more spacious.

The more resources you have—and the more organized you are—the more memory and disk space you'll save.

But whether your dividends are measured in megabytes or merely in Ks, Suitcase is guaranteed to save you gigabytes of aggravation.

Even if you're operating in System 7. Because System 7 still stuffs your resources into your System File. And System 7 still makes you close down all your applications and restart your Mac each time you install a new font.

Which is a real pain in the, uh, system. Suitcase, on the other hand, gives you unlimited access to all your resources. And total control over how you organize them. Each suitcase can pack up to 800 fonts, 64 DAs, and any number of FKEYs and sounds.

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

Tips are optional. But here's one for those of you who find font ID conflicts even more irritating than running out of memory.

Get Suitcase. It eliminates them.

Call us at 1-800-666-2904. We'll tell you about our vaunted 24-hour toll-free technical support.

We'll also tell you that Suitcase is backed by a one-year money-back guarantee. So you can be sure this baggage will live up to its claims.
Check It Out

When you think about it, buying software and hardware is like voting for president. Of the dozens of substandard schmoes originally available, you vote for the one you hate the least, and if you make the wrong decision, you’re stuck with it for the next four years. Granted, a word processor doesn’t have the power to launch nuclear missiles at Canada, but you get the idea.

It shouldn’t be like this. I mean, you don’t have these problems when you buy pants. You go to the pants store, find someone with a name tag, and say, “Sell me some pants.” They show you the pants they have in stock — a small assortment that nonetheless covers the full spectrum of pants needs for just about everyone. You get to try the pants on, and if they’re not exactly what you need, the pants person will work to find you a pair that fits. If you end up buying a pair, you can come back a week later, offer some lame excuse, and get your money back. No wonder the number of satisfied pants owners in America exceeds that of computer owners.

All I want to say is that being a Mac consumer in this day and age isn’t the piece of cake it might have been 10 years ago. In the interests of making your road a little wider, a little smoother, a little flatter, and with more public lavatories right where you need them, we present to you . . . me! My charter is to fight for the rights of all Mac consumers, to root out slimeballs wherever they may be, and to change the names to protect the innocent (neatly dodging another pesky lawsuit). Here’s how I propose to do it:

No Gratuitoius Violins

Sticking It to the Twits. There’s a reason why “60 Minutes” is such a popular show. Viewers don’t tune in to hear about the latest 12-year-old concert violinist or about the lady in Philadelphia who built a two-story youth center entirely out of discarded egg cartons without government funding. People tune in because they love a good scandal; there’s no better way to spend a Sunday night than hearing about a baby-food company that tried to sell used brake fluid as 100-percent grape juice. So when a company tries to pull similar shenanigans with the members of the Mac community, I’ll look into it and set you hip, pronto.

Essential Consumer Information. You’ve got laws that protect you as a consumer. They won’t do you much good if you don’t know about them, though (oddly enough, manufacturers don’t usually volunteer this kind of information). In addition, there are simple tips and techniques for locating sources of software and hardware and for not getting taken to the cleaners when you decide to make a buy. There are even ways — hushed, arcane methods, some involving a forest glen, a full moon, and nudity — of getting useful information and answers from Apple Computer. I’m planning to present you with wheelbarrows of information as useful as this, if not usefuller.

Occasional Oscar™ picks. As the only computer-industry columnist providing regular coverage of the Oscar race, I hope to be deluged with free movie tickets, promotional gewgaws, and studio-sponsored press junkets to exotic locales. So sue me.

A Little Humor. Hey, fighting injustice ain’t all doom ‘n’ gloom. Keeping a little perspective on your petty little crises of consuming may help prevent the next one. If you want all your activism to be earnest and dour, stick with Ralph Nader. Plus it really helps pad my word count. (See, there’s a joke right there.)

That, in a nutshell, is what I’ve got planned. If you have any pressing consumer-related questions, have had a particularly rapturous or hallucious experience dealing with a certain company or product, or just want to get something off your chest besides the shirt off your back, then by all means drop me a line and fill me in. Devotees of the USPS can address their correspondence to MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Those of you who are hip with electronic mail can message me via CompuServe (72511,204), America Online (andyi), or the Internet (andyi@world.std.com).

First Blood

Just to give you a taste of the sorts of issues I’ll be discussing, let’s kick things off with a look at CheckFree. It’s an electronic service that lets you pay your bills, not with the pre-Revolutionary method of writing and mailing out paper checks but by the Jetson-age method of electronically transferring funds from your bank account directly into the payee’s. Using either the checking software provided by CheckFree or a third-party financial package that supports the CheckFree...
service (such as Intuit’s Quicken), you specify who’s to be paid, how much, and when. The software then transmits this information via modem to the CheckFree Corp., which then handles the electronic transfer of funds through the Federal Reserve. If the payee can’t accept electronic payments, CheckFree will laser-print and mail standard paper checks.

Both the electronic and the paper payments appear on your monthly bank statement; your local bank treats the electronic checks made via CheckFree just like traditional paper ones.

CheckFree is a phenomenally slick service, and it offers a glimpse at what all banking services will be like in the not-too-distant future. Here in 1992, though, the system still seems to have a few holes. According to the reports from disgruntled CheckFree users, it’s hardly a fail-safe system. In the time since CheckFree became available for the Mac, reports of electronic payments that either never reached the payee or were posted late have appeared fairly regularly on on-line services. The problems seem to crop up because there are several links in the electronic-payment process. First, of course, there are the users. The CheckFree software is well thought out and reports all problems to users, but nonetheless it’s very easy for someone who hasn’t read the manual to go to bed, secure in the tragically false knowledge that payments have been made, without actually having completed the few necessary steps for transmitting payment info to CheckFree. Also, the second half of the snafu equation is picked up by the payee. Unfortunately, not all the people you send checks to can handle electronic money transfers gracefully. Because all-electronic payments don’t come accompanied by a payment stub, a suitably incompetent lending institution can post your payment incorrectly. Worse, many companies delay posting electronic payments for as many as ten business days. You did everything right, CheckFree did everything right, but nonetheless your mortgage payment shows up almost three weeks late — a scary scenario.

For its part, CheckFree is very upfront about the inherent limitations of its service. The company recommends that before you use CheckFree, you contact all your regular payees directly and inform them that you want to make your payments electronically. CheckFree also recommends that you make your first set of payments weeks in advance and follow up on each one carefully. Finally, if CheckFree somehow messes up and fails to make a payment for you by the date you specify, it’ll pay whatever late fee the payee sticks you with — as much as 50 bucks. But if the payee doesn’t post your payment in time because of its own lack of electronic know-how or if CheckFree has to print a check and send it out via snail mail and it arrives late, you’re on your own. Also, practically nothing can reimburse you for any damage to your credit rating or the possibly serious repercussions of a late payment.

There are good points, however. Whether I called as an ordinary consumer or as an investigative hound frenzied by the scent of fresh red ink, the folks at CheckFree were helpful and forthcoming with information. It would also be grossly unfair not to mention that there are thousands of people who use CheckFree every month without a single problem.

**My Two Cents’ Worth**

CheckFree is a service whose time will undoubtedly come one day — here and now, though, it’s just plain impractical. Sure, there can be delays when you mail checks the old-fashioned way, but at least you’re using a system you already know and the payee will be sure to get a form of payment that it’s comfortable with. On top of all that, CheckFree is pretty expensive: $9 a month for as many as 20 transactions and $3 for every 10 transactions thereafter. That’s enough to get The Disney Channel and Cinemax for a month, folks.

Almost any home-finance program can automatically print checks on customized dot-matrix or laser-ready banking stock. If you’re writing so many checks that the task of putting those preprinted checks in the mail and licking the envelope flaps every month is a crippling, demoralizing physical burden, you can clearly afford to hire an accountant to handle all that stuff for you.
VideoSpigot.
Pour video into your Mac just like the professionals.

"VideoSpigot is one of the most productive tools for conceptualizing in TV design. Its simplicity and power open the door to new experiments in multimedia." - Joseph Prieboy, Macintosh Consultant, Home Box Office, Inc., New York, NY

"With VideoSpigot, three-dimensional data such as flow analyses can now be communicated via digital QuickTime movies. Thus, we provide viewers with interactive control over the information, greatly enhancing their comprehension." - B. Scott Ruble, The Dow Chemical Company, Midland, MI

"Putting video clips featuring key speakers into our Persuasion documents brings a real sparkle to HMO presentations. VideoSpigot makes it easy to incorporate all sorts of things in a dynamic medium." - Sean Harrington, Health Net, Woodland Hills, CA

"Now it's simple to include video in our clients' computer-based training programs. VideoSpigot's QuickTime capability makes every Macintosh into a platform for delivering interactive communications." - John Fishback, P&P Studios Inc., Stamford, CT

"When people ask how we get such a clean capture of digitized video, it's satisfying to say it's done really inexpensively— with VideoSpigot. For pre-visualizing, you can't beat it for consistently flawless results." - Harry Marks, Marks Communications, Hollywood, CA

More than 20,000 users. See SuperMac's award-winning VideoSpigot and VideoSpigot Pro in action... and you, too, can become a QuickTime moviemaker. To find the nearest reseller call 800-334-3005. For immediate information via fax, call SuperFacts' 800-541-7680. (In the 408 area, call 524-4797.)

© 1992 SuperMac Technology. All rights reserved. SuperMac, SuperMac Technology, and VideoSpigot are trademarks of SuperMac. In no event shall SuperMac be liable for any indirect, special, incidental, or consequential damages. Windows and Microsoft are registered trademarks of Microsoft Corporation. QuickTime is a trademark of Apple Computer, Inc. Adobe Premiere is trademarked software of Adobe Systems Incorporated. All other brands and product names are trademarks of their respective holders.

CIRCLE 155 ON READER SERVICE CARD.
Microsoft Excel 4.0

Upgrade

$88

Now, Mac Zone makes it easy to move up to the unprecedented new power and ease that Microsoft Excel version 4.0 offers you. Simply mail or fax us page 1 of your Microsoft Excel User’s Guide or disk 1 of Microsoft Excel for the Mac and you can upgrade to Microsoft Excel version 4.0 today! Then you’ll see for yourself just how easy power can be.

Microsoft #04545

Full Version

$294

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 #00227

- New customizable toolbars give you instant access to the right set of tools for your work.
- Autosum™ lets you automatically sum rows of numbers with a click on the toolbar.
- Wizards are interactive outline tutorials that walk you through tasks, including chart creation, to give you instant access to the most common options.
- Autofill recognizes trends in your data and intelligently extends them as far as you’d like.
- Drag and Drop lets you quickly move data with your mouse from one area of your spreadsheet to another.
- Best Fit automatically re-sizes column widths to fit the longest string of text or numbers.

Plus, you get all the traditional Excel tools you’ve come to expect and rely on:
- Scenario Manager lets you change multiple assumptions to examine different scenarios of the same model and review a summary of these multiple scenarios.
- Analysis ToolPak includes the most extensive financial, statistical, engineering and scientific functions of any spreadsheet, including ANOVA, regressions, histograms, Bessel functions and many more.
- Crosstabs lets you easily create reports from your databases. A Crosstab Report Wizard helps automate the creation of these reports so you can understand relationships in your data.
- Workbooks lets you group and store related files together, which makes it easy for you to retrieve all of your related worksheets.
- Data Consolidation enables you to combine data from an unlimited number of worksheets into a summary report.
- Outlining allows you to look at your worksheet in any level of detail.

- = System 7 Compatible  / = Money Back Guarantee

OTHER MICROSOFT PRODUCTS

<table>
<thead>
<tr>
<th>SKU</th>
<th>SYS/7/MBG</th>
<th>ZONE PRICE</th>
<th>AWARDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Word 5.0 #04696</td>
<td>✔</td>
<td>$294</td>
<td>❌</td>
</tr>
<tr>
<td>Microsoft Word 5.0 Upgrade #00596</td>
<td>✔</td>
<td>$124</td>
<td>❌</td>
</tr>
<tr>
<td>Microsoft Power Point 2.01 #01220</td>
<td>✔</td>
<td>$244</td>
<td>❌</td>
</tr>
<tr>
<td>Microsoft Office 2.5 #00427</td>
<td>✔</td>
<td>$478</td>
<td>❌</td>
</tr>
<tr>
<td>Microsoft Works 3.0 #00567</td>
<td>✔</td>
<td>$154</td>
<td>❌</td>
</tr>
</tbody>
</table>

LIVING IN DENMARK OR SWEDEN?

Call for a FREE Mac Zone Scandinavia Catalog

Sweden: 08-665-09-90  fax: 08-661-80-70
**Expanded Shipping Hours!**
**Place Your Order till 2 am E.T. for Same Day Shipping • Only $3**

### QUALITY STORAGE DRIVES... AT AMAZING PRICES

**52 MB Quantum External HD**

$358

Our 52MB Quantum is not only fast and reliable, but attractive and ergonomically pleasing as well. Some of its features include: 3.5' LPS drive type, an average access time of less than 17 milliseconds and a throughput speed of 2 to 4MB per second. DPI #04880

- Compact, space-saving chassis: Connor, Fujitsu and Quantum externals
- 2-Year limited warranty: Quantum and Syquest
- Top-quality components by PLL, the leading manufacturer of after-market hard drives

#### SKU | Formatted MB | Drive Type | Drive Mechanism | Access Time | Throughput MB/Sec | ZONE PRICE | Cost/MB
--- | --- | --- | --- | --- | --- | --- | ---
04880 | 52 | 3.5'LPS | Quantum | 17 | 2.0-4.0 | $358 | $6
04881 | 105 | 3.5'LPS | Quantum | 17 | 2.0-4.0 | 499 | 5
04882 | 240 | 3.5 | Quantum | 16 | 5.0-10.0 | $848 | 4
05367 | 330 | 3.5 | Fujitsu | 12 | 4.0-5.0 | 1358 | 3.2
05365 | 520 | 3.5 | Fujitsu | 12 | 4.0-5.0 | 1584 | 4.3
04451 | 45 | 5.25" | Syquest | 19 | 1.2 | 548 | 12
04452 | 88 | 5.25" | Syquest | 19 | 1.2 | 698 | 8

![SyQuest 44MB Cartridge](image_url)

**CALL NOW FOR OUR LATEST COMPETITIVE PRICES!**

- **Plus/SE**
  - CPU: Classic
  - # of Slots: 4
  - MB After Upgrade: 80
  - ORDER Part #: 03428
  - MB Module: 1
  - Price/Module: $34

- **Classic**
  - CPU: Classic with adapter
  - # of Slots: 2
  - MB After Upgrade: 80
  - ORDER Part #: 03428
  - MB Module: 1
  - Price/Module: $34

- **MAC II**
  - CPU: Mac II, lcx, IIIc, IIIci
  - # of Slots: 8
  - MB After Upgrade: 80
  - ORDER Part #: 03579
  - MB Module: 1
  - Price/Module: $42

- **MAC II FX**
  - CPU: Mac II FX, IIIc
  - # of Slots: 8
  - MB After Upgrade: 128
  - ORDER Part #: 00849
  - MB Module: 16
  - Price/Module: $996

- **QUADRA 700,900**
  - CPU: Quadra 700, 900
  - # of Slots: 16
  - MB After Upgrade: 128
  - ORDER Part #: 00848
  - MB Module: 8
  - Price/Module: $498

- **POWER BOOK**
  - CPU: PB 100/140/170, PB 140/170
  - # of Slots: 1
  - MB After Upgrade: 80
  - ORDER Part #: 00591
  - MB Module: 2
  - Price/Module: $148

- **LaserWriter NTX**
  - CPU: LaserWriter NTX
  - # of Slots: 12
  - MB After Upgrade: 70
  - ORDER Part #: 03586
  - MB Module: 1
  - Price/Module: $40

- **SE/30, IIsi**
  - CPU: SE/30, IIsi
  - # of Slots: 8
  - MB After Upgrade: 80
  - ORDER Part #: 03428
  - MB Module: 1
  - Price/Module: $34

- **LC/LC II**
  - CPU: Mac LC/LC II Classic II
  - # of Slots: 2
  - MB After Upgrade: 80
  - ORDER Part #: 00849
  - MB Module: 4
  - Price/Module: $159

**Memory Upgrades**

- **FREE! SIMM Installation Guide**

**Inexpensive, Safe and Easy**

Multi-tasking with today's memory-hungry applications eats up memory—lots of memory. System 7 alone consumes almost 2MB! Aldus PageMaker blocks out well over 2MB. Limited memory means limited efficiency. Increase your multi-tasking capabilities today by installing our high-quality SIMMs (Single Inline Memory Modules) and you'll never again have to quit from your spreadsheet to pluck a single fact from your database.

**Plug-and-Play Installation**

Best of all, SIMMs are easy to install—simply open your Mac case and plug them in. All you need is a SIMMs and your installation kit in your hands tomorrow.

**Top-Quality SIMMs**

Unlike many direct marketers of SIMMs, here at the Mac Zone we do not carry the slower 100 and 120 nanosecond (ns) SIMMs. We carry only the ultra-fast 70 and 80 nanosecond models.

**Lifetime Guarantee**

We offer a complete lifetime guarantee on all our SIMMs. With our $3 overnight delivery you can have your SIMMs and your installation kit in your hands tomorrow.
Design It Yourself and Save!
The Tools You Need To Make A Lasting Impression

$159 DesignCAD 2D/3D

DesignCAD is a revolutionary professional computer-aided design and drafting package that provides complete 2D drafting and 3D modeling in one package. It’s designed for engineering (mechanical, architectural & electrical), animation, desktop publishing and multimedia applications. DesignCAD provides you with all the speed and accuracy you need to manipulate complex two- and three-dimensional designs. File support for DXF, IGES, XYZ, PICT and RIB (MacRenderMan).

- **DesignCAD is easy to use:** Tests prove that DesignCAD’s user-friendly interface allows you to quickly produce complicated drawings in a fraction of the time many competing products require. Flexibility and power found within DesignCAD means you save time and money! DesignCAD is truly the CAD system that ANYONE can use.
- **DesignCAD saves you money:** DesignCAD has all the power and utility of programs costing hundreds of dollars more.
- **Software compatibility built-in:** Along with the extensive hardware support, you get software compatibility. DesignCAD comes with file transfer utilities (at no extra charge, of course!) that let you read and write files in other formats such as IGES, DXF, HPGL, XY or XYZ coordinates, ASCII text files, EPS, PostScript and PICT or from most other CAD systems. And DesignCAD is very useful for desktop publishing systems such as Aldus PageMaker, Quark Express, Microsoft products and others!
- **DesignCAD offers fully integrated 3D geometry:** Need 3D capability? DesignCAD has you covered. Other drafting programs require you to use two software packages or added modules to perform 3D designs. DesignCAD provides you with a fully integrated 3D package based on a powerful 3D mathematical foundation. And you get excellent 2D drafting support as well!

**DiVA VideoShop**

$398

Create & edit sophisticated, attention-grabbing QuickTime movies with DiVA VideoShop. Use the recording module to capture video clips. Edit movies with copy-and-paste simplicity, then add effects, overlays, titles and up to 16 video tracks. Plus, you get a CD containing over 300 movies and sounds. FREE: Diva #00602

**MacGlobe**

$44

MacGlobe is the geography tool for anyone whose interests transcend their own time zone. It provides stunning country maps and global information that you can use for presentations, overheads and reports. PC Globe #04328

**MacUSA**

$32

MacUSA captures the rich panorama of life in America and puts it right in the palm of your hand. MacUSA is the ultimate national portrait, endlessly entertaining and informative, loaded with colorful maps and charts, even state flags and state songs. PC Globe #05479

**Design Your Own Home:**

- Architecture #03609 ............................................ 58
- Landscape #03610 ................................................ 58
- Interiors #03611 ..................................................... 58
- Sprout! #05085 ...................................................... 46

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. Sprout! is a complete computer planning tool for vegetable gardeners. Abracadata
Do It Quicker, Sharper with Aldus
Mac Zone Is Your One-Stop Desktop Design Resource

Aldus PageMaker 4.2
$494

- FREE Aldus PrePrint 1.5
- Aldus Additions
- System 7 Savvy
- Numerical Control
- Improved Performance
- Hotlink to Aldus FreeHand 3.1

This is it. The one and only PageMaker desktop publishing powerhouse from Aldus. The new System 7 Savvy version 4.2 is packed full of enhancements and features. There's a new hotlink between PageMaker and Aldus FreeHand 3.1. By taking advantage of the Apple Events, this hotlink allows you to update placed EPS files without leaving the PageMaker document. PageMaker 4.2 also supports other standard System 7 features such as Subscribe, Balloon Help and TrueType. And Aldus is now shipping PrePrint with PageMaker 4.2. With PrePrint you can produce color separations of any PageMaker publication and enhance and correct TIFF images.

Some of the other new enhancements to PageMaker include: a control palette for precise numeric placement and scaling of objects; User-interruptible screen redraw; baseline-to-baseline leading; page sizes up to 42"x42" and much more. Aldus #04573

Aldus IntelliDraw
$194

- Complete set of standard drawing tools makes learning easy.
- Smart graphic objects easily link elements in your document for super easy updates and changes.
- Full text capabilities offer flexible options
- Automatic assistance with aligning, sizing and orienting objects helps you create accurate drawings quickly.
- Create symbols with clones of any graphic that can be changed automatically when you change the master.
- Symmetragon and Connectiton tools help you quickly produce symmetric shapes and connect new shapes to existing objects.
- Intelligent templates and clip art have pre-defined relationships built-in to save you time.
- Sticky connectors help you create interactive, dynamic drawings.
- Dimension lines help you dimension drawings and run what-if scenarios.

New from Aldus, IntelliDraw is an exciting new type of drawing program that gives you an easy new way to visually experiment, refine and draw your ideas. Innovative smart tools link graphics in your drawing so they respond to changes automatically, making IntelliDraw one of the fastest ways to create dynamic drawings. You'll create visual what-if scenarios with features like intelligent clip art & templates, automatic symmetrical objects and dimension lines. You also get auto-alignment, shape blending, arrows & dashes, powerful text handling capabilities, unlimited layers, color gradients, easy object animation, slide show mode, standard draw tools and more. You can even share files seamlessly between Mac & Windows versions! Aldus #05481

System 7 Compatible • Money Back Guarantee
SuperOffice $218

Stop rummaging around your desktop for the information you need to get the job done. SuperOffice puts everything you need right at your fingertips.

If you're a busy business person with dozens of appointments, customers and commitments, SuperOffice can help you get on top of the information maze and stay there. SuperOffice is a fully integrated, multi-or single-user database system for use on PC/Windows and Apple Macintosh.

The SuperOffice package provides you with an excellent set of organizational tools. You get a diary for tracking your daily activities, an advanced time manager, a to-do list, a planned activities follow-up utility, a customers file to keep track of key contacts, letter/fax/spreadsheet templates, four types of reports (customers by user-definable categories, customer list, mailing label and customer follow-up), and much more.

SuperOffice #04966

![SuperOffice Competitive Upgrade](#)

SuperOffice 5 User #00957 $998

SuperOffice 10 User #00956 $1058

**It's easy to use.** SuperOffice uses only a few screens, and it prompts you for all entries. You can choose to run the program with the intuitive ease of pull-down menus or the speed and simplicity of command and "speed" keys. SuperOffice window assemblysemble familiar desk items, e.g., Post-it notes, calendar pages, index cards and paper clips.

**It's flexible.** You get user-definable system setup, user-definable spreadsheet and word processing templates, user-definable contact classification fields and more. Going on a business trip? Export the data you need from SuperOffice and update the master data file with the new information when you get back.

**It's compatible with what you're using now.** You can access most popular business software from within SuperOffice: Microsoft Word, Microsoft Excel, PowerPoint, MacWrite, Aldus PageMaker, WordPerfect, Lotus 1-2-3, Ami Pro and others are but a few of the supported applications.

**SuperOffice Competitive Upgrade #01001 $69**

**SuperOffice 10 User #00956 $1058**

SuperOffice puts everything you need right at your fingertips.

If you're a busy business person with dozens of appointments, customers and commitments, SuperOffice can help you get on top of the information maze and stay there. SuperOffice is a fully integrated, multi-or single-user database system for use on PC/Windows and Apple Macintosh.

The SuperOffice package provides you with an excellent set of organizational tools. You get a diary for tracking your daily activities, an advanced time manager, a to-do list, a planned activities follow-up utility, a customers file to keep track of key contacts, letter/fax/spreadsheet templates, four types of reports (customers by user-definable categories, customer list, mailing label and customer follow-up), and much more.

SuperOffice #04966

![SuperOffice Competitive Upgrade](#)

SuperOffice 5 User #00957 $998

SuperOffice 10 User #00956 $1058

**It's easy to use.** SuperOffice uses only a few screens, and it prompts you for all entries. You can choose to run the program with the intuitive ease of pull-down menus or the speed and simplicity of command and "speed" keys. SuperOffice window assemblysemble familiar desk items, e.g., Post-it notes, calendar pages, index cards and paper clips.

**It's flexible.** You get user-definable system setup, user-definable spreadsheet and word processing templates, user-definable contact classification fields and more. Going on a business trip? Export the data you need from SuperOffice and update the master data file with the new information when you get back.

**It's compatible with what you're using now.** You can access most popular business software from within SuperOffice: Microsoft Word, Microsoft Excel, PowerPoint, MacWrite, Aldus PageMaker, WordPerfect, Lotus 1-2-3, Ami Pro and others are but a few of the supported applications.

**SuperOffice Competitive Upgrade #01001 $69**

**SuperOffice 10 User #00956 $1058**
Manage Your Data More Effectively
We Carry the Utilities You Need to Keep a Step Ahead

<table>
<thead>
<tr>
<th>PERSONAL PRODUCTIVITY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>After Hours Software</td>
<td>SuperOffice Corp</td>
</tr>
<tr>
<td>03908 Touch Base 2.0</td>
<td>04966 SuperOffice Single User</td>
</tr>
<tr>
<td>Altai</td>
<td>01001 SuperOffice Competitive Upgrade</td>
</tr>
<tr>
<td>04949 In Control</td>
<td>The Open University</td>
</tr>
<tr>
<td>Casady and Greene</td>
<td>04671 The Desktop Lawyer Mac</td>
</tr>
<tr>
<td>04810 Super Quick Des</td>
<td></td>
</tr>
<tr>
<td>CE Software</td>
<td></td>
</tr>
<tr>
<td>03624 Alarming Events</td>
<td></td>
</tr>
<tr>
<td>01497 Calendar Maker 3.0</td>
<td></td>
</tr>
<tr>
<td>Distech Corporation</td>
<td></td>
</tr>
<tr>
<td>04550 Facilitator</td>
<td></td>
</tr>
<tr>
<td>Holopress</td>
<td></td>
</tr>
<tr>
<td>00451 Will Maker 4.0 Mac</td>
<td>34</td>
</tr>
<tr>
<td>03781 For The Record 2.0 Mac</td>
<td>28</td>
</tr>
<tr>
<td>04720 Living Trust</td>
<td>69</td>
</tr>
<tr>
<td>Now Software</td>
<td>64</td>
</tr>
<tr>
<td>03580 Now Up To Date</td>
<td>64</td>
</tr>
<tr>
<td>Pastel Development</td>
<td>64</td>
</tr>
<tr>
<td>04752 Daymaker</td>
<td>64</td>
</tr>
<tr>
<td>Psybryon</td>
<td>64</td>
</tr>
<tr>
<td>00200 Calendar (DA) 1.1.3</td>
<td>39</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>UTILITIES</td>
<td></td>
</tr>
<tr>
<td>AlSoft</td>
<td></td>
</tr>
<tr>
<td>00828 AlSoft Power Utilities</td>
<td>62</td>
</tr>
<tr>
<td>02853 DiskExpress II 2.0</td>
<td>49</td>
</tr>
<tr>
<td>Alysys</td>
<td>49</td>
</tr>
<tr>
<td>00938 More Disk Space</td>
<td>62</td>
</tr>
<tr>
<td>00512 Super Disk</td>
<td>49</td>
</tr>
<tr>
<td>Berkeley Systems Design</td>
<td></td>
</tr>
<tr>
<td>04046 More After Dark Bundle V.2</td>
<td>40</td>
</tr>
<tr>
<td>04053 More After Dark Vol. 1</td>
<td>23</td>
</tr>
<tr>
<td>02785 After Dark 2.00</td>
<td>28</td>
</tr>
<tr>
<td>Casa Blanca Works, Inc.</td>
<td>64</td>
</tr>
<tr>
<td>04686 Drive Share</td>
<td>64</td>
</tr>
<tr>
<td>03858 Drive 7 Universal Formatter 2.0</td>
<td>49</td>
</tr>
<tr>
<td>Dantz</td>
<td></td>
</tr>
<tr>
<td>04722 Disk Fit Pro</td>
<td>72</td>
</tr>
<tr>
<td>03828 Remote 10Pack 1.3 w/o Retros.</td>
<td>146</td>
</tr>
<tr>
<td>02856 Retrospect 1.5</td>
<td>146</td>
</tr>
<tr>
<td>Fifth Generation</td>
<td></td>
</tr>
<tr>
<td>04989 SuperLaserpool 3.0</td>
<td>98</td>
</tr>
<tr>
<td>04815 Fastback Plus 2.6</td>
<td>117</td>
</tr>
<tr>
<td>02194 Pyroll 4.0 for Mac</td>
<td>24</td>
</tr>
<tr>
<td>01122 SuperSquash 5.0</td>
<td>61</td>
</tr>
<tr>
<td>FWB, Inc.</td>
<td>61</td>
</tr>
<tr>
<td>00555 Hard Disk Toolkit</td>
<td>124</td>
</tr>
<tr>
<td>GDT Software Inc.</td>
<td>124</td>
</tr>
<tr>
<td>00642 PowerPrint</td>
<td>94</td>
</tr>
<tr>
<td>00981 BetterWriter V1.0.1</td>
<td>38</td>
</tr>
<tr>
<td>Handsoft Corporation</td>
<td>38</td>
</tr>
<tr>
<td>00855 TrashMaster 1.0</td>
<td>39</td>
</tr>
<tr>
<td>Iomn Simulations</td>
<td>39</td>
</tr>
<tr>
<td>04542 On Cue II 2.0</td>
<td>56</td>
</tr>
<tr>
<td>Kent Marsh</td>
<td>56</td>
</tr>
<tr>
<td>00258 FolderBolt 1.0</td>
<td>73</td>
</tr>
<tr>
<td>Magna</td>
<td>73</td>
</tr>
<tr>
<td>04811 Empower II V4.07</td>
<td>148</td>
</tr>
<tr>
<td>Maxa Corporation</td>
<td>148</td>
</tr>
<tr>
<td>05025 Sneoper</td>
<td>124</td>
</tr>
<tr>
<td>Microcom</td>
<td>124</td>
</tr>
<tr>
<td>03046 Microcom Value Pak (MVP)</td>
<td>158</td>
</tr>
<tr>
<td>03777 Virex 3</td>
<td>56</td>
</tr>
<tr>
<td>Now Software, Inc.</td>
<td>56</td>
</tr>
<tr>
<td>04191 Now Utilities 3.0</td>
<td>83</td>
</tr>
<tr>
<td>Paliant</td>
<td>83</td>
</tr>
<tr>
<td>04955 Auto Double</td>
<td>44</td>
</tr>
<tr>
<td>04956 Disk Double 3.7</td>
<td>44</td>
</tr>
<tr>
<td>Synnalec</td>
<td>44</td>
</tr>
<tr>
<td>04890 Norton Utilities 2.0</td>
<td>98</td>
</tr>
<tr>
<td>00116 SAM 3.0</td>
<td>64</td>
</tr>
<tr>
<td>Teknosys, Inc.</td>
<td>64</td>
</tr>
<tr>
<td>00897 Help</td>
<td>89</td>
</tr>
<tr>
<td>Thought I Could</td>
<td>89</td>
</tr>
<tr>
<td>04762 Wallpaper</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Norton Utilities 2.0</td>
<td></td>
</tr>
<tr>
<td>Norton Utilities, the essential solution for data recovery, protection and backup, now comes with SUM! You get two award-winning products for one low price! The fusion of these two products results in the first utility software package that fully integrates advanced disk repair and data recovery, automatic backup, data security and productivity enhancements all rolled into one informative, easy-to-use product. Symantec #04980</td>
<td></td>
</tr>
</tbody>
</table>

Norton Utilities 2.0
$98

**ALSoft Power Utilities**
$64

Enhance the performance of your Mac with these powerful utilities.

**DiskExpress II** intelligently optimizes your hard disk. There's also a disk partitioner, a System 7 Apple menu enhancer, a disk and directory diagnostic, a screen saver, a disk activity indicator and MasterJuggler, for managing font suites and applications.

**FolderBolt**
$72

Protect your data. With FolderBolt, you can create locked folders, read-only folders or drop folders with a simple shift-click of the close box. They can't be opened, duplicated, deleted or moved without the user-definable password. The package comes complete with activity logging and administrator override. Kent Marsh #00258

**NightWatch II**
$88

Protect your hard disk from unauthorized access with NightWatch II. Its instant screen privacy feature thwarts snooping and well-intended rummaging through your desktop. Features a multitude of protection & timed-locking options, animated screen-saving images and entertaining sounds. Provides rigorous protection at its friendliest. Kent Marsh Ltd. #04981

**DiskFit Pro**
$72

DiskFit saves you time by providing fast, easy, efficient backup to disks, cartridges or optical devices. It copies only new versions of files to the backup, keeping backup sets compact and backups fast. Files are stored in Finder format for easy retrieval. Compatible with both System 6 and 7. DiskFit Pro is the ideal backup solution for any Macintosh. Dantz #04722

**Retrospect**
$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 #00250

**Secure Your Data With Dantz Automatic Backup!**

**NOW SHIPPING**

Fax your order 24 hours 7 days a week: 1-206-881-2421
Call Now for our New Summer Catalog
64 Pages • Exciting New Products • Super Values

**UPGRADE YOUR LC**

Equalizer LC
Virtual Memory w/o FPU

$259

DayStar Systems

Replace the LC’s antiquated 68020 processor and get what Apple put in the new LC II—the powerful and reliable 68030. DayStar’s Equalizer LC costs only one-third as much as Apple’s 68030 upgrade, and offers an optional math chip. You get full System 7 compatibility, virtual memory and 500% faster math performance. Upgradable to PowerCache. DayStar Digital #00360 $259

Equalizer LC w/FPU #00579 $336

Universal Powercache

40Mhz w/o FPU #04319 $888

50 Mhz w/o FPU #04321 $1348

and get what Apple put in the new LC II—the faster math performance. Upgradable to Apple’s 68030 upgrade, and offers an Equalizer LC costs only one-third as much as Apple Computer Corp. #05478 $99

**UPGRADE TO SYSTEM 7**

System 7 and two 1MB SIMMS

If you’re not running System 7, you’re working too hard. System 7 brings a whole new world of power, ease of use, and versatility to every Macintosh personal computer. And with an additional 2MB of RAM you’ll be able to tap into the full power of System 7, including multi-tasking, file sharing, finder windows and more. Apple Computer Corp. #05478 $136

**LightningScan Compact**

Scanning just became more affordable and portable than ever! Using a small disk port interface, LightningScan Compact is the easiest scanner to set up and use. No external power supply is required. Thunderware #00519 $289

Lightning Scan Pro #00514 $489

Lightning Scan 400 #00212 $904

**MacVision**

Color Video Digitizer 4.1

$498

Capture high-quality color images that turn heads with the MacVision® Color Video Digitizer 4.1. This easy-to-use video digitizer accepts NTSC composite or S-video input from a camera, VCR, still camera, or laser disk player. Existing images, or new images captured by MacVision, can be edited, merged with text and enhanced. MacVision Image Processing Software supports RGB Color, grayscale and halftone images. Compresses QuickTime images and EPS for more efficient use of disk space. Koala Technology #00509 $498

**Hard Disk ToolKit Personal Edition**

$48

Hard Disk ToolKit Personal Edition is the quick, easy and powerful way to format, partition, password protect and test any SCSI hard drive, removable drive or optical drive for unprecedented performance and security. FWB #00547 $48

**DataPak MO/128 Rewritable Optical Drive**

$1629

Because optical discs use a laser beam to read and write data, they do not wear out, and are not vulnerable to head crashes. This makes them much safer than magnetic hard disks, so they’re great for archiving valuable data. And the cartridges are interchangeable, so you can add extra capacity and transport large files. Mass Microsystems #00332 $1629

**Hardware**

| Applied Engineering | 04956 3.5 Plus Drive | 499 |
| DPI | 04451 DPI 45MB Removable Syquest, 548 |
| | 04866 DPI 88MB Removable Syquest, 298 |
| | 04880 DPI 128MB Ext Quantum, 358 |
| | 04881 DPI 105MB Ext Quantum, 498 |
| | 04882 DPI 240MB Ext Quantum, 648 |
| | 05367 DPI 330MB Ext Fujitsu HD, 1258 |
| | 05366 DPI 520MB Ext Fujitsu HD, 1564 |
| | 05055 FWB PocketHammer 50, 324 |
| | 05056 FWB PocketHammer 100, 748 |
| | 04981 FWB PocketHammer 200, 1198 |
| | 04964 FWB hammerDisk 88MB Removable, 564 |
| | 04965 FWB hammerDisk 44MB Removable, 574 |
| | 03845 FWB PocketHammer 426, 1998 |
| | 03827 FWB hammer 500, 1998 |
| | 00175 Mass Micro DataPak 45 Remov, 359 |
| | 00332 DataPak MO/128 3.5" Optical, 1629 |
| | 00335 Diamond Drive 80Portable 2", 439 |
| PLI | 00162 Infinity 88 Turbo HD, 799 |
| | 00214 Infinity 40 Turbo-220V, 699 |
| | 00445 015 MB Ext. HD, 536 |
| | 00811 Quick SCSI, 372 |
| | 00705 1.97 GB FH SCSI, 2748 |
| | 00913 Infinity 88 Ilo Footprint, 868 |
| | 00920 Infinity 40 Ilo Footprint, 784 |
| | 02181 Infinity 40 Turbo HD Rem, 598 |
| | 02182 Infinity 40/40 Turbo HD, 1158 |
| | 04465 52MB External Hard Drive, 418 |
| | 04469 Infinity Optical Drive, 1658 |
| | 04817 Infinity Floptical 3.4 Ext, 498 |

**NOW SHIPPING**

Available in 2 to 3 days

Code #20001

1-800-248-0800 • MAC ADVISORS TAKES ORDERS 24 HOURS A DAY

Use a laser beam to
read and write data,
...not vulnerable to
head crashes. This makes
them much safer than
magnetic hard disks, so
they're great for
archiving valuable
data. And the cartridges
are interchangeable, so
you can add extra
capacity and transport
large files.
Mac Zone Means Business
Call Us Today to Establish a Corporate Account

The Mac Zone
Established 1986

Networking

Asante
00005 F/Powerbooks 10 BaseT  294
00020 Maccon + 30E  164
00221 Maccon+1a +64K Ram  218
00228 Maccon + 30 IET  128
00327 EN/SCSI SCSI Ethernet  328
00347 Person to Person 10pk  256
00348 10 T Hub/12  256
00420 Person to Person 50pk  256
00434 10 T Hub/8  256
00407 Person to Person 2 Pack  98
00510 Maccon 3 SE  218
00511 Maccon 3NuBus 64K  218
00820 Maccon + 30 IE MC  314
00361 Maccon + II ETEn  164
00362 Maccon + I ET 64K Ram  218
00364 Maccon 30 ET  158
00367 Maccon+30IE  218
00395 10T MAU  84
00418 Maccon + 30 I ET MSG4  314
00434 Maccon + 30 ET MC  259
00493 Maccon+3 I lse  218

Dayna Communications Inc
00003 Dayna Etherprint 10T  342
00321 Ethernet Plus 4 Devices  588
00322 Ethernet Plus-T  4 Devices  588
00485 DaynaPort SCSI Link  272
00487 DaynaPort SCSI Link-T  272
00488 DaynaPort SCSI Link-3  272
00683 24 DaysaPort/EZ  148
00685 DaynaPort/USB  148
00686 DaynaPort/EALC  148
03346 Dayna Etherprint  348
04139 DaynaPort/EZ T  264
04307 Dayna D1000 Single User  294
04595 DaynaPort/E-T  148
04717 DaynaPort/E/20  148
04718 DaynaPort/E  148
04719 DaynaStar MultiHub  238
05184 NetMounter Single User  54
05185 NetMounter 5 User  224
05186 NetMounter 10 user  334
05187 DaynaPort/SCSI Link-PB  294
05190 DaynaPort/SCSI Link-PB  294
05191 DaynaPort/SCSI Link-PB  338
05192 DaynaStar Hub-12  332
05279 DaynaPort TRX-T  386
05280 DaynaPort TRX  386

Farallon
00679 EtherMac II-TN  158
00677 EtherMac II-T  158
00678 EtherMac I-En  208
00698 EtherMac LC-TN  158
00880 EtherMac LC-TN + FPU  240
00681 EtherMac LC-10T  158
00882 EtherMac LC-10T + FPU  240
00883 EtherMac LC-C  158
00884 EtherMac LC+C-FPU  230
00685 EtherMac 30-TN  189
00886 EtherMac 30-TN + FPU  275
00591 EtherMac 30-T  189
00887 EtherMac 30-T + FPU  275
00693 EtherMac 30-C  238
00694 EtherMac 30-C-FPU  328
00696 EtherMac SE-C  208

Technology Works
00228 LC 10BT/Thin EN w/FPU  240
00225 SI 10BT/Thin EN w/FPU  288
00226 SI 10B/Thin EN  228
00327 SE/30 10BT/Thin EN  228
00328 SE 10 BT/Thin EN w/FPU  184
00390 Mac NuBus Thin EN  174
00391 Mac NuBus 10BT EN  174
00392 Mac NuBus 10/100/Thin/AUI EN  198

Timbuktu 4.0 Single User
$128
Use the Timbuktu Power Pack with AppleTalk Remote Access to control the full power of your office Mac from home or on the road. Run power-hungry applications remotely. Includes two copies of Timbuktu screen-sharing and file transfer software, two PhoneNET StarConnector devices, a carrying case, pocket knife, tools and wiring accessories. Requires one copy of Timbuktu and remote networking software at each location. Farallon #00420

PhoneNET Star Connector/24
$1298
Now you can manage and expand your network more easily than ever. StarConnector's patented circuitry amplifies LocalTalk signals. With StarCommand software (included) you can manage your StarConnector from any Mac on the network. Farallon #04739

$548 LanRover/L
LanRover™/L is a stand-alone communications server for Apple Computer's AppleTalk Remote Access. It allows PowerBeck users and users of desktop Macintoshes running AppleTalk Remote Access software to call and connect to an AppleTalk network over standard telephone lines. Once dialed into LanRover/L, you can take advantage of network services—for example, e-mail, databases and groupware—as if you were directly connected to the network. LanRover/L also provides network Macintoshes with a shared modem for dial-in and dial-out to remote information services, bulletin boards or hosts. LanRover/L offers network administrators several unique advantages for managing dial-in and dial-out. The package includes Shiva Net Manager which provides easy centralized management and security features. LanRover/L is a reliable, dedicated device that can be installed in a location where there is no risk of accidental shut-off or tampering. Shiva #05128

NetMounter Single User
$54
With NetMounter, you can easily access NetWare from your Mac. This innovative utility lets a Macintosh log into any NetWare file server, with no need for NetWare for Macintosh. Once logged in, you can copy files to and from the server, and edit MS-DOS files with Macintosh applications. Dayna Communications, Inc. #05184

AppleShare Server 3.0
$998
AppleShare Server 3.0 is the premiere file sharing software for the Mac. This new version meets the security, performance and multi-tasking requirements of larger work groups and departments. Apple Computer #05475

< = Manufacturers providing a 30- or 60-day Money Back Guarantee. If you're not satisfied with your purchase of any item, call our Customer Service Hotline for a Return Authorization Number and details. Items must be returned with all original packaging and registration card.
Bring your graphics up to speed.

Get with it. MacDraw Pro 1.5 is one of the fastest drawing programs ever. So now you can make faster work of text, scrolling, rotation, gradients, printing, and much more.

But speed isn’t the whole story behind this updated version of the Macintosh best-seller. It’s what you can do with all this performance.

MacDraw Pro 1.5 takes full advantage of System 7. Like QuickTime, Publish and Subscribe, even Apple events.

It also uses familiar word processing style rulers for greater control of how text looks on a page.

And you can import PICT, PICT2, TIFF, EPSF and all MacDraw files, you name it.

Yet for all these features, MacDraw Pro 1.5 remains as accessible as ever.

Call 1-800-544-8554, ext. 45, and trade up. If you own MacDraw Pro it’s just $15, or $99 with any earlier version of MacDraw.

And do it soon. Because when there’s a program this fast, you don’t want to get left behind.
During the past five years, American industry has been shifting away from basic long-term research and toward market-oriented short-term research. Companies like Apple look at companies like Xerox — whose Palo Alto Research Center (PARC) spawned the graphical user interface, the desktop metaphor, the iconic representation of documents, windows, the laser printer, page-description languages, object-oriented programming systems, notebook computers — and all they see is failure.

Why? Simply because Xerox failed to turn its ground-breaking research into products that profited Xerox. Other companies (Apple and Adobe, for example) have profited greatly, as have computer users, but Xerox benefited little.

Companies are trying to avoid the Xerox mistake in two ways: by scaling back total investment in research and development and by refocusing that investment toward research that looks likely to turn into products within a predictable period. According to National Science Foundation data as reported by Elizabeth Corcoran in the June '92 issue of Scientific American, annual real growth in industrial R&D spending dropped to 1.5 percent between 1985 and 1990, down from almost 7 percent between 1975 and 1985. But the real story is how companies are refocusing their research. Here’s how it used to be: When I was a graduate student in computer science in the late ’70s, a fellow student interviewed for a job at AT&T’s prestigious Bell Labs facility. The interviewer told him that as a Bell Labs researcher, he would be free to pursue any interesting project, “as long as it didn’t have anything to do with telephones.” Anyway, that’s what he told me. It was the attitude then prevalent at places like Bell Labs and Xerox PARC.

These days, according to Corcoran, things are much different. Xerox, for example, now calls itself a “document company” and demands that research projects support this characterization. A project to develop a scalable multiprocessor computer didn’t fit this model, so Xerox found a corporate partner to develop it. Apple is not exempt from the trend: Its ATG (Advanced Technology Group) has been refocused as well.

Is this anything to be concerned about? Does it matter to the average Mac user that Apple and the rest of the industry are shifting to nearer-term research projects?

This being an election year, I thought I’d present arguments in the form of a debate between two users, whom I will call, in a blatant rip-off of the comic strip of the same name, Frank and Ernest.

Debatable Developments

Frank: If you ask me, we’ve had quite enough innovation for the time being. I’m tired of buying hardware that’s obsolete before I get it plugged in, and I can live without the software innovations that dictate that 2 megabytes of memory is an entry-level configuration. What we need now is not innovation; it’s consolidation. Let’s make our existing tools work better for us. Rather than basic research, we need the most practical sort of research: Computer companies need to examine how people work with computers and see how they can better integrate the boxes into people’s lives. They need to tame existing innovations to serve us better.

Ernest: That’s fine for now, but will you be content with the same hardware and software ten years from now? If System 7 is any indication, further refinements of today’s standard user interface, however elegant, will not lead to any simplification or overall increase in ease of use. Most of that interface, most of the defining features of today’s personal computer, in fact, were developed at Xerox PARC in the 1970s, and it took more than a decade to bring the fruits of that work to the majority of users. The PARC researchers, by the way, attempted to do just what you suggest: examine how people work with computers and try to better integrate them into people’s lives. Basic research is long-term research. The research behind the computer of the year 2000 had better be under way now.

Frank: And it is. What do you think Taligent (Apple and IBM’s joint operating-system venture) is about?

Ernest: It’s certainly not the equivalent of the ground-breaking PARC research. A better example might be Kaleida (another Apple/IBM joint venture to develop multimedia technology), and look how much trouble it’s having getting off the ground. If there is a recent equivalent to the PARC work, it might be Brenda Laurel’s work in the 1980s at Apple. Laurel, who edited The Art of Human-Computer Interface Design (Reading, Massachusetts: Addison-Wesley Publishing Co., 1990), believes that the entire concept...
of a user interface is obsolete. Her work is provocative and far-reaching and may lead to vastly more usable computers. Of course, she’s no longer at Apple.

Frank: Laurel is a multimedia booster. I’m not convinced that becoming a movie producer is going to make me better at my job. The only sure thing about multimedia is that it’s a time-and-money sink. What’s wrong with concentrating on developments that save users time and money? Smaller, faster, cheaper: Those are directions that pay off. Can’t we assume that any research that looks likely to go in those directions will be pursued aggressively? Think about this new research into single-electron transistors. Now that’s pretty basic physics, but the payoffs for computer technology are obvious. I don’t think I’d worry about funding for that.

Ernest: You’re probably right. But many research programs that are much less “basic,” in your sense, are likely to be cut off or back-burnered. Smaller, faster, and cheaper can usually be added to an existing system without disrupting the way users work. But if you seriously want improvements in ease of use, you have to realize that the only way to make something easier to use is to change the way it’s used. Innovations in ease of use are always disruptive to users who have already learned the old ways. A system like Ted Nelson’s Xanadu, which throws out the concept of a file and is conceptually incompatible with everything, is likely to have a hard time finding its way out the door when companies who are investing in research take such a short-term view.

Frank: But look at pen-based computer software. The GO operating system is an incompatible innovation. So is the user interface of Apple’s Newton. They got out the door.

Ernest: Those systems address a new market, run on new hardware, and address different needs than desktop computers do. But it’s not that easy to find new markets, and in the existing market, innovation has to fight the inertia of the installed base.

Frank: Look, the personal-computer industry is not even supposed to innovate. There may be a problem, but it’s not Apple’s problem. Motorola and Intel can best do cutting-edge work in semiconductor technology; Cray can best do cutting-edge work in hardware design. Apple and other personal-computer vendors are in the business of supplying product.

Ernest: The trouble with this view is that other players increasingly tend to define themselves in terms of personal-computer companies. Apple has a lot to say about Motorola’s future products. So if Apple and IBM undervalue basic research, it has broad implications.

Frank: But that’s all hardware, which is just what runs the software. Software is what matters, and software innovation doesn’t require atom smashers. Stick a few scrappy-haired programmers in a basement with an equal number of Sun workstations, and you’ll get software breakthroughs. Look at the spreadsheet program: It was invented by two students working on a borrowed Apple II. Or fractals: Out of recreational mathematics came this novel and groundbreaking approach to data compression and image generation.

Ernest: The fact that I can grow vegetables in my backyard doesn’t mean that nobody in the world goes to bed hungry. Innovation doesn’t count for much if you can’t use it because of bad patent policy. The last decade or two saw many patents issued for techniques that had been in use for years. Things are getting better: Patent examiners must now have engineering degrees to judge software patents, but there are still too many patents being issued. Patent policy is not serving its intended purpose of stimulating innovation.

Frank: But you admit that the situation is improving. Besides, you’re talking about politics, not innovation. And I don’t think you’re giving software enough credit. Software is not like soybeans. Programmers use software to write more software. Think about what that means. Programmers have the tools with which they can improve their own tools, in an infinite cycle. I’m thinking about CASE — computer-aided software engineering. Think about using software to improve the software you use to improve the software you use. It’s recursive. It’s like compound interest on intellectual investment. And you’re worried about innovation?

Ernest: Uh-huh. Of course today’s programmers do their innovative brainstorming on whiteboards and napkins and scoff at CASE. But with sufficient investment in long-term research, we might someday have the kinds of tools you’re talking about.
The Articulate Systems
Family of Voice Recognition
and Sound Recording
Products for the Mac

Voice Navigator II

Think: Speak: Done! That's how easy it is to work with Voice Recognition on your Macintosh®.

Voice Navigator II allows you to control any Macintosh application by voice, using spoken commands to execute any function normally performed with a keyboard and mouse.

Voice Navigator II recognizes any voice, any accent, any language.

Why Use Voice? Voice is the most productive and intuitive form of input because speaking is so natural.

Select tools, change fonts and point sizes, zoom in and out, click buttons, fill cell ranges, send voicemail messages, all by spoken commands.

Voice Navigator II is a combination of hardware and software, which connects via the SCSI port. Voice Navigator II is compatible with all Macintoshes.

Included FREE with Voice Navigator II is a stylized high-quality unidirectional, filtering DesktopMike.

Voice Recognition is available today. You've read about the promises, now experience the reality. Purchase the best and latest technology in the industry!

Let Voice Navigator introduce you to the new computer interface - the voice user interface!

$699 SRP

Voice Navigator SW

Voice Navigator II SW has all the same capabilities as Voice Navigator II without the need for any hardware!

Articulate Systems uses the sound input port found on the new Macintoshes as the digitizing source.

Therefore, if you own a Macintosh LC, LC II, Classic II, IIsi, PowerBook 140, 170, or Quadra, you can make your computer understand what you say with software only.

A microphone valued at $149 is included FREE with Voice Navigator SW. Choose from a high quality custom designed free standing DesktopMike for office environments or a Headset microphone for high noise environments. Both are unidirectional and noise-cancelling. (The microphone that ships with the new Macintoshes is not suitable for voice recognition.)

Voice Navigator works with ANY Macintosh application. Imagine Desktop Publishing, Graphics, Multimedia, CAD/CAM, Word Processing, Spreadsheets, and Databases all controlled by your voice. It's faster and easier than clicking buttons and chasing menus!

$399 SRP

Voice Impact Pro

Record, edit and play back sounds, music and memos with Voice Impact Pro. This advanced sound digitizing product is an ergonomically designed hardware device that allows any Macintosh to input sounds for use in Multimedia, Business Annotation, Music Editing and other general uses.

Get two FREE applications! Voice Record and "SoundWave" to do special effects, rate and frequency changes, as well as a host of other capabilities.

Voice Impact Pro uses a Digital Signal Processor (DSP), a unidirectional filtering microphone and supplies on-board MACE (Macintosh Audio Compression Extensions) in real-time on all Macs. Voice Impact Pro records at 22kHz, 11kHz, and 7kHz, and allows for 3 to 1 and 6 to 1 sound compression. In addition, the Pro provides a LINE IN jack so you can input music from stereo and CD's directly.

$229 SRP

Voice Impact

Voice Impact is a low cost sound digitizer.

Key differences between Voice Impact and Voice Impact Pro are: Voice Impact has an omnidirectional microphone and doesn't use a DSP chip for sound compression.

Voice Impact provides recording at 22kHz, 11kHz, and 7kHz, and allows for 3 to 1 and 6 to 1 sound compression on any Mac with a 68020 processor or better.

Voice Impact is a compact device perfect for voice annotation, sound and music recording into everyday applications. Includes two FREE editing packages.

$99 SRP

Voice Record

Voice Record is two software applications for the price of one!

Voice Record is a simple recording and editing application, and "SoundWave" is a sophisticated application that offers powerful recording and editing capabilities for adding high quality sound stacks and applications. Utilize both applications to do special effects, rate and frequency changes, as well as a host of other capabilities.

Voice Record is designed to work with any Macintosh that has a sound input port, including the LC, LC II, IIsi, Classic II, PowerBook 140 & 170, and Quardras.

$69 SRP

Available at all
COMPUSA locations

© 1992 Articulate Systems, Inc., 65W West Cambridge Pk., Suite 4050, St. Louis, MA 02139 • Phone (617) 436-1566 • Fax (617) 693-3516. All Rights Reserved. Articulate Systems is a trademark of Articulate Systems, Inc. All other trademarks are property of their respective companies.

Circle 71 on reader service card.
We've heard it a million times. Whenever people want great-looking color for an overhead presentation or a knock-out comp, they ask for a QMS® printer. Not just any color printer, but a QMS.

And they get the kind of images you see on this page. And they also help confirm what everybody knows.

That we've set the color PostScript® standard of quality from the very beginning. With full Pantone® approval. And with more than 20 million QMS prints turned out so far.

We also give you a choice of two printers: the QMS ColorScript® Model 30i as well as the QMS ColorScript Model 30si. One prints terrific 11”x17”/A3 non-bleed
a QMS.

images; the other prints the same terrific images 11"x17"/A3 full bleed.

And with our low prices, you should also know how easy it is to put a QMS ColorScript in your office today. Just call us at 1-800-422-2769, ext. 2974 (or 205-639-4400). We'll send you full information on both of our models. And you won't have to settle for a copy of anything.

Because you can get an original QMS.

QMS. First In Color.
NO MATTER WHICH MAC YOU OWN, DAYSTAR CAN MAKE IT BETTER.

DayStar products boost your Mac’s performance and improve your productivity. We offer you great manuals, no risk guarantees, a 3 year warranty, upgrades, and unsurpassed toll-free support.

For The Macintosh LC... Advanced Capabilities.
Maximize your LC without spending a bundle. Even bring it to Quadra-level speeds.
Equalizer LC™ — Replace your antiquated 68020 processor and get what Apple put in the new LC II — the powerful 68030 processor. It also offers an optional math chip (which the LC II doesn’t). You get full System 7 compatibility, virtual memory and faster math performance.
PowerMath LC — Put a math chip in your LC or LC II and speed up spreadsheet recals 500% or more!

For The Macintosh IIsi... More Speed & Slots.
For about the price of Apple’s single-purpose PDS adapter board, add slots, math chips, acceleration and cache cards.
ComboCache IIsi™ — Get 40% more speed to go with your PDS adapter, an optional math chip and still have a slot left for another PDS board.
DualPort IIsi™ — Get a PDS adapter, a math chip, and another slot for a DayStar accelerator!

For The Mac IIsi, Iici and Quadras...
FastCache™ and QuadraCache™ — The low-cost cache card that puts the “zip” back in your Mac. Boosts performance 20-40%.

For The Mac LC, LC II, IIX, IICX, IIsi, Iici, SE, SE/30 and Classic...
Universal PowerCache™ — When you’re ready for the ultimate in acceleration, turn to our award-winning PowerCache. We use the power and reliability of a 68030 processor (at 33, 40, or 50 MHz speeds) to offer performance gains up to Quadra-level speed. Our single, universal PDS design supports ten Macs®, and is 100% compatible.

For NuBus Macs...
Break The Hard Drive Bottleneck.
DayStar offers you two ways to speed up applications that need fast hard drives.
RAM PowerCard™ — Put SIMMs on a NuBus card. Get a superfast internal RAM drive for one-fourth the price of an external RAM drive. Accelerates large files up to 300%.
SCSI PowerCard™ — Puts new life into slow drives and removable. Disk intensive applications run up to 200% faster.

The Upgrades You Need.
Our Swap-Up program lets you upgrade your system as your needs change. Call us at the number listed below for details.

Get all the details. Call for an immediate fax!
800-962-2077

© 1992 DayStar Digital, Inc.

Other brands and product names are trademarks or registered trademarks of their respective holders. Product specifications are subject to change without notice.
Visual alchemy: Morphing is the current rage, and Gryphon Software (619-454-6836) has produced a simple morphing utility, Morph ($149). To create a QuickTime movie, you pick two PICT images of the same size, match a point in the starting image to a point in the final image, and set the length for the metamorphosis. Hours and hours of nonproductive fun are promised.

By Russell Ito

Project managing: Aerospace companies and caterers have one thing in common: If they don’t manage their work efficiently, nothing gets off the ground. Project-management software isn’t just for large-scale manufacturing anymore.

Microsoft Project 3.0 ($695) should be shipping at about the time you read this. Project’s strong suit has been its flexibility, and Microsoft has taken that even further in version 3.0. You can enter project information directly into a variety of views and create custom dialog boxes that contain only the fields you use most often. Like Excel 4.0, Project offers a customizable tool bar, and it even borrows some Excel features, including a Fill Down command and the ability to double-click on a column border to automatically set the best width for the column. 800-426-9400 or 206-882-8080.

MacProject Pro ($599), from Claris (408-727-8227), should ship in the third quarter of this year. The hottest new feature is the integrated outliner, which lets you brainstorm first and then use the outline data to fill a variety of charts and tables. MacProject Pro lets you open multiple documents, so you can create cross-project dependencies. MacProject Pro really shines in its data-sharing ability. You can attach a document from any application to a task and then automatically launch the application and open the document under either System 6 or System 7. The program’s Exchange links let you export MacProject data into other analysis applications, such as FileMaker Pro or Excel, to create custom reports and charts automatically — again under System 6 or System 7.

Up to Date . . .

Atlas Pro 1.5, the latest version of Strategic Mapping’s geographic-analysis package, incorporates its own command language, extended support for Apple events, and upgraded U.S. street data. 408-985-7400. $795.

Expressionist 3.0 is a major upgrade of Prescience’s equation editor. New features include user-configurable palette buttons, text rulers, and expanded macro capabilities. 415-543-2252. $199.95.

FastTrack Schedule 2.0, AEC Software’s Gantt-chart maker, offers scheduled versus actual bars, percent-complete display/calculation, task-duration calculation, and customizable chart scales. 703-450-1980. $279.
SpreadBase: Smart Spreadsheetsing

You know more about your data than your spreadsheet program does. Imagine this scenario: You've created a spreadsheet that summarizes your company's sales by region by month. Now suppose you look at the data and decide what you really need is to look at each month's sales by region. Too bad. With conventional spreadsheet programs, there's no easy way to do even this simple transformation, because spreadsheet programs aren't able to "understand" the relationships between categories ("regions" and "months") in a spreadsheet. This is exactly the problem SpreadBase was designed to solve.

SpreadBase is a new analysis tool that combines the look and feel of a spreadsheet program with the underlying power of a relational-database engine. With SpreadBase, you categorize your data as you enter it, so creating different views of your data or setting up hierarchies and relationships among categories is easy — performing an analysis involves manipulating only the categories, not the data itself. What's more, because the underlying architecture is a database, any changes you make in one area of your analysis, such as adding a sales territory, automatically update throughout the data set.

Users who have had to wrestle with data from host databases will be especially pleased with SpreadBase, because it includes the ClearAccess technology for directly accessing host databases through a variety of APIs, including DAL. Some of the host databases supported include those created by ORACLE, Sybase, Ingres, and DB2. And for those who normally get their data from a spreadsheet or desktop database, SpreadBase can also import data in SYLK, dBASE, WKS, and tab- and comma-delimited formats.

SpreadBase comes as a fully integrated system. In addition to the analysis and connectivity tools, it provides charting capability and a complete report-generating function — all of which are tied to the data, so you can change the data and immediately see that change reflected in your report.

Objective Software, Inc., 248 Homer Avenue, Palo Alto, CA 94301; 415-324-3333. $695.

**Now Utilities 4.0: Less Is More**

Now Utilities has been shrinking ever since its first release. It started with 12 utilities and then dropped to 10; now version 4.0 has reduced that number to 7. One advantage is that the included programs are now more focused and more powerful, so less is indeed more — OK, fewer is more. The utilities included in the package are NowMenus, StartUp Manager, NowSave, Super Boomerang, WYSIWYG Menus, Now Scrapbook, and Profiler. Version 4.0 requires System 7.

Because Now Software has adopted a policy of shared resources among modules, version 4.0 actually uses less memory than the previous version did while providing more functionality and a common interface.

The biggest changes have been made to NowMenus, which has absorbed many of the functions of the previous version's MultiMaster module. You can reorder the Apple menu by dragging, add separators to create visual groupings, and keep track of your most recently used files and folders in a menu on the left or
Radius’ VideoVision

You’ve heard of books on tape. Well, files on tape — videotape, that is — may be the next thing, thanks to Radius’ desktop video system, VideoVision. A combination 24-bit-display card and video input/output system, VideoVision lets you produce truly professional-looking video output directly from the Mac.

The VideoVision system consists of a NuBus card and an external breakout box. The breakout box provides two video inputs (composite and S-video) and two stereo audio inputs plus a stereo audio mix input, stereo audio output, and a single video output (composite or S-video). The box also offers a serial port, so VideoVision can provide device control without taking up your modem port. The card, however, is the important part of the equation.

The VideoVision card can function as a display card, driving monitors as large as 16 inches at 24 bits, but the real magic is what it can do with live video. The VideoVision system is the first reasonably priced desktop video device to offer flicker-free Mac-video output for display on NTSC monitors or for recording on tape. You can also resize a live-video window to any size without degradation of the image. It also offers on-the-fly standards conversion, so you can convert from NTSC, PAL, or SECAM input to NTSC or PAL output.

The card also offers two buses for expansion — the H-Bus and the R-Bus. The H-Bus is an open-spec video-specific bus that can be used either in daughterboard or side-by-side NuBus implementations. Designed specifically for video, H-Bus gets around the NuBus transfer bottleneck by offering transfer rates as high as 60 megabytes per second. JPEG/MPEG compression/decompression cards will be among the first devices to take advantage of this bus.

The R-Bus is a full-duplex 24-bit Radius proprietary bus that also offers 8-bit alpha-channel support. Future R-Bus devices could include support for teleconferencing or for second video cards to run multiple video windows at various pixel depths.

For a limited time, Radius will bundle VideoShop, from DVA, and Action from Macromedia, with VideoVision.

Radius, Inc., 1710 Fortune Drive, San Jose, CA 95131; 408-434-1010. $2,399.

Radius’ VideoVision lets you create truly professional-looking video presentations right on your desktop. With the VideoVision system, you can produce flicker-free video output in a window whose size you can control.
Visibly faster. The RealTech laser printers' high performance Weitek RISC processor prints complex documents 4 to 5 times faster than other non-RISC laser writers in their price range. ATM font rendering technology builds raw type characters 4 to 5 times faster. The RealTech uses a new version of the Sharp printer engine that prints 9 pages per minute.

Based on Adobe PostScript® Level 2...
the next generation of Adobe's page description language, which has become the industry standard for defining pages of integrated text and graphics. It contains a number of performance, function and print quality enhancements that save printing time and improve quality. PostScript Level 2 is compatible with all current application software that supports the PostScript® language. In addition, PostScript® Level 2 offers new capabilities, including forms handling, graphic patterns support, and new half-tone algorithms.

Genius-level memory.
One pool of memory is available for all resource needs. Memory is dynamically allocated and automatically reclaimed; no arbitrary memory restrictions exist. Disk space management is improved to eliminate fragmentation and improve transfer of information from the hard disk to RAM.

HOW REALTECH STACKS UP

PERSONAL LASER PRINTERS

<table>
<thead>
<tr>
<th>RealTech Laser</th>
<th>Apple LaserWriter INTR</th>
<th>NEC Model 95</th>
<th>TI microLaser 35</th>
<th>Apple ProS LaserWriter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$1695</td>
<td>$2195</td>
<td>$1749</td>
<td>$1794</td>
</tr>
<tr>
<td>Pros</td>
<td>Weitek RISC processor</td>
<td>Anscor RISC processor</td>
<td>Motorola 68000</td>
<td>Weitek RISC processor</td>
</tr>
<tr>
<td></td>
<td>9 ppm 8.5x11</td>
<td>9 ppm 8.5x11</td>
<td>6 ppm 8.5x11</td>
<td>Motorla 68000</td>
</tr>
<tr>
<td></td>
<td>Optional 2nd paper tray</td>
<td>Optional 2nd paper tray</td>
<td>Optional 2nd paper tray</td>
<td>Optional 2nd paper tray</td>
</tr>
<tr>
<td></td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td></td>
<td>SCSI port</td>
<td></td>
<td></td>
<td>Optional SCSI port</td>
</tr>
<tr>
<td></td>
<td>2 mb RAM (+8)</td>
<td>2 mb (+1)</td>
<td>2 mb (+3)</td>
<td>2.5 mb (+4)</td>
</tr>
<tr>
<td></td>
<td>PostScript Level 2</td>
<td>PS Level 2</td>
<td>PS Level 2</td>
<td>PS Level 2</td>
</tr>
<tr>
<td>Cons</td>
<td>Only available through</td>
<td>No SCSI port</td>
<td>No SCSI port</td>
<td>Expensive options</td>
</tr>
<tr>
<td></td>
<td>HARDWARE THAT FITS 1-800-394-USER</td>
<td></td>
<td></td>
<td>Daughter board design</td>
</tr>
<tr>
<td></td>
<td>4 ppm</td>
<td>Only expandable to 4 mb RAM</td>
<td>Only expandable to 5 mb RAM</td>
<td>Upgradable to 10.5 mb, but not all memory usable for PS</td>
</tr>
<tr>
<td></td>
<td>Optional env. feeder $269</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Elimination of fragmentation = memory allocated dynamically and automatically reclaimed

610 South Frazier
Conroe, Texas
77301
NEW! "LEASE TO FIT" Programs*

We've made it easier than ever to own our productivity-increasing products by offering five different leasing programs. Choose the one best tailored to your business's needs!

1. **True Lease**...with 10% buy-out option
2. **Installment Lease**...with $1.00 buy-out option
3. **Speed Lease**...90- or 180-day terms, with buy-out or conversion to other leases
4. **20/20 Lease**...10% security deposit, 20 equal payments, 10% buy-out
5. **90-day Deferred Lease**...no payment for 90 days; first and last payment in advance

Call today and we'll fax you a lease application.

*All leases are subject to credit approval. All lease payments in our ads are based on the "True Lease" program at 48 months. Prices, lease, prices, and rates are subject to change without notice. NOTE: Minimum lease payment is $50 per month.

Toll-free Information: **1-800-364-LESS**

HARDWARE THAT FITS • S. Frazier • Conroe, TX 77301

*Printed on recycled paper to show our concern for the environment.*
NEC Silentwriter Model 95

Micro-fine toner and NEC’s patented “Sharp Edge” technology gives you sharp, black print quality.


NOW YOU CAN CHOOSE FROM THE BIGGEST-EVER SELECTION OF HARDWARE VALUES!

We want you to become a repeat customer. So we give you discount mail-order prices on 100s of hardware products...superior customer service...our unbeatable hassle-free warranty...toll-free tech support...and an unsurpassed return policy.

What’s more, we do it all with a smile...because that’s what you deserve.

WE GUARANTEE...you’ll be pleased with the power, performance, and competitive price of any of our products, which are:

- Priced LESS than the comparable Apple product.
- Backed by a minimum 1-year warranty and our 30-day money back guarantee.

If you’re not satisfied with what you buy from us, just call. We’ll refund your purchase price (minus consumables, for printers).

Before returning merchandise, we must ask that you call our Customer Service Dept. to receive a returned merchandise authorization number (RMA). This number must be included with any printer you return. No C.O.D. returns, please. NOTE: Our ads originate entirely on Macintosh systems, from concept to film. Call us for more information!
The ideal networking printer. The RealTech Laser's and Laser 400's three interface ports (AppleTalk, RS-422, IBM PC parallel, and RS-232-C) can be used simultaneously. They can be assigned either PostScript or LaserJet II emulation, making it the ideal network printer. It switches automatically between interfaces and emulations, and spools files on a real-time basis. A Hewlett Packard LaserJet Series II emulation allows use with non-PostScript applications software.

Prints full-page 11x17 documents! No more tiling to get the full image area, or taping letter-size pages together! The RealTech Laser 400 is the optimum tabloid printer.

SCSI port. The standard configuration includes a SCSI port and 2 Mb of RAM upgradable to 10 Mb (RealTech Laser) or 4 Mb of RAM upgradable to 16 (RealTech Laser 400).

AGAINST THE COMPETITION

<table>
<thead>
<tr>
<th>11x17 Printers/High-Speed Printers</th>
<th>RealTech Laser</th>
<th>QMS 2210</th>
<th>Hewlett-Packard IIIi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$4495</td>
<td>$9995</td>
<td>$9995</td>
</tr>
<tr>
<td>Pros</td>
<td>Weitek RISC processor</td>
<td>Motorola 68020</td>
<td>RISC-based formatter</td>
</tr>
<tr>
<td>8 ppm 11x17</td>
<td>11 ppm 11x17</td>
<td>17 ppm 8.5 x 11</td>
<td></td>
</tr>
<tr>
<td>15 ppm 8.5x11</td>
<td>22 ppm 8.5x11</td>
<td>2 paper trays</td>
<td></td>
</tr>
<tr>
<td>2 paper trays</td>
<td>Optional 2nd paper tray*</td>
<td>2 paper trays</td>
<td></td>
</tr>
<tr>
<td>300 or 400 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td></td>
</tr>
<tr>
<td>SCSI port</td>
<td>SCSI port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 mb RAM upgradable to 16</td>
<td>4 mb RAM</td>
<td>5 mb RAM upgradable to 17 mb</td>
<td></td>
</tr>
<tr>
<td>PostScript Level 2</td>
<td>PS Level 1</td>
<td>PS Level 1</td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td>Only available through</td>
<td>Very expensive</td>
<td></td>
</tr>
<tr>
<td>Only available through</td>
<td>Limited to 300 dpi</td>
<td>Expensive</td>
<td></td>
</tr>
<tr>
<td>HARDWARE THAT FITS</td>
<td>Poor paper handling</td>
<td>Limited to 300 dpi</td>
<td></td>
</tr>
<tr>
<td>1-800-364-USER</td>
<td>Slow for complex graphics; 4 mb RAM maximum</td>
<td>Na 11x17 output; no SCSI port</td>
<td></td>
</tr>
</tbody>
</table>

* Optional paper tray $115

Money-back guarantee. Our famous 30-day money-back guarantee backs these products. If you're not completely satisfied, we'll refund your purchase price, minus consumables. RealTech laser printers are also backed by a one-year warranty.

TECH SUPPORT:
1-800-364-MACS

FAX ORDERING:
1-409-539-4141

LEASING INFORMATION:
1-800-364-LESS
CALL: 1-409-760-2400

HOURS:
8 am-7 pm CST
Toll-free in the U.S. & Canada, too!
**Seiko Instruments ColorPoint PSX $6795**  
It's fast! Prints on roll-fed paper or roll-fed transparency to within 1/4" border on all sides, ensuring that the full-color image is printed without reducing the image size. 300 dpi color thermal printer uses 25 MHz RISC processor, 6 Mb RAM standard, upgradable to 34 Mb. Adobe PostScript® language compatible. Download, process and print images simultaneously; it has multiple frame buffers. Includes three interfaces as standard: AppleTalk, Centronics, and RS-232, plus a SCSI port, allowing users to share the ColorPoint among Macs, PCs, workstations, or a network. 39 resident fonts.

**Seiko Instruments ColorPoint PS $5295**  
Same specifications as the PSX, but with a 16 MHz processor, 6 Mb of RAM standard, upgradable to 34 Mb.

**Seiko Instruments Personal ColorPoint PS $175**  
High quality color! 300 dpi color thermal printer can produce full-bleed comps on plain paper or transparencies. B4 page size allows printed image of 8.5" x 11.93". 6 Mb RAM upgradable to 10 or 22 Mb. 39 resident fonts, 16 Mhz RISC processor.

**Seiko Instruments Smart Label Printer Plus $1495**  
Can print bar-coded labels. Takes less desk space than a Rolodex® file. Prints labels for envelopes, file folders, diskettes, notebook covers, file cards, name tags, and more. Bar-coding capability makes it useful for tagging low-volume inventory. Includes software (with its own database, text editor and bar-code generator), serial cable and 130 self-adhesive labels.

**CoStar Label Printers**
- **AddressWriter $469**
- **LabelWriter II $189**

**RasterOps CorrectPrint 300 $44995**  
Photographic-quality proofs for around $5 a page!  
(With our leasing program, you can afford leading-edge desktop color technology.)  
The highest-quality color available in desktop color proofing technology. The RasterOps CorrectPrint 300 uses a four color (CMYK) dye-sublimation thermal printing process at 300 dots per inch. The result is a continuous-tone print that resembles photographic-quality output. The CorrectPrint 300 prints on special sheet-fed paper or transparencies, not on rolls. For best output, special coated paper is required. It uses a RISC controller with JPEG decompression capability. The CorrectPrint 300 comes with 0Mb RAM, 12 Mb RAM is required, and it is upgradable to 36 Mb RAM.  
It's Adobe PostScript® language compatible, and includes three interfaces as standard: AppleTalk, Ethernet, RS-232C, plus a SCSI port, allowing users to share the ColorPoint among Macs, PCs, workstations, or a network. 39 resident fonts.

**Seiko Instruments ColorPoint PSX**

**Seiko Instruments ColorPoint PSX**

**Seiko Instruments ColorPoint PS**

**Seiko Instruments Personal ColorPoint PS**

**Seiko Instruments Smart Label Printer Plus**

**CoStar Label Printers**

**RasterOps CorrectPrint 300**

**Seiko Instruments ColorPoint PSX**

**Seiko Instruments ColorPoint PS**

**Seiko Instruments Personal ColorPoint PS**

**Seiko Instruments Smart Label Printer Plus**

**CoStar Label Printers**

**RasterOps CorrectPrint 300**
High-speed thermal printer produces edge-to-edge comps on 11x17 or smaller paper...
300 dpi thermal transfer technology prints quality color or monochrome output. 10 Mb standard; upgradable to 18 or 34 Mb. Three interface ports (RS-232, parallel, and AppleTalk®) can be used simultaneously. Includes 39 resident Bitstream fonts.

Brilliant, saturated color at 300 dpi
Adobe PostScript® compatible—perfect for graphic arts applications, publishing, business presentation graphics, and more. 4 scanning passes; Pantone-approved color palette. Includes printer tray and sheet feeder.

Prints on BOTH sides of thermal or plain laser paper!*
- Easy-access front control panel
- 300 dpi
- 10 Mb of RAM

* The RealTech Color 350 uses state-of-the-art thermal technology, which allows you to print on both sides of thermal paper, or on both sides of high-quality, smooth finish plain laser paper. (Use thermal paper or clay-coated paper for optimum output quality and consistency.) Call for more information.

Where else would you find such a high-quality, affordable color printer?
Microsoft Excel 4.0

Microsoft waxes cold on the features war and hot on usability with Excel 4.0.

Like a world-class athlete, Microsoft seems to thrive on perfecting its game as much as on competing with its rivals. Only one year after shipping the last major release of its best-selling spreadsheet program, Excel, Microsoft has completed version 4.0, an impressive revision that successfully leverages a fairly narrow but key focus — making more accessible the small number of features that get the most use.

Auto-Spreadsheet

Whether you’re a power user or a spreadsheet dilettante, chances are you spend a lot of time fussing with your data to make it look presentable on a worksheet. Microsoft has added an AutoFormat feature that should make format fussing a thing of the past. Now you can simply select a group of cells, and Excel will automatically apply an aesthetically pleasing format to it.

In addition, you can accomplish many everyday operations in Excel 4.0 simply by dragging. For example, you can select a group of cells and drag them to a new position. Even more useful is the AutoFill feature, which can intelligently create a data series for you. By typing Region 1 into a cell, pressing Enter, and dragging the fill handle (a small square) across several rows or columns, for example, you can get Excel to fill in the appropriate labels — Region 2, Region 3, and so on.

Furthermore, if you select two cells that contain the numbers 10 and 20 and then use the fill handle to drag a selection, Excel will fill subsequent cells with 30, 40, 50, and so on. Excel even recognizes some words — if you type in the labels June and July, you can use AutoFill to complete the monthly labels for your data series. You can also use this feature to clear cells quickly by selecting a large area on a worksheet and then dragging the fill handle to reduce the size of the selected area (the Undo command works in case you drag too far).

With its multiple customizable tool bars, you can tailor Excel 4.0 to fit your work style. You can open the tool bars as resizable floating palettes or dock them on one side of your screen. You can even mix and match buttons among tool bars and add macro buttons to them. If you don’t like the look of a button, you can design your own button face in a drawing program and paste it onto the button.

Excel 4.0 makes it even easier to access commonly used commands than the previous version did. If you hold down the Option and Command keys and click on an object, Excel brings up a pop-up menu that contains commands relevant to your selection, whether you’re clicking on a worksheet, toolbar, chart, or graphic object. Excel’s Command-Option-click combination can’t be modified, and it may conflict with some third-party utilities, but in most cases, you can reprogram your utilities to use other keystroke combinations. Another new timesaver is the ability to close all open documents with a single command.

Undergoing Analysis

If you regularly construct complex spreadsheet models, several new tools in version 4.0 should make your life easier. The Scenario Manager is an add-in macro for what-if analysis that lets you specify multiple cells as variables. As you run different scenarios on your data by changing the input values of the cells, a summary-report function enables you to draw comparisons among them. For complex what-if scenarios, Excel 4.0 lets you define custom dialog boxes as well as simple macros.

Excel 4.0’s new Workbooks ease the process of organizing and navigating related spreadsheet files. When you create a Workbook, you’re actually creating a new file format that’s capable of holding multiple worksheets, charts, and macro sheets. A Workbook table of contents lets you easily navigate the related documents, and you can share the entire collection with coworkers as a single Workbook file rather than as an unwieldy hodgepodge of separate files. To reverse the process, you can unbind documents from Workbooks and use them as stand-alone worksheets, although you can still reference them through a Workbook’s table of contents.

Anyone who has struggled with Excel 3.0’s charting module probably has new charting features at the top of their wish...
list for version 4.0. The good news is that version 4.0’s ChartWizard makes charting easier. The bad news is that the program has maintained its original charting architecture, which means you can place a chart on a worksheet but must still open the chart in a separate window to edit it.

To ease the chart-building process, ChartWizard guides you through it, step by step, with dialog boxes that provide graphic explanations for each step as well as access to Excel’s help system. If you’ve already mastered Excel’s charting idiosyncrasies, you can bypass ChartWizard by using a fast-forward button. Other useful charting enhancements include a dialog box that lets you view the ranges you’re selecting as you edit a chart’s data series and the ability to click on 3-D charts and rotate them directly rather than manipulating them through a secondary dialog box.

Also-Rans

In addition to the major enhancements in Excel 4.0, several minor improvements also bear mentioning. You can now create and print reports that consist of multiple worksheet views and scenarios, and a new Print to Fit command lets you print worksheets of a specific size or length. The Crosstab reporting feature makes it easy to summarize data from Excel databases. Excel 4.0’s QuickTime support lets you create animated charts from complex data sets. And the Excel 4.0 Software Development Kit (available separately) provides developers with information on how to make use of Excel 4.0’s rich Apple-events support.

Excel’s context-sensitive on-line help system is one of the best we’ve seen. After you’ve selected the help icon on the tool bar, you can click on any object or tool on-screen to call up the appropriate information. Every dialog box is equipped with a Help button, and a search feature makes it easy to find a particular topic. Each topic has a pop-up window with information on shortcuts and special techniques as well as hypertext links to other topics. In addition, you can print any topic and set up bookmarks for subjects you consult frequently. The Back button lets you retrace your steps through every one of the topics you’ve viewed. Excel 4.0’s printed documentation is also an improvement — it’s less bulky and is organized into fewer books than version 3.0’s documentation was.

PowerBook users can install on-line help and leave the documentation at home. The help file’s massive size — 1.657K — is the only drawback. Moreover, if you install everything Excel 4.0 offers, you’ll need nearly 9 megabytes of storage!

Microsoft’s extensive usability testing has clearly paid off — Excel 4.0’s near-flawless interface design is proof positive of its effectiveness. However, we still have a few items on our wish list. Many of Excel 4.0’s new features are implemented through add-ins, which must load and configure themselves before you can use them. As a result, response is sluggish for some commands. We hope future versions will be smarter about which add-ins to preload at launch. We’d also like to see the addition of a macro compiler or tokenizer, which would improve the execution speed of complex macros.

The Bottom Line

We applaud Microsoft for eschewing the features war in favor of making Excel 4.0 easier and more comfortable to use than previous versions. The AutoFormat and AutoFill time-savers alone should significantly boost users’ productivity. Moreover, it may be safe to assume that Microsoft has turned its attention more to attracting new users to spreadsheet programs than to stealing its competitors’ customers. If that’s so, then chalk one up for the Redmond usability team. If you’ve never used a spreadsheet program before and you’re looking to get the most power for your money, Excel 4.0 is an excellent choice. If you’re already an Excel user, you won’t want to skip this upgrade.

— Louis E. Benjamin, Jr.
The latest upgrade of the Macintosh’s most popular disk-repair and data-recovery package won’t dazzle users with innovation, but it does give them more for their money than the previous version did. Norton Utilities for Macintosh 2.0 features state-of-the-art recovery tools, new backup options, and a suite of enhanced security and disk-organization utilities borrowed from the now-defunct SUM (Symantec Utilities for Macintosh) package.

Mr. M.D.

Norton Utilities’ essential diagnostic and repair utility, Norton Disk Doctor, packs even more muscle in version 2.0 than it did in the previous version. Disk Doctor can now handle a wider variety of situations involving damaged volumes (drives as well as partitions). In addition, Symantec has increased the program’s data-recovery success rate by beefing up Disk Doctor’s UnErase and Format Recover commands.

Also substantially improved is FileSaver, a control panel that tracks deleted files, stores volume-backup information, and saves comments during desktop rebuilding. The data that FileSaver records is essential to the package’s ability to restore erased files and recover data from damaged disks. FileSaver can now update its data at user-specifiable intervals or on demand through the use of a hot key. This feature will have special appeal to network administrators, because the previous version’s updates on restart weren’t useful for servers. Other new options also let you designate the circumstances under which FileSaver updates are performed. PowerBook users, for example, can set FileSaver to perform updates just before their PowerBook goes to sleep.

Speed Disk, Norton’s volume-optimization utility, is improved in version 2.0 to allow the defragmentation of the current startup volume. The previous version didn’t allow operations on startup volumes, with the exception of scans to determine fragmentation. Defragmentation guarantees that all files are stored contiguously on a volume. Optimization takes defragmentation one step further and moves all files toward the beginning of the volume, thereby creating a large contiguous free space. As with the previous version of Speed Disk, the optimization process can be prioritized, so files that aren’t frequently altered (system files, control panels, and extensions, for example) are located closer to the beginning of the volume than frequently used files are. As a result, frequently used files are closest to the free space on the volume, which allows them to grow with less likelihood of fragmentation.

Revamped completely in version 2.0 is Norton’s Directory Assistance, one of the most comprehensive directory-dialog-box extenders currently available. On a menu bar that it adds to each Open, Save, and Save As dialog box, the utility lists your most recently accessed files and folders and lets you specify any files and folders you want listed permanently. You can also control the sorting order of the list, find files and folders (Directory Assistance uses the same high-speed search engine as Norton’s Fast Find tool does), and create new folders—all without returning to the Finder.

The Fast Find DA, a carryover from version 1.0, was originally designed to outperform System 6’s Find File DA. Version 2.0’s Fast Find continues the tradition by outclassing System 7’s Finder. Fast Find quickly builds a list of files and folders that match user-specified search strings. You can inspect each found item by choosing Get Info,

In addition to new backup and security options, Norton Utilities 2.0 features numerous enhancements to existing features. With the new FileSaver options, for example, PowerBook users can set the utility to perform updates just before their PowerBook goes to sleep.

Norton Utilities’ Speed Disk, which graphically displays the allocation of files on a volume as well as the total degree of fragmentation, is enhanced in version 2.0 to allow the defragmentation of the current startup volume.
which lets you determine the file’s origin, or by looking at the contents of the file with Fast Find’s viewer. To display the file’s icon and the directory in which it resides in the Finder, you can simply Option-double-click on the file’s name in Fast Find’s list, causing an Apple event to be sent to the Finder. In addition to enhancements to existing features, Symantec has added several new tools to the Norton Utilities package, including timed-backup capabilities. Norton Backup lets you back up files to floppies or to a single large file (for example, to a file that resides on a server), and it can optionally compress the data. Once you’ve specified the backup medium and the files, folders, and volumes you want to back up, you can save the settings. If you need to perform regular unattended backups, you can use Backup’s scheduling feature to set times for either incremental or full backups. The Norton Backup extension can automatically start a backup for you on a set time.

By incorporating tools from the SUM package, Norton Utilities has grown in breadth to include several serviceable security and disk-organization tools. The Floppier utility, which was completely rewritten for Norton 2.0, lets you store complete representations of floppy disks in a file on your hard disk, making it an excellent tool for mass formatting and duplication of floppy disks.

One drawback to Floppier, however, is that its file format is incompatible with Apple’s DiskCopy utility. Still, Floppier offers one advantage over DiskCopy. DiskCopy files are always the size of an entire floppy disk, whereas Floppier files contain only used sectors of the disk. Empty sectors are not saved, which generally reduces the size of Floppier image files. If you don’t need compatibility with DiskCopy, Floppier is an excellent tool.

The new Norton data-security tools are Wipe Info and Norton Encrypt. Wipe Info is the antithesis of everything Norton Utilities has stood for in the past. Rather than excelling at rescuing files, this utility excels at permanently erasing files, volumes, and free space on volumes, by overwriting specific areas. Normally, when files are deleted, the directory information is erased but the data itself remains. Wipe Info ensures that the data as well as the directory information is destroyed. Not even Norton Utilities’ data-recovery tools can restore data once it’s been wiped out with this tool. System 7 users can take advantage of Wipe Info’s ability to create a Wipe Info Trash, which operates much like the System 7 Trash, except that any files dragged onto it are permanently erased.

Norton Encrypt is an application that lets you encrypt and decrypt files with either Norton’s own proprietary algorithm or with the DES (Data Encryption Standard) method. Under System 7, you can drag and drop files or folders directly onto Encrypt to either encrypt or decrypt them.

Norton’s security features are a nice windfall, but most users who require fairly stringent security measures will probably be better off investing in a standalone security package.

The Norton Partition feature, also taken from SUM, lets you create large invisible files, called soft partitions, that reside within the hard partitions on your hard disk. By partitioning a high-capacity disk that stores many files, you can significantly shorten the time it takes to locate files. However, soft partitions have their pros and cons when compared with hard partitions, which are created with hard-disk-formating utilities. Data in soft partitions may not be easily recoverable if the hard partition crashes. Separate hard partitions, on the other hand, are likely to remain unharmed when other partitions go down. Version 2.0 of Norton’s recovery tools provides extra support for Norton soft partitions to improve the chances of recovering their contents after a crash.

In general, soft partitions are more flexible and convenient to set up than hard partitions. You can create, delete, and expand them on the fly, which you can’t do with hard partitions. Norton Partition lets you encrypt all the data in a partition — some hard-partitioning utilities also provide this feature, which provides an extra degree of security, but be forewarned that it also makes recovery from serious crashes virtually impossible.

The Bottom Line
Norton Utilities for Macintosh 2.0 is a solid collection of data-recovery and productivity tools, teamed with several backup and security options. Although the latest version doesn’t win any prizes for innovation, as did the first version of the program, we highly recommend it. Norton Utilities for Macintosh provides an invaluable safety net for your data — no serious hard-drive user should be without it.

— Stephan Somogyi

Get Info
Norton Utilities for Macintosh

Published by: Symantec Corp., 10201 Torre Avenue, Cupertino, CA 95014; 408-253-9600.
Version: 2.0.
List Price: $149.
AddressWriter

The AddressWriter makes short work of printing envelopes, but its talents don’t come cheap.

If you need to print a lot of envelopes but aren’t up to wrestling with a dot-matrix or laser printer, CoStar has an alternative called the AddressWriter, a dedicated envelope printer that promises to eliminate the hassle of printing envelopes with traditional printers. Laser printers require that you feed envelopes manually unless you buy a costly feeder. Even more problematic is the printer’s heated fusion rollers, which tend to melt the envelopes’ adhesive, producing a nicely printed — but sealed — envelope. Dot-matrix printers aren’t much better — they don’t seal envelopes, but they also generally require manual feeding or a special attachment.

Pricey Solution

The AddressWriter solves the envelope-printing dilemma, but at $595, it’ll need to print a lot of envelopes to justify the cost. An unusual-looking X-shaped device with a small footprint (8.5 inches wide by 8 inches deep), the AddressWriter comes with a bin for catching printed envelopes, but the bin hangs off the edge of a desk. This means that you must place the printer on the edge of a surface that’s raised at least a foot above its surroundings. Behind its space-age exterior is a fairly ordinary 8-pin dot-matrix printer with 144-dpi resolution.

The AddressWriter’s feeder holds 100 standard #10 envelopes or about 200 postcards. It takes about 30 seconds to print a mailing address and a return address on a #10 envelope, and one ribbon prints about 1,000 envelopes. CoStar recommends using either TrueType fonts or ATM with PostScript Type 1 fonts for the best results.

The printer connects directly to a Mac’s serial port, meaning that it ties up a serial port and limits the printer to use with a single Mac. However, an optional $199 LocalTalk interface box lets you put the AddressWriter onto a network, which is ideal if you already have a printer and a modem hooked up to your Mac or if you want to share the AddressWriter among several Macs.

Once you’ve attached the printer to your Mac via a LocalTalk or direct serial connection, you must install the AddressWriter software, which uses Apple’s Installer. Unfortunately you can’t customize the installation: The program disk installs not only the AddressWriter program and DA but also the AddressWriter serial driver, whether you want it or not. The AppleTalk driver comes on a separate disk with its own Installer. Both Installers insist on installing yet another copy of TeachText. You can print to the AddressWriter from any application simply by selecting the printer in the Chooser. The Page Setup dialog box lets you select from a variety of common envelope sizes, and you can have the printer “read” an envelope’s size by running the envelope through the printer.

The AddressWriter application and DA provide the most convenient means for printing envelopes.

The application uses three windows: one each for an envelope template, an address list, and a mailing address. In the template window, you can choose a variety of common envelope and postcard sizes, control the position of the mailing and return addresses, choose whether to print postal bar codes, and include optional graphics such as a company logo. You enter and edit addresses in the mailing-address window, and saving an address adds it to the address list. You can also import address lists from other applications in a variety of formats, including tab-delimited text. You can use multiple address lists, but you can have
only one open at a time. Each address list is sorted alphabetically or by ZIP code, but printing choices are limited to the current address or the entire list — you can't select a range for printing or set up subsets of the list.

The DA, a scaled-down version of the application, opens automatically to the last-selected envelope template and address list, but you can select alternative templates or lists from pop-up menus. One useful feature lets you copy an address from another application to the Clipboard, open the AddressWriter DA, and have the address transferred automatically to the envelope, ready to print.

One annoying aspect of the AddressWriter is that when you have it selected in the Chooser, all your applications default to a page size that's equivalent to the selected envelope size. In order to get proper pagination in your word-processing application, for example, you must remember to go back to the Chooser and select your standard printer. Apple's forthcoming drag-and-drop printing features will largely eliminate this situation, but for now, you're stuck with it.

**The Bottom Line**

No one will argue against the superior qualities of the ubiquitous laser printer — it's fast and quiet, and it produces good print quality. However, when it comes to printing envelopes, neither the laser printer nor the dot-matrix printer wins any accolades. CoStar's AddressWriter is a good solution, but at $595 for the single-user version, it's pricey. An optional $75 label feeder increases its versatility, but it's still too costly for casual use. The AddressWriter is most viable as a shared network resource, with the addition of the $199 LocalTalk interface. If you print many envelopes, this gadget can make your life easier.

— Bruce Fraser

### FILE & DISK MANAGEMENT

**HAM, HAND-Off II, and On Cue II**

Three System 7 file-management utilities aim to boost productivity.

File-management utilities are a surefire way to boost your Mac productivity. We tore apart three of the most recent offerings — HAM, HAND-Off II, and On Cue II — to find out how each utility goes about speeding the process of accessing files and applications and how their techniques differ. When the dust cleared, we found that despite the quality of their design, not one of these System 7 utilities can match the economy and range of functionality of Now Software's blockbuster Now Utilities package, although HAND-Off II managed to come up with one very valuable feature missing from Now Utilities and On Cue II's file-search feature is a standout.

**HAM**

HAM stands for Hierarchical Apple Menus, and that's exactly what it creates. Under System 7, items in folders that reside within the Apple Menu Items folder become readily accessible from the Apple menu as hierarchical submenus, so you don't have to double-click on every folder in a path to get to the file you're looking for.

In addition, HAM can create a Recent items folder on the Apple menu that contains your most recently used applications, files, and folders. A handy control panel lets you change the order in which your Apple-menu items are listed, and you can elect to show or hide individual items.

HAM mimics the functions of CE Software's Tiles with HAMlets, which are icons that you access from the Apple menu, from the desktop, or from within any folder. A HAMlet is designed to let you re-create your desktop as it exists at any time, so that when you double-click on the icon, it opens everything that was open at the time you created the HAMlet. As a result, HAMlets can simultaneously launch multiple files and applications.

**HAND-Off II**

HAND-Off II has three main missions. The most important one is its unique ability to wipe out the "Application is busy or missing" dialog box. If you attempt to open a file that was created in an application that is unavailable, the utility automatically opens it in another application that's both available and compatible. Second, the program provides a

---

**Get Info**

**AddressWriter**

Manufactured by: CoStar Corp.,
22 Bridge Street, Greenwich, CT 06830; 203-661-9700.
List Price: $595; LocalTalk interface kit, $199; label feeder, $75.
separate Launch menu that’s similar to those of On Cue and Now Utilities’ MultiMaster. Finally, its SuperMenu feature makes the System 7 Apple menu hierarchical.

HAND-Off’s application substitution can be a real hard-disk space saver, because you don’t need to keep as many applications available just to open files. For example, with HAND-Off you can set up your system so that all MacWrite, TeachText, Microsoft Works, and text documents open automatically in Word and all PICT, TIFF, and paint files open in Canvas. A special HAND-Off dialog box lets you make on-the-fly substitutions when you attempt to open a file created by a missing application. In addition, from then on, HAND-Off automatically uses the substitute application you specified whenever you open the same type of file (you can edit substitutions in HAND-Off’s control panel).

You can configure HAND-Off’s Launch menu to provide easy access from your menu bar to files, folders, folder aliases, and applications. You can even create groups of files and applications, called Briefcases, and launch everything in a Briefcase from the menu. Files attached to applications or in Briefcases appear as hierarchical submenus, and submenus can be as many as five levels deep. When you’re switching among applications, HAND-Off remembers the speaker-volume and color-depth settings for each application and adjusts them on the fly.

HAND-Off’s SuperMenu is similar to HAM’s Apple-menu utility, but in our tests, HAND-Off’s utility offered faster access. Missing in both HAM and HAND-Off, however, is the ability to display installed Chooser extensions on a submenu of the Chooser, a feature that’s included in Now Utilities’ NowMenus. This option makes for fast and easy printer switching.

Finally, we found HAND-Off’s AutoHide feature to be a real improvement over System 7’s ability to hide Windows of background applications. Without AutoHide, hidden applications reappear whenever you switch applications; AutoHide keeps all background applications hidden.

On Cue II

On Cue II provides a menu-bar item for file and application launching that’s similar to HAND-Off’s. It also lets you group files and applications for launching, although it calls the groups MultiSets rather than Briefcases. You can’t install folder aliases on your launch menu, as you can with HAND-Off, but On Cue’s folders organize the menu’s contents into convenient submenus. On Cue also doesn’t adjust speaker volume or color depth as you switch applications, but it does track your most recently used files and folders for fast access.

A feature called On Disk creates popup menus in the standard Open and Save dialog boxes that let you create new folders; perform file-management functions such as duplicate and rename; and find files, folders, and disks. A powerful search feature lets you find files by name, type, creator, size, or date modified.

On Cue has five extension modules. KeyLauncher lets you launch files simply by typing all or part of the filename into a dialog box and clicking on the Launch button. MatchMaker performs application substitution similar to that of HAND-Off, except that you must preconfigure substitutions in the MatchMaker dialog box rather than on the fly when you open the file. The Quitter dialog box lets you quit from background applications without switching to them first. Restart and Shut Down work just as their counterparts on the desktop’s Special menu do, but from within applications.

On Cue’s QuickFinder DA can display all currently available files of a specified type (such as an application). Many standard types are preinstalled, but you can add others. Typing the first few letters of the name of the file you’re searching for jumps you to the filename, and you can launch the file either by pressing Return or by double-clicking. QuickFinder is an especially convenient and unique way to find and launch files.

Last but not least, On Startup is an extension manager similar to INITPicker. At bootup, you can enable or disable individual extensions and control panels, change the order in which they load, and save preconfigured sets for special purposes. Like INITPicker, On Startup automatically disables any extension that it suspects may cause a system error, although in our tests, this feature occasionally disabled extensions for no apparent reason.

The Bottom Line

If you’re running System 7, you’ve probably already noticed a significant boost in your productivity. By adding a System 7 utility, you’ll get even more out of your Mac. All three of the file-
Typist Plus Graphics, ScanMan Model 32, and LightningScan Pro 256

The Typist Plus Graphics bests the competition as a double-duty OCR and image-processing tool.

When Caere first introduced the Typist, a unique hand-held scanner designed for OCR, the product generated less than rave reviews. Two recent developments have helped to improve the Typist's image, however. Caere's new model, the Typist Plus Graphics, does double duty for OCR and image processing, so it's a more versatile tool. In addition, compared with the latest entries in the hand-held-OCR/image-processing field — Logitech's ScanMan Model 32 and Thunderware's LightningScan Pro 256 — the Typist Plus Graphics' relative speed and ability to scan text directly into documents allows it to come up smelling like a rose.

Typist Plus Graphics

To use the Typist Plus Graphics, you launch the Typist software from the Apple menu, open an application such as a word-processing or page-layout program (any program that accepts keyboard input should work with the Typist), and start scanning. Recognized text flows into your open document at the insertion point. The OCR software has controls for scan direction (down, right, left, auto), brightness, and column selection as well as controls for processing spreadsheet formats and documents printed on dot-matrix printers. If you have only an occasional need for OCR, the Typist will be a welcome tool, but its poky performance and higher error rate relative to software-only OCR packages such as OmniPage Pro make it impractical for processing medium to heavy loads. Compared with the other hand-held scanners we tested, however, the Typist boasted the best OCR performance.

The Typist's Graphic Editor, identical to that of Caere's industrial-strength OCR package, OmniPage Pro, lets you scan printed graphics; manipulate them with image-processing tools; and save them to disk as line art or as gray-scale TIFF, PICT 1 or 2, MacPaint, or EPS files. The Typist Plus Graphics doesn't support 256

Clockwise from upper left: Logitech's ScanMan Model 32, Thunderware's LightningScan Pro 256, and Caere's Typist Plus Graphics. Of the three, the Typist Plus Graphics most successfully combines OCR and image processing into one easy-to-use package.
Now you can transform your Macintosh into a "Label Publisher" with new Mac Label Pro, Software from Avery.

Features include:
- Preset layouts for Avery Dot Matrix Printer Labels and Laser Printer Labels, including mailing, shipping, file folder, diskette and card products.
- Drawing tools and a library of clip art.
- Rotate and fill patterns.
- Serialization for sequentially numbered labels.
- Easy mail merge and graphic importing.
- On-line help.

Call 1-800-541-5507 for a dealer near you. Retail price only $99.95

See us at MacWorld Expo Booth #5564
CIRCLE 57 ON READER SERVICE CARD.

We compared the recognition speed and accuracy of Typist Plus Graphics, ScanMan Model 32, and LightningScan Pro 256 for a 750-word document with that of OmniPage Pro used with a flatbed scanner (our test platform was a Mac IICx with 8 megabytes of RAM). Hand-held scanners are a good choice if you need to capture both photos and text, but they’re best used only for light-duty OCR.

levels of gray — it’s strictly a 1-bit device. Gray scale is interpolated through software. The only drawback to scanning graphics with the Typist is its inability to stitch multiple-pass images together — scanned artwork must be smaller than the 5.25-inch scan head (it can stitch text, however).

The Typist’s SCSI implementation has been changed somewhat from the first version — instead of having to be positioned as the last device in the SCSI chain, it must now be positioned as the first item in the chain (after the Mac itself, of course).

The Typist requires a Mac SE or later, 4 megabytes of RAM, MultiFinder or System 7, and a hard drive.

ScanMan Model 32

Unlike the Typist, the ScanMan Model 32 began life as a hand-held gray-scale graphics scanner. Only recently did its maker, Logitech, transform it into a double-duty OCR/image-processing tool by bundling it with the company’s OCR program, CatchWord Pro.

The main differences between the ScanMan/CatchWord Pro bundle and the Typist are software-related and are most apparent for OCR. The ScanMan lacks the Typist’s convenience factor of interactive scanning from within other applications. You must export scanned text to a separate document (the ScanMan supports a variety of formats) and then import, open, or place it in an application. The software imposes a crippling 32K limit (two to three pages) on each OCR scan. CatchWord Pro does support text stitching (as does the Typist), so if you need to make more than one pass over a page, the software can fit the results together properly. CatchWord Pro can scan text in English, French, or German too.

The ScanMan’s graphics-scanning software also falls short when compared with the Typist’s. The program provides basic retouching tools (you can erase; crop; paint; draw; and perform limited transformations such as rotate, invert, or flip) as well as controls for adjusting brightness and contrast. But the ScanMan’s image-processing tools are not nearly as robust as the Typist’s Graphic Editor, which provides an anti-aliasing brush and a variety of special effects. Moreover, the ScanMan supports only 32 levels of gray. Fortunately, given its relatively narrow scan head (4.5 inches), the ScanMan software supports image stitching, so you can make several passes to scan images larger than the scan head. You can use the ScanMan’s graphics-scanning software in DA or application form, but the DA lacks support for the compressed-TIFF format.

To install the ScanMan, you connect it to your SCSI chain with a SCSI-adapter box. Because the device is internally terminated, you must place it at the beginning or end of the chain, unless you’re willing to crack open the adapter box (instructions provided) and remove the termination. The package requires a Mac Plus or later, at least 2 megabytes of RAM (4 megabytes if you’re running System 7), and a hard drive with 4 megabytes or more of free space.

LightningScan Pro 256

Like Logitech’s ScanMan, Thunderware’s LightningScan Pro 256 began life as an image scanner. Only recently has it
been positioned as a dual-purpose product that includes Olduvai's ReadIt Pro OCR software.

Despite the relative OCR competence of ReadIt Pro (see review, March '92, page 50), we experienced more problems with the LightningScan Pro/ReadIt Pro OCR package than with either of the other hand-held-scanner packages we tested. We suffered several system crashes under System 7, even though no extensions were present and Thunderware claims that its product is System 7-compatible.

Overall, we found the LightningScan Pro far fussier for OCR than the other two products — the scanner head must be positioned just so on a page, and the drag speed must be just right for the scan to be acceptable. Under System 7, ReadIt Pro's Send Text To command lets you scan text directly into a document open in another application, such as a word processor, but in our tests this feature worked erratically at best.

Where the LightningScan Pro package really shines is in image processing. The package comes with two image-processing programs: Thunderware's own ThunderWorks and MicroFrontier's outstanding Enhance.

Compared with Caere's Graphic Editor, ThunderWorks sports a more conventional Mac interface, and it can scan and edit 1- and 8-bit images. The program comes with various controls for brightness and contrast as well as with filters for manipulating images and creating halftones. The software is capable of stitching images together, so you can scan images that are larger than the scanner's 4.5-inch head. Editing tools are included, and you can work at the fat-bits level. ThunderWorks can save files in the compressed/uncompressed-TIFF, MacPaint, EPS, PICT, and ThunderScan formats.

Enhance offers even more in the way of sophisticated image-editing features than does ThunderWorks, including masking, customizable transformation filters and editing tools, anti-aliasing, and a magic-wand selection tool.

The LightningScan Pro 256 connects to your Mac through a SCSI-converter box, and you can easily insert the converter at any point in the SCSI chain (unlike with the other two scanners). You need at least 2 megabytes of RAM (4 or more recommended), a hard drive, and System 6.0.7 or later.

### The Bottom Line

The original Typist's marriage of hand-held scanning hardware to OCR software generated a lot of fanfare, but not until Caere made the product more versatile with the Graphic Editor could we place the Typist on our recommended list. If you're looking for an inexpensive scanning product that lets you capture photos as well as an occasional page or column of text, the Typist Plus Graphics is worth considering, given its ability to scan text directly into documents and its capable image-processing tools, wider scan head, and speed advantage relative to the ScanMan and the LightningScan Pro. For image scanning, the device's quasi-gray-scale approach won't meet the needs of professionals, but it's quite suitable for casual use.

The award for graphics handling goes hands down to Thunderware's LightningScan Pro 256, the only package in the group that offers true 256-level gray-scale scans, with powerful image-processing tools to boot. However, we found the LightningScan Pro's OCR technique too error-prone for us to recommend the device as a combined OCR/graphics solution.

— Gregory Wasson

### Get Info

**LightningScan Pro 256**


Version: 1.3.2.

List Price: $649.

**ScanMan Model 32**

Manufactured by: Logitech, Inc., 6505 Kaiser Drive, Fremont, CA 94555; 415-795-8500.

Version: 2.1.

List Price: $599 (bundled with CatchWord Pro).

**Typist Plus Graphics**

Manufactured by: Caere Corp., 100 Cooper Court, Los Gatos, CA 95030; 408-395-7000.

Version: 2.0.

List Price: $695.
External Charger/Conditioner for the PowerBook Models 140 & 170

The Model BC-4070 Charger/Conditioner is a must for all Model 140 & 170 PowerBook users. It automatically cycles the battery over its full range to correct and prevent loss of running life caused by short cycling of nicad batteries.

The Model BC-4070:
- Prevents loss of capacity due to memory effect.
- Restores battery to full capacity.
- Optimizes battery performance.

Only $189.95
Includes AC & 12V DC Power Adapters

Other PowerBook Products:
- Automobile Power Adapter .......... $99.95
- Auxilliary Power Pack ................. $189.95
- Charger for Model 100 ............... $149.95

We make your portable more portable...Call Today!
800-659-5956

Lind Electronic Design
6414 Cambridge Street
Minneapolis, MN 55426
Phone: (612) 927-6303
Fax: (612) 927-7740

CIRCLE 23 ON READER SERVICE CARD.

MUSIC & SOUND

SoundEdit Pro and AudioTrax

Mac audio enthusiasts gain a wide range of new tools with SoundEdit Pro and AudioTrax.

Both the latest version of Macromedia’s popular SoundEdit program, SoundEdit Pro, and Passport Design’s AudioTrax are good examples of the trend toward ever-more-sophisticated tools for recording and editing sound with the Mac. SoundEdit Pro will have special appeal to those who own Macs with built-in sound-recording capability, and AudioTrax is a good entry-level tool for novice MIDI users.

SoundEdit Pro

To the previous version’s support for the MacRecorder, SoundEdit Pro adds support for the built-in sound-recording capabilities of the newest Mac models (the Classic II, LC, LC II, IIsi, Quadras, and the PowerBook 140 and 170). For those who already own SoundEdit, SoundEdit Pro offers several attractive enhancements.

In addition to expanded sound-input support, SoundEdit Pro features a virtual-memory scheme that eliminates RAM constraints, which means that the maximum recording time is limited only by available disk space. And professional-level users who own Digidesign’s Audiomedia or Sound Tools system will be enticed by SoundEdit Pro’s ability to work with 16-bit sound files.

Background processing is another valuable addition to Macromedia’s program. With SoundEdit Pro, you can elect to filter a large disk-based sound or change its sampling rate and then switch to another application while SoundEdit Pro continues file processing as a background task. In our tests, however, this feature worked reliably only under System 7.

SoundEdit users will notice that the program’s mixing feature is changed in SoundEdit Pro. The good news stemming from this change is that the sound-mix quality is clearly superior to that of SoundEdit. The bad news is that the mixing interface is more awkward and less capable than that of the previous version. For example, if you want to mix two sound channels, the channels must reside in the same document and you can’t preview a mix or easily set volume changes for each track during the mix.

Macromedia has also made some improvements to the program’s standard-effect filters and added several new ones. SoundEdit Pro’s new Noise Gate filter handily reduces low-volume artifacts and noise between sounds. A new Emphasize filter increases high-frequency response by putting the sound through a high-pass filter, a process that’s similar to boosting the treble control on a stereo system.

Numerous small improvements on its predecessor further enhance SoundEdit Pro. You can preview a sound in the Open dialog box without opening its file — a truly useful addition. If you’re looking for a way to do audio analysis or...
**Power Up To Maximum Ram**

<table>
<thead>
<tr>
<th>MEMORY KITS</th>
<th>SDRAM SIZES AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACINTOSH PLUS</td>
<td>1MB, 2MB, 3MB, 4MB</td>
</tr>
<tr>
<td>MACINTOSH SE</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH SE/30</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH II</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH IIE</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH IIC</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH IICX</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH LC</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH LCII</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH LCIII</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH LCIV</td>
<td></td>
</tr>
<tr>
<td>LASERWRITER UNIV</td>
<td></td>
</tr>
<tr>
<td>TI MICROLASER</td>
<td></td>
</tr>
<tr>
<td>HP LASERJET</td>
<td></td>
</tr>
<tr>
<td>PORTABLE</td>
<td></td>
</tr>
<tr>
<td>QUADRA 700</td>
<td></td>
</tr>
<tr>
<td>QUADRA 900</td>
<td></td>
</tr>
<tr>
<td>POWERBOOK 120</td>
<td></td>
</tr>
<tr>
<td>POWERBOOK 160</td>
<td></td>
</tr>
<tr>
<td>POWERBOOK 200</td>
<td></td>
</tr>
<tr>
<td>CARDS</td>
<td></td>
</tr>
<tr>
<td>MACINTOSH LC</td>
<td>512K VRAM - LC FPU</td>
</tr>
<tr>
<td>MACINTOSH LCII</td>
<td>ADAPTER CARD - ADAPTER CARD WITH FPU</td>
</tr>
<tr>
<td>QUADRA 700/900</td>
<td>256K VRAM</td>
</tr>
<tr>
<td>MACINTOSH IIC</td>
<td>CACHE CARD</td>
</tr>
</tbody>
</table>

**More power for the PowerBook.**
Available in 2MB, 4MB, and 8MB.

Corporate PD's accepted, all major credit cards honored and
volume discounts are available. Fax: 713-809-8300.

Toll Free Direct Line: 800-866-2785

Circle 105 on Reader Service Card.
MacQuill
The One Program
All Candidates Agree On!

“It's A Great
Word Processor
that Automatically
Wraps Text Around
Graphics”

“You Can Have
Multiple and
Resizeable
Columns, and It's
So Easy Even Dan
Quayle Can Use It”

MacQuill
$99.00
Suggested Retail Price $149.00

- Drag Blocks of Text or Graphics
  Anywhere on the Page
- Paste In and Resize Graphics
- Paragraph Style Sheets
- Spell-Checker...and Much, Much More!

Page Make-Up for the Rest of US
1-800-524-3315

REVIEWS

AudioTrax offers an
inexpensive way to
synchronize sampled
sound with MIDI
sequences.

tweak sounds to a fine degree, you can
view the spectral- and standard-wave-
form displays simultaneously. SoundEdit
Pro provides a fairly extensive set of
controls and options for adjusting the
spectral-display modes, and you can
export spectral-display data into a spread-
sheet program to do sound research.
When you open sound resources, a new
interface lists the resources, allows you
to preview them, and displays all rele-
vant resource-file data without requir-
ing ResEdit. And finally, a long-overdue
addition lets you set cue points, or mark-
ers, that enable you to jump instantly to
a specific section of a sound file.

Our tests uncovered several annoying
bugs. After using the Pause button, when
we tried to continue playing the paused
sound, the playback was erratic (the
sound skipped and was distorted). Also,
the playback indicator tended to skip
and disappear, which limited its overall
usefulness.

Although the $295 list price of Sound-
Edit Pro seems a bit high, the $75 up-
grade cost is well worth it for current
SoundEdit owners. All in all, SoundEdit
Pro is a solid upgrade to a leading sound-
editing program.

AudioTrax
AudioTrax is uniquely designed to
blend MIDI sequences with as many as
two channels of 8-bit 22-kilohertz (or
lower) sampled sound. The program is
essentially a scaled-down version of the
Sound Tools/Studio Vision (Digidesign/
 Opcode) combination, which provides
similar functionality for 16-bit CD-quality
sound. At $299, AudioTrax is the
least expensive program for mixing MIDI
music with sampled sound effects, but
its limitations may frustrate professional
MIDI musicians.

AudioTrax provides a set of controls
that work with both the MacRecorder
and the audio-input abilities of sound-
capable Macs, so you can digitize sound
directly from within AudioTrax. How-
ever, the program’s sample-editing tools
are rather limited.

In addition to support for the standard
Cut, Copy, and Paste commands, the
program provides three filters — one for
normalizing (raising the recorded-sound
volume to its highest possible point with-
out introducing distortion), one for ad-
justing the gain (volume) of a recorded
sound, and one for applying a noise gate
(adjusting volume within a specific range).
Unfortunately, AudioTrax doesn’t support
any of the echo/flanging/equalization options of SoundEdit
Pro.

AudioTrax’s MIDI sequencing por-
tion, which is based on Passport’s Trax
sequencing program, contains a useful
set of sequencing controls for begin-
ning-to-intermediate MIDI musicians. You
can create as many as 64 tracks (with 16
playing at any given time) either by re-
cording in real time into the sequencer
or by entering notes one by one in step-
record mode.

The software provides controls for
accessing and editing the recorded MIDI
data as discrete MIDI events, tracks,
and measures. Event editing is presented
in a highly graphical fashion and in-
cludes the ability to automatically
smooth, or quantize, notes that fall out-
side the beat. Professional MIDI users,
however, will find the sequencer portion
of AudioTrax weak compared with Pass-
port’s Master Tracks PRO, Opcode’s
Vision, and Mark of the Unicorn’s Per-
former sequencers.

The documentation that comes with
AudioTrax is excellent and includes a tutorial, a reference guide, and a slim volume on using AudioTrax in conjunction with other applications such as HyperCard and Macromedia's Director.

The Bottom Line

With their support for the audio-input capabilities of the new Macs, SoundEdit Pro and AudioTrax bring a range of powerful sound-management features within reach of a broad audience. SoundEdit Pro's numerous enhancements to its predecessor make it a must-have for current users of SoundEdit and an attractive option for owners of sound-capable Macintoshes who want to fully exploit the audio capabilities of their machine.

AudioTrax seems to be targeting multimedia producers who want to synchronize low-quality sampled sound with reasonably sophisticated MIDI music. However, the limitations of 8-bit 22-kilohertz audio make it undesirable for singing tracks and barely acceptable for spoken voice-overs. In addition, when the sampled sound is mixed with the relatively high quality of MIDI instruments, it's likely to stand out like a sore thumb. But AudioTrax's low price will give novice MIDI users an inexpensive way to experiment with syncing sampled sound with MIDI, so if that's what you're looking to do, this program may be the way to go.

— David Biedny
Introducing the DayMaker®
Travel Case Bundle.
• The DayMaker Travel Case: Custom designed for the PowerBook®.
  Lets you use your PowerBook without having to take it out of the case. Form-fitted. No slack, straps, or sliding. Ports accessible. Open front for easy trackball use. Tough Dupont Nylon Cordura.
• DayMaker personal organizer software: Gives you the power to organize your work and life. Control over information and time. Exclusive "tag" system lets you define your own categories, then view and print customized lists and calendars that perfectly match your needs. "DayMaker is the premier personal information manager on the Mac."—MacWeek
Special Bundle Price $149.99 plus $8.50 shipping and handling.
See your dealer or call toll-free 1-800-756-8553.

REVIEWS

Frontier
UserLand’s scripting tool lets you write your own utilities for automating your desktop.

Although DOS users have been automating their desktops with batch files for years, only recently have Mac users gained the same level of control. With the release of Frontier, the first system-level scripting tool for the Mac, you can write your own utilities to enhance the Finder. Moreover, if you have programming experience, whether in HyperTalk or some other language, you can write even more powerful scripts that link the functions of IAC-aware applications.

The User’s View
As miniprograms, scripts differ from commercial applications in two ways. They’re shorter (from one line to a hundred lines and more), making them well suited for simple utility functions such as finding locked files. They also differ from commercial applications in production time — typically, scripts can be written, tested, and put into use in minutes, in contrast to the months required for commercial applications.

Frontier comes with a collection of ready-made utility scripts, so you can begin using the program as soon as you install it (you don’t even have to read the documentation to use the scripts). Among those included in the package are scripts for counting the files in a folder, finding all locked files, backing up selected files, and displaying a graph of the free space on all mounted disks. On-line services such as CompuServe offer a growing number of scripts created with Frontier.

To use these Finder-related “desktop scripts,” you simply double-click on their icons, just as you would with a stand-alone application. Unlike stand-alone applications, however, the scripts require Frontier to be present. If Frontier is not running when you click on a script, you’ll experience a delay as Frontier launches. As a result, if you use scripts regularly and can afford the memory (Frontier requires 1 megabyte of RAM and System 7), it’s best to keep Frontier open and running at all times. If you hold down the Command key while double-clicking on a desktop-script icon, you’ll bring up the actual script in Frontier’s script editor, where you can examine or modify it.

Of course, the real benefit of UserLand’s Frontier is that it lets you write your own scripts, a process that can be as easy as typing a single command or as challenging as any assignment in intermediate programming.

The Scripter’s View
Desktop scripts are only one of the script types you can create with Frontier. You can also create one-line scripts,
which perform system functions or simple calculations, or multiline scripts, which perform more-complex tasks. Multiline scripts are composed in Frontier's script editor and can either be saved as desktop scripts or stored in Frontier's internal database, where you can invoke them by typing their name in the program's Quick Script window. Keep in mind that multiline-script writing is real programming and Frontier provides a real programming environment.

The key to unlocking Frontier's power lies in mastering its programming language, UserTalk. UserTalk is a serious programming language derived from C, so don't expect it to be as simple to learn and use as HyperTalk. The language consists of a few basic structuring elements, standard operators, and some 350 verbs. You can extend the language by creating new verbs.

Several novel features in UserTalk make it easier to use and learn than most other programming languages. One such feature is outlining. Other languages use semicolons and special terms to indicate the structure of a program; UserTalk employs a simple outline structure.

### Compiling and Debugging

Frontier compiles UserTalk scripts and retains the source code. Compilation of scripts consisting of 100 lines or less is fast. A debugger provides single-stepping and breakpoints. Hypertextual links let you Command-click on a verb to see its on-line documentation, created with a separate application called DocServer; updating the on-line documentation is simply a matter of updating the text file. DocServer ensures that your verbs will be documented consistently with UserLand's style, which is an important feature for those who want to distribute their scripts.

Another novel feature is Frontier's object database. The program stores all data types, including scripts, in a hierarchical internal database through which you can easily browse. The object database automatically invokes the appropriate editors as you browse through items — the outline editor is invoked for the outline, for example, and the script editor for scripts. Variables used by scripts are also stored in the object database, so scripts can share data without requiring that script writers fuss with various file formats.

One especially powerful UserTalk feature is the ability to work with all forms of IAC (Apple events, Apple's Object Model, Microsoft's DDE, and UserLand's IAC Toolkit), so Frontier scripts can drive any application that can respond to IAC events. Typically, this requires some form of "glue code." (Glue code already exists in several applications, notably Aldus PageMaker 4.2.)

Frontier also lets you set scripts to run in the background, where they can display the time, monitor real-time processes such as E-mail, and perform background tasks such as backup. When several scripts perform related functions, you can group them into a "suite," provide them with their own menu (menus can be edited), and install or distribute them as a unit.

Ambitious script writers should be able to do impressive things with Frontier, using it to tie functions of various applications together in scripts. Frontier is not intended to serve as an application-development language, however, and you shouldn't expect scripts to perform at the same level as commercial applications do. Simple scripts won't seem particularly slow, but those that visit a lot of folders and files can take a long time to execute. Finally, Frontier scripting is for neither novices nor the unwaried. Its access to the system makes it a potentially dangerous tool (it's possible, for example, to erase a hard disk with Frontier).

### The Bottom Line

UserLand's Frontier is a smoothly executed and powerful tool for developing utilities that drive both the system and IAC-aware applications under System 7. Although not everyone will want to tackle the complexities of scripting with Frontier, those who do will find that it gives them unprecedented control over the Mac and its applications.

— Michael Swaine

---

### Get Info

**Frontier**

*Published by: UserLand Software, 400 Seaport Court, Redwood City, CA 94063; 415-369-6600.*

*Version: 1.0.*

*List Price: $249.*

---

**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 $39. Call now, 1-800-343-4714, x 606 G for complete details.
How far will we go to get you the info you need to make buying decisions? Oh, about 40,000 miles. Direct from our TV studio to a broadcast satellite and back to your dish. It's MacTV™! Another MacConnection customer-service first. An hour-long show filled with product demonstrations, news, and tips for getting the most from your Mac.

With regular appearances by MacWEEK columnist Don Crabb, MacTV is for everyone from the individual user to the corporate MIS specialist. Watch as we put all sorts of Mac products through their paces—spreadsheets, databases, hard drives, monitors, utilities, games, and more. There's no better way to learn about Mac software and hardware.

A NEW SHOW EVERY DAY.

If you or your company has been considering buying a satellite dish, now is a great time because prices for a complete system including installation are as low as $1000. That's a pretty good deal for a whole new world of TV viewing. Including MacTV, which we uplink every weekday from 8 a.m. to 9 a.m. directly from our studios.
Soon you'll be able to order hour-long videocassettes of individual MacTV shows that include demos of specific products or coverage of specific topics (e.g., networking, spreadsheets, etc.). Stay tuned for details. Or order the premiere show now for just $9.95.

Available on VHS
Since 1984, the original Mac mail-order source.

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).

Products preceded by * are System 7 compatible. For specific features of System 7, please ask your salesperson when placing your order. Also, our System 7 Video featuring Macworld Contributing Editor Lon Poole is just $9 (22/4) or free when you order Apple's System 7 for $79 (2794).

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 MSG item, call us for an authorization and return it complete in the original packaging/receipt card for a refund check (or credit on your credit card.)

Corporate Accounts welcome. Bids and P.O.'s accepted. Please call 800-800-4444 for information.

Since 1984, the original Mac mail-order source.

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).

Products preceded by * are System 7 compatible. For specific features of System 7, please ask your salesperson when placing your order. Also, our System 7 Video featuring Macworld Contributing Editor Lon Poole is just $9 (22/4) or free when you order Apple's System 7 for $79 (2794).

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 MSG item, call us for an authorization and return it complete in the original packaging/receipt card for a refund check (or credit on your credit card.)

Corporate Accounts welcome. Bids and P.O.'s accepted. Please call 800-800-4444 for information.

Since 1984, the original Mac mail-order source.

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).

Products preceded by * are System 7 compatible. For specific features of System 7, please ask your salesperson when placing your order. Also, our System 7 Video featuring Macworld Contributing Editor Lon Poole is just $9 (22/4) or free when you order Apple's System 7 for $79 (2794).

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 MSG item, call us for an authorization and return it complete in the original packaging/receipt card for a refund check (or credit on your credit card.)

Corporate Accounts welcome. Bids and P.O.'s accepted. Please call 800-800-4444 for information.
real multimedia.

! **DeltaPoint** ... 60 day MBG
3558 DeltaGraph Professional 2.0—Over 35 different chart types for business, presentation, scientific, statistics, and engineering in both 2D and 3D. Chart types include: line, pie, bar, column, scatter and others.$199.

! **Lotus Development** ... 30 day MBG
3006 O 1-2-3 for Mac... $99.
2796 O Managing Your Money 9.0 (Aug. '92)... 49.
Microlytics ... 60 day MBG
2842 O Works 3.0 (July '92)... 155.
3869 O Excel 4.0... 295. 5257 O Upgrade... 99.
4902 O Word 5.0... 295. 1503 O Upgrade... 125.
5454 O The Microsoft Office 2.0... 475.
5402 O EndNote 1.5... 85. 6010 O Plus 1.2... 145.
Nisus Software
5683 O Nisus 3.0... 238. 1612 O Compact 3.3... 32.
Nolo Press ... 30 day MBG
2081 O WillMaker 4.0 (not valid in LA)... 35.
1204 O Living Trust 1.0 (not valid in LA)... 45.
OCCAM Research Corp. ... 60 day MBG
3697 O MUSE 1.01... 469.

**GRAPHICS & DESIGN PUBLISHING, PRESENTATIONS**

! **Adobe Systems**
4145 O Adobe Premiere 2.0—Combines video footage, audio recordings, animation, still images & graphics to create high-quality digital movies. Motion control, Film Strip file, PostScript rasterizer & more are new with 2.0... $305.

**FULLY FUNCTIONAL GRAPHICS & DESIGN SOFTWARE**

! **Adobe Type Library** ... ea.
4870 O Expert Color Paint 1.0... $99.
4870 O Expert Color Paint 1.0... $99.
5001 O Streamline... 122.
6644 O Adobe Photoshop... 548.
1983 O Expert Color Print 1.0 ... $119.
2145 O Aldus 2... 30 day MBG
7541 O Adobe Illustrator... $199.

MacConnection 800-800-4444
14 Mill Street, Marlow, NH 03456 603-446-4444 FAX 603-446-7791
One hour of pure

PROGRAMMING UTILITIES, HYPERCARD, SECURITY

- Abbots Systems  ... 30 day MBG
- TouchBASE or 3314 DateBook ... ea. 79.
- DateBook & TouchBASE Bundle...... 125.
- Aladdin Systems  ... 30 day MBG
- StuffIt Space Saver (Aug. '92)...... 34.
- StuffIt Deluxe.................... 55.
- Aldus  ... 30 day MBG
- SuperCard 1.6........................ 195.
- ALSoft ... 30 day MBG
- MasterJuggler 1.57C.............. 25.
- DiskExpress II 2.11.............. 49.
- ALSoft Power Utilities 1.01...... 62.
- Alysis Software  ... 30 day MBG
- SuperDesk 49.1608  ... More Disk Space 42.
- Apple Computer
- System 6 Personal (w/ PRET video), 79.
- QuickTime Starter Kit........... 155.
- System 7 Group Upgrade Kit...... 278.
- ASD Software  ... 30 day MBG
- FileGuru 2.7 (1 user)............. 138.
- Baseline Publishing  ... 30 day MBG
- NIT Manager 1.1.................. 33.
- NIT Info Pro 1.0............. 39.
- NIT inet Manager 2.0 ....... 189.
- NIT Proxy 1.03 ........ 34.
- NIT Ticker 2.1 .......................... 8.
- NIT TracJet 2.0 ...................... 50.
- NIT Watch 1.0 ...................... 34.
- NIT Viewer 1.0..................... 62.
- DiskDoubler 3.75 .................. 45.
- INITPicker 2.02 ..................... 34.
- Backmatic 50 ..................... 50.
- DiskExpress II .................... 110.
- DiskExplorer II 2.11 .......... 49.
- DiskPartitions 1.0 ......... 34.
- DiskSweeper 1.0 ............ 62.
- DiskSweeper II 2.0 ....... 155.
- DiskWizard 1.0 .............. 34.
- DiskTop 1.0 ..................... 62.
- DiskTop Pro 1.0 ............. 155.
- Drive 6..................... 49.
- Drive 7 2.0 ..................... 49.
- Drive 8 2.0 ..................... 49.
- Drive 8 Pro 1.0 ............. 155.
- Drive 9 2.0 ..................... 49.
- Drive 9 Pro 1.0 ............. 155.
- Drive 10 2.0 ................. 49.
- Drive 11 2.0 ............... 49.
- Drive 12 2.0 .................. 49.
- Drive 13 2.0 .................. 49.
- Drive 14 2.0 .................. 49.
- Drive 15 2.0 ............... 49.
- Drive 16 2.0 .................. 49.
- Drive 17 2.0 .................. 49.
- Drive 18 2.0 .................. 49.
- Drive 19 2.0 .................. 49.
- Drive 20 2.0 .................. 49.
- Drive 21 2.0 .................. 49.
- Drive 22 2.0 .................. 49.
- Drive 23 2.0 .................. 49.
- Drive 24 2.0 .................. 49.
- Drive 25 2.0 .................. 49.
- Drive 26 2.0 .................. 49.
- Drive 27 2.0 .................. 49.
- Drive 28 2.0 .................. 49.
- Drive 29 2.0 .................. 49.
- Drive 30 2.0 .................. 49.
- Drive 31 2.0 .................. 49.
- Drive 32 2.0 .................. 49.
- Drive 33 2.0 .................. 49.
- Drive 34 2.0 .................. 49.
- Drive 35 2.0 .................. 49.
- Drive 36 2.0 .................. 49.
- Drive 37 2.0 .................. 49.
- Drive 38 2.0 .................. 49.
- Drive 39 2.0 .................. 49.
- Drive 40 2.0 .................. 49.
- Drive 41 2.0 .................. 49.
- Drive 42 2.0 .................. 49.
- Drive 43 2.0 .................. 49.
- Drive 44 2.0 .................. 49.
- Drive 45 2.0 .................. 49.
- Drive 46 2.0 .................. 49.
- Drive 47 2.0 .................. 49.
- Drive 48 2.0 .................. 49.
- Drive 49 2.0 .................. 49.
- Drive 50 2.0 .................. 49.
- Drive 51 2.0 .................. 49.
- Drive 52 2.0 .................. 49.
- Drive 53 2.0 .................. 49.
- Drive 54 2.0 .................. 49.
- Drive 55 2.0 .................. 49.
- Drive 56 2.0 .................. 49.
- Drive 57 2.0 .................. 49.
- Drive 58 2.0 .................. 49.
- Drive 59 2.0 .................. 49.
- Drive 60 2.0 .................. 49.
- Drive 61 2.0 .................. 49.
- Drive 62 2.0 .................. 49.
- Drive 63 2.0 .................. 49.
- Drive 64 2.0 .................. 49.
- Drive 65 2.0 .................. 49.
- Drive 66 2.0 .................. 49.
- Drive 67 2.0 .................. 49.
- Drive 68 2.0 .................. 49.
- Drive 69 2.0 .................. 49.
- Drive 70 2.0 .................. 49.
- Drive 71 2.0 .................. 49.
- Drive 72 2.0 .................. 49.
- Drive 73 2.0 .................. 49.
- Drive 74 2.0 .................. 49.
- Drive 75 2.0 .................. 49.
- Drive 76 2.0 .................. 49.
- Drive 77 2.0 .................. 49.
- Drive 78 2.0 .................. 49.
- Drive 79 2.0 .................. 49.
- Drive 80 2.0 .................. 49.
- Drive 81 2.0 .................. 49.
- Drive 82 2.0 .................. 49.
- Drive 83 2.0 .................. 49.
- Drive 84 2.0 .................. 49.
- Drive 85 2.0 .................. 49.
- Drive 86 2.0 .................. 49.
- Drive 87 2.0 .................. 49.
- Drive 88 2.0 .................. 49.
- Drive 89 2.0 .................. 49.
- Drive 90 2.0 .................. 49.
- Drive 91 2.0 .................. 49.
- Drive 92 2.0 .................. 49.
- Drive 93 2.0 .................. 49.
- Drive 94 2.0 .................. 49.
- Drive 95 2.0 .................. 49.
- Drive 96 2.0 .................. 49.
- Drive 97 2.0 .................. 49.
- Drive 98 2.0 .................. 49.
- Drive 99 2.0 .................. 49.
- Drive 100 2.0 .............. 49.
- Drive 101 2.0 ............ 49.
- Drive 102 2.0 ............ 49.
- Drive 103 2.0 ............ 49.
- Drive 104 2.0 ............ 49.
- Drive 105 2.0 ............ 49.
- Drive 106 2.0 ............ 49.
- Drive 107 2.0 ............ 49.
- Drive 108 2.0 ............ 49.
- Drive 109 2.0 ............ 49.
- Drive 110 2.0 ............ 49.
- Drive 111 2.0 ............ 49.
- Drive 112 2.0 ............ 49.
- Drive 113 2.0 ............ 49.
- Drive 114 2.0 ............ 49.
- Drive 115 2.0 ............ 49.
- Drive 116 2.0 ............ 49.
- Drive 117 2.0 ............ 49.
- Drive 118 2.0 ............ 49.
- Drive 119 2.0 ............ 49.
- Drive 120 2.0 ............ 49.
- Drive 121 2.0 ............ 49.
- Drive 122 2.0 ............ 49.
- Drive 123 2.0 ............ 49.
- Drive 124 2.0 ............ 49.
- Drive 125 2.0 ............ 49.
<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>New MathBlaster Plus</td>
<td>$34</td>
</tr>
<tr>
<td>Alge-Blaster Plus</td>
<td>$34</td>
</tr>
<tr>
<td>EARTHQUEST or 3118 Ecology 1.0</td>
<td>$34</td>
</tr>
<tr>
<td>Electronic Arts</td>
<td>$34</td>
</tr>
<tr>
<td>4D Boxing</td>
<td>$34</td>
</tr>
<tr>
<td>Expert Software</td>
<td>$34</td>
</tr>
<tr>
<td>Expert Astronomer 1.0</td>
<td>$34</td>
</tr>
<tr>
<td>Graphic Simulations</td>
<td>$34</td>
</tr>
<tr>
<td>Hellcats Over the Pacific 1.0</td>
<td>$34</td>
</tr>
<tr>
<td>Great Wave</td>
<td>$34</td>
</tr>
<tr>
<td>KidMath 2.0 (Color)</td>
<td>$34</td>
</tr>
<tr>
<td>NumberMaze</td>
<td>$34</td>
</tr>
<tr>
<td>Talking Spell It Plus</td>
<td>$34</td>
</tr>
<tr>
<td>Casino Master</td>
<td>$34</td>
</tr>
<tr>
<td>OSimEarth 1.1</td>
<td>$34</td>
</tr>
<tr>
<td>Manhole 1.6</td>
<td>$34</td>
</tr>
<tr>
<td>Puzzle Master</td>
<td>$34</td>
</tr>
<tr>
<td>SimCity</td>
<td>$34</td>
</tr>
<tr>
<td>Talking Moose 4.0</td>
<td>$34</td>
</tr>
<tr>
<td>Sprout!</td>
<td>$34</td>
</tr>
<tr>
<td>The Playroom 2.0 (CP)</td>
<td>$34</td>
</tr>
<tr>
<td>Carmen Sandiego Series (CP)</td>
<td>$34</td>
</tr>
<tr>
<td>SimCity (CP)</td>
<td>$34</td>
</tr>
<tr>
<td>Centron Software</td>
<td>$34</td>
</tr>
<tr>
<td>DateBook</td>
<td>$34</td>
</tr>
<tr>
<td>The Reprint Violet</td>
<td>$34</td>
</tr>
<tr>
<td>DrawPerfect</td>
<td>$34</td>
</tr>
<tr>
<td>Illustrator, FreeHand, Word, HyperCard</td>
<td>$34</td>
</tr>
<tr>
<td>QuarkXPress, Lotus 1-2-3, ClarisWorks</td>
<td>$34</td>
</tr>
<tr>
<td>Tower's Project</td>
<td>$34</td>
</tr>
<tr>
<td>Mediator</td>
<td>$34</td>
</tr>
<tr>
<td>Jungle Book</td>
<td>$34</td>
</tr>
<tr>
<td>Spelling Tutor</td>
<td>$34</td>
</tr>
<tr>
<td>World Explorer</td>
<td>$34</td>
</tr>
<tr>
<td>SpreadSheets</td>
<td>$34</td>
</tr>
<tr>
<td>Flight Simulator 4.0</td>
<td>$34</td>
</tr>
<tr>
<td>Expert Astronomer 3.1</td>
<td>$34</td>
</tr>
<tr>
<td>Interplay Productions</td>
<td>$34</td>
</tr>
<tr>
<td>BattleChessa (3D animation)</td>
<td>$34</td>
</tr>
<tr>
<td>ClockCheckMate (Infinite play levels)</td>
<td>$34</td>
</tr>
<tr>
<td>Learning Company</td>
<td>$34</td>
</tr>
<tr>
<td>Reader Rabbit 3.0 (CP) (ages 4-7)</td>
<td>$34</td>
</tr>
<tr>
<td>Super Solvers: Midnight Rescue!</td>
<td>$34</td>
</tr>
<tr>
<td>Writing Center 1.0</td>
<td>$34</td>
</tr>
<tr>
<td>Leister Productions</td>
<td>$34</td>
</tr>
<tr>
<td>EARTH QUEST</td>
<td>$34</td>
</tr>
<tr>
<td>Oregon Trail 1.0</td>
<td>$34</td>
</tr>
<tr>
<td>Number, Word, or Super Munchers ea.</td>
<td>$34</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$34</td>
</tr>
<tr>
<td>Flight Simulator 4.0</td>
<td>$34</td>
</tr>
<tr>
<td>Multimedia Library</td>
<td>$34</td>
</tr>
<tr>
<td>Educ: Series V, 1-Animated Relativity</td>
<td>$34</td>
</tr>
<tr>
<td>Nordic Software</td>
<td>$34</td>
</tr>
<tr>
<td>Turbo Math Facts 2.0</td>
<td>$34</td>
</tr>
<tr>
<td>PreSchool Pack - Color 1.0</td>
<td>$34</td>
</tr>
<tr>
<td>Benton Overseas</td>
<td>$34</td>
</tr>
<tr>
<td>Vocubulæreve Levels I &amp; II (Spanish, Fren, Germ, Ital, Rus)</td>
<td>$34</td>
</tr>
<tr>
<td>Vocubulæreve Level III (Spanish, Fren, Germ, Ital, Rus)</td>
<td>$34</td>
</tr>
<tr>
<td>Personal Training Sys ... 60 MBG</td>
<td>$34</td>
</tr>
<tr>
<td>WinZip</td>
<td>$34</td>
</tr>
<tr>
<td>WordPerfect Premium</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Acrobat Premium</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Premiere Pro</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Captivate</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe After Effects</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Photoshop</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Dreamweaver</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Illustrator</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe InDesign</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Flash Professional</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Fireworks</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Muse</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Primelife</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Prelude</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Storyline</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe XD</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Captivate Premium</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Premiere Pro</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Creative Cloud</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Motion Professional</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Dimension Professional</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Audience Professional</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Wallaby Professional</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Spark Professional</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro Premium</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Premium)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Enterprise)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Team)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Professional)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Business)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Enterprise)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Team)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Professional)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Business)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Enterprise)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Team)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Professional)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Business)</td>
<td>$34</td>
</tr>
<tr>
<td>Adobe Campaign Pro (Enterprise)</td>
<td>$34</td>
</tr>
</tbody>
</table>
MacTV: Coming soon

**MacTV: Coming soon**

- Berkeley Systems ... 30 day MBG
- Macintosh PC Exchange ... 69.
- AppleTalk Remote Access ... 165.

**COMMUNICATIONS MODEMS, MAIL, NETWORKS**

- Apple Computer
- Star Trek: The Final Frontier ... 29.
- Star Trek: The Logical Collection ... 29.

**Argosy Software ... 30 day MBG**

- Software Bridge/Mac 2.0.1 ... 99.

**CE Software ... 60 day MBG**

- QuickMail (5 user) ... 240.
- QuickMail (10 user) ... 379.

**FREE SYSTEMS ... 30 day MBG**

- White Knight ... 85.
- Global Village ... 30 day MBG ... 129.

**COMPUTER ORIGINS ... 30 day MBG**

- Multimedia Library ... 30 day MBG
- Macintosh PC Exchange ... 69.
- General Reference CD-ROM Bundle ... 299.
- Goller Encyclopedia (CD-ROM) ... 249.
- Voyager ... 30 day MBG
- Software Toolswork
- Grolier Encyclopedia (CD-ROM) ... 249.

**CD-ROM**

- Broderbund
- Just Grandma and Me (CD-ROM) ... 34.
- Viewpoint CD-ROM ... 579.

**COMMUNICATIONS**

- System 7 Video ... 2245 w/Lo's Book 25.
- RasterOps 24SX ... 649.
- Sigma Designs
- Power Portrait (platinum) ... 760.

**SOFTWARE TOOLSWORK**

- The Miracle (piano teacher) ... 349.
- Software Bundle
- Star Trek: The Logical Collection ... 29.
- Star Trek: The Frontiers ... 29.

**STATE OF THE ART ... 30 day MBG**

- Video Spigot LC ... 347.
- Video Spigot ... 479.
- Video Spigot Pro ... 1649.

**MULTIMEDIA AND SOFTWARE**

- Video Spigot LC or 1114 ... 347.
- Video Spigot ... 479.
- Video Spigot Pro ... 1649.

**SPEICAL REPORTS**

- Video Spigot LC or 1114 ... 347.
- Video Spigot ... 479.
Mac TV
ON THE AIR!

OUR VERY OWN TV SHOW WITH DAZZLING DEMOS, TANTALIZING TIPS, AND THE LATEST MAC NEWS.

Turn On.
Tune In.
Boot Up.

ANOTHER UNPARALLELED NEW SERVICE FROM THE FOLKS WHO BROUGHT YOU EVERYTHING OVERNIGHT® $3, TOLL-FREE TECHNICAL SUPPORT, AND MONEY-BACK GUARANTEES!

CALL 800/800-6912 FOR PROGRAM INFORMATION.
(See 2-page ad preceding our product pages for more info.)
**Synergy Software ... 30 day MBG**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>VersaTerm 4.6</td>
<td>...</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac 302</td>
<td>...</td>
</tr>
</tbody>
</table>

**Logicle Technology**

5525 QuickFit Xtra: McB24CV — Send and receive fax at 9600 bps. Add 2400 bps modem communication and throughput to 9600 with V.42bis. Great styling, lighted icons, cables and lifetime warranty **$169.**

**Expert Software ... 30 day MBG**

6219 @ Expert Astronomer 1.0 — Learn astronomy by displaying and printing the stars & planets from your location. View 9000+ celestial objects, track eclipses or comets. Perfect for novices or experts. Includes Introduction to Astronomy guide. **$29.**

**Expert Software ... 30 day MBG**

6219 @ Expert Astronomer 1.0 — Learn astronomy by displaying and printing the stars & planets from your location. View 9000+ celestial objects, track eclipses or comets. Perfect for novices or experts. Includes Introduction to Astronomy guide. **$29.**

**Applied Engineering ... 30 day MBG**

1971 FastMath LC | ... |

**UPGRADES & DRIVES**

**SIMMs**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MB SIMM</td>
<td>$69.</td>
</tr>
<tr>
<td>2 MB SIMM for ILLI</td>
<td>...</td>
</tr>
</tbody>
</table>

**MEMORY, ACCELERATORS**

**Kraft Systems**

7519 @KM30 Trackball | ... |

**Logicle**

1671 @MouseMan | ... |

**Microtek**

1975 @Scanmaker 500C5 | ... |

**Microtek**

1985 @Scanmaker 6000Z | ... |

**Silicon Graphics**

1486 MacSpeakers (two, stereo) | ... |

**Sophisticated Circuits ... 30 day MBG**

8009 @PowerKey 2.01 76 | ... |

**Thunderware**

4994 @LightningScan 400 | ... |

**Thumbelina Mac**

4476 @Exodus 4.0 | ... |

**PowerCache for SE/30, II , Ibx, Icxi, Icili, Ilsi, LC | ... |

**FieldWorks, Inc. ... 30 day MBG**

2329 PocketHammer 100 699 | ... |

**Dayna ... 60 day MBG**

8722 DaynaFile II 1.2 3/4 Drive | ... |

**DayStar Digital ... 30 day MBG**

8722 DaynaFile II 1.2 3/4 Drive | ... |

**DayStar Digital ... 30 day MBG**

Does not include optional math chip.

**PowerCache for SE/30, II , Ibx, Icxi, Icili, Ilsi, LC | ... |

**PowerCache for SE/30, II , Ibx, Icxi, Icili, Ilsi, LC | ... |

**Monterey Design Group**

1486 MacSpeakers (two, stereo) | ... |

**Mouse Systems ... 30 day MBG**

7520 @Little Mouse | ... |

**Mouse Systems ... 30 day MBG**

8001 @Little Mouse Plus | ... |

**Mouse Systems ... 30 day MBG**

9471 @G-Mouse | ... |

**Mouse Systems ... 30 day MBG**

5377 SilentWriter Model 95 | ... |

**Mouse Systems ... 30 day MBG**

3036 @Grappler 2.0 92 3692 @iSap 115. | ... |

**Mouse Systems ... 30 day MBG**

1144 Dynamic Source (platinum or black) ea. | ... |

**Mouse Systems ... 30 day MBG**

2230 Dynamic Source (platinum or black) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 2230 Dynamic Source (platinum or black) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |

**Mouse Systems ... 30 day MBG**

69. 3652 MouseMan (set of 2) ea. | ... |
At Peachtree, we've been making Mac accounting software longer than anyone—since 1984. And our products have won more awards than any other accounting software.

For accounting as easy as it gets, try Peachtree Accounting for Macintosh. For only $99, it combines all the functions you need—G/L, A/R, A/P, and payroll—in one package.

For more in-depth analysis, there's the Insight Expert Accounting Series—advanced modules that can crunch numbers, analyze data and forecast trends. All for $395 per module.

We back our Mac products with 30 days of free support and a money-back guarantee. So see your local dealer or call PeachLine at (800) 428-9976.

Evolve creates custom financial reports on accounting data, but its file setup is cumbersome.

Evolve is a financial-analysis tool that aims to provide something most accounting packages are missing—namely, the ability to produce a variety of custom financial statements, budgets, business ratios, and graphs. Unfortunately, getting data from an accounting package into Evolve is a daunting chore that will likely drive most users to seek alternative solutions.

Excel Macros

Evolve is actually a complex collection of Microsoft Excel 3.0 macros. To use the program, you must have Excel 3.0 installed on your hard disk. For some functions, such as creating graphs, Evolve uses Excel’s tools.

Unfortunately, several weaknesses seriously detract from Evolve’s overall usefulness as a reporting tool. Initial setup is clumsy and far from automatic. In addition, most calculation operations are quite slow compared with those in spreadsheet or accounting programs.

To create its budgets and statements, Evolve maintains a set of records separate from those in your accounting program. As a result, before you can import your financial data into Evolve, you must create an Evolve data set, which comprises a nested collection of files and folders that store company information, imported data, reports, charts, work files, and layout templates. You can create as many data sets (for different companies, for example) as disk space allows.

Creating data sets is a chore in itself, but Evolve’s cumbersome and nonstandard interface complicates the process. To begin with, the program uses a rigid naming and positioning scheme for the folders and files within data sets. Only the top-level folder in each set can have a unique name. The remaining files and folders within a set receive the same names (Balance Sheets and Trial Balances, for example) as their counterparts in other sets, which means that you must be careful not to open more than one set at a time. In addition, if the top-level folder for each set doesn’t reside at the root level of the disk, Evolve can’t locate it. Moreover, you can’t double-click on a data set to open it; instead, you must use the Open Set command on Evolve’s File menu.

To get data from your accounting program into an Evolve data set, you begin by exporting a trial balance in SYLK, CSV, WKS, WK1, WK3, DIF, DBF2, DBF3, DBF4, Excel, or ASCII format. Before Evolve can import it, however, the data must adhere to the following format: Column 1, G/L account number; Column 2, Account description; Column 3, First month’s amounts; Columns 4 and up, Each subsequent month’s
Puts 2,000 Macintosh Experts At Your Desktop

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

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

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

Help! detects:
• Startup document conflicts
• Software or hardware incompatibilities
• Environmental problems
• Improperly installed files
• Memory problems
• Damaged files
• Duplicate files

New! Network Help!™
If you're supporting a network of Mac users, a network version of Help! is now available!

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

Help!
Every Mac User Needs It.

© Copyright 1991, 1992 Teknosys, Inc. All rights reserved. The Teknosys, Help!, and Network Help! logos and trademarks of Teknosys, Inc. All other product names are trademarks, registered trademarks, or service markers of their respective creators.

CIRCLE 138 ON READER SERVICE CARD.
They wanted to bring color copying in-house.
We've just opened the door.

Color documents were always of supreme importance to the people at this world-famous movie and publishing company. In fact, they spent thousands per month on outside color copying services. They wanted their own machine but no one had put together the kind of performance and support they needed. Then Tammy Johnson and the Xerox team introduced them to the Xerox 5775 Digital Color Copier.

They were all impressed by the color quality and speed of the Xerox 5775. And the numbers people were especially attracted to the low costs per copy and high reliability figures. Then the creative people got their hands on it.

They found the color touch screen so easy to use that it opened up a whole new world of creative possibilities.

And they were pleased to learn that soon they could fully network the Xerox 5775 to Macs and IBM PC-compatibles.

The only question that remained was service and support. Xerox had the answer. One person to call anytime for anything, direct Xerox service for all components and the Xerox Total Satisfaction Guarantee.

If you want to put the power of color to work in your business, open the door to Xerox. We'll put it together for you. For more information on the Xerox 5775, call 1-800-TEAM-XRX, ext. 702.
amounts. All column headings and blank rows in the trial balance must be removed, and the G/L account number and the amounts must be numbers only.

Because many accounting programs support alphanumeric G/L account numbers, this is a surprising limitation. And even though Evolve includes powerful parsing commands to help you format the data, the procedure is time-consuming. Most users will probably resort to a spreadsheet or word-processing program to format their data, and some may find that it takes less time to type data directly into an Excel worksheet than it does to import and reformat it.

Evolve comes with predefined charts of accounts for proprietorships, estates, partnerships, and corporations. The accounts fall into eight general categories, and the number of accounts in each category is fixed. Each data set can comprise as many as 99 departments. Before you can load data into a new data set, you must manually allocate each account in your source file to the correct account

Evolve creates ratios that let you compare accounts and displays them in worksheet format. It uses Excel 3.0's charting tools to graph the data.

**PHOTOREALISM**

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 flexible 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.

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.

**PHOTOREALISM**

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 flexible 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.
Plug-n-Play
1000-dpi Plain-Paper Typesetting

Just plug it in. That’s all you need to do with your Unity™ 1000 Plain-Paper Typesetter. From the moment it arrives, you have access to extraordinary typesetting capabilities.

The ability to print 1000-dpi, camera-ready copy on plain paper right in your own office is pretty extraordinary in itself. But from the moment you plug it in, the Unity 1000 also has multi-platform capabilities. So if your office uses a combination of Macintosh®, PC, Sun, and DEC or other computers, you’re in luck. Unity’s HotPort™ feature automatically selects the LocalTalk®, parallel, serial, or optional Ethernet® interface* for every print job, and LaserMaster’s SmartSense™ technology automatically switches to PostScript® or PCL.

Plus, the Unity 1000 comes with 135 Type 1 typefaces—that’s 100 more than other PostScript devices. It provides enough space on its internal hard drive to store more than 200 of your own typefaces as well, so you’ll never have to download another font. And because the Unity 1000 is expandable and software upgradeable, it’s a plain-paper typesetter designed to last.

Give us a call to find out more about the plug-and-play Unity 1000 from LaserMaster™. We bet it’s the typesetter you’ve been waiting for.

1-800-950-6868 Dept. 15A
1-612-944-9330, Fax: 1-612-944-0522

Multi-Platform Plug-n-Play Typesetting!

For Large-Format and Higher-Volume, Plain-Paper Typesetting:
The LaserMaster 1200 Plain-Paper Typesetter

This powerful, 11 x 17-inch typesetter for your Macintosh or PC lets you tackle all your oversized jobs for just pennies a page. A high-speed, CPU-based controller gives you super-fast PostScript printing at speeds up to 20 pages per minute.

For Typesetting on a Budget:
The LaserMaster 1000/4 Personal Typesetter

This compact typesetter produces the same 1000-dpi, camera-ready copy as the Unity 1000. Yet since its bus-based architecture shares the resources of your own PC or Macintosh, it cost significantly less. For high-resolution output, PostScript and PCL compatibility, and 135 included Type 1 typefaces, this price can’t be beat.

Circle 178 on Reader Service Card.

*Optional Ethernet card will be available third quarter, 1992. ©1992 LaserMaster Corporation, 6900 Shady Oak Road, Eden Prairie, MN 55344. The LM logo and TurboRes are registered trademarks, and LaserMaster, Unity, SmartSense, SmartSenser, PostPort, 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. These products incorporate Microsoft TrueType software with LaserMaster extensions for performance and resolution enhancement. Prices valid in the U.S. only. Specifications subject to change without notice. All camera-ready copy for this advertisement was produced by a LaserMaster Unity 1000.
REVIEWS

in Evolve's chart of accounts. Depending on the length of your chart of accounts, this tedious process can take hours. Evolve's strength lies in its ability to store five years' worth of data. Adding to standard monthly income statements and balance sheets, you can print comparative income statements and balance sheets that include data from any number of specified months during those five years. If the program's predefined reports don't suit your fancy, you can design your own, using Evolve's report editor.

To quickly compare accounts or account groups with one another, you use Evolve's ratios. For example, a ratio might compare total sales with the cost of goods sold. Evolve generates ratios as worksheets that include dollar values as well as the percentages by which the compared amounts differ. You can graph such data with a single command.

When you're generating a budget for income and expenses, it's best to start by studying past data. Evolve automatically generates budget worksheets based on past activity for use as the starting point for future budgets, and you can use Excel formulas to project budget growth.

Evolve includes seven predefined financial charts, including assets breakdown, income versus expenses, and instant profit picture. It can also create custom graphs with the numbers from virtually any report (all of Excel's graphing features are available).

The Bottom Line
Although Evolve rightly targets the need for flexible reporting tools in accounting packages, the solution it provides is too costly, in both dollars and time. If you need to create monthly reports, for example, you'll find yourself spending an excessive amount of time each month formatting your accounting data to meet Evolve's requirements. As a result, you may as well save the $195 cost of Evolve and use Excel alone to format your reports.

However, an even better solution should be available in the near future. Dedicated report generators are being developed for many popular Mac accounting packages. These stand-alone programs read data directly from the accounting program's files, eliminating the tedious process of reformatting, exporting, and importing the data. They may cost a bit more than Evolve, but they don't require Excel and they can save you a lot of time. ~

— Darryl Lewis

Get Info

Evolve

$49.95

Published by: Absolute Solutions, Inc., 3142 Vista Way, Suite 400, Oceanside, CA 92056; 800-633-7666 or 619-966-8000.

Version: 1.01.

List Price: $195.

HANDS OFF

Simply place NISCAN Spectra™ over your image to scan. It's as small as a hand scanner but gives you the resolution of a flatbed. And the scanner head does the work, leaving your hands free. Spectra doesn't waste valuable space on your work surface, either.

24-Bit Color Scanner

Spectra captures over 16 million colors in a single pass in resolutions of 25 to 400 dpi. Now you can scan a 4" X 6" area with the same color fidelity as your 24-bit color printer. And Spectra requires no interface card; it comes with software ready to plug into your Macintosh.

Scan Transparencies or Prints

Spectra comes ready to scan any reflective art. And now you can scan transparencies as well with the addition of a simple lightbox, saving a lot of time and money.

Under $1000

At this price, 24-bit color has never been so reasonable. And a quality scanner has never been so convenient and easy to use. To get your hands on one, call (214) 242-9696.

NISCAN SPECTRA

For the Macintosh

NISCA Corporation, Tokyo (03) 3374-7881 • NISCA Incorporated, Dallas (214) 242-9696

Copyright © 1992 NISCA Incorporated. NISCAN and NISCAN Spectra are trademarks of NISCA Incorporated. All product names and trademarks are the property of their respective owners.

CIRCLE 215 ON READER SERVICE CARD.
Perfect Color in Minutes

Whatever the monitor. Whatever the image. For the first time ever your desktop color proof will match your final print.

EFI's Cachet Color Editor promises you perfect color in minutes!

Introductory price, $395.

Color desktop publishing will never be the same.


Call 1-800-285-4565 to order Cachet or ask for your FREE DEMO DISK.

Cachet system requirements: Mac LC with math coprocessor, Mac II or Quadra family. Hard disk, 5MB RAM (8MB recommended), 8 to 24-bit video card. Color monitor, 13" or larger. System 6.05 or later. This ad was produced using Cachet.
Aside from TwinIt’s $199 cost, the only price you pay for continuous backup is reduced speed during writes to the primary disk. In our tests, disk writes took 40 to 50 percent longer when TwinIt was turned on; this percentage may vary with different hardware. TwinIt shouldn’t generally make reading from disk take longer, but with applications such as Photoshop that create scratch (temporary) files on disk, it sometimes does. TwinIt can be disabled at any time, but you must resynchronize the drives before you turn it back on.

If you want data security and peace of mind without the hassles of traditional backup software, using TwinIt is about the easiest way to go. Granted, you pay a performance penalty and must invest in an extra drive, but when your primary drive dies and the twin saves the day, both will seem like small prices to pay.


— Owen W. Linzmayer

**NetModem/E**

Until recently, versatiliy was not exactly the word that came to mind for describing modems. Sure, some modems could handle both data and fax, but not until Shiva’s NetModem/E hit the shelves did we get a truly multitalledent device. The NetModem/E is an Ethernet device that, without using a Mac as a dedicated communications server, handles one of three key tasks on a network: shared network dial-in over a single phone line, remote dial-in, or remote routing of AppleTalk or IPX packets over phone lines. All of the modem’s talents can be shared on mixed Novell NetWare/AppleTalk networks by Macs and PCs — one user at a time, of course, for dial-in and dial-out.

The NetModem/E hardware consists of a sleek, compact 1.440-bps modem that comes with a built-in Ethernet interface. Ethernet interface options include thentinet, thicknet, AUI and 10BASE-T. The device features V.32bis and V.42bis support.

The software provided with the package is easy to install and use. For dial-out purposes, the software supports most popular communications packages, so you don’t have to learn another program in order to use the modem.

Because you can’t see or hear the remote device you’re accessing, Shiva makes sure you’re not left in the dark by including a tiny virtual-modem icon, complete with indicator lights, in the menu. As the modem dials and connects to outside services, you hear a simulated version of the familiar dial tone, beeps, and connection roar, so you always know how your calls are progressing.

For System 6 users, the NetModem/E’s dial-in software provides a much more efficient way to connect to the network and collect E-mail than a remote-control package such as Timbuktu does. (With AppleTalk Remote Access, System 7 users already have dial-in capabilities similar to the NetModem/E’s.) Instead of controlling a host machine remotely, as with remote-control software, dial-in users become actual nodes on the network. No separate communications software is required for connecting to the network — all you need is a modem.

The NetModem/E comes with Shiva Net Manager software for configuring the modem from any workstation on the network. Particularly noteworthy is Net Manager’s ability to download firmware upgrades to the modem so you never have to disconnect the device to maintain it.

Overall, the NetModem/E is elegantly implemented and eliminates the need to dedicate a Mac as a network communications server. At $1,699, it may seem pricey, but compared with a dedicated Mac and multiple modems scattered over a network, it is relatively affordable.

Shiva Corp., One Cambridge Center, Cambridge, MA 02142; 617-252-6300. $1,699.

— Susan Janus

**Pro Tools**

Digidesign, the company that defined digital audio on the desktop, has forged a new definition with Pro Tools, a powerful recording and editing system for your 68020 (or later) Mac.

The Pro Tools package includes a NuBus digital Audio Card and rack-mountable Audio Interface module, plus ProDeck and ProEdit software for mixing and editing. Pro Tools allows desktop-recording engineers to move beyond...
the physical limits of a tape-based system to a new way of producing music. A single Pro Tools card lets you play back on 4 tracks simultaneously and instantly access as many as 32 virtual tracks (which exist only in memory or on disk). Virtual-track access gives you the freedom to experiment in ways not possible in the analog world, because you can try instant variations of your recordings without tape juggling or lower sound quality.

The Audio Card, a Motorola 60000 DSP-based (digital-signal-processor-based) NuBus card, has four analog audio inputs and four outputs for recording and playback. The card also comes equipped with two digital inputs and two outputs (AES/EBU or S/PDIF) that let you import a DAT (digital audiotape) recording, edit the tracks, and export them back to DAT without ever leaving the digital domain. However, the card doesn’t include the DACs (digital-to-analog converters) and ADCs (analog-to-digital converters); Digidesign has moved them into the separate Audio Interface module to improve encoder performance.

Digidesign has done out itself by designing this system with 18-bit DACs to provide sound quality unparalleled in any other Digidesign product. Pro Tools lets you capture audio at either 44.1 kilohertz for CD-quality sound or 48 kilohertz for DAT-quality sound.

If you need more than 4 simultaneous tracks, you can add as many as three additional Audio Cards (and their accompanying Audio Interface modules) at 4 tracks per card, for a total of 16 tracks. If you add one or more of these extra Audio Cards, you’ll also need Digidesign’s System Accelerator, a 68020-based accelerator card ($3,500).

For mixing tracks, Pro Tools includes ProDeck, an upgraded version of Digidesign’s award-winning Deck program. With ProDeck, you can assign channels and set levels, equalization, and effects parameters. ProDeck’s interface mimics a studio engineer’s mixing console, so if you have studio experience, you will find it easy to learn. ProDeck uses a tape-transport metaphor for its controls and includes basic MIDI sequencing options. When you’re finished recording, you can use ProEdit to re-arrange your audio (and MIDI) tracks by cutting and pasting, or you can alter your tracks’ actual waveforms with the program’s optional Sound Designer II ($995).

ProDeck and ProEdit each give you a wealth of options. The original shipping versions had some bugs — moving between software modules, for example, could cause system crashes — but they should be fixed in version 1.1 by the time you read this.

Digidesign has provided audio engineers with an extremely powerful tool at a remarkably reasonable price. (New England Digital’s Synclavier, for example, costs well over $250,000.) Pro Tools offers so much for just $5,995 that there really is no alternative.

Digidesign, 1360 Willow Road, #101, Menlo Park, CA 94025; 415-688-0600. Version 1.0. $5,995.

— Stefan B. Lipson

Sherlock Holmes, Consulting Detective

Over the years, many manufacturers have proclaimed their games to be interactive movies, but Sherlock Holmes, Consulting Detective (an official product of Arthur Conan Doyle’s estate) is the first game that truly delivers. It features more than 90 minutes of live-action video, for which you need a Mac LC or higher with a color monitor and System 6.0.7 or later. Sherlock uses ICOM’s exclusive video-digitization process, which displays video at 15 frames per second with synchronized audio from a CD. ICOM went all out to make the video segments movielike, filming 25 actors in more than 70 costumes on 25 Victorian-era sets. The result is the most realistic interactive computer game yet.

The CD contains three mysteries: The Mystified Murderess, The Tin Soldier, and The Mummy’s Curse. Each has an introductory video clip that provides all the information you need to get started.

The interface consists of a video screen surrounded by resource icons. Your most valuable resource is the directory, an alphabetical reference guide to the people and places of Sherlock’s London. Each name has an associated video clip that lets you interview a witness or suspect; examine the scene of the crime; or get vital information from a location such as the library, Office of Records, Scotland Yard, or Chief Medical Examiner’s office. Beware, however: Some people lie, and red herrings abound.

The London Times contains vital clues. Additional resources include Sherlock’s private files, which contain useless information as well as clues; the Baker Street Irregulars, Holmes’ group of street watchers, who can help you sort the clues from the red herrings; and your notebook, which lets you copy names of people and places you want to check out.

You get points, which are more like demerits, every time you use a resource; the object of the game is to solve the case with as few points as possible. When you think you have the solution, you click on the gavel icon and take your case to court. Answer the judge’s questions correctly, and you’ll get a video clip of Holmes bragging about how he solved the case. One mistake, though, and you’re sent back into the field for more information.

If you like a good mystery, you’ll love Sherlock Holmes, Consulting Detective, and you’ll be happy to learn that a sequel will be available early next year.

ICOM Simulations, 648 S. Wheeling Road, Wheeling, IL 60090; 708-520-4440. Version 1.00. $69.95.

— Bob LeVitus

Intersect CDR-73M

The NEC Intersect CDR-73M adds the most useful feature you can think of for a CD-ROM drive: speed. For the same price as the older CDR-73, NEC doubles the throughput of the earlier model with a technological innovation. The access times are still eight to ten times as long as for eraseable optical discs, and most CD-ROMs have only modest performance gains, but the CDR-73M does make running QuickTime movies directly from CD-ROMs practical and even desirable.

The Intersect CDR-73M drive is the first dual-speed CD-ROM drive for Mac users. For audio tracks, the drive uses the ordinary CD-ROM maximum rotational speed — usually about 250 rpm — at the center of the disc. For data tracks, the CDR-73M doubles the rotational speed to achieve a 280-millisecond access time and effectively doubles the throughput. The CDR-73M can detect whether a track is data or audio and can switch between
Managing piles of information is child's play to Helix Express.
If your personal and business information management needs are simple at the moment, Helix Express is the perfect solution. It can do everything a basic information management program can do, plus a whole heap more!

Why you really, really should want a program that will do a "whole heap more."
In a flat file database program, you can perform simple functions like searching, reporting, and indexing.
For now, that may be all the capability you need. And Helix Express is the solution.
In the beginning, you might use Helix Express to...
...keep track of customers.
As your business grows, you can also use it to...
...keep track of customers and produce invoices.
Of course, you'll continue to be more and more successful. And when you are, you can use Helix Express to...
...keep track of customers and produce invoices and control your inventory and receivables.
Pretty soon you'll have more and more people working for you (although not as many as you would need without Helix Express).
And guess what? They can use Helix Express, too, because...
...it's also a multi-user program.

Helix Express is the complete database solution for Mac users of all sizes.
It's "kidstuff" for you to start using it! Most relational databases require you to use programming language to design an application. With Helix Express, you don't need to learn a single command or write a single line of program code.

What's more, it includes document and project management features not available anywhere else!
It allows you to store and search for a document by a keyword, then retrieve and launch it in its native format. Helix Express can specify workflow and track project progress. It even has version control to track who updated a document, and when. It results in so many more timesaving benefits not offered by any other database program that you'll just have to call us to learn more about them!

Let Helix Express manage your "whole heap of things" now, and in the future.

*Except babies. For that, you're on your own.
Verbatim® tapes, optical and floppy disks. Your best defense against data loss.

Hey, at least the data's safe.

Circle 162 on reader service card.
the two speeds on the same disc, speeding up for the data portions and slowing down for the audio tracks so that Verdi doesn't sound like the Chipmunks.

Data throughput to your Mac is aided by an efficient 64K cache, which helps smooth out animated images coming directly from a CD-ROM disc. In our tests, this improved throughput was most apparent with QuickTime movies, which ran much more smoothly on the CDR-73M than on other CD-ROM drives. Other multimedia discs don't fare as well, however, since they're timed to make sure that animation and sound are in sync even on the slowest CD-ROM drives.

We tested the CDR-73M against a TurboDrive CD-ROM drive, from Peripheral Land, using an 8-megabyte IC with the disk cache set to 128K. The CDR-73M proved to be about 13 percent faster during a Finder copy (dragging a 10-megabyte folder containing 80 files from a CD-ROM to a hard disk), but it ran about 18 percent slower than the PLI drive while navigating through a Brotherbund children's CD-ROM called Just Grandma and Me — probably because of the timing factors mentioned for non-QuickTime multimedia. Perhaps for similar reasons, a MacroMind Director animation was no faster on the CDR-73M than on the PLI drive. Two HyperCard tests (opening a stack on a CD and doing a search) also ran at virtually the same speed on both drives.

The CDR-73M's hardware has some deficiencies and some advantages. Because the SCSI ID comes preset to 0 (the default setting of Mac internal hard drives), most Mac users will have to change the ID to another number — it isn't easy, though, because you have to set the address on an awkwardly recessed rear-panel DIP switch. However, the power switch is conveniently located on the front panel, as are the volume-control dial and the headphone jack for playing audio CDs (there are also stereo-output jacks on the back). And by the time you read this, you'll be able to buy a CDR-74 instead of a CDR-73M for $50 more and get the added features of double doors (for better dust protection) and socketed firmware (for snap-in upgrades).

Overall, we can recommend the NEC Intersect CDR-73M. Its enhanced performance with QuickTime will save you from having to copy CD-ROM multimedia presentations to a big hard disk. In the future, we hope to see other types of CD-ROMs that take advantage of the CDR-73M's relatively high throughput.

John Rizzo

**TrashMaster**

**Shredder**

If you need more control over when and how you empty your Trash and how thoroughly you destroy it, you should know about TrashMaster and Shredder. TrashMaster concentrates on when and how to trash your data, whereas Shredder specializes in thoroughly destroying it.

TrashMaster is a control panel that adds menu controls and filtering to Trash emptying. The menu controls transform the Empty Trash item on the Finder's Special menu into a hierarchical menu, so you can choose to empty the Trash by disk drive, volume, folder, subfolder, or even by file. We found this feature awkward and wished we could turn it off.

The filtering feature lets you create filters to define when to empty which part of your Trash. Filters let you determine whether to empty the Trash at a particular time, such as hourly or daily, or when events such as startup or shutdown occur. You can also create filters for trashing files with specific attributes such as a designated size or age. Because System 7 retains Trash items until you empty them, filters may come in handy for the terminally forgetful; however, we felt they were techno-overkill.

In the realm of deliberate overkill, a special Incinerate filter automatically erases files of defined types (for example, temporary and print-spool files) when they're deleted either by TrashMaster or by an application. TrashMaster includes an option to erase files according to Department of Defense (DOD) specifications (three writes).

If three writes isn't drastic enough for deleting your confidential data, however, you're better off with Shredder. A System 7-savvy application for erasing files and disks, Shredder actually shows up on your desktop as two icons representing the independent applications Shredder and Scrubber.

Shredder deletes files by overwriting them in one of three ways you can choose: all zeros, random data, or DOD specification 5220.22m. Scrubber erases unused areas of a volume or file, using one of the same three options. Both applications prevent file-recovery programs from retrieving erased information.

You can use Shredder and Scrubber in several ways: You can simply drag and drop file or disk icons onto the Shredder or Scrubber icons and use them as you use the Trash. You can also double-click on the icons to gain more options for shredding and scrubbing. You can set interval shredding or scrubbing to work in the background at a specific time, as you can with TrashMaster's time-based filters. Or you can access Shredder and Scrubber Apple events with such programs as HyperCard, QuicKeys, or UserLand Frontier.

You need to launch Shredder and Scrubber directly at least once to set your erasure, timing, and sound preferences (you can assign a grinding, shredding, or chopping sound to play continuously during shredding or scrubbing). For us, the novelty of the sounds wore off quickly; we turned them off after the first run.

Shredder's 46-page manual is easily understandable, and the program itself worked smoothly in all our tests. It did balk at locked files, but it skipped over them without interruption or damage.

Shredder requires System 7, as do most features of TrashMaster (the Incinerate function can work under System 6). Overall, we found Shredder fast and reliable. TrashMaster provides more flexibility and control for emptying the Trash, but we aren't certain how many people will really use all of its features.

Shredder, DLM Software, 3525 Del Mar Heights Road, Suite 319, San Diego, CA 92130; 619-283-2343. Version 1.0.1. $69.

TrashMaster, Utiliton, P.O. Box 811, Allen, TX 75002; 800-428-8766 or 214-727-2329. Version 1.1. $69.95.

— Tom Petaccia

**A Silly Noisy House**

The package describes it as "an animated audio toolbox," but that description doesn't do it justice. A Silly Noisy
"DeltaGraph Professional has no competition. No package offers the tools, elegant interface, and variety of sophisticated chart types. Also unmatched is its flexibility for formatting, tweaking, and modifying every chart element. If you're looking for the best, look no further than DeltaGraph Pro."
—Becky Waring, MacUser, June 1992

“Feature for feature, DeltaGraph Professional is the best general-purpose business and technical charting program available for the Macintosh.”
—Bill Justin, MACWORLD, May 1992

“Best graphic and charting package on the Mac. Adding presentation capabilities gives me more flexibility.”
—Roger Glebe, Lockheed Corporation

“It’s a graphics presentation power house.”
—Joe Lee, General Electric Information Services

“I am impressed with the range of things DeltaGraph Pro does. It's the only product on the market that addresses all complex charting needs. DG Pro is one hot product.”
—Lori S. Jennings, TRW Electronics Systems

“DG Pro has expanded the range of chart types that I can produce and provides charts that are not available on any other Mac package.”
—David Pelz, Mac Engineering and Scientific Report, CADventures

“DeltaGraph Professional does things that Excel, Cricket, and Wingz does, but better and easier. It consists of more useful items such as making a bunch of graphs on one document without having to do a lot of cut and pasting. I use DeltaGraph Professional in place of all other graphic systems.”
—John Kingsley, Kingsley Associates

“All scientists or engineers should have this package for the charting features alone.”
—Doug and Denise Green, InfoWorld Magazine

“It is exceptionally easy to use and provides more flexibility than any other package available.”
—Dr. Jaime Dananberg, University of Michigan

Call Today.
RISK FREE GUARANTEE
To hear more about DeltaGraph Professional, including our Risk Free Guarantee, call 1-800-446-6955 ext. 105
Or visit your nearest reseller
House is an imaginative pastiche of clever animations, delightful sounds, and familiar songs that will surely capture your three-to-eight-year-old's heart.

A Silly Noisy House is easy to install and even easier to play. If you can click the mouse, you have all the skill it takes; even three-year-olds get the hang of it in minutes. You move from room to room by clicking, and you activate items in the rooms by clicking on them.

Every room contains dozens (if not hundreds) of toys and common household items; clicking on an item makes an animated sequence, a song, or a sound play.

The popcorn popper goes into action with mouth-watering sound effects. The oven reveals a different delicacy, such as a birthday cake that magically transports you to a birthday party, each time you click on it. There's a hatbox filled with fanciful hats that change with each mouse click, and there's even a skeleton in the closet—a teddy-bear skeleton that dances a jig. The music and sound effects throughout the game are superb.

The only drawback is the required hardware investment—a color Macintosh, 2 megabytes of RAM, a hard drive with at least 6 megabytes available, a CD-ROM drive, and external speakers or headphones. Even so, if you've got the horsepower, this is one of the best ways we've seen to use it.

Our test subjects—editors' kids and neighbors of editors' kids—who are bored by much of the software we try on them, never seemed to tire of A Silly Noisy House. The younger ones liked it best, but even the eight-year-olds played for hours. Several months after it arrived, they were still playing it almost every day. That's a powerful endorsement indeed.

The Voyager Company, 1351 Pacific Coast Highway, Santa Monica, CA 90401; 800-446-2001 or 310-451-1383. $59.95.

—Bob LeVitus

**CameraMan**

If you need to capture screens and on-screen actions for training materials or software demonstrations, you should know about CameraMan. It allows you to capture screen action into a QuickTime movie, a PICS file, or a series of sequential PICT files—and, unlike Farallon’s MediaTracks, it captures color.

CameraMan consists of a system extension and an application. The application runs in the background under either System 7 or MultiFinder (for System 6.0.7 users) and allows you to set a variety of options such as recording speed, which area of the screen to capture, and which keys to press to stop and start capture. You can record the entire screen or an area you select (either graphically or by typing numerical screen coordinates). Or you can use the Follow Cursor option to record a fixed-size area surrounding the cursor as it moves around the screen.

CameraMan lets you determine your own trade-off between image quality and amount of compression when recording QuickTime movies. Although the documentation strongly recommends using the default CODEC (compressor/decompressor) settings (best quality, lowest compression), our experiments with the higher-compression CODEC settings let us reduce QuickTime file size by almost 30 percent without degrading image quality unacceptably.

We found CameraMan very limited in its capture speed. On a IIx set to 8-bit video, the maximum recorded frame rate never really rose above 4.5 fps (frames per second), even though CameraMan lets you set much higher frame rates. If you're thinking of creating a tutorial for a 32-bit painting, 3-D, or animation program, be forewarned: You'll need to set the display to 8-bit video if you want 4-to-6 fps speed. To get higher frame rates, you need to lower the depth settings to 4-bit or to black-and-white, which can work well for word-processing and database programs and other types of software that don't require color.

One obvious omission in CameraMan is that you can't use an LC/itis/Quadrasonic microphone or a MacRecorder to record audio into a QuickTime movie as you create it. You can use a QuickTime editor such as Adobe’s Premiere or Diva’s VideoShop to mix audio into the capture after you've created it, but most people would rather narrate during the capture and have that narration available as a reference. Aside from this oversight, CameraMan is a useful utility for QuickTime trainers and demo makers.


—David Biedny

**Life Forms**

If you've ever tried to describe human movements in words, you know that showing beats telling every time. And if you want to show complex human motion on a Mac, Life Forms is the way to go. The program, originally developed for choreography and priced at $1,200, has been acquired by Macromedia and released at the much more reasonable price of $495.

Life Forms works by interpolating motion between keyframes—that is, it fills in the motion necessary to create smooth transitions from one body position to another. The interface for positioning each body part is intuitive, so even beginners can enjoy virtually instant gratification. Although the program can't address minute details of human anatomy, you can use it for facial expressions, control it to simulate fairly intricate motions, as the sample files of dancing and running demonstrate.

If you want your animated humans to look as realistic as their movements, you need to do some exporting: Life Forms' humans are strictly wire-frame figures. Fortunately, Life Forms is compatible with Swivel 3D Professional, Macromedia's 3-D modeling software. You can save a Swivel animation script that drives an included set of Swivel body parts, and you can modify the Swivel files to create your own, more lifelike, 3-D-rendered humans. You can also save your animations in PICS and QuickTime formats, but then you can play them only as wire frames.

The program's interface, although fairly straightforward, sometimes feels slightly cluttered. There are so many menus and submenus that the tear-off menu feature can actually be a minus instead of a plus, because it adds to the clutter. However, once you've gotten used to the program's interface, you'll probably spend hours trying out strange moves that would break the back (and other body parts) of a real Homo sapiens. If your world requires animated people, Life Forms is a necessary and fun tool.


—David Biedny

NEW ON THE MENU

**QUICK CLICKS**

Bob Levitus

**CameraMan**

If you need to capture screens and on-screen actions for training materials or software demonstrations, you should know about CameraMan. It allows you to capture screen action into a QuickTime movie, a PICS file, or a series of sequential PICT files—and, unlike Farallon’s MediaTracks, it captures color.

CameraMan consists of a system extension and an application. The application runs in the background under either System 7 or MultiFinder (for System 6.0.7 users) and allows you to set a variety of options such as recording speed, which area of the screen to capture, and which keys to press to stop and start capture. You can record the entire screen or an area you select (either graphically or by typing numerical screen coordinates). Or you can use the Follow Cursor option to record a fixed-size area surrounding the cursor as it moves around the screen.

CameraMan lets you determine your own trade-off between image quality and amount of compression when recording QuickTime movies. Although the documentation strongly recommends using the default CODEC (compressor/decompressor) settings (best quality, lowest compression), our experiments with the higher-compression CODEC settings let us reduce QuickTime file size by almost 30 percent without degrading image quality unacceptably.

We found CameraMan very limited in its capture speed. On a IIx set to 8-bit video, the maximum recorded frame rate never really rose above 4.5 fps (frames per second), even though CameraMan lets you set much higher frame rates. If you’re thinking of creating a tutorial for a 32-bit painting, 3-D, or animation program, be forewarned: You’ll need to set the display to 8-bit video if you want 4-to-6 fps speed. To get higher frame rates, you need to lower the depth settings to 4-bit or to black-and-white, which can work well for word-processing and database programs and other types of software that don’t require color.

One obvious omission in CameraMan is that you can’t use an LC/itis/Quadrasonic microphone or a MacRecorder to record audio into a QuickTime movie as you create it. You can use a QuickTime editor such as Adobe’s Premiere or Diva’s VideoShop to mix audio into the capture after you’ve created it, but most people would rather narrate during the capture and have that narration available as a reference. Aside from this oversight, CameraMan is a useful utility for QuickTime trainers and demo makers.


—David Biedny

**Life Forms**

If you’ve ever tried to describe human movements in words, you know that showing beats telling every time. And if you want to show complex human motion on a Mac, Life Forms is the way to go. The program, originally developed for choreography and priced at $1,200, has been acquired by Macromedia and released at the much more reasonable price of $495.

Life Forms works by interpolating motion between keyframes—that is, it fills in the motion necessary to create smooth transitions from one body position to another. The interface for positioning each body part is intuitive, so even beginners can enjoy virtually instant gratification. Although the program can’t address minute details of human anatomy, you can use it for facial expressions, control it to simulate fairly intricate motions, as the sample files of dancing and running demonstrate.

If you want your animated humans to look as realistic as their movements, you need to do some exporting: Life Forms' humans are strictly wire-frame figures. Fortunately, Life Forms is compatible with Swivel 3D Professional, Macromedia's 3-D modeling software. You can save a Swivel animation script that drives an included set of Swivel body parts, and you can modify the Swivel files to create your own, more lifelike, 3-D-rendered humans. You can also save your animations in PICS and QuickTime formats, but then you can play them only as wire frames.

The program's interface, although fairly straightforward, sometimes feels slightly cluttered. There are so many menus and submenus that the tear-off menu feature can actually be a minus instead of a plus, because it adds to the clutter. However, once you've gotten used to the program's interface, you’ll probably spend hours trying out strange moves that would break the back (and other body parts) of a real Homo sapiens. If your world requires animated people, Life Forms is a necessary and fun tool.


—David Biedny
SONY 19" Trinitron Color System

8 Bit with RasterOps 8XL $1698.00

24 Bit With RasterOps PaintBoard $2598.00

- The SONY 19" Trinitron is one of our best buys yet! True Trinitron color at a great price!
- Includes a 8 bit or 24 bit Video board and cable
- The page display supports all Mac IIsi, IIsi SE-30, and the LC

Sampo 20" Mono System $598.00
Grey Scale System $898.00

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

NuDesign Full Page Grey Scale $398.00

- Plug compatible with IIsi, IIsi Quadra (16 levels of grey).
- Available with a 1 bit interface card for all Mac IIsi, SE-30, SE and LC $488.00.
- 20" Monitors manufactured by Sampo for Apollo/HP

UMAX 600 DPI COLOR SCANNER & Other Scanners

Umax UC-630 With Photoshop $1268.00

- Transparency/Slide Scanner Option $798.00
- Automatic Document Feeder $498.00
- Rated four mice by MacUser (Dec '91)
- Rated first 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

Umax UC-1200S With Photoshop $4498.00

- Transparency/Slide Scanner Option $898.00
- Includes Adobe Photoshop
- 8 1/2 x 14 Scanning area
- Incredible 1200 dpi scanning resolution recognizes 1 billion colors internally
- Single-pass design increases scanning speed

Sharp JX-320 With Photoshop $1598.00

- One pass scanner
- 8 1/2 x 11 Scanning area
- Includes Adobe Photoshop

800-621-8469
Hours: 8:30 - 8:00 CST, Saturdays 10:00 - 4:00
Technical Service and Order Tracking (6:30-5:00): 312-664-8225

60 East Chestnut - 145, Chicago, IL 60611
The Drive That Apple Uses

For two years Conner has been one of Apple's largest hard drive suppliers!

Conner Drives

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>C 42 MB</td>
<td>$218</td>
</tr>
<tr>
<td>C 65 MB</td>
<td>$298</td>
</tr>
<tr>
<td>C 120 MB</td>
<td>$398</td>
</tr>
<tr>
<td>C 170 MB</td>
<td>$498</td>
</tr>
<tr>
<td>C 212 MB</td>
<td>$648</td>
</tr>
<tr>
<td>C 540 MB</td>
<td>$1148</td>
</tr>
</tbody>
</table>

C 85 MB $278
C 120 MB $378
C 170 MB $468
C 212 MB $568
C 540 MB $728

These new Conner drives are so reliable, that Conner has been one of Apple's largest suppliers of drives. The 150,000 hours Mean Time Between Failure and the incredible speed of the 540 are just two reasons to buy a Conner. Give us a call and we'll tell you the rest...

Fujitsu Drives

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 MB 3.5&quot;</td>
<td>$278</td>
</tr>
<tr>
<td>185 MB 3.5&quot;</td>
<td>$498</td>
</tr>
<tr>
<td>330 MB 3.5&quot;</td>
<td>$1128</td>
</tr>
<tr>
<td>425 MB 3.5&quot;</td>
<td>$1148</td>
</tr>
<tr>
<td>520 MB 3.5&quot;</td>
<td>$1248</td>
</tr>
<tr>
<td>680 MB 3.5&quot;</td>
<td>$1288</td>
</tr>
<tr>
<td>1.2 Gig 5.25&quot;</td>
<td>$1948</td>
</tr>
<tr>
<td>2.06 Gig 5.25&quot;</td>
<td>$3318</td>
</tr>
</tbody>
</table>

Optical Drives

NuDesign 3.5" 128mb Optical $1298
Ricoh 600mb Optical $2198

 Toshiba CD ROM

Toshiba 3301 $538

Chinon CD ROM

Chinon CDC-431 $438

SyQuest 44MB & 88MB Removable

44MB Removable $448.00
88MB Removable $598.00

Maxtor Drives

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>120mb 3.5&quot;</td>
<td>$358</td>
</tr>
<tr>
<td>213mb 3.5&quot;</td>
<td>$598</td>
</tr>
<tr>
<td>760mb 5.25&quot;</td>
<td>$1398</td>
</tr>
<tr>
<td>1.2Gig 5.25&quot;</td>
<td>$1898</td>
</tr>
</tbody>
</table>

DAT Tape Backup

NuDesign Dat 2.1 Gig Capability $1298
ArDat 2.1 Gig Capability $1398
WangDat 2.1 Gig Capability $1498

NuDesign Dat 2.1 Gig Capability $1298

SyQuest 2.1 Gig DAT $1298!

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 drive products only. Return Authorization number required for returns. Prices, terms and availability subject to change without notice.

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 drive products only. Return Authorization number required for returns. Prices, terms and availability subject to change without notice.

800-621-8469
Hours: 8:30 - 8:00 CST, Saturdays 10:00 - 4.00 Technical Service and Order Tracking call: 312-664-8225

CIRCLE 161 ON READER SERVICE CARD.

150,000 hours Mean Time Between Failure is the average life expectancy of a drive.
The Right Word Processor

Don’t be fooled by lists of features. Your work should determine which word-processing program you pick. Here’s how the leading packages compare.

BY TED LANDAU

In spite of the telephone, written words are still a primary means of communication. Maybe we have fax machines to thank for that, but whatever the reason, because we have so much more to communicate these days, word processors have become as essential as paper — and as complex as relativity theory.

Choosing a word processor doesn’t have to be complex or confusing, however, if you start by asking yourself one simple question: What do I do most often? If you know the jobs you’re most likely to do with your word processor, picking the most appropriate package can be a snap.

To help guide you, we’ve divided the spectrum of typical word-processing tasks into five categories: short, medium, and long documents; page layout; and merge documents (see Table 1). Within each category, we’ve focused on the key features necessary for success at that task (see Table 2).

In deciding which program was best suited for a given category, we considered how well the key features were implemented and how easy the program was to learn and use.

The Competition

We reviewed six word processors: three midlevel programs — MacWrite II, Taste, and WriteNow — and three high-end — Microsoft Word, Nisus, and WordPerfect. Although there is some overlap between the two levels, only the high-end applications include such features as indexing, tables, outlining, and macros.

Price is also an issue. You can pick up a midlevel program for about $100, whereas a high-end package can cost four times as much.

MacWrite II. The easiest to learn of any of the word processors, MacWrite II also has the fewest high-end features. MacWrite Pro, Claris’ souped-up version of MacWrite II, should be out soon (see the “Coming Soon: MacWrite Pro” sidebar).

Taste. With style sheets, an integrated address-book database, and exceptionally strong graphics options, Taste is surprisingly full-featured for a mid-level package. In its initial release, Taste was plagued with system-crashing bugs and slow performance; the current version, 1.02c, is faster and more stable.

WriteNow. Fast, small, and RAM-lean, WriteNow 3.0 retains the sleek design of its predecessors. WriteNow has more features than MacWrite II, and version 3.0 includes style sheets.

Microsoft Word. Word is the program that first defined high-end word processing on the Mac. In version 5.0, Microsoft has added several new features aimed at overcoming Word’s reputation as an un-Mac-like program.

Nisus. Nisus is a full-featured word processor...
Word-Processing Programs

with superb text-manipulation tools, but some of the tools are very awkward to use, especially compared with those of the other packages.

WordPerfect. Despite its DOS heritage, WordPerfect 2.1 emerges with a crisp and clean interface that belies its underlying complexity. Although it’s WYSIWYG in some respects, there are some curious lapses too. Still, WordPerfect has excellent graphics features and was the first word processor to support QuickTime. (Word 5.0 has since joined the ranks as well.)

Short Documents: Bread and Butter

All the word processors we reviewed have the basic tools for short-document tasks: paragraph formatting with rulers, font and style selections, find-and-replace, and the ability to paste pictures from the Clipboard. Also now standard are a spelling checker and a thesaurus.

If letters and memos represent the bulk of your work, you don’t really need much beyond these basic tools. In the short-document category, well-implemented simplicity surpasses feature-rich complexity.

How They Stack Up. Easy-to-use, intuitive, and WYSIWYG. These terms just about sum up MacWrite II. MacWrite II’s menus and dialog boxes are clearly laid out and easy to follow (see Figure 1). All aspects of the program work exactly as you would expect. MacWrite II gives you just one view of your document; there’s no cumbersome switching between page-preview modes and no separate windows for headers and footers.

MacWrite II includes just a few “beyond the basics” features, but they are well chosen. For example, it makes invisible characters such as tab markers and returns visible, and it has the only built-in spelling checker that can

Coming Soon: MacWrite Pro

MacWrite Pro is Claris’ long-overdue and much anticipated upgrade to MacWrite II. With any luck, it should ship sometime this fall. Judging from an early beta version, MacWrite Pro will be well worth the wait. Despite the addition of numerous high-end features, the package retains MacWrite II’s ease of use and simplicity.

One of MacWrite Pro’s most significant features is a table function whose flexibility and range of options compare very favorably to those of Microsoft Word’s table function and that is easier to use.

MacWrite Pro also has greatly expanded page-layout capabilities. Especially welcome is the ability to place a text or graphic object anywhere on a page, complete with text runarounds. With this frame-placement feature and MacWrite Pro’s tool palette, you can easily create customized borders around a frame and then shade it by choosing from 64 colors.

Best of all, MacWrite Pro includes true style sheets that follow WriteNow’s lead of permitting both paragraph- and character-based styles. MacWrite Pro also supports section divisions and variable-width columns, and it even lets you restart page numbering with each new section.

Rounding out the list of notable features, MacWrite Pro lets you stick electronic Post-it-type notes onto a page, in case you want to make annotations or comments. For System 7 users, MacWrite Pro supports publish-and-subscribe.

Despite all these features, MacWrite Pro is still MacWrite at heart. Some high-end features—including indexing, outlining, a glossary, and the ability to create tables of contents—are still missing. And although MacWrite Pro’s page-layout alert you to spelling errors as you type. It also has a feature that lets you assign a name to a particular combination of type font, style, and size so that you can reapply it by using a single command. Unfortunately, the program doesn’t recognize such user-defined combinations as “true” styles.
features are much improved compared with MacWrite II's, they
don't match WordPerfect's or Taste's.
Overall, MacWrite Pro seems well positioned to retain its
appeal to entry-level users while simultaneously broadening its
base to include a significant segment of the high-end market.

so if you change any part of the combination, MacWrite II
doesn't change other occurrences of that style to match.
If you frequently include graphics in your documents,
Taste may be a good bet. In addition to the basic tools,
Taste has a MacDraw-like tool palette for creating and

medium Documents: Business/Academia
Even for the simplest medium-length document, heads
ners and footers are necessary, if only for including page
numbers. All the programs we reviewed can generate

Table 1: Word-Processing Tasks

<table>
<thead>
<tr>
<th>Task Type</th>
<th>Typical Examples</th>
<th>Key Requirements</th>
<th>Recommended (in order)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short documents</td>
<td>Letters, memos, brief reports, simple fliers</td>
<td>Ease of use, basic text formatting, ability to paste graphics.</td>
<td>MacWrite II</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Taste</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Word</td>
</tr>
<tr>
<td>Medium documents</td>
<td>Business reports, academic manuscripts, business proposals</td>
<td>Headers and footers, find-and-replace, tables, outlining.</td>
<td>Word</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long documents</td>
<td>Books and manuals.</td>
<td>Style sheets, tables of contents, indexing, cross-referencing, section divisions.</td>
<td>Word</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WordPerfect</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nisus</td>
</tr>
<tr>
<td>Page layout</td>
<td>Newsletters, presentations, documents that include graphics.</td>
<td>Frame placement, column formatting, graphics importing and editing.</td>
<td>WordPerfect</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Taste</td>
</tr>
<tr>
<td>Merge documents</td>
<td>Form letters, labels, automated documents</td>
<td>Smooth print merge.</td>
<td>Word</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Taste</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MacWrite II</td>
</tr>
</tbody>
</table>
simple headers and footers, and some can do more, producing different headers and footers for facing pages, for instance.

Another essential feature present in all six programs is find-and-replace. In most of the programs, this feature lets you do more than just locate a specific text string; you can also search for matches based on such attributes as font, size, and style. Most of the packages also let you search for invisible characters such as tabs and paragraph markers, and the best ones let you define search strings by using wildcard and other specialized characters.

Tables and outlines are two other features you need for writing medium-length documents. Both are helpful for organization and presentation. A glossary feature provides a quick way of adding recurring phrases or graphics to a document. If you write formal or technical documents, footnote, endnote, bibliography-citation, and equation-writing functions may all be important.

How They Stack Up. For headers and footers, Word is the only program that lets you have separate sections, each with its own page-numbering sequences. WordPerfect loses points, because you can view headers and footers (as well as footnotes, for that matter) only in Print Preview mode. MacWrite II is the only program without options for multiple or odd/even headers and footers.

When it comes to find-and-replace, Nisus deserves special mention. Combining wildcard matching with Boolean-type search criteria, Nisus' search capability is far more powerful than that of any of the other packages. But mastering all this, particularly at the PowerSearch+ level, requires considerable effort — more than most users are likely to be willing to make (see Figure 3). Word's and WordPerfect's find-and-replace functions are easier to use and should be adequate for all but the most demanding users. WriteNow is the only word processor without any attribute-searching capability.

If you need to include tables in your documents, you have two choices: Word or WordPerfect. Word's table-generating commands are so outstanding that they could have been marketed as a separate application (see Figure 4). If you've ever tried to create a table by setting multiple tabs, you'll quickly appreciate what Microsoft has accomplished. With Word, you can almost instantly create a table of any number of rows and columns, with or without borders. Text always remains within a cell as you type, because the row height expands to accommodate the amount of text. You can merge or delete cells as desired, sort the data based on any column, and use basic math functions.

WordPerfect's table features are more limited in scope. For example, you can't select a column of cells in a table and you can't merge cells, largely because you form tables by using a variation of WordPerfect's column-formatting commands rather than true table commands.

Word scores again with the best outline-processing capabilities. You can shift between the Normal and the

Outline views of the same text. When using the Outline view, you can collapse, expand, and move headings, much as you would with the Acta or MORE outlining programs, but if you want to change the look of a heading, you have to leave the Outline view and enter either the Page Layout or the Normal view. WordPerfect's outlining function can do neither of these things. Nisus' outlining function is inconveniently hidden within a separate macro file and is so slow and clumsy as to be almost useless. The other word processors have no outlining features at all.

Long Documents: Writing Pros

Once you've started using style sheets, you'll wonder how you ever managed to write without them. They're probably the most critical feature for successfully writing
Small Words: Nisus Compact and LetterPerfect

Even Mac Classic and PowerBook users need to write, so they need word processors that can fit within their tight memory configurations. Recognizing this, the makers of Nisus and WordPerfect have introduced streamlined versions of their products: Nisus Compact ($150) and LetterPerfect ($149), respectively.

Both products jettisoned their big brothers' macro commands; graphics editors; most frame-placement options; and the commands for tables of contents, indexes, and cross-references.

As a result of these omissions, Nisus Compact weighs in as a program that's much smaller but also easier to use than Nisus is. Happily, it retains almost all the positive features that made Nisus unique: multiple levels of undo, an Append to Clipboard command, and rectangular and noncontiguous selection. Although Nisus Compact's find-and-replace is considerably scaled down from Nisus' PowerSearch, it still outdistances most of the competition and is much more accessible. It even adds a Fuzzy Find option for locating text that approximately matches your selection. Nisus Compact also retains, for better or worse, virtually all of Nisus' ruler and style-sheet functions.

Nisus Compact's File Clerk Catalog, for locating and organizing files on your disk, isn't exactly a breeze to use, but it's a great improvement over Nisus' Catalog function. Unfortunately, Nisus Compact does not arrive as a complete package. The spelling checker, thesaurus, and merge functions — all important features — are sold as separate modules.

For PowerBook users, Nisus Compact can run completely from RAM, conserving battery life. Overall, Nisus Compact is an attractive product.

LetterPerfect (which was still unreleased as we approached deadline) is a scaled-down version of WordPerfect. Although LetterPerfect is a very serviceable word processor, scaling down means losing WordPerfect's greatest strength: its page-layout features. Not only is the graphics editor gone but so are the border and shading options, text sidebars, figure captions, and most of the specialized commands for frame placement. LetterPerfect has also abandoned style sheets. It does retain several of WordPerfect's better features, however, including its flexible column-formating and find-and-replace options. And, unlike Nisus Compact, LetterPerfect comes as a complete package.

Before you run out to buy either of these programs, however, consider WriteNow 3.0. In terms of disk space and memory requirements, WriteNow is the most compact of any Mac word processor.

long documents and are no longer restricted to high-end applications. Every program we reviewed except MacWrite II includes some sort of style-sheet option.

Typically, defining a style means giving a name to the format settings (the font, ruler settings, and so on) in a paragraph. Once you've defined a style, you can directly apply all of its settings to any other paragraph by selecting the style's name. The distinguishing characteristic of style sheets is that when you modify a style definition, the program updates all text previously assigned that style to reflect the change. This not only saves time but also makes it much easier to maintain a consistent format throughout a long document.

A word processor's ability to create tables of contents, indexes, and cross-references, complete with automated updating of page numbering, is another important concern if you work on long documents. For example, if your text includes a cross-reference such as “See Figure 3 on page 18,” you need a program that updates the page number whenever an editing change moves Figure 3 to another page. Having this ability in your word processor is not crucial if you export your documents to a page-layout program, however.

How They Stack Up. It's in the long-document category that the difference between the high-end programs and the midlevel ones is clear. None of the midlevel programs even make it to the starting gate here.

Word's style sheets are exceptionally easy to learn and use. You can access styles from a pop-up menu on the ruler. Whenever you select a defined style for a paragraph, Word conveniently lets you choose whether to change the paragraph formatting to match the style or whether to

Figure B: Nisus Compact's File Clerk Catalog, not available in Nisus, helps you keep track of your files. With Nisus Compact, you can assign categories to each Nisus-readable file on your disk. You can then use File Clerk to filter the files list, displaying just those files that match your selection criteria.

Figure C: LetterPerfect lacks the style sheets, macros, graphics, and page-layout features of its big brother, WordPerfect, but its Find/Change dialog box retains the complete set of options found in WordPerfect.
Word-Processing Programs

redefine the style to match the paragraph.

WordPerfect's style sheets require more effort to master, and using them isn't always straightforward. Sometimes you have to plow through as many as three separate dialog boxes, each with numerous and often unclear choices. However, WordPerfect is the only program that permits user-entered text to be part of a style definition. This can be useful, for example, if you want to have your paragraphs always begin with the same phrase or label.

Nisus has two style functions. The first, user-named rulers, is much like Word's styles feature, except that it doesn't have character-formatting options. The second, the Styles menu command, lets you combine character and paragraph formatting. There is actually another set of rules governing how unnamed rulers work. With all these options, even experienced users can get confused. In the case of Nisus' style functions, as with many of its other features, we appreciated its capabilities much more than its implementation of them.

Being able to generate a table of contents automatically is important when you're working on long documents. Among the high-level programs, Word has the easiest method (relatively speaking!) for creating a table of contents. In most word processors, you identify items to be included in a table of contents by marking them with hidden text code. Word can bypass this requirement by building a table of contents directly from your outline headings.

For indexing, the situation is more muddled, with no program consistently better than the others. Word is best for creating nested index listings and for applying style formats to indexes. Both Nisus and WordPerfect are better than Word at indexing terms that span several pages or that subsume different categories. Nisus has the fastest method for indexing all occurrences of a word; it uses a special PowerSearch function to index any word you enter in the Search dialog box. WordPerfect is the only program that can generate an index based on a list of words in a separate document. Both WordPerfect and Nisus do cross-referencing, a feature that is altogether absent from Word.

Surprisingly, Word is the only program with section-division and document-linking functions. As mentioned previously, Word is the only application that lets you have separate page-numbering sequences within the same document. It is also the only program that can produce a single index from several separate but linked documents.

Although not a high-end application, WriteNow deserves special mention for having the most-clearly designed and functional style sheets (see Figure 5). It has paragraph- and character-level styles and employs a logical sequence of style "layers" that makes it easy to predict the effects of any style override or redefinition. Clearly, T/Maker has benefited from seeing where the others have stumbled.

Page Layout: Expanded Processing

If you're serious about page layout, use a page-layout program, such as PageMaker or QuarkXPress. Not even the best word processor can substitute for one of these applications. Still, if you need layout capabilities only occasionally, such as for an in-house newsletter, it's convenient and economical to use your word processor to do the job.

Probably the most critical layout feature is frame placement, which is the ability to position separate graphic

---

Figure 5: WriteNow 3.0 features a thoughtfully designed system for style sheets that allows paragraph- as well as character-based styles. The system includes separate pop-up menus along the bottom border, and WriteNow adds icon symbols after a style's name to indicate the presence of any selective formatting that overrides a style definition.

Figure 6: WordPerfect's excellent page-layout features let you shift from a one-column to a two-column format within the same page. It's easy to place a graphic frame, complete with border, shading, figure caption, and text runaround. The circular text was created with one of WordPerfect's many prerecorded macros.
objects or text sidebars within the main text and have the text run around the frame. For example, by using a frame, you can easily flow text around a picture.

Another key feature is the program's general handling of graphics. For page layout, you need much more than just the ability to paste pictures. You should also be able to edit graphics and directly import different graphic formats such as TIFF and EPS.

Column formatting is another essential ingredient if you're laying out a newsletter or similar document. All six programs can display text in columns, but with very different degrees of flexibility.

Some of the other layout features available, such as shading and borders for frames or paragraphs, can benefit almost any document.

**How They Stack Up.** Both Taste and WordPerfect let you place graphic or text frames anywhere on a page and have the main body text run around the borders of the frame. They also let you place frames either in front of or behind the text, although only Taste lets you easily shift a frame from one layer to another. With Taste, you can even run text inside the borders of a graphic frame. Both programs let you anchor a frame to either a specific paragraph or a specific location on the page. WordPerfect is the only program that can link figure captions to a frame and automatically sequence figure-caption numbers (see Figure 6). Overall, WordPerfect surpasses Taste largely because of its greater placement precision, but Taste is generally easier to use.

These two programs also have separate 8-bit-color MacDraw-like graphics layers for creating and editing graphics. We preferred Taste's approach of a transparent
Word-Processing Programs

graphics layer that overlays the text to WordPerfect’s separate graphics-editor window.
Although Word can theoretically match most of the features of these other two programs, it loses points, because its procedure for placing frames is nearly impossible to master. Proper placement of a frame, if you are lucky enough to achieve it, requires several shifts back and forth among three views of the document (Normal, Page Layout, and Print Preview) and the use of two commands from the Frame menu. Also, although Word 5.0 includes a graphics editor, it has a bare minimum of tools and supports only eight colors. Finally, when you’re working with page layout in Word, you may run into some minor but annoying screen-redraw problems.

Taste, Word, and WordPerfect all let you vary the number of columns in different parts of a document, but only Word and WordPerfect allow different column formatting on the same page. Only WordPerfect lets you set unequal column widths.

When it comes to page layout, Nisus is a second-string player. It has a transparent graphics layer, with flexible frame-placement options, and a set of graphic editing tools. However, it falls behind the others because its borders can be set only for a whole page, not for specific paragraphs or objects. Also, you’re limited to having the same number of columns throughout a document. Finally, its graphics-importing options are weaker than those of the other contenders here; for example, Nisus can’t directly import TIFF documents.

MacWrite II and WriteNow have no frame-placement features and no graphics-editing tools. Graphics can be pasted in only through the Clipboard as characters in a line of text, which prevents independent movement of the frame and precludes any sort of text runaround.

For adding shadings and borders, Taste and WordPerfect again top the list.

### Merge Documents: Form Letters

A word processor can automate the task of producing multiple variations of a form letter so you can personalize your message without re-creating the document for every recipient.

The single essential feature here is a Merge command, which lets you combine two files. One is a letter template into which you’ve inserted special merge codes, and the other comprises the data, typically an address list, to be merged with the letter. When you execute the Merge command, the program creates a series of letters, each customized for a different addressee.

More-specialized merge options include conditional commands (used, for example, to include a request for payment only if the amount owed is greater than zero), a method for printing multiple records on the same page (useful for printing addresses on label sheets), and a means of setting selection criteria (necessary if, for instance, you want to send letters only to people who live in a particular city). Another specialized merge option lets you set the program to pause for and request user input. This can be applied to tasks other than form letters, such as automating prompts for filling out an application.

Other potentially useful features for writers of form letters include a Find File or Catalog command, for locating specific letters from among a large library of files on-disk, and stationery documents, which allow you to save modifications to a template without the risk of altering the original document.

### How They Stack Up

In the merge-documents category, Word tops the list by combining ease of use with an extensive range of features. With its new Print Merge Helper, you can insert merge codes simply by clicking on the correct code name from a convenient pop-up menu—no typing or memorization is required. Word can handle any and all of the specialized merge tasks cited above.

### Table 3: Word Processors

<table>
<thead>
<tr>
<th></th>
<th>MacWrite II 1.1 v3</th>
<th>Nisus 3.06</th>
<th>Taste 1.02c</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$129</td>
<td>$395</td>
<td>$149</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>Weak graphics and page-layout functions. No style sheets or multiple headers and footers.</td>
<td>Difficult to use. Too dependent on macros for commonly needed features.</td>
<td>Slow performance for graphics. No tables. Confusing style-sheet commands.</td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td>Claris Corp.</td>
<td>Nisus Software, Inc.</td>
<td>DeltaPoint, Inc.</td>
</tr>
<tr>
<td></td>
<td>201 Patrick Henry Dr.</td>
<td>107 S. Cedros Ave.</td>
<td>2 Harris Ct., Ste. B-1</td>
</tr>
<tr>
<td></td>
<td>Santa Clara, CA 95052</td>
<td>Solana Beach, CA 92075</td>
<td>Monterey, CA 94041</td>
</tr>
<tr>
<td></td>
<td>408-727-8227</td>
<td>619-491-1477</td>
<td>408-649-4000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>619-491-6154 (fax)</td>
<td>408-649-4020 (fax)</td>
</tr>
</tbody>
</table>
3M brand ¼-inch mini data cartridges are just what you need for unattended backup of important data or storing files and applications. And they’re a lot easier to handle than a growing pile of diskettes.

That’s why more and more businesses are buying low-cost ¼-inch data cartridge drives. They offer a proven track record of reliability and performance. And you can store up to 250 megabytes on a single low-cost, pocket-sized cartridge (depending on drive and data compression software).

It’s another reason why more businesses protect important information on 3M brand data storage products than any other brand in the world. Find out more. Call 1-800-888-1889, ext. 52.

One way to save 250 megabytes.

Without a handful of diskettes.
Word-Processing Programs

from conditional merges to pausing for user responses.

Still, for simpler merge tasks, Taste and MacWrite II work as well as Word and are even easier to use. Like Word, both Taste and MacWrite II use point-and-click methods that let you enter merge codes easily. Taste also has a built-in address-book database and the simplest methods for printing labels and setting selection criteria. Taste's major omission is its lack of conditional commands. MacWrite II does include conditional commands, but it has no options for setting selection criteria or creating labels.

Nisus and WriteNow both have powerful instruction sets (WriteNow is virtually identical to Word in this regard), but both programs lose points in ease of use because they require that you manually type all merge codes and delimiters.

WordPerfect requires its own specially formatted codes, even in the data files. Thus, unlike the other programs, it cannot directly use tab-delimited text imported from a database. It also has no conditional commands, a surprising oversight for a high-end application.

Nisus, Word, and WordPerfect all have a cataloging feature that facilitates locating files, including an ability to search the text within a document without having to open it. Overall, Word's cataloging feature is by far the most convenient to use.

The Bottom Line

If your use of a word processor spans several of these categories, the best all-around choice has to be Microsoft Word. In many areas, such as creating tables, outlines, and merges, it clearly outdistances the competition. And in those areas in which Word isn't at the top, it is almost always near it.

That isn't to say that using Word is a constant joy — far from it. Despite version 5.0's new ease-of-use features, Word is still in need of an interface overhaul. Particularly frustrating are its dependence on multiple views and its handling of frame placement. Furthermore, Word's anemic graphics editor isn't worth bothering with. And just by looking at its densely packed 830-page users' guide, you can tell that this is not the easiest program to learn to use.

Among the other high-end applications, WordPerfect is the preferred choice if page-layout functions are high on your priority list. Nisus, with unique features such as multiple Clipboards and PowerSearch, offers much to admire, but it has too many weak areas and too steep a learning curve for us to be able to justify giving it any overall recommendation.

If you don't need a high-level application, we recommend MacWrite II, largely because of its unsurpassed ease of use. However, if you frequently work with graphics, go with Taste. Both packages handle short to medium documents capably and have a strong set of merge features. Consider WriteNow only if you expect to make heavy use of style sheets.

But before you purchase a midlevel word processor, take a look at integrated packages such as ClarisWorks and GreatWorks (see "Swiss-Army Software," June '92, Buyer's Guide page 44). If its word-processing module meets your needs, an integrated package can be a great bargain.

Eventually, you may really need two word processors. Word 5.0 may be fine on a desktop machine, but it's too big and disk-intensive for a PowerBook, where WriteNow's compactness wins. So your ultimate decision may be to choose the best pair of programs.

Ted Landau is a MacUser contributing editor and a professor of psychology at Oakland University, in Rochester, Michigan. He is currently working on a book on Macintosh problem solving.

<table>
<thead>
<tr>
<th>Table 3: Word Processors, continued</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Word 5.0</td>
</tr>
<tr>
<td>List price</td>
</tr>
<tr>
<td>Cons</td>
</tr>
<tr>
<td>Poor frame-placement functions.</td>
</tr>
<tr>
<td>Weak graphics editor. Too many</td>
</tr>
<tr>
<td>views.</td>
</tr>
<tr>
<td>Company</td>
</tr>
<tr>
<td>Microsoft Corp.</td>
</tr>
<tr>
<td>One Microsoft Way</td>
</tr>
<tr>
<td>Redmond, WA 98052</td>
</tr>
<tr>
<td>206-882-8080</td>
</tr>
<tr>
<td>WordPerfect 2.1</td>
</tr>
<tr>
<td>List price</td>
</tr>
<tr>
<td>Pros</td>
</tr>
<tr>
<td>Superior outlining. Superior</td>
</tr>
<tr>
<td>tables and merge functions.</td>
</tr>
<tr>
<td>Excellent style sheets. Excellent</td>
</tr>
<tr>
<td>section divisions.</td>
</tr>
<tr>
<td>Cons</td>
</tr>
<tr>
<td>Awkward style sheets. Inconvenient</td>
</tr>
<tr>
<td>mail-merge operations. No glossary.</td>
</tr>
<tr>
<td>Company</td>
</tr>
<tr>
<td>WordPerfect Corp.</td>
</tr>
<tr>
<td>1555 N. Technology Way</td>
</tr>
<tr>
<td>Orem, UT 84057</td>
</tr>
<tr>
<td>801-222-5800</td>
</tr>
<tr>
<td>WriteNow 3.0</td>
</tr>
<tr>
<td>List price</td>
</tr>
<tr>
<td>Cons</td>
</tr>
<tr>
<td>Weak graphics and page-layout</td>
</tr>
<tr>
<td>functions. No searching attributes.</td>
</tr>
<tr>
<td>No endnotes.</td>
</tr>
<tr>
<td>Company</td>
</tr>
<tr>
<td>T/Maker Co.</td>
</tr>
<tr>
<td>1390 Villa St.</td>
</tr>
<tr>
<td>Mountain View, CA 94041</td>
</tr>
<tr>
<td>415-962-0195</td>
</tr>
<tr>
<td>415-962-0201 (fax)</td>
</tr>
</tbody>
</table>

110 September 1992 MacUser
Where is it written that a great word processor has to be an expensive word processor? MacWrite II, in fact, has just rewritten that story. Now it costs only $129.

A remarkable price for the word processor favored by over one million users worldwide. Everyone agrees that MacWrite II is as simple and straightforward as a well-written sentence. With a rich feature set that's equally accessible. So it's the only word processor you'll ever need.

What are you waiting for? Call 1-800-3CLARIS for the name of your local dealer. And see for yourself why MacWrite II is the essential Macintosh word processor.
It'll remind you of a Macintosh

One look at this Lotus® spreadsheet, and it will all come back to you. All those feelings of power and control that surfaced when you first sat down in front of a Mac®.

You see, this isn't just another version of Lotus 1-2-3®. It's a spreadsheet that really grabs hold of the full computing power of Macintosh®. So everything you've come to love about Mac computing is now available in 1-2-3.

Take our graphing tools. They're as easy to use as the Mac itself. With just a point and a click of your mouse, you can preview, create and change all graphs. And the icon palette offers you every type of graph imaginable—3D pie charts, bar charts, area and scatter graphs—literally hundreds of variations are available to you in an array of colors.

You probably first bought your Macintosh because it would make life easier for you. You'll buy this spreadsheet for the same reason. You see, 1-2-3 for Macintosh is the only Mac spreadsheet to provide true 3D technology. So, in addition to file linking, you can use 3D to consolidate data or create multi-page reports all in a single worksheet file.
You can view and work with up to 256 worksheets simultaneously. In short, 3D makes the job of analyzing and consolidating a snap. And after using it, you'll wonder how you got along so long without it.

1-2-3 for Macintosh also offers in-cell editing, a feature that lets you edit text, formulas and data directly in the cell. So you can focus on the worksheet, instead of the formula bar above. Makes sense, doesn't it?

Because the program captures the true spirit of Macintosh, it has recently earned the Editor's Choice Award from Computer Reseller News as well as praise from Apple Chairman and CEO John Sculley, who has called it, "a spectacular product." (He doesn't throw comments like that around every day.)

So pick up a copy of 1-2-3 for Macintosh from your favorite dealer. Or call 1-800-TRADEUP, ext. 6683 for a free working model. (Excel users, be sure to ask about our special upgrade price.)

1-2-3 for Macintosh. It'll bring back fond memories.

Lotus 1-2-3 for Macintosh

Come see us at MacWorld, Boston, Booth #5626.
The Third Dimension

Four hundred years later, it's time to go beyond perspective:
3-D graphics on the desktop are here.

BY DAVID BIEDNY

Ever since the 16th century, when painters started using perspective, graphic artists have struggled to cram our three-dimensional world into a flat, two-dimensional space — whether that space was a canvas or a color monitor. Artists have always longed for a way to stick their hands into their work to create and manipulate a realistic, three-dimensional world, but until recently that capability has been beyond their grasp. The arrival of 3-D graphics applications, however, has finally given them the tools they need.

The 3-D products reviewed here are primarily visualization tools intended for illustration and animation, not the numerical accuracy that's required in CAD software, for instance. (CAD software offers the precision needed for manufacturing, but in contrast to 3-D graphics applications, CAD packages tend to have more-limited rendering and animation capabilities.)

The 3-D-Program Market

The interest in Mac 3-D visualization software is much more intense than you might imagine — at least judging by the plethora of 3-D programs available. We've divided the potential market into beginning, intermediate, and advanced users (see Table 1).

You need at least a Macintosh II-class machine to do any serious 3-D modeling and rendering. Generally, Quadras are the machines of choice, because you want the fastest machine you can get.
3-D Programs

Going to Work

Typical 3-D creative sessions can be broken down into three separate stages:

• Modeling: creating the basic shapes, or skeletons, of 3-D objects.
• Rendering: specifying surface attributes and textures, lighting, and camera attributes.
• Animation: adding motion to objects and lights in order to create a sequence of moving images.

Not all programs offer a full set of modeling, rendering, and animation features, and price point does not really play a role in the equation. Table 2 outlines the various programs' capabilities.

Modeling: Making the World

All the programs that include modeling enable you to create basic primitive shapes (cubes, spheres, and cylinders) and use basic tools such as extrusion and lathing tools to modify the shapes, but a variety of modeling features differentiates one modeler from another:

• Spline-based tools: the ability to use spline curves to create smooth, flowing geometries. Spline-based modeling dramatically extends the ability to create organic-looking shapes, at the cost of increased redrawing and rendering time. Alias Sketch!, MacTOPAS, Presenter Professional, and Ray Dream Designer all offer spline-based tools. NURBS (nonuniform rational B-splines) is an advanced derivative of spline-based modeling that gives you exquisite control over shape characteristics. Alias Sketch! currently is the only program with true NURBS.

• Vertex editing: the ability to grab individual control points, or vertices, and reposition them, giving users fine-detail control over their models. Alias Sketch!, MacTOPAS, Presenter Professional, Ray Dream Designer, Sculpt 3D and 4D, and Super3D all offer vertex editing.

• Lofting: the ability to stretch a “skin” over shapes that are in effect cross-sectional ribs. Think of a boat hull: It has cross-sectional ribs along the length of the hull, with fiberglass or aluminum sheets laid across the ribs to form the main hull wall. Alias Sketch!, MacTOPAS,Presenter Professional, Ray Dream Designer, Sculpt 3D and 4D, StrataVision 3d, and Swivel 3D Professional/SwivelMan all offer a form of lofting.

Another important consideration for Mac artists is 3-D type. Typically, you need ATM and/or TrueType in order to create extruded 3-D type. Most of the programs offer extruded fonts, but you should consider the following issues:

• Infini-D and MacroMind Three-D can extrude only TrueType fonts, which is a hassle for artists with large libraries of PostScript fonts. Although several commercial utilities let you convert PostScript to TrueType, it would be easier if these programs simply supported ATM.

• Presenter Professional, Ray Dream Designer, Showplace, and StrataVision 3d all give you some way of beveling the edges of extruded text. Mr. Font, a separate application in the ElectricImage package, is unique in that it automatically creates the bevels as a separate object, letting you easily specify different texture and surface attributes for the bevels (extruded type with a shiny beveled edge and matte-finished front and back faces is a common television effect).

The final things to take into consideration are input and output formats. Every program (except for Showplace, which uses RIB [RenderMan Interface Bytestream] as its native format) has a custom file format for its models and...
Solid Textures

Figure 2: Like Infini-D, Ray Dream Designer is an all-in-one package that's well suited for beginners. It includes a great selection of fully editable built-in procedural textures. Because these are procedural textures and not surface maps, you can apply them all the way "through" an object.

scenes, but many programs import and export DXF as well. However, DXF often presents interapplication compatibility problems and inconsistencies that make it somewhat flawed as a universal standard. We found the Transporter utility, which ships with ElectricImage, to be the most powerful file-format converter available for the Mac.

Rendering: Making It Real

The rendering process is the most computationally intensive part of 3-D work and one of the most important, because it delivers the final product. Most of the packages we reviewed offer the following types of rendering: wireframe, hidden-surface, Z-Buffer (most basic shaded view), Gouraud (basic smoothing and shading), and Phong (shadows, environmental reflections, basic transparency, and textures).

Another type of rendering called ray tracing simulates light bouncing around a room, complete with interobject reflections; refractivity; and better shadows, transparency, and lighting effects. Alias Sketch!, Infini-D, Presenter Professional, Ray Dream Designer, Sculpt 3D and 4D, Showplace/MacRenderMan, and StrataVision 3d all offer ray tracing.

StrataVision 3d provides a unique rendering mode, Raydiosity, which is similar to Radiosity, a technique developed at Cornell University that takes into account the conservation of light energy in a scene. With either scheme, colors "bleed" from objects onto other objects, resulting in an uncanny and seductive realism. The Cornell technique and StrataVision’s Raydiosity are both ravenous CPU vampires, so even simple scenes can take weeks to render on the fastest Macs.

One of the more important but often forgotten features to look for in 3-D software is the ability to generate an alpha channel, a mask that isolates the foreground objects from the background. You use the mask to combine, or composite, multiple rendered 3-D objects into a single scene. With this technique, you can simulate shadows and reflections without greatly increasing the rendering time. Alpha channels are also crucial for cleanly integrating 3-D computer animation with live-action surroundings. ElectricImage, MacroMind Three-D, MacTOPAS, Presenter Professional, Ray Dream Designer, and Showplace can all generate alpha channels.

Animation: Making It Move

Although people tend to envision flying logos when thinking about animation, you actually have animation even if only part of an image changes over time. The easiest way to create an animation is to set "keyframes" and use software to create the in-between frames (tweening) that fill in the action between keyframes.

Although all the programs that support animation let

Table 1: The 3-D-Program Market

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Products</th>
<th>Tables Price Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desktop publishing, General graphics, Presentations.</td>
<td>Infini-D Ray Dream Designer Showplace/MacRenderMan StrataVision 3d</td>
<td>up to $1,000</td>
</tr>
<tr>
<td>Advanced presentations.</td>
<td>Alias Sketch! MacroMind Three-D Presenter Professional</td>
<td>$1,000 to $2,500</td>
</tr>
<tr>
<td>Industrial design. Package design.</td>
<td>ElectricImage Animation System MacTOPAS Presenter Professional Sculpt 3D Sculpt 4D</td>
<td>$2,500 and up</td>
</tr>
<tr>
<td>Advanced industrial engineering. Broadcast animation. Engineering.</td>
<td>Showplace/MacRenderMan StrataVision 3d</td>
<td>$1,000 to $2,500</td>
</tr>
</tbody>
</table>
you move objects around on the screen, this is only the beginning of creating an animation. The most desirable scenario is one in which you can modify any parameter of any element over time. For example, you might want to have a stationary object with an animated light source. MacroMind Three-D has the best animation interface, an extension of the VideoWorks/Director Score metaphor.

Another form of animation is “morphing,” which lets you change the basic geometry of an image, or 3-D model, over time — metamorphosing a car into a dolphin, for example. Typically, if you want to morph one model into another, the beginning and-ending objects must have exactly the same number of vertex points. Only one Mac program, Infini-D, supports true morphing, which lets you morph between two totally different objects. Morph animation can be somewhat unpredictable, however.

**Beginning Users: General Graphics**

Users getting started in 3-D often find themselves involved in general desktop-publishing tasks and perhaps multimedia. For them, the all-in-one packages are ideal.

**Infini-D.** Infini-D offers the most balanced set of features for beginning and intermediate users. The general interface, with some minor exceptions, is a study in clarity and interactivity. The object floater displays the current status of any selected object, including position and scaling and size data. As you change an object’s attributes with the interactive tools, the object floater instantly updates and displays the new object statistics. But although the modeling portion of the program includes some neat goodies, such as the Terrain Tool, Infini-D’s lack of spline and lofting tools may frustrate advanced artists. Infini-D comes with an excellent selection of procedural textures, however, along with an enormous preprogrammed texture library. Unlike surface maps, procedural textures

Figure 3: StrataVision 3d’s rendering quality is excellent, but StrataVision is the slowest renderer of any of the packages we tested. A typical StrataVision working session is shown here. Note that the spotlights are displayed in the actual color assigned to each light, which produces the colored shadows in the rendered window at the right.

![MacUser](image)

### Table 2: Features of 3-D Programs

<table>
<thead>
<tr>
<th></th>
<th>Alias Sketch!</th>
<th>ElectricImage Animation System</th>
<th>Infini-D</th>
<th>MacroMind Three-D</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ease of use</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Documentation</td>
<td>++</td>
<td>•</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Price/performance</td>
<td>++</td>
<td>•</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td><strong>Modeling</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential object complexity</td>
<td>•••</td>
<td>NA</td>
<td>•</td>
<td>NA</td>
</tr>
<tr>
<td>File-format import/export</td>
<td>•</td>
<td>•••</td>
<td>•</td>
<td>•••</td>
</tr>
<tr>
<td>Font extrusion and beveling</td>
<td>NA</td>
<td>•••</td>
<td>•*</td>
<td>•*</td>
</tr>
<tr>
<td>Vertex editing</td>
<td>•••</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Rendering</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effects-maps positioning and options</td>
<td>•</td>
<td>•••</td>
<td>•••</td>
<td>•••</td>
</tr>
<tr>
<td>Rendering speed</td>
<td>•</td>
<td>•••</td>
<td>••</td>
<td>•••</td>
</tr>
<tr>
<td>Rendering quality</td>
<td>••</td>
<td>•••</td>
<td>•••</td>
<td>•••</td>
</tr>
<tr>
<td>Rendering-acceleration options</td>
<td>NA</td>
<td>•••</td>
<td>•••</td>
<td>•••</td>
</tr>
<tr>
<td><strong>Animation</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morphing</td>
<td>NA</td>
<td>•</td>
<td>•••</td>
<td>•••</td>
</tr>
<tr>
<td>Keyframe control</td>
<td>NA</td>
<td>•••</td>
<td>•</td>
<td>•••</td>
</tr>
<tr>
<td>QuickTime support</td>
<td>NA</td>
<td>NA</td>
<td>•••</td>
<td>NA</td>
</tr>
</tbody>
</table>

*TrueType only.
are actual descriptions of a surface, so, for example, a wood procedural texture lets you punch a hole through a "wooden" object and have the grain inside the hole match that on the outside faces. Textures can be animated, and the Surface Composition dialog box (see Figure 1) lets you layer and combine static and procedural texture maps in just about any way. You can scale, rotate, and reposition any texture, and you can view a sample of the textures mapped onto a selected object.

Infini-D's animation interface is better than Strata-Vision's but not nearly as good as the one in MacroMind Three-D. Infini-D is unique in its ability to morph between two entirely different objects with different numbers of vertex points as well as between two textures (the texture morph is really more of a cross-fade between the beginning and ending textures). A minor but frustrating problem is the program's swapping of the z and y axes: Instead of representing depth, the labeled z axis represents width, a convention not found in any other 3-D program. Also, the rendering speed and rendering quality of objects (especially straight edges) and texture maps leave something to be desired. Although you can choose to render a rectangular selection of any image in order to see the effects of your settings without rendering the entire image, this feature works only with the ray-tracing mode instead of with all rendering modes.

Ray Dream Designer. Ray Dream Designer is a relatively powerful renderer — it's one of the faster ray tracers, offers great rendering quality, and has wonderful procedural textures (see Figure 2). Ray Dream is especially attractive to print designers, because of its ability to render at very high resolutions. The program's modeling abilities include a lofting-extrusion mode and text extrusion along variable paths. There's also a fast, shaded-preview window, which is extremely useful for viewing

![Figure 4: SwivelMan combines Swivel 3D Professional with MacRenderMan so users can take advantage of that program's high-quality rendering functions. The dialog box on the right contains the controls for manipulating the selected texture (which in this case belongs to the left figure's body). The reflective-metal effect is produced by an environment map.](image-url)
the results of a complex modeling task without fully rendering the object. Ray Dream offers wonderful soft shadows in its ray-tracing rendering mode. The program’s modeler, LightForge, offers a great set of fully modular built-in textures plus a “wire texture” shader that combines transparency with a variable horizontal and vertical grid. Although Ray Dream’s modeling features will satisfy most beginning-to-intermediate users, the fact that LightForge and SceneBuilder, the program’s scene-composition tool, are separate programs is more of a nuisance than a benefit. Users may also find the SceneBuilder interface confusing. Animators will want to look to Infini-D, but print artists should consider Ray Dream Designer.

**Showplace/MacRenderMan.** A front end for MacRenderMan, Showplace assumes that you are already using an external modeler with the ability to save models in RIB format. Showplace requires MacRenderMan, so unless you already own MacRenderMan or SwivelMan, you’ll want the bundle (see the “SwivelMan and Showplace/MacRenderMan” review, August ’92, page 58). Showplace is a composition and lighting environment with a highly graphical interface — novices will feel comfortable with it in no time. The program has no modeling or animation tools, and although you would expect a Pixar program to offer a good interface to the complex world of RenderMan shaders, it offers only limited access to shader parameters. The Showplace/MacRenderMan bundle might be more attractive if it were less expensive.

![Figure 5: Alias Sketch! may interest those who model curvy objects, but its sluggish performance and unusual interface may offset its spline-based-modeling capabilities. Using a scanned image as a perspective reference, you can reshape the perspective grid (the large yellow grid beneath the object), so the model matches the background more closely.](image)

**StrataVision 3d.** Although StrataVision 3d offers some of the best rendering quality of all the packages we reviewed, it’s unfortunately one of the slowest renderers we tested.

StrataVision offers exquisite, precise control over all surface attributes (see Figure 3) and also uses any 2-D
Introducing Motorola's New Macintosh Server.

Motorola's really done it this time. We've put an immensely powerful, RISC-based, Apple-Share-compliant server in an enclosure so compact, it fits on the desktop. Or anywhere else you care to put it.

We call it the 8120 server, and it offers up to 64MB of memory, 38 MIPS of performance, and 5GB of storage to your Macintosh workgroups.

Incredible Shrinking Price,
Starting Under $5,000.*

Only Motorola has the know-how to make a server so small and powerful, so affordable. Using fewer parts and more efficient manufacturing processes, Motorola saves money every step of the way. A savings passed right on to you.

More Users, Less Real Estate.
Your Macintosh workgroup may grow in complexity, but your server won't. Thanks to a modular, user-installable design, adding users and capacity is as easy as stacking boxes.

Big On Reliability.
Naturally, fewer parts means fewer problems. But when necessary, field service is simply a matter of swapping modules.

Now that's the kind of quality and support you expect from Motorola.

And the new 8120 is just part of our extensive family of high performance, RISC-based network servers.

To put one on your network right now, call Motorola today. Soon your Macintosh workgroup will see the advantages of being small minded.

1-800-759-1107 Ext. MU

Honey, I Shrunk The Server.

©1992 Motorola Inc. Motorola and the Motorola logo are registered trademarks of Motorola Inc.
All other brand or product names mentioned are trademarks or registered trademarks of their respective holders.
*Excluding disk and tape options.
3-D Programs

Figure 6: With its speed and extensive file-import capabilities, ElectricImage Animation System should be the primary choice for professional 3-D animators. Mr. Font, an included application, lets you create a look that should be familiar to TV viewers. (This image, showing shadow casting, was created with a prerelease version of ElectricImage 1.5.)

texture both as an alpha channel for diffusion, transparencies, specularities, and as the more standard bump and color maps. Adding a texture to a diffusion map lets you create subtle embossing effects. StrataVision also lets you attach alphas to light sources, which makes it effortless to simulate light streaming through a pane window.

The program has a fairly robust tool set, and many of the included modeling tools are stored as external modules, making future expansion a snap. StrataVision is also the only program in our group that includes a Radiosity-based rendering mode. Unfortunately, that mode is so sluggish that it's virtually unusable. Given the program's generally slow rendering speed, you probably won't want to use StrataVision as your main animation generator. For still images, though, StrataVision's general rendering quality is hard to beat.

Super3D. Super3D is a good basic modeler that in many ways feels like a 3-D MacDraw. The program adheres well to the standard Macintosh interface, and CAD/2-D artists will find the transition to 3-D relatively painless. Unfortunately, Super3D lacks advanced modeling tools and quality rendering modes, which limits its overall value.

The big question is whether Aldus will update Super3D in the future. The last update, version 2.5, added MacRenderMan support, with few other improvements, and Aldus seems uninterested in taking the program any further. The modeling and rendering abilities of the program have been surpassed by other packages, and although some novices might want to look at Super3D, we think that most who are just entering the 3-D world would be well advised to look at Infini-D as a starting point.

Swivel 3D Professional. Swivel 3D Professional is the workhorse of Macintosh modelers. It sports a workable interface and straightforward modeling tools (see Figure 4). The hierarchical object-linking abilities can be constrained in a variety of ways, so Swivel3D is a good choice for building characters and complex moving models. The program's built-in smooth rendering is lightning-fast and, in many cases, good enough for final images.

Although Swivel 3D also offers basic keyframe animation, you'll want a separate animation and rendering program for professional-quality work. SwivelMan bundles the Swivel 3D Professional and MacRenderMan programs together, but unless you plan to render images with MacRenderMan, there is no reason to choose SwivelMan over Swivel 3D Professional. If you're considering SwivelMan because MacRenderMan is your main renderer, you'll be better served if you spend the extra money on Presenter Professional, which offers much better control of, and compatibility with, MacRenderMan.

Intermediate Users: Multimedia

Although animation isn't the primary goal for intermediate users, it is a part of their work — often within the context of an authoring system such as HyperCard or Director. Package designers, architects, and graphic designers also fall into this group.

Alias Sketch! Alias Sketch! is likely to interest those who want to model smooth, curvy organic images beyond the realm of most of the other modelers reviewed here. The modeling interface is a bit unusual and has an unavoidably steep learning curve. Although the program's main strengths are its NURBS modeling abilities, it does offer decent rendering quality. You can import a scanned background image and interactively match the perspective of a model with the background perspective, an incredibly useful feature that's unique to this program (see Figure 5).

Alas, there are some problems worth noting: The program is sluggish on even the fastest Macs, and it's very difficult to accurately position 2-D texture maps. Although NURBS can be a very powerful modeling method for creating complex objects, it probably won't serve well as the primary modeling paradigm for most users. Alias Sketch! 1.0.2 has fewer bugs than version 1.0, but it isn't totally bug-free. Still, Alias Sketch! might interest those who want an advanced NURBS modeler.

MacroMind Three-D. MacroMind Three-D has the most-powerful animation controls of the programs discussed here. Every detail of every element of a scene can be interpolated over time. The Score interface will be familiar to Director users and is well worth its reasonable learning curve. Although the built-in-rendering quality isn't superb, MacroMind Three-D can use MacRenderMan as a rendering engine (MacroMind Three-D is the only program that offers plug-in rendering engines, but unfortunately, Macromedia hasn't released any alternative, more powerful rendering engines).
WHY ALL OTHER OCR SOFTWARE IS NOW OBSOLETE!

INTRODUCING TypeReader™ FOR MACINTOSH™

We'll save you the time of checking out the comparison charts. There simply is no better OCR software program for the Mac.

It's TypeReader from ExperVision™. The first OCR (optical character recognition) software that can read any page of type. And any type of page.

Because TypeReader utilizes a revolutionary new OCR technology, Macintosh users will be able to read documents more accurately and automatically than ever before. Not just the crisp and clear documents, but the real documents that cross your desk every day. Even the hard to read faxes. You'll save both time and money by no longer having to re-type your existing documents.

Because we Macintosh users expect and demand graphics that give us what we see on screen, TypeReader has a WYSIWYG editor which preserves all the formatting of your original document, including margins, tabs, columns, and tables. And, proofing is made simple with TypeReader's exclusive On-Screen Verifier which allows you to view suspect characters from the original document.

No other OCR software product can make these claims.

TypeReader goes even further. By integrating Hewlett-Packard's AccuPage technology, complex colored or stained documents can also be recognized accurately.

And, TypeReader is completely System 7 and 6 savvy.

You might think that all of this was enough to motivate anyone to buy the new TypeReader. But wait, there's more!

RECOGNIZING A GREAT DEAL!

If you've been using the current outmoded OCR products, we don't need to tell you how frustrating your experiences have been. That's why, for a limited time, owners of other OCR software products can purchase TypeReader for only $149! If you're not currently using OCR software, we've got great news for you too. Go to your local dealer and get the best price you can for TypeReader (suggested retail is $695). You'll get a $100 rebate immediately! That's right, $100 off your purchase price!!!

To see TypeReader in action, contact CompUSA, Egghead, Computer City, MacConnection, MacWarehouse, or your local dealer. For the dealer nearest you or technical information, call 1-800-READ-TYPE (1-800-732-3897). Or order TypeReader now, call 1-800-562-8882

CIRCLE 180 ON READER SERVICE CARD.

Also available for Windows™

Theirs, with competitive OCR software programs, documents break up — leaving you with the burdensome and time-consuming task of reformattting.

OURS. With the push of a button, TypeReader accurately recognizes all your documents — retaining tables, columns, font styles and sizes.

Many OCR TECHNOLOGY THROUGH THE YEARs

OVR TECHNOLOGY THROUGH THE YEARS

OCR technology improves dramatically as ExperVision introduces TypeReader.

Each program, in its day, improved recognition or created a new helpful, accurate reading technology. Only TypeReader has one:

TypeReader is a quicker, better OCR with superb formatting.

Not only are you reading documents accurately and automatically, but you are also improving your data entry, since you don't have to type in the documents. No other OCR software product can make these claims.

Because we Macintosh users expect and demand graphics that give us what we see on screen, TypeReader has a WYSIWYG editor which preserves all the formatting of your original document, including margins, tabs, columns, and tables. And, proofing is made simple with TypeReader's exclusive On-Screen Verifier which allows you to view suspect characters from the original document.

No other OCR software product can make these claims.

TypeReader goes even further. By integrating Hewlett-Packard's AccuPage technology, complex colored or stained documents can also be recognized accurately.

And, TypeReader is completely System 7 and 6 savvy.

You might think that all of this was enough to motivate anyone to buy the new TypeReader. But wait, there's more!

RECOGNIZING A GREAT DEAL!

If you've been using the current outmoded OCR products, we don't need to tell you how frustrating your experiences have been. That's why, for a limited time, owners of other OCR software products can purchase TypeReader for only $149! If you're not currently using OCR software, we've got great news for you too. Go to your local dealer and get the best price you can for TypeReader (suggested retail is $695). You'll get a $100 rebate immediately! That's right, $100 off your purchase price!

To see TypeReader in action, contact CompUSA, Egghead, Computer City, MacConnection, MacWarehouse, or your local dealer. For the dealer nearest you or technical information, call 1-800-READ-TYPE (1-800-732-3897). Or order TypeReader now, call 1-800-562-8882

CIRCLE 180 ON READER SERVICE CARD.

1 What you scan is what you get. 11 Title page from WordScan, WordScan Plus, OmniPage, OmniPage Professional, OmniPage Direct, ReadRight, ReadIt, AccuText, Recognize, or Penware documentation required.

1 Offer expires 9/30/92. ExperVision, the ExperVision logo, TypeReader, "Any page of type. Any any type of page." and On-Screen Verifier are trademarks of ExperVision, Inc. AccuPage is a trademark of Hewlett-Packard.

All other names are trademarks of their respective holders. ©1992 ExperVision, Inc. All rights reserved. ExperVision, 3390 N. First Street, San Jose, CA 95134, (408) 428-9988.
3-D Programs

We did run into problems importing certain models (imported models sometimes mysteriously expanded to fill most of the visible “world”) and encountered various bugs and crashes during more complex rendering tasks. The included FireWorks application—a postprocessing engine for compositing multiple rendered, animated elements; applying limited filters; and dumping the animation to a VTR—was unpredictably problematic.

**Table 3: Pros and Cons of 3-D Programs**

<table>
<thead>
<tr>
<th>Alias Sketch!</th>
<th>Pros</th>
<th>Cons</th>
<th>Ideal Users</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Powerful NURBS modeling.</td>
<td>• Slow.</td>
<td>• Industrial designers.</td>
</tr>
<tr>
<td></td>
<td>• Matches perspective of scanned background.</td>
<td>• Weak texture map positioning.</td>
<td>• Intermediate to advanced users.</td>
</tr>
<tr>
<td>ElectricImage Animation System</td>
<td>• Excellent rendering quality.</td>
<td>• Relatively weak animation features.</td>
<td>• Animation-production studios.</td>
</tr>
<tr>
<td></td>
<td>• Fastest software-only rendering speed.</td>
<td>• Expensive.</td>
<td>• Intermediate to advanced animators.</td>
</tr>
<tr>
<td></td>
<td>• Best font beveling.</td>
<td>• Very weak documentation.</td>
<td>• Intermediate to advanced users.</td>
</tr>
<tr>
<td></td>
<td>• Excellent texture-mapping options.</td>
<td>• No shadows.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supports alpha channels.</td>
<td>• Hardware-key protection.</td>
<td></td>
</tr>
<tr>
<td>Infini-D</td>
<td>• Intuitive and powerful surface/texture composer.</td>
<td>• Mediocre rendering performance.</td>
<td>• General 3-D-graphics artists.</td>
</tr>
<tr>
<td></td>
<td>• Large selection of procedural textures.</td>
<td>• Mediocre rendering quality.</td>
<td>• Beginning to advanced animators.</td>
</tr>
<tr>
<td></td>
<td>• Nonuniform polymorphic interpolation of models (morphing).</td>
<td>• No true spline-based modeling tools.</td>
<td>• Beginning to advanced users.</td>
</tr>
<tr>
<td></td>
<td>• Excellent interface.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Availability of network rendering.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MacroMind Three-D</td>
<td>• Excellent animation interface.</td>
<td>• Sporadic performance problems.</td>
<td>• General 3-D-graphics artists.</td>
</tr>
<tr>
<td></td>
<td>• Supports alpha channels.</td>
<td>• Sporadic problems importing models.</td>
<td>• Beginning to advanced animators.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Buggy compositing program.</td>
<td>• Beginning to advanced users.</td>
</tr>
<tr>
<td>MacTOPAS</td>
<td>• Excellent modeling tools.</td>
<td>• Expensive.</td>
<td>• Industrial designers.</td>
</tr>
<tr>
<td></td>
<td>• Very good rendering quality.</td>
<td>• Weak animation.</td>
<td>• Intermediate animators.</td>
</tr>
<tr>
<td></td>
<td>• True reflections in Phong mode.</td>
<td>• Hardware-key protection.</td>
<td>• Intermediate to advanced users.</td>
</tr>
<tr>
<td></td>
<td>• Supports alpha channels.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presenter Professional</td>
<td>• Excellent modeling tools.</td>
<td>• Hardware-key protection.</td>
<td>• Engineers.</td>
</tr>
<tr>
<td></td>
<td>• Spline-based modeling.</td>
<td></td>
<td>• Industrial designers.</td>
</tr>
<tr>
<td></td>
<td>• Excellent MacRenderMan support.</td>
<td></td>
<td>• Intermediate animators.</td>
</tr>
<tr>
<td></td>
<td>• Very good rendering quality.</td>
<td></td>
<td>• Intermediate to advanced users.</td>
</tr>
<tr>
<td></td>
<td>• Availability of hardware acceleration.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Supports alpha channels.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Presenter Professional.** For its price level, Presenter Professional is in a class of its own. It offers a balanced set of modeling tools, decent animation capabilities, and good rendering quality. The interface has a definite learning curve (well worth the effort to master) but is not nearly as complicated as Sculpt’s modeling interface. Presenter’s Digital Clay feature makes it easy to create nonuniform geometries: When you select a vertex point and pull on it,
Kodak's 1889 Innovation.

Kodak #1 Camera:
Brought photography to the masses by providing easy access to silver based imaging technology.


KODAK Professional RFS-2035 Film Scanner:
Using Kodak's area-array sensor technology brings high quality images to your Macintosh, IBM or PC-compatible computer from any 35mm material.

KODAK Professional DCS-200 Digital Camera:
Brings digital images directly into your Macintosh, IBM or PC-compatible computer with image resolutions at 4 times higher than analog systems.

KODAK XLT-7720 Digital Continuous Tone Printer:
Sets the standard for thermal dye sublimation printing technology with improved speed, larger print area, and connectivity.

For over 100 years Eastman Kodak has been the leader in photographic innovation. At Ken Hansen Photographic we are proud to announce Kodak's latest breakthroughs. As the country's leading supplier of electronic imaging equipment, we can help you design and implement complete electronic photography systems. Visit our New York showroom, or better yet, send for our complete information kit and sample images* and see electronic photography - Kodak style.

KEN HANSEN PHOTOGRAPHIC.
920 Broadway, New York, NY. 10010
Telephone: (212) 673-7536, Fax: (212) 473-0690
Applelink: KENHANSENIMG

* $10.00 postage and handling fee may be in the form of cash, check, or credit card, refundable upon purchase.

Name: ___________________________ City: __________ State: __________ Zip: __________
Credit Card #: ___________________ Exp Date: __________

© Authorized Value Added Reseller

KODAK is a trademark of the Eastman Kodak Company.

Circle 123 on reader service card.
the program automatically warps and stretches connected surfaces. Although the modeler doesn’t offer the NURBS power of Alias Sketch!, Presenter Professional is noticeably faster than Sketch! and its tools will satisfy even discerning advanced users.

Presenter Professional has some capabilities that are more closely related to the traditional CAD world. For example, the program can calculate an object’s volume and surface area, which should make it especially attractive to package designers.

Presenter Pro offers the best interface to the MacRenderMan language of any of the packages reviewed here. It provides access to all of a shader’s attributes and parameters and produces the most-stable RIB output. This program is a solid performer for intermediate and advanced users.

### Table 3: Pros and Cons of 3-D Programs, continued

<table>
<thead>
<tr>
<th>Program</th>
<th>Pros</th>
<th>Cons</th>
<th>Ideal Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ray Dream Designer</td>
<td>• Excellent rendering quality. • Excellent rendering speed. • Availability of network rendering. • Supports alpha channels.</td>
<td>• Weak interface. • Modeler and scene creator are separate applications.</td>
<td>• General 3-D-graphics artists. • Print artists. • Beginning to advanced users.</td>
</tr>
<tr>
<td>Sculpt 3D and 4D</td>
<td>• Spline-based modeling tools. • Absolute-vertex and polygonal-face control. • Excellent rendering quality. • Availability of hardware acceleration.</td>
<td>• Difficult interface. • Weak documentation. • Hardware-key protection.</td>
<td>• Industrial designers. • Engineers. • Advanced users.</td>
</tr>
<tr>
<td>Showplace/MacRenderMan</td>
<td>• Excellent rendering quality. • Highly graphical interface. • Supports alpha channels. • Availability of hardware acceleration. • Availability of network rendering. • Availability of UNIX rendering.</td>
<td>• Requires RIB-geometry files. • Separate application for texture-map and extruded-font generation. • Weak MacRenderMan shader-parameter interface.</td>
<td>• General 3-D-graphics artists. • Print artists. • Beginning to intermediate users.</td>
</tr>
<tr>
<td>StratoVision 3d</td>
<td>• Modular plug-in modeling tools. • Advanced texture controls. • Excellent rendering quality. • Availability of network rendering.</td>
<td>• Mediocre animation tools. • Slow rendering. • No true spline-based modeling tools.</td>
<td>• General 3-D-graphics artists. • Print designers. • Beginning to intermediate animators. • Beginning to advanced users.</td>
</tr>
<tr>
<td>Super3D</td>
<td>• Precise modeling tools. • Straightforward interface.</td>
<td>• Limited rendering support. • Limited animation capabilities. • Grim prospect for future updates.</td>
<td>• Engineers. • Beginning to advanced users.</td>
</tr>
<tr>
<td>Swivel 3D Professional/SwivelMan</td>
<td>• Powerful hierarchical linking of models. • Very fast Phong rendering mode.</td>
<td>• Relatively weak rendering quality. • Weak MacRenderMan interface. • Weak texture-map positioning/rendering quality. • No true spline-based modeling tools.</td>
<td>• General 3-D-graphics artists. • Engineers. • Beginning to advanced animators. • Beginning to advanced users.</td>
</tr>
</tbody>
</table>
Out of the blocks to number one in a scant six months. Few things this side of NASA have ever experienced this kind of blast-off.

Because nobody else has figured out how to combine word processing, graphics, spreadsheet, charting, database, and communications quite like ClarisWorks. No awkward modules, no hidden speed traps.

Simply, ClarisWorks has caught on so fast because it's so easy to catch on to. All the tools you need are always right there. And because it doesn't devour memory, ClarisWorks still leaves a PowerBook with room for volumes.

But don't just take our word for it. “ClarisWorks is now the yardstick against which other integrated software programs will be measured,” lauds MacWeek. “A standout...a breakthrough in price and capability,” raves MacUser.

Of course, the best way to see why ClarisWorks soars above the rest is to strap yourself in at your authorized Claris dealer. If you’re a Microsoft Works user, you’re cleared for a very special takeoff: a trade up offer of only $99. Just call us at 1-800-544-8554, ext. 36. Then get your hands on ClarisWorks. And blast through work.

©1992 Claris Corporation. All rights reserved. In Canada call 1-800-544-8554, ext. 48. Claris is a registered trademark. ClarisWorks and Simply powerful software are trademarks of Claris Corporation. All other product names are trademarks or registered trademarks of their respective owners. Offer expires 12/31/92.
Advanced Users: Production Pros

For advanced users, 3-D modeling and animation — with total control over the highest-quality rendering — are the key. These folks’ livelihoods depend on their 3-D packages, and they mix and match products as necessary.

**ElectricImage Animation System.** ElectricImage is the choice of most professional Macintosh 3-D animators. Its rendering speed and wide variety of file-format importation options make it both fast and flexible, two essential factors in a production environment.

Although ElectricImage does not offer ray tracing, its Phong rendering is the fastest of any of the packages. The program has the best texture mapping and texture controls, even though it lacks procedural textures. Textures can be applied to objects through an alpha channel, and alphas can also be used to restrict luminance, diffusion, and reflectivity attributes (for example, you can use an alpha channel to create irregular, shiny “embossed” areas on an otherwise dull matte surface). The biggest omission in version 1.05 is that it lacks shadows, but version 1.5 should include them (see the “Future Dimensions” sidebar).

The Transporter file-conversion utility is excellent and can convert just about any type of 3-D-geometry file, even high-end files created with programs such as WaveFront (a 3-D UNIX-based visualization package). The animation interface tends to be a love/hate affair, but the program offers better technical feedback during the rendering process than do any of the other packages. As noted earlier, Mr. Font, ElectricImage’s text-extruding program, is in a class by itself. If your work consists primarily of still and animated 3-D text logos, Mr. Font alone is worth the price of admission (see Figure 6).

ElectricImage comes with a CD-ROM full of textures, sample models and images, and a variety of animation files and utilities. The current version of the software suffers from a weak, disorganized manual and some strange model-importing quirks (particularly frustrating is the way ElectricImage resets the standard axis orientation of imported models, a real pain for advanced users who do a lot of tweaking). Regardless of these drawbacks and its high price, ElectricImage has clearly established itself as the industrial-rendering workhorse of the Mac 3-D universe.

**MacTOPAS.** MacTOPAS is among the most expensive of the all-inclusive packages. Although it has a balanced set of modeling, rendering, and animation tools, it’s overpriced in comparison with the potential competition. A good variety of basic and advanced modeling tools, very good rendering quality, and speed are the strong points of this package. The documentation is relatively weak, though, which is a problem, given the hidden power of the program’s tools. If MacTOPAS were priced to compete with Presenter Professional, it would be a much more reasonable contender for intermediate and advanced users.

**Sculpt 3D and 4D.** Sculpt 3D is probably the most capable modeler of the bunch — if you’re willing to spend substantial time tackling the dense, unintuitive modeling

---

**Table 4: 3-D Programs**

<table>
<thead>
<tr>
<th>Company</th>
<th>ElectricImage Animation System 1.05</th>
<th>Infini-D 1.1.2</th>
<th>MacroMind Three-D 1.01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alias Research</td>
<td>110 Richmond St. E. Toronto M5G 1P1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Canada</td>
<td>Electric Image, Inc. 117 E. Colorado Blvd., Ste. 300 Pasedena, CA 91105</td>
<td>Specular International 233 N. Pleasant St., Amherst, MA 01004</td>
</tr>
<tr>
<td></td>
<td></td>
<td>818-577-1627</td>
<td>413-540-7600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>818-577-2426 (fax)</td>
<td>413-540-1531 (fax)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>List price $7,495</td>
<td>$895</td>
<td>$1,495</td>
</tr>
<tr>
<td>MacTOPAS</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$7,495</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presenter</td>
<td>Professional 1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ray Dream</td>
<td>Designer 2.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sculpt 3D</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>List price $3,600</td>
<td>$895</td>
<td>$2,500</td>
</tr>
<tr>
<td>MacTOPAS</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$7,495</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>AT&amp;T GSL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3520 Commerce Crossing Ste. 300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indianapolis, IN 46240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>317-644-4964</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>317-575-0649 (fax)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presenter</td>
<td>Professional 1.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ray Dream</td>
<td>Designer 2.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sculpt 3D</td>
<td>2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>List price $3,600</td>
<td>$895</td>
<td>$2,500</td>
</tr>
<tr>
<td>MacTOPAS</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$7,495</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>AT&amp;T GSL</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3520 Commerce Crossing Ste. 300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indianapolis, IN 46240</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>317-644-4964</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>317-575-0649 (fax)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MORE. OR LS.

GCC PERSONAL LASERPRINTER® II

- Exclusive edge-to-edge printing capability
- Flexible scaling: 25% to 400% in 1% increments
- Upgradeable for PostScript® and networking
- Shareable under System 7™ file-sharing capabilities
- Straight paper path for printing on heavy stock, envelopes or film
- Envelope printing software, Adobe Type Manager® and on-screen Page Preview included
- Economical toner recycling and silent 'sleep' mode
- High-speed SCSI interface; faster background printing
- Interactive front-panel LCD display
- 200-sheet paper tray

APPLE PERSONAL LASERWRITER® LS

Plus a one year trouble-free warranty and toll-free support. All for just $949. Now that you've seen how much more the GCC PLP™ II has to offer, why settle for LS? Call 800-422-7777, ext. 554, for the name of your nearest GCC dealer, or to order directly from GCC.
interface. The poorly written documentation doesn’t make the task any easier, although the three bundled videotapes are actually fairly useful. The learning curve is steep, but if you learn to think the way Sculpt does, you’ll be able to model just about anything, regardless of the complexity of the geometry. Sculpt’s general rendering quality is top-notch, as are its procedural textures.

The animation capabilities of Sculpt 4D are not really worth the extra $1,000. If you want the ultimate Mac 3-D animation setup (ease of use and price notwithstanding), Sculpt and ElectricImage are a potent team. A hard-core group of aficionados has mastered the Sculpt interface, and Byte-by-Byte recently unbundled the modeler portion of the program to sell for $1,495. With a reworked interface, this program could be the modeler to beat.

The Bottom Line
If you’re a novice who’s looking for the best combination of features and performance at a reasonable price, Infini-D and StrataVision 3d are the two main contenders. Infini-D is more useful for those who are primarily interested in powerful animation capabilities, whereas StrataVision 3d is a better package for high-quality still rendering. Users primarily concerned with rendering speed might consider Ray Dream Designer, which offers better ray-tracing performance than either Infini-D or StrataVision 3d, at the cost of a more complicated interface. Swivel 3D Professional is a good workhorse modeler, but you’ll probably want to wait for its future incarnation, MacroModel (see the “Future Dimensions” sidebar).

For intermediate users, Presenter Professional is a good modeler and renderer, with a balanced set of features and a reasonable price (compared with MacTOPAS’). MacRenderMan artists should consider Presenter Professional as the best front end to the power of MacRenderMan. Although Sculpt is the most powerful modeler of the bunch, it really needs some interface help. If you’re willing to spend the time tackling it, though, you’ll be able to model just about anything you can imagine.

We’d like to recommend MacroMind Three-D for animation, but before we do, Macromedia needs to spend some time making the product more robust. With better performance and some fine-tuning, Alias Sketch! could be a great NURBS modeler for intermediate users.

High-end users will probably end up turning to Electric-Image Animation System as their primary rendering and animation program, feeding it models from just about anything (thanks to the flexibility of its Transporter file converter). On the modeling side, Sculpt 3D and 4D, Alias Sketch!, and Presenter Professional all come to mind, even given the performance limitations of Sketch! and the interface quirks of Sculpt. MacTOPAS simply prices itself out of the running.

David Biedny, coauthor of The Official Adobe Photoshop Handbook, considers life to be a 3-D movie that doesn’t need special glasses.

Table 4: 3-D Programs, continued

<table>
<thead>
<tr>
<th>Sculpt 4D</th>
<th>Showplace/ MacRenderMan 1.1.1</th>
<th>StrataVision 3d</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$3,500</td>
<td>$995</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Super3D</th>
<th>SwivelMan</th>
<th>Swivel 3D Professional 2.0.4</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$495</td>
<td>$895</td>
</tr>
<tr>
<td>Company</td>
<td>Aldus Corp. 411 First Ave. S. Seattle, WA 98104 206-628-2320</td>
<td>Macromedia, Inc. 600 Townsend St. San Francisco, CA 94103 415-442-0200</td>
</tr>
</tbody>
</table>
We put a lot in so you can get a lot out.

Great Value! That’s what everyone is saying about the Microcom Value Pak™ (MVP). MVP includes Microcom’s complete family of essential utilities.

- Virex®
- Microcom 911 Utilities™
- Complete Undelete™
- Citadel with Shredder™
- Carbon Copy™ for the Mac

MVP packs these five products in one value-priced box. See your dealer for MVP today and you too will say...

GREAT VALUE!

PO Box 51489
Durham, NC 27707
(919) 490-1277 ext.623
FAX: 490-6672
BBS: 419-1002 (3,1,N)


CIRCLE 74 ON READER SERVICE CARD.
New Life for Old Macs

Before you part company with your old Mac — and a wad of cash to buy a new one — spend some time in the Mac workshop to see how you can bring that old war-horse up to snuff.

BY DON CRABB

It takes some experience to know what you can do to upgrade an old Mac, and it takes just as much experience to know when it’s time to buy a new one. With these concerns in mind, I’m going to give you the benefit of my years as a computer consultant and suggest some upgrade options that might help you decide whether your Mac is able to do the work you want to do.

Obviously, I can’t discuss every Mac in this article, so I’ve chosen three discontinued models that are still in use — the Plus, the Mac II, and the Portable. Why these three Macs? For one thing (assuming that not many of you still use a 128K), they represent the bottom end of the three Mac families — the compact, modular, and portable Macs. Another reason is that there are still a bunch of Pluses and Mac IIs around and they’ve got a lot of good years left in them. The Portable is a different story — it wasn’t a big seller, but if you have one, you probably need some advice on how to coax a little more oomph from what is a decent and reliable machine, especially in an office setting.

If you don’t have a Plus, a Mac II, or a Portable, stick around — the upgrades and repairs I’m about to describe may also apply to your Mac. What’s more, I start a regular column next month that will look at the various Macs’ upgrade-and-repair options in detail.

Before we start, give your Mac a quick physical (see the “Diagnostic Checklist” sidebar), and then join me as I look at each of the three Macs in turn. I’ve divided the upgrade paths into three categories: essential — upgrades that are well worth the time and expense required; easy — usually inexpensive fixes you can do yourself; and expensive — upgrades you should think twice about.
Performance Enhancers

Mac Plus Family History

Although Apple has expanded the Mac line far beyond the original 128K beige toaster, that growth has remained focused on only three kinds of Macs. At the bottom end are the compact Macs, currently represented by the Classic and Classic II (but also including the 128K, 512K, 512Ke, Plus, SE, and SE/30 models). Compact Macs comprise an upright plastic case that contains a 9-inch monochrome monitor and a logic board that holds the CPU, some memory (most of the Plus’ memory is on an add-on daughterboard), support circuitry, ports (Pluses lack ADB [Apple Desktop Bus] ports) and related electronics, and an analog-video board that drives the built-in display.

The second generation of compact Macs began with the Mac Plus, which debuted in 1986 and bowed out in 1990 to make way for the Classic. With its built-in 800K floppy-disk drive and SCSI external connector, the Plus was the first serious business Mac.

Apple sold hundreds of thousands of Mac Pluses, and many remain in service today, despite the machine’s serious limitations: a glacial 8-megahertz 68000 CPU, a maximum of 4 megabytes of RAM, no color-display capability, a single 800K floppy-disk drive, no internal hard drive, no ADB ports, and no expansion bus. Yet, although Mac Pluses won’t win any speed awards, they can still be useful machines that can even run System 7.

Best Tasks

- Increase memory to 4 megabytes and keep the software load down. Your Mac Plus will work fine in many settings. You can do word processing, work with flat-file databases and small spreadsheets, and do simple graphics work on a Mac Plus. It can also function as a decent LocalTalk file server with AppleShare 3.0 or DataClub Elite if you max out the memory and plug it in to a large, fast hard-disk drive.

Mac Plus Upgrades

- Essential. The best upgrade for the Plus is a memory boost to 4 megabytes of RAM, which lets you goose up the speed for around $100. You can do this yourself, but it involves cracking open the case, cutting two resistors loose if you’re upgrading from 1 megabyte, removing the old 256K SIMMs, and replacing them with 1-megabyte SIMMs. Unless you know what you’re doing, consider having a dealer do this. Some don’t charge extra for such an installation, but others charge as much as $200. Alternatively, ask the firm you buy the memory from if it has any step-by-step instructions (written or on video). Remember that if you’re doing it yourself, you need special equipment (a case cracker and a Torx screwdriver) to get the case open. Memory vendors can supply you with these tools.

With 4 megabytes of RAM on-board, it’s time to install a minimal System 7, with only the fonts, extensions, and control panels you really need. This will let you use

<table>
<thead>
<tr>
<th>Upgrade</th>
<th>Pros</th>
<th>Cons</th>
<th>Approximate Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery</td>
<td>Keeps clock accurate.</td>
<td>None.</td>
<td>$10</td>
</tr>
<tr>
<td>Up to 4 MB of RAM</td>
<td>Faster. Ability to use System 7 or MultiFinder.</td>
<td>None.</td>
<td>$100</td>
</tr>
<tr>
<td>External fan</td>
<td>Keeps the power supply cool.</td>
<td>Blows dirt into the machine.</td>
<td>$80 to $100</td>
</tr>
<tr>
<td>New power supply</td>
<td>Old power supply isn’t robust and can be strained.</td>
<td>Expensive.</td>
<td>$300</td>
</tr>
<tr>
<td>Third-party SuperDrive</td>
<td>Gives you 1.44-MB disk capacity.</td>
<td>High-density disks incompatible with other old Macs’ drives.</td>
<td>$400 to $500</td>
</tr>
<tr>
<td>External hard-disk drive</td>
<td>Boosts productivity. Usable with other Macs.</td>
<td>None.</td>
<td>$400 and up</td>
</tr>
<tr>
<td>External monitor</td>
<td>Easy on the eyes. Good for spreadsheets and DTP.</td>
<td>Finicky to install and expensive.</td>
<td>$500 and up</td>
</tr>
<tr>
<td>CPU accelerator</td>
<td>Faster CPU.</td>
<td>Has Plus ROMs, so can’t take advantage of all new software. Can strain old power supply.</td>
<td>$800 to $1,600</td>
</tr>
<tr>
<td>System software</td>
<td>Minimal System 7 gets you into the new game in town.</td>
<td>Needs 4 MB of RAM. System 7 slower than System 6.</td>
<td>$100</td>
</tr>
<tr>
<td>New input devices</td>
<td>A new mouse or trackball can make an old Mac feel new.</td>
<td>Plus lacks an ADB port to make this easily possible.</td>
<td>$70 and up</td>
</tr>
</tbody>
</table>

Total price: $2,760 and up

Table 1: Although minor upgrades and repairs can lengthen the life of a Plus, this table shows that a full-blown upgrade doesn’t make good sense — it costs way too much. You’d be better off buying a Classic II or an LC II.
applications that have special features such as publish-and-subscribe. Even with only 4 megabytes of RAM, you can still run several medium-sized apps simultaneously under System 7’s built-in cooperative multitasking. You won’t, however, be able to use System 7’s 32-bit-addressing scheme or virtual memory. System 7 is not essential — if you don’t need any of its special features, you might as well use System 6, because it’s faster.

Another good upgrade is to add an external hard-disk drive (take it with you when you move up to your next Mac). A 100-megabyte external hard drive can be found for as little as $400.

Easy. Besides getting a new external hard drive, adding a new or replacement keyboard or a new mouse makes sense for many Plus owners. Remember that because the Mac Plus doesn’t have an ADB port, any keyboard or mouse you buy for it won’t be easy to use with ADB-equipped Macs. A new keyboard costs about $125. Replacement or upgrade mice start at about $70.

Expensive. Consider adding an external monitor. It will be expensive — $500 or more — and it’ll be a pain to install without an expansion slot, but you’ll be giving your eyes a break when doing DTP, spreadsheet, or even basic word-processing work. You can forget about color, however, because Mac Plus ROMs don’t support it. Nor can the Plus support an internal 1.44-megabyte SuperDrive floppy-disk drive, although you can add an external SuperDrive from a third-party vendor such as PLI. If you need to replace the internal floppy drive, you’ll spend between $200 and $400. An external third-party SuperDrive-compatible floppy drive costs more than $500.

Unless you absolutely have to have high-density-disk compatibility, this is an upgrade to skip.

If you’d like to upgrade the Plus’ CPU, be forewarned that the computer lacks any sort of expansion or PDS (processor-direct slot) to plug an accelerator in to. There are 68020 and 68030 upgrade boards that can be installed in a Plus, but the job is best left to the pros, because it involves some fancy wire wrapping, clipping, and soldering. Some CPU-upgrade cards for the Plus can be equipped with external video capabilities and more than 4 megabytes of RAM. You can expect to pay around $1,000 for a 33-megahertz 68030 accelerator board for a Plus.

A 33-megahertz FPU (floating-point unit, also referred to as a math coprocessor) can add another $250 to $300. Plug this in to your new 33-megahertz accelerator, and you’ll dramatically improve the performance of any product that uses floating-point arithmetic, such as spreadsheet programs and some graphics programs.

As long as a Plus is using the original 128K ROM, there is a limit to the improvements an accelerator can provide. It simply can’t turn your Plus into a modular Mac, for example, and Apple doesn’t make an upgrade motherboard for the Plus that would make it comparable to a Classic or Classic II. Adding an accelerator board might also strain an already overworked power supply or result in too much heat buildup on the machine’s circuit boards. The Plus lacks a built-in fan, and external fans have the bad habit of blowing dirt into the machine. Frankly, no matter what speed gains accelerator boards might provide, I simply wouldn’t waste the money on them. They’re too costly and still don’t fully modernize your Plus.
Performance Enhancers

Mac II Family History

Modular Macs, of which the Mac II was the first example, hit the streets in late 1987. With these machines, Apple said goodbye to the compact, all-inclusive case of the Mac Plus and opted instead for a traditional PC-style set of stacked boxes. The bottom box is a large case that can hold two floppy-disk drives (although only one was standard in the original configuration), a full-height hard-disk drive, a huge power supply and fan, six NuBus expansion slots, and a large motherboard. The top box is a monitor, which is purchased separately. The Mac II sports a 16-megahertz 68020 CPU and eight SIMM slots. The base model lacks a PMMU (paged-memory-management unit), so it can’t use System 7’s virtual-memory feature. A standard Mac II doesn’t work with System 7’s 32-bit-addressing feature, which limits it to a maximum of 4 megabytes of RAM, because it lacks 32-bit-clean ROMs.

Apple stopped making the Mac II in 1990, by which time the Mac IIx, IIcx, Ici, and Mac Ilfx were available. The IIcx and Ici have a smaller case and only three NuBus slots. The Iix had a redesigned motherboard to accommodate a 16-megahertz 68030 CPU (with on-chip PMMU) and a 68882 FPU. The Ilfx used another updated motherboard design based on a 40-megahertz 68030. The latest modular Macs are the Mac LC, which has a 16-megahertz 68020; the Iis, with a 20-megahertz 68030; the Quadra 700, a 25-megahertz 68040 that comes in a Iici-sized case with two NuBus slots; and the Quadra 950, which has a 33-megahertz 68040 and comes in a tower case with five NuBus slots.

Best Tasks

The Mac II makes the most sense for serious upgrading and long-term use. With its built-in 68881 FPU chip, spreadsheets and database reports can be generated quickly, as long as you have a minimum of 8 megabytes of RAM. Add more RAM and a fast hard drive, and you have a great file server—with six NuBus slots, you can add Ethernet or token-ring cards with impunity. It also makes a good print server when connected to a PostScript printer. Throw in an accelerator, and you’ve got near-Quadra performance for a much lower cost. The Mac II is also an excellent basic office or home machine. You can add large-format monochrome or color monitors as well as just about any other kind of NuBus specialty board, such as an accelerated-video card, a DSP (digital-signal processing) board, or a video-capture board.

Table 2: Recommended Upgrades for the Mac II

<table>
<thead>
<tr>
<th>Upgrade</th>
<th>Pros</th>
<th>Cons</th>
<th>Approximate Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>MODE32</td>
<td>32-bit cleanliness.</td>
<td>None</td>
<td>Free</td>
</tr>
<tr>
<td>8 MB of RAM</td>
<td>Faster</td>
<td>None</td>
<td>$200</td>
</tr>
<tr>
<td>32 MB of RAM</td>
<td>If you can afford this, go for it.</td>
<td>None</td>
<td>$1,000</td>
</tr>
<tr>
<td>NuBus Ethernet card</td>
<td>EtherTalk speed where applicable</td>
<td>None</td>
<td>$250</td>
</tr>
<tr>
<td>Third-party SuperDrive</td>
<td>Gives you 1.44 MB of disk capacity.</td>
<td>Can’t use high-density disks with some older Macs.</td>
<td>$400 to $500</td>
</tr>
<tr>
<td>floppy-disk drive</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External hard-disk drive</td>
<td>More storage space.</td>
<td>Easy on the eyes.</td>
<td>$400 and up</td>
</tr>
<tr>
<td>Large-format monochrome</td>
<td>Easy on the eyes.</td>
<td>Expensive</td>
<td>$500 to $5,000</td>
</tr>
<tr>
<td>or color monitor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMMU</td>
<td>Can use System 7’s virtual memory.</td>
<td>Installation can be tricky.</td>
<td>$100 to $200</td>
</tr>
<tr>
<td>NuBus accelerator</td>
<td>Faster CPU</td>
<td>68040 boards cause some software incompatibilities.</td>
<td>$1,000 to $3,000</td>
</tr>
<tr>
<td>CPU accelerator</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iicx replacement motherboard</td>
<td>Faster, Built-in SuperDrive.</td>
<td>Expensive</td>
<td>$3,000</td>
</tr>
<tr>
<td>System software</td>
<td>Full System 7.</td>
<td>Expensive</td>
<td>$1,000</td>
</tr>
<tr>
<td>New input devices</td>
<td>A new mouse, trackball, or keyboard can make an old Mac feel new.</td>
<td>None</td>
<td>$50 and up</td>
</tr>
</tbody>
</table>

Total price $7,400 and up
Street price of new Mac Quadra 950 8/400 $8,000

Table 2: The Mac II is a great platform for building nearly any modern Mac you might need. With its six NuBus slots and built-in FPU chip, you can easily and relatively inexpensively add accelerators, memory, and peripherals to boost performance.
machine. The Mac II can use a wide variety of NuBus-based CPU upgrades, from solid 68030 designs (DayStar Digital makes the PowerCache line of boards, which I’ve used with considerable success — the 50-megahertz PowerCache is particularly sweet at a price of around $1,300) to units such as the 33-megahertz 68040 Radius Rocket 33; TokaMac boards, from Fusion Data Systems; and forthcoming Intel i860-based cards. These NuBus accelerator cards range from $500 to more than $2,000.

**Easy.** If you really want to pump up the performance of your Mac II, you’ll need a software upgrade: MODE32, a 32-bit memory extension from Connectix, which is distributed free by Apple (you can get a copy from user groups and on-line services such as America Online and MacUser’s ZiffNet/Mac). MODE32 cleans up the 32-bit-dirty ROMs on Mac IIs, IIx’s, IIcx’s, and SE/30s so they can use System 7’s 32-bit-addressing option.

This means that you can break the real-RAM barrier of 8 megabytes. To use MODE32, just drag it into your System Folder and restart. Then you can use the Memory control panel to turn on 32-bit addressing, which lets you use software that simply won’t work without it. If you’ve installed a 68851 PMMU (about $99 from a third-party chip house) in your Mac II, you can also use part of your II’s hard disk as a page-swapping area for virtual memory. You don’t need a PMMU if you have a 68030 or 68040 accelerator: It’s built in to those chips.

**Expensive.** Consider adding a IIfx motherboard upgrade from Apple. For around $3,000, you can swap your old motherboard for the 40-megahertz 68030 power of the IIfx. Even though Apple is phasing out the IIfx, this is a good deal for Mac II owners who can still find the boards. Some dealers may be discounting the boards’ prices. Besides the faster CPU, you get built-in support for a SuperDrive floppy drive, faster SCSI, faster NuBus, new 32-bit-clean ROMs, and a host of other performance tweaks that simply adding a CPU accelerator can’t necessarily match. You’re also buying Apple hardware, which provides a more flexible path for upgrades than does adding a third-party accelerator.

If you’ve added a fast hard drive, make the most of it with a SCSI-2 card from a vendor such as PLI or MicroNet ($400 and up). The standard data rate between the Mac II’s CPU, its RAM, and the built-in SCSI tops out at less than 2.5 megabytes per second. With a SCSI-accelerator card added, however, you can raise this data rate to more than 10 megabytes per second, dramatically improving the apparent speed of connected hard drives.
Performance Enhancers

Mac Portable Family History

The first Mac Portable became available in late 1989. Heavily criticized because of its boat-anchor weight and dimensions, the Portable is one of the worst-selling Macs ever. Even so, it appears frequently among the business clients I’ve consulted for and you can find new or used Portables at bargain-basement prices. I’ve seen ads in MacWEEK, for example, for fully equipped Portables with 9 megabytes of RAM, a 2,400-bps modem, and a 40-megabyte hard drive for $1,200. That’s an excellent buy for a three-year-old machine that has performance comparable with that of the Classic. Apple stopped manufacturing the Portable in 1991, just before passing the torch of Mac portability to the PowerBooks, its first notebook-sized machines.

The Portable was based on a 16-megahertz 68000 CPU and was quite a technology trendsetter, with its reliance on expensive SRAM (static RAM), special ASICs (application-specific integrated circuits), a fancy power-management system (including a lead-acid battery rumored to be able to jump-start a Yugo), a fast active-matrix screen, a 40-megabyte hard drive, and a 1.44-megabyte SuperDrive. Many Portables also came equipped with Apple’s 2,400-bps modem (although third-party modems were and still are available).

The Portable came in two versions: the original non-backlit model and a 1990 revision that included a backlit screen. For about a year, Apple sold a Portable backlit upgrade kit for about $1,000, but that item disappeared from its price list when the PowerBooks were released.

The original model came with only 1 megabyte of RAM, expandable to 2 megabytes with Apple’s expensive SRAM card and 5 megabytes with third-party SRAM cards. The backlit model had 2 megabytes of built-in RAM and could use PSRAM (pseudostatic RAM) effectively, with third parties providing 8-megabyte PSRAM cards to jump the RAM to 9 megabytes. Theoretically, the original Portable could use third-party PSRAM add-ons too — especially those added to the machine’s PDS (processor-direct slot) — but the results were sometimes unreliable.

Mac Portable Upgrades

Essential. If you own a nonbacklit Portable, find an Apple dealer who can track down and install one of those wonderful — if expensive and discontinued — backlight kits. This will limit your costs for any repairs down the line.

Table 3: Recommended Upgrades for the Mac Portable

<table>
<thead>
<tr>
<th>Upgrade</th>
<th>Pros</th>
<th>Cons</th>
<th>Approximate Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 8 MB of RAM</td>
<td>Faster</td>
<td>Hard to find.</td>
<td>$450 and up</td>
</tr>
<tr>
<td>Internal or external hard-disk drive</td>
<td>Better work-load capacity.</td>
<td>None.</td>
<td>$500 and up</td>
</tr>
<tr>
<td>External Ethernet adapter</td>
<td>Lats you use the Portable for network diagnostics.</td>
<td>Expensive.</td>
<td>$450 and up</td>
</tr>
<tr>
<td>Internal modem</td>
<td>Telecommunications possible.</td>
<td>Can’t be used on other Macs.</td>
<td>$400</td>
</tr>
<tr>
<td>Backlight upgrade</td>
<td>Easy on the eyes.</td>
<td>Dealer-installed only.</td>
<td>$1,000</td>
</tr>
<tr>
<td>System software</td>
<td>Full System 7.</td>
<td>Needs 9-MB upgrade.</td>
<td>$100</td>
</tr>
</tbody>
</table>

Total price: $2,900 and up

Table 3: Because the Portable is only a few years old and is pretty sturdy, you’re unlikely to have to shell out much for repairs. If it makes you feel more secure, however, consider getting an AppleCare contract from your local Apple dealer. This will limit your costs for any repairs down the line.
story runs along similar lines. You might find a vendor or two that’s still selling internal hard drives for the Portable in sizes bigger than the standard 40 megabytes, but the search may be brutal. You’d be wiser adding external SCSI storage to your Portable, because it can be used on other Macs. If you want to maintain some portability, try a compact hard drive from Liberty, LaCie, or Mirror. You can find them in sizes as large as 210 megabytes.

Don Crabb is the director of labs and a senior lecturer in computer science at the University of Chicago as well as MacUser’s newest contributing editor. His new column, The Mac Workshop, starts next month.

For Your Information

Some of the products and techniques mentioned in this article have been covered in detail in previous MacUser articles. You’ll also find more than 1,000 condensed mouse-rated reviews in “MiniFinders Buyer’s Guide,” August ’92, page 87. Relevant articles are listed here in reverse chronological order.

“System Lite,” May ’92, page 217 — How to streamline System 7 and eliminate the features you don’t need.
“How to Buy Memory,” February ’92, page 259 — Points to consider when expanding your Mac’s memory.
“The Ultimate System Folder,” January ’92, page 94 — A list of 50 simple ways to supercharge System 7 inexpensively.
“How to Buy Hard-Disk Drives,” December ’91, page 225 — Here’s what you need to know when you’re in the market for space.
“Keyboard Care and Feeding,” June ’91, page 221 — Quick and easy steps that can help keep your keyboard in action.
“SIMMple Pleasures,” April ’91, page 194 — All you need to know to buy and install the right SIMMs at the best price.
“New Year’s Resolutions,” January ’91, page 237 — Ten general maintenance steps to help keep your Mac running like new.
“The Self-Supporting Mac,” October ’90, page 263 — A comprehensive list of frequently asked questions with answers, covering topics from powering your Mac overseas to the best backup methods.
“In Search of the Ultimate Mac,” September ’90, page 230 — Check out the “UltiPlus” section for tips on making the Mac Plus faster and more powerful.

— Amanda B. Michael
The PowerBook alternative...

If you are considering purchasing an Apple® PowerBook®, you owe it to yourself to look at the alternative — The Outbound™ Notebook System.

Ask for your Outbound product guide today.

Smaller, lighter, faster, upgradeable

The Outbound family of Notebook computers are up to 50% faster than PowerBooks, 7% lighter, provide 17% more screen area and are a true notebook size at 8.5" x 11". Their unique modular design lets you "mix and match" the CPU, hard drive, and memory you want, before and after you buy. You get the performance you need at the start, then upgrade simply and easily by installing low-cost modules.

- Hard drives from 20 MB to 120 MB
- CPUs from 20 to 33 MHz
- RAM from 2 to 14 MB

Notebooks use genuine Apple ROM and System Software and are equipped with all of the ports you’d expect in a Mac®.

The specs speak for themselves:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>OUTBOUND NOTEBOOK 2000</th>
<th>OUTBOUND NOTEBOOK 2030</th>
<th>OUTBOUND NOTEBOOK 2030E</th>
<th>OUTBOUND NOTEBOOK 2030E</th>
<th>OUTBOUND NOTEBOOK 2030E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upgradeable CPU</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Internal Floppy</td>
<td>YES</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Standard Processor</td>
<td>68000</td>
<td>68000</td>
<td>68030</td>
<td>68030</td>
<td>68030</td>
</tr>
<tr>
<td>Speed</td>
<td>20 MHz</td>
<td>20 MHz</td>
<td>20 MHz</td>
<td>25 MHz</td>
<td>25 MHz</td>
</tr>
<tr>
<td>Maximum Hard Drive</td>
<td>120 MB</td>
<td>40 MB</td>
<td>120 MB</td>
<td>80 MB</td>
<td>80 MB</td>
</tr>
<tr>
<td>Drive Available</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full size silent</td>
<td>YES</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>keyboard and true</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>notebook size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum RAM Available</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>RAM</td>
<td>4 MB</td>
<td>8 MB</td>
<td>4 MB</td>
<td>8 MB</td>
<td>14 MB</td>
</tr>
<tr>
<td>Math Coprocessor</td>
<td>No</td>
<td>No</td>
<td>Optional</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Price</td>
<td>$1999</td>
<td>$1999</td>
<td>$2999</td>
<td>$2999</td>
<td>$2999</td>
</tr>
<tr>
<td></td>
<td>2030/220</td>
<td>100/220</td>
<td>2030/440</td>
<td>140/440</td>
<td>170/440</td>
</tr>
<tr>
<td></td>
<td>2 MB RAM</td>
<td>2 MB RAM</td>
<td>4 MB RAM</td>
<td>4 MB RAM</td>
<td>4 MB RAM</td>
</tr>
<tr>
<td></td>
<td>20 MB HD</td>
<td>20 MB HD</td>
<td>40 MB HD</td>
<td>40 MB HD</td>
<td>40 MB HD</td>
</tr>
<tr>
<td></td>
<td>Ext. floppy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notebook prices based on retail sales. PowerBook prices reflect published Apple retail pricing. Technical specifications and prices subject to change without notice.

Enjoy Mac compatibility

The Macintosh ROM is pre-installed with memory conscious System 6.0.7, but Outbounds are fully compatible with System 7 and thousands of Macintosh applications. All models include an internal SuperDrive™ equivalent floppy disk drive for working with high and low density Mac and MS-DOS® diskettes.
The experts love it too!

“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

“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.”
1991 BYTE Award of Merit
BYTE Magazine

“Outbound’s new Notebook System has the unique ability to grow along with your requirements and your budget.”
MacUser Magazine

Outbound Systems, Inc. 4840 Pearl East Dr. Boulder, Colorado 80301
Phone: 303.786.9200 Fax: 303.786.8611

and mobile Mac accessories

Like our Notebook, you can count on Outbound peripherals and accessories for innovation and 100% compatibility with Macintosh and Outbound computers.

The Outbound Outrigger monitor

Our Outrigger Intelligent portrait monitor for instance, eliminates the expensive SCSI interface normally required to hook a computer to a full-size monitor. A simple SCSI cable will connect the Outrigger to your Outbound Notebook, Apple PowerBook or any Macintosh. It sports a lightning fast, built-in 20 MHz 68000 processor and an extra SCSI port for even more versatility. The Outrigger increases your screen area up to 200% and helps turn your notebook into a true desktop station.

The Pocket Port Fax modem

When you’re on the road, smaller and lighter is better, as long as it’s powerful. And that’s the story with our Pocket Port Fax modem. This featherweight offers data compression and error correction at speeds up to 9600 bps. At just 3.3” x 2.3” x 1” and 3.5 oz., it’s fully ADB powered, ending the need for heavy AC adapters or batteries.

Order direct and save

You can order Outbound products right from the folks who make them. Just call toll-free and use your credit card. And when you call, be sure to ask about our low-cost financing and our expanding family of products for your mobile Mac office.

For a complete listing of Outbound’s peripherals and accessories ask for your free Outbound product guide today.

1-800-444-4607

Or call for the Outbound dealer nearest you 7 a.m. to 6 p.m. Mon.-Fri. and 8 a.m. to 4 p.m. Saturdays Mountain time. Visa, MasterCard, Discover and American Express accepted. Overnight shipping available.

CIRCLE 78 ON READER SERVICE CARD.
PowerPC: Where No Mac

Apple's forthcoming PowerPC processors promise Quadra performance at an LC price. But will your software run on them?

Nobody likes to wait for a computer to do its job. When you launch an application, you don’t want to stare at an artistic splash screen. You want to get to work. When you rotate a 20-megabyte color image, you don’t want to watch a progress bar for ten minutes. You want your image to be rotated. And if your Mac can’t perform your requested task without delay, you want it to at

One of Apple’s agreements with IBM is a plan to develop a new set of microprocessors based on IBM’s POWER chip set.
Agents could perform tasks such as automatically sorting incoming voice and electronic mail at your office.

Has Gone Before

BY HENRY BORTMAN

least let you do something else while you wait.

There are two basic reasons why you can't have what you want. Yet. Reason No. 1: The microprocessor that powers your Mac is too slow. Reason No. 2: In some fundamental ways, the Mac's operating system is obsolete.

So you wait.

OK, OK, I can hear the chorus of critics already. "What do you mean, the Mac isn't fast? What about the Quadra 950?" And "How can you say that the Mac can't do two things at once? System 7 lets you run as many apps as you want."

Sure. I'll concede that things have improved. The Quadra 950 certainly has a performance edge over the 128K Mac. And System 7's multitasking is definitely a step up from the original quit-one-app-go-back-to-the-desktop-and-launch-another-app Finder. But are you really satisfied?

Didn't think so.

But take heart. Apple has two projects in the works that should ease your frustration. One is hardware and goes by the name of PowerPC. PowerPC is the collective name of a family of four new microprocessor designs that Apple, IBM, and Motorola are codeveloping. They'll be at the core of tomorrow's Macs. And they'll be fast — even the slowest units will outperform today's top-of-the-line 68040 processors. Each of the four designs, will, over time, be available in several different chips, much as today's 68030 comes in several varieties, each with a different clock speed.

The second project is a reworking of some of the basic functions of Macintosh system software. The new system will still be System 7, but it will be architected differently from today's system. Among the benefits: Programs will run in the background more smoothly, and when an application crashes, the whole system won't crash with it.
Future Macs

The PowerPC That Will Be

One of Apple’s agreements with IBM is a commitment to develop a new set of microprocessors based on IBM’s POWER chip set. POWER is a RISC (reduced-instruction-set computing) design that’s used in IBM’s RS/6000 workstations. Other popular RISC designs include Sun’s SPARC and SuperSPARC chips, used in its SPARCstation and SPARCserver computers, and MIPS’ R3000 and R4000 chips, used in workstations from Silicon Graphics, DEC, and other vendors.

Although RISC has taken hold in the workstation market, today’s desktop machines — Macs and PCs — are based on CISC (complex-instruction-set computing) microprocessors. These terms, RISC and CISC, refer to how microprocessors process information. It might seem that a reduced instruction set would be a step backward, but actually it makes it possible for RISC chips to process information much faster than CISC chips can.

In fact, many computer vendors speculate that CISC architectures such as the Intel 80x86 (the processor family that includes the 80286, 80386, and 80486, which are used in PCs) and the Motorola 680x0 (including the 68000, 68020, 68030, and 68040, used in Macs) are nearing the peak of their performance potentials. They believe that to achieve a significant leap in performance beyond today’s desktop computers, future systems will have to switch to RISC (see Figure 1).

Apple has said that the future of the Mac is in PowerPC-based computers, and the company means it. Apple, IBM,

Figure 1: PowerPC Performance

Figure 1: Apple expects even the least powerful and least expensive PowerPC Macs to outperform today’s top-of-the-line Quadra 950 in the basic integer number-crunching tasks that comprise the majority of a computer’s work. Integer SPECmarks are an industry-standard measure of this computing power.

Casper
voice-recognition technology will let you command your Macintosh by talking to it.
and Motorola are spending somewhere around a billion dollars to develop a set of four different PowerPC chips to power future Macs. Although these new processors will be screamers compared with today’s machines, Apple plans to deploy them not only at the high end but also throughout the Mac line. In fact, the first chip off the assembly line will be the PowerPC 601, designed for machines in the middle of today’s Mac price range (see Figure 2).

Start saving now. Macs based on the 601 should start showing up sometime in 1994. These will be followed by desktop systems, based on the PowerPC 604 chips, with prices starting at around what a IIci costs; the portable and low-cost systems will be based on the low-power, inexpensive 603; and ultraperformance desktop and server systems will be based on the 620, with correspondingly premium prices.

Users will benefit from this increased performance in three ways. The most obvious one is that faster Macs will make applications run faster. The second is that high performance will become less expensive. This is generally true in the computer industry. The $3,000 or so that you had to pay in 1984 for an 8-megahertz 68000-based Mac with 128K of RAM and a 9-inch monochrome monitor would today buy you a 16-megahertz 68030-based LC II with 4 megabytes of RAM, an 80-megabyte hard drive, and a color monitor, and you’d probably have some money left over for buying software. But the shift to PowerPC will represent a quantum leap in that trend.

The third benefit is the most exciting. Maybe you’ve heard about Casper, the voice-recognition technology that Apple is working on. Casper will let you command your Mac by talking to it. Maybe the promise of pen-based Macs intrigues you. Support for pen input would let you use your Mac in situations where you couldn’t use a keyboard and could dramatically change the way artists approach a computer. Maybe you can’t wait for intelligent agents to hit the scene. Agents could perform tasks such as automatically sorting incoming voice and electronic mail at your office, deciding — based on your previous instructions — what was important to you, and forwarding it to the off-site conference you’re attending.

What all these technologies have in common is that they require tremendous computational power, which only the most powerful of today’s desktop computers even begin to provide. PowerPC will lay a new high-performance-computing foundation that will make these and other advanced technologies commonplace.

**Compatibility**

But let’s take a step back from visions of the *USS Enterprise* to a little harsh reality. Those of you who were early purchasers of 68040-based Mac Quadras know that with new chip designs come compatibility headaches. Many Mac applications wouldn’t run on the Quadras until the software vendors released new versions, even though the 68040 was part of the same microprocessor family as the 68000, 68020, and 68030 that powered earlier Macs. So, pop quiz: What would you expect to happen when you try to run today’s applications on a Mac containing a processor with a completely different design?

Although bookies in Vegas are already taking bets, Apple says not to worry. The PowerPC operating system will provide a 68020-emulation mode that should enable today’s applications to run straight out of the box — without modification. In much the same way that Insignia’s SoftPC uses a Mac’s 680x0 processor to emulate a PC, enabling you to run DOS programs on a Mac, Apple will use the PowerPC’s horsepower to create a software emulation of a 68020-based Mac so you can run existing Mac applications on a PowerPC Mac (see the “Old Apps, New Tricks” sidebar for more details).

Apple faces the same problem that application developers do. System 7 is written for 680x0 processors, and it won’t run on a PowerPC-based computer. At least at first, Apple’s going to have to convert portions of the system to native PowerPC code and emulate the rest.
Future Macs

To further complicate matters, Apple’s going to need several years to replace all the 680x0 models in the product line with PowerPC equivalents. And even then, there is still the small matter of an installed base of several million 680x0-based Macs whose users are unlikely to appreciate being left behind. So Apple will need to maintain two concurrent versions of the Mac operating system, one for 680x0 Macs and the other for PowerPC Macs.

Apple says that it will do all it can to minimize the pain involved in this situation. For example, it’s working to develop a new application installer that will let you choose among installing a program for 680x0 Macs, PowerPC Macs, or both. If you choose both, it’ll take up a little more room on your hard drive, but you’ll be able to run the same copy of the application on either type of machine. In fact, you’ll be able to move a hard disk between a 680x0 Mac and a PowerPC Mac and have all the programs on it work with either system. With a little luck — OK, with a lot of luck — you’ll be able to do the same thing with the operating system itself.

Revising the System

But Apple is planning to do far more with System 7 than merely port it to the PowerPC. It’s going to make some changes in the basic architecture of the Mac’s operating system. Notice I said “architecture,” not “interface.” The latter will evolve too, of course, but Apple’s talking about something different.

That something is called a microkernel, a small piece of

Support for pen input
would let you use your Mac in situations where you couldn’t use a keyboard and could dramatically change the way artists approach a computer.
system software, customized for a specific microprocessor, that performs very basic system tasks. The rest of System 7 will be built on top of the microkernel. This system rewrite will enable Apple to implement some changes in the Mac OS that are long overdue. Here are the highlights:

- **Preemptive multitasking.** A basic feature of UNIX, preemptive multitasking defines how applications running at the same time share access to a computer’s processor. It works by giving each task (or program) a turn, in a kind of round-robin arrangement. Benefit: Background processes run much more smoothly. Say goodbye to programs behaving like PrintMonitor, which is supposed to be unobtrusive but which often takes over control of your computer for several seconds, leaving you frantically clicking on windows, menus — anything to reassert your authority — wondering if you’ve crashed.

- **Multithreading.** Different parts of an application or system process will be able to run simultaneously. You will, for example, be able to start copying a file from the Finder and, without waiting for the copy to finish, open folders and launch applications, also from the Finder.

- **Protected memory.** When’s the last time this happened to you? Your Mac crashed. I’m not talking about the graceful kind of crash, in which an application bites the dust and you return to the Finder. I’m talking about the reboot-and-take-a-coffee-break type of crash. With protected memory, if one application crashes, your other applications and your system will keep on ticking. This, however, will work only with programs that are written to be microkernel-aware.

- **New I/O subsystem.** Look forward to much speedier hard-drive response, thanks to better management of data transfer to and from mass-storage devices. Photoshop will love this one. So will file servers.

- **Interprocess messaging and shared libraries.** These will make possible instant extensibility of the system as well as of applications. Think of it as plug-in heaven. But these capabilities will go beyond what you can achieve today with plug-ins. They will encourage developers to move away from everything-but-the-kitchen-sink applications and go toward small, highly efficient single-function apps that users can string together to create customized work environments.

Of course, there’s a catch — maybe even two or three. Application vendors will have to rewrite their programs to take advantage of the new services provided by the microkernel. And although Apple is expecting to be able to provide a special translator (see the “Old Apps, New Tricks” sidebar) to help vendors produce applications that take full advantage of the PowerPC’s processing muscle, that unfortunately won’t move applications an inch closer to benefitting from the microkernel.

And although Apple may get the microkernel-based version of System 7 running on 680x0 Macs even before PowerPC makes the scene, the first PowerPC Macs will probably ship with a nonmicrokernel system. Apple hasn’t yet decided whether it will make the microkernel-based System 7 available on 680x0 Macs first or wait and release it on PowerPC Macs simultaneously.

In any case, the services the microkernel will make possible will appear slowly over time.

**The Bottom Line**

Apple’s going to have some really, really fast Macs, starting in 1994. PowerPC will provide the Mac with a dramatic increase in processing power, without a corresponding increase in price.

A lot of effort is going into ensuring compatibility between the two types of Macs and between the systems that run on them. In particular, Apple is working hard to guarantee that today’s applications will run on the PowerPC machines. Meanwhile, engineers are figuring out how to use the increased processing power of the PowerPC chips for exciting new technologies such as handwriting recognition, voice recognition, intelligent agents, and a
Future Macs

few things it's still too early to drop hints about.
Expect a few bumps in the road during the transition period. But expect Macs in 1994 and beyond to be far better machines than they have ever been before. And just maybe you'll be able to spend more time working and less time waiting.

As MacUser's technical director, Henry Hortman is first in line for a PowerPC.

Old Apps, New Tricks

Mac programs are usually written in programming languages such as C or Pascal and are then compiled to run on 680x0 processors. This compiling process converts the C or Pascal code a programmer has written, turning it into native instructions that 680x0 processors can understand. The problem in moving an application from 680x0-based Macs to PowerPC-based Macs is that native 680x0 instructions will look like gibberish to PowerPC processors. For today's apps to run on a PowerPC, their 680x0 native code will need to be converted to PowerPC native code.

Normally, this porting process—converting an application that runs on one type of processor to run on another—involves recompling the original C or Pascal code with a compiler that's designed to generate native code for the new processor. Although that sounds simple, it can be an arduous and time-consuming task.

Apple hopes to alleviate some of the pain by providing a 68020 emulator on its PowerPC Macs. With the emulator, today's Mac applications will think they are running on a Mac with a 68020 processor. But in reality, the emulated 68020 will be a software program running on the PowerPC processor. And because the PowerPC chip will have to do the processing for both the emulation program and the original application, programs that run in emulation mode will run more slowly than those that run in native-PowerPC mode.

So, great, first Apple says you'll be able to get Quadra performance for the price of an LC, and then it says you're going to lose that performance in the emulator. This is exciting?

There's more to it. On a Mac, applications spend a lot of time invoking a set of operating-system routines known collectively as the Macintosh Toolbox. The Toolbox handles such things as displaying text, drawing the rectangles that comprise Mac windows, and erasing parts of the screen and redrawing them.

Although there are thousands of such routines, it turns out that most applications spend most of their time calling a relatively small subset of them. Although Apple will initially use the emulator to run most of System 7 on PowerPC Macs, it will convert these most common Toolbox routines to run in native PowerPC mode, without going through the emulator. So emulated apps will really be "enhanced" emulated apps.

But all this is a worst-case scenario. Apple is working with a company, Echo Logic, that has a special translator, FlashPort, that can convert applications directly from native-680x0 to native-PowerPC code, without requiring the time and effort of recompilation. The resulting programs have identical functionality and behavior to the originals but can take full advantage of PowerPC performance. Hopefully, Apple and Echo Logic will make this process cost-effective enough to enable even small companies to utilize it.

Figure A: Today’s applications are written to run on 680x0-based Macs. These same applications will run, unmodified, on PowerPC Macs, whose system software will include a software emulation of a 68020-based Mac. Their performance will be equivalent to their performance on today’s Macs. In addition, old applications converted to run directly on PowerPC Macs or new ones written from scratch for the PowerPC Macs will get a significant performance boost from the new processors.
Any questions?

If so, keep reading.

We know there's nothing like a bottleneck to slow down traffic.
So eliminate the Macintosh SCSI bottleneck with the QuickSCSI NuBus card and you could enjoy an increase in data transfer rates up to 300 percent. When you install QuickSCSI in your Mac II-series computer, you can reach data transfer rates up to 30 percent faster than the Quadra.

One backup you'll appreciate.
With QuickSCSI's disk mirroring, backups occur automatically and immediately on a second drive, so you don't have to worry about losing valuable data due to disk failure. You can even mirror up to three drives at once! Think of it as getting the performance of a Corvette for the cost of a Miata. In addition, most hard disk and removable media drives are supported.

Both internal and external drives can be connected to QuickSCSI, and an additional seven SCSI devices can be added for every QuickSCSI installed. And because QuickSCSI doesn't disable the Mac's existing SCSI port, up to 14 devices can be connected simultaneously.

PLI 240 3.5 DRIVE ON A MAC IIfx

<table>
<thead>
<tr>
<th>SUSTAINED READ (k/sec)</th>
<th>0</th>
<th>500</th>
<th>1000</th>
<th>1500</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>With QuickSCSI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without QuickSCSI</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PLI's drives are supported by our toll-free technical support, 24-hour BBS, 30-day money-back guarantee and five-year warranty.

The Most Trusted Name in Storage Solutions.

800-288-8754
Peripheral Land Incorporated
47421 Bayside Parkway • Fremont, CA 94538
510-657-2211 or Fax 510-683-9713

CIRCLE 181 ON READER SERVICE CARD.
Okay, so you think you’ve got all the storage space you need.... Think again. Tomorrow, you’ll need more! Applications and files keep getting bigger. You need color. You want all the desktop space you can get—without taking up more of the top of your desk, and what about sound or QuickTime?

It used to be that the largest drive you could fit in a ci was about 500 MB, but not anymore! Today, the number is 830 MB.

APS offers the Toshiba 830 for $1499—the 3.5-inch storage solution for multi-user systems, workstations, file servers, oh...and the individual Macintosh user who just can’t get enough storage.

**Toshiba—Storage for Tomorrow**
- Toshiba's 830 not only provides you with over 800 MBs of storage, but it fits internally in the Mac SE, SE/30, cx, ci and the Quadra 700.
- With an average seek time of 12.5 ms, find the data you need—fast.
- Transfer rates as high as 1.2 MB/sec.

**Tomorrow Is Today**
**Toshiba 830 in APS ZFP Case** $1599

Okay, so you need the space, like the price and don’t mind an additional peripheral on or around your desk. Get the 830 in an APS zero-footprint case for just $1599. You can still fit it under your classic Mac or place it conveniently under one of your other APS peripherals. Are you prepared for tomorrow? Call APS Technologies today.
The LC, the si and the Classic II are all great "little" machines. These Macs work great at home and have boosted efficiency in the office, but, until now, you could only get 100 megabytes inside.

APS introduces the 7213—the new, very fast, very quiet 200 MB hard drive from Maxtor. Best of all, you can put it inside your LC, si or Classic II!

**The New Maxtor 7213**
- Maxtor's 7213 not only provides you with over 200 MBs of storage, but it fits internally in the Mac LC, LCII, si, and Classic II. And, of course, it fits in most of the other Macs too.
- The 7213 is very fast—an average seek time of 15 ms and a data transfer rate of 1.8 MB/sec.
- The 7213 is very quiet—only 35 dBA in idle (spinning) on-track mode with an operating vibration of only 1G.
- The 7213 also provides low power consumption—only 3.7 watts needed to read or write—that's less than other "low power" drives.
- All in all the Maxtor 7213 is the perfect fit for the Mac that needs a little more hard disk space inside.

**Great Prices. Priceless Support!**

**Why Choose APS Technologies?**
- Toll-free technical support—call as often or for as long as you need. See why APS has won 2 MACWORLD Service hero awards!
- Disk-for-Disk Replacement Warranty—you'll probably never need it, but if you do, 90% of our warranty service is performed within 48 hours (most within 24 hours). Return shipping via FEDEX Standard Overnight Service—no charge.
- 24-hour BBS with the latest version of our software.
- 30-Day Money-Back Guarantee • Your risk in the transaction is the cost of shipping.
- Disk-for-Disk Replacement Warranty • All drives come pre-formatted with Apple's latest stable all-platform System software, a 1MB of compacted publicly distributable software, and APS Technologies' "ALLIANCE POWER TOOLS" SCSI formater/hard partitioner.
- Prices & Specifications Subject to Change Without Notice •

**M-F 7AM—9PM CST    SAT 10AM—4PM CST**

Visa/MC, Discover, AMEX—No Surcharge


Alliance Peripheral Systems, 2900 S. 291 Hwy., Independence, MO 64057

1-800 235-2750
Shareware seldom gets a fair shake. When the time comes to pass out awards, the more high-profile commercial products usually get all the glory. But shareware products often deliver a substantial portion of the functions and features that their commercial cousins do — at a fraction of the price. Most people could save hundreds of dollars by substituting just one or two top-notch shareware programs for commercial programs loaded with features they’ll never use.

To give these incredible bargains their own moment in the spotlight, we sent ballots to more than a hundred movers and shakers in the Mac community, ranging from company CEOs to the industry’s best writers, editors, tech-support managers, and others. We asked them to nominate their favorite shareware and freeware in a dozen categories (see the sidebars for some of their specific comments).

We tallied the votes, and here are the results: the very best in Mac shareware and freeware and a tribute to the talented Mac enthusiasts who bring these programs to life. Each program description includes the filename and the library in which you can find the files in the ZiffNet/Mac (Zmac) Download & Support Forum.
System Enhancements

This category produced more nominees than any other. This isn’t surprising, because system enhancements are the most popular type of shareware for the Mac. Their popularity might seem a little odd, given that the Mac is known for its technically superior operating system. These programs prove that even a very good thing can sometimes still be improved.

And the winner is . . .

SuperClock. SuperClock is a well-mannered, intelligent screen clock (see Figure 1). It is always visible in the right corner of the menu bar, unless a screen saver is in operation. PowerBook users will appreciate the program’s new battery-power indicator. Author: Steve Christiansen. Freeware; 18K (SUPERC.SIT, Library 3).

Honorable mentions go to . . .

Boomerang. Boomerang adds a pop-up menu that contains your most recently opened folders and files to the standard file dialog box. It lets you jump instantly to a folder or open a file. Author: Hiroaki Yamamoto. Shareware, $30; 60K (BMR202.SIT, Library 3).

General Utilities

This category also pulled in many nominees: People love to tinker with their Macs, increasing the system heap, managing SCSI devices, and so on.

And the winner is . . .

SCSI Probe. SCSI Probe is a control panel that tells you what devices at a particular address are attached to your SCSI port and lets you mount off-line volumes. Author: Robert Polic. Freeware; 30K (SCSIPR.SIT, Library 3).

Honorable mentions go to . . .

Bootman. Bootman provides a simple, elegant way to increase your system heap and the number of files you can have open. Author: Bill Steinberg. Freeware; 16K (BOOTMN.SIT, Library 1).

Text Tools

When using your word processor is overkill or when you need

Figure 1: SuperClock is the best of the many utilities that can put the time of day — and other useful information — on your menu bar.

Adam C. Engst

Editor and Publisher, *TidBITS*

AppSizer. Michael Peirce’s AppSizer lets you resize the memory partition for an application on launch and optionally save that size as the default (APPSIZ.SIT, Library 3).

TrashMan. I don’t take my trash to the dump, and I don’t want to have to empty my Mac’s trash can either. TrashMan tracks how long a file has been in the trash and destroys it after a user-specified amount of time (TRAMAN.CPT, Library 3).

Carpetbag. Suitcase for the poor. Carpetbag simply opens resource files (fonts, Fkeys, and so on) in a folder as though they were stored in the System file (CARPET.CPT, Library 3).

Remember? An excellent date-reminder program that’s competitive even with some recent commercial releases (REMDA.SEA, Library 2).

Downline. Takes the files stored in a user-specified folder, deBinhexes and unStuffes them, and then puts the output into another user-specified folder. The easiest way to handle a bunch of downloads in succession (DOWNL1.CPT, Library 1).
different features, a variety of shareware text tools stands at the ready.

And the winner is . . .

**McSink.** With its multiple windows, advanced controls, macros, color, and icon-grabbing capabilities, McSink is much more than an ordinary DA word processor/text editor. The program can be upgraded to Vantage, a commercial version of the product, available from Baseline. Author: David McWherter. Shareware, $45; 116K (MCSINK.SIT, Library 2).

Honorable mentions go to . . .

**DOCMaker.** DOCMaker lets you create stand-alone, self-running document files that can run on any Mac. You can use the files to distribute documents without knowing what word processor each recipient has. Author: Mark Wall. Shareware, $25; 170K (DOCMAK.SEA, Library 1).

**miniWriter.** A useful text editor that never seems to fall, miniWriter is one of the most popular pieces of Mac shareware ever. Author: David Dunham. Shareware, $12; 30K (MINIWR.SIT, Library 2).

**DTP/Font Tools**

The DTP arena hasn’t produced a tremendous number of shareware products, but the ones that do exist are top-notch. The winner was chosen by an overwhelming number of the people balloted.

And the winner is . . .

**theTypeBook.** This program is a utility that helps you create and maintain a typeface reference book that demonstrates the various artistic attributes of each face on a printed page. TrueType-compatible. Author: Jim Lewis. Freeware, 102K (TYPEBK.SEA, Library 1).

Honorable mentions go to . . .

**Add/Strip.** Add/Strip automatically performs much of the work necessary to clean up text-only files destined for import into page-layout, word-processing, database, or spreadsheet programs. It lets you substitute or remove em dashes, smart quotes, and so on, all in one pass. Author: Jon Wind. Shareware, $25; 95K (ADDSTR.SIT, Library 1).

**Carpethag.** Carpethag is a shareware clone of Suitcase. It’s not as powerful, but it’s much cheaper. Author: James Walker. Shareware, $5; 35K (CARPET.CPT, Library 3).

**Graphic Tools**

If you’re a budding painter, you can draw and paint yourself into a corner with any of the nominees in this category.

And the winner is . . .

**LightningPaint.** LightningPaint is a remarkable painting-type graphics program. It sports all the usual painting tools and even some unusual ones, such as spiral and starburst tools (see Figure 2). LightningPaint saves files in its own format or in MacPaint, startup-screen, or PICT format. Requires Compact Pro (see later). Author: Humayun S. Lari. Shareware, $14 ($7 for students); 160K (LPAIN.T.CPT, Library 1).

Honorable mention goes to . . .

**AppleDraw.** An older piece of software, this drawing program in a DA provides most of the features casual users will ever need. Author: Gunther Blaschek. Freeware, 32K (APDRAW.CPT, Library 2).
Personal Information Managers/Number Crunching

Taking care of business doesn't necessarily require a corporate bankroll. The programs honored in this category help keep you organized and in the black.

And the winners are... Remember? Remember? is a personal reminder system composed of a DA and a system extension (INIT) that lets you set alarms to notify you of upcoming events, deadlines, and the like. Author: Dave Warker. Shareware, $20; 150K (REMDA.SEA, Library 2). (The documentation, if you need it, is available as the file REMDOC.SEA.)

BiPlane. BiPlane, the “affordable shareware spreadsheet,” is a full-featured business tool (see Figure 3). Features include SYLK-file compatibility with Microsoft Excel, 512 columns by 16,384 rows, 102 functions, and business graphics. When you become a registered user, you get a DA version, Help files, and a 200-page manual. Author: Alan Porter. Shareware, $59; 177K (BiplAN.SEA, Library 1).

Honorable mentions go to... Address Book. This is an address-book application and DA. Address Book prints to envelopes; labels; Rolodex cards; and size B, D, J, and K Day-Timers. Author: Jim Leitch. Shareware, $30; 194K (ADDRBK.SEA, Library 1).

To Do! The To Do! DA is an attractive, well-designed program for keeping track of your daily activities. It’s easy to use and very handy. Author: Andrew Welch. Shareware, $15; 68K (TODO.SEA, Library 2).

System 7 Only

System 7 may be heaven, but there are ways to tweak it, as the programs honored in this category make abundantly clear.

And the winner is... MODE32. MODE32 is a System 7 extension that enables Mac II, IIx, IICx, and SE/30 computers to use 32-bit addressing and access more than 8 megabytes of real or virtual memory. Developed by Connectix and made available through a blanket distribution agreement with Apple, MODE32 is free — kudos to both Apple and Connectix for this generous gift to the Macintosh community. Author: Connectix. Freeware; 40K (MODE32.SEA, Library 3).

Honorable mentions go to... ZMakeAlias. ZMakeAlias puts a Make Alias option inside the Save and Save As dialog boxes for all applications. Author: Mike Throckmorton. A ZiffNet/Mac exclusive. Freeware; 45K (ZMAKEA.SIT, Library 3).

MenuChoice. MenuChoice is a control panel that makes folders in your Apple Menu Items folder show up as submenus on the Apple menu. Author: Kerry Clendinning. Shareware, $15; 50K (MENUCH.SEA, Library 3).

Security/Antiviral Tools

Protecting your data from prying eyes and malicious viruses is an unfortunate necessity. There was no real contest in this category — the winner garnered more votes than any program nominated in any category.

And the winner is... Disinfectant. Disinfectant is
a free virus-prevention and disk-scanning and -repair program (see Figure 4). Version 2.8 includes a new protection INIT and excellent built-in documentation and can detect the latest Mac viruses: MBDF A, INIT1984, and Code 252. The author should be canonized for providing this program to the Mac community. Author: John Norstad, Freeware; 204K (DISINF.SIT, Library 8).

VirusDetective. VirusDetective is an outstanding user-configurable antiviral system. It scans floppies, creates logs, and does much more. Help is built in. Author: Jeff Shulman. Shareware, $40; 164K (VIRDET.SEA, Library 8).

Telemcommunications/Compression

Shrieking and shrinking might be a good subtitle for this category. The winners should come as no big surprise.

And the winners are . . .

ZTerm. ZTerm is a fast, efficient telecommunications program that’s not overloaded with features. It can store settings, phone numbers, and simple macros. ZTerm supports Zmodem, Xmodem, Ymodem, and CompuServe’s QuickB scheme, so you don’t have to switch applications to use older protocols. Author: David Alverson. Shareware, $30; 186K (ZTERM.CPT, Library 1).

Compact Pro. Compact Pro is a file-compression utility that allows you to shrink files so they take up less disk space. Files compressed by Compact Pro are typically smaller than those compressed by StuffIt 1.5.1. You can also create auto-extracting archives to send to someone who doesn’t have Compact Pro. Author: Bill Goodman. Shareware, $25; 120K (CPTPRO.SEA, Library 1).

StuffIt Classic Installer. This self-extracting archive installs StuffIt Classic, the shareware version of StuffIt Deluxe. Author: Raymond Lau. Shareware, $25; 378K (STUFCL.BIN, Library 1).

StuffIt Expander. StuffIt Expander is a must-have free compression utility that decompresses files from any of the StuffIt formats as well as files from Compact Pro and AppleLink packages. Author: Aladdin Systems. Freeware; 71K (STUFEX.SEA, Library 1).

Connectivity

With Apple and IBM cozying up to one another, having the right connections is definitely a plus. Being able to “talk” the other platform’s lingo or move files through different formats is a must, and the honorees in this category make that a whole lot easier.

And the winner is . . .

GIFConverter. This program lets you view GIF, TIFF, RIFF, RLE, PICT, startup-screen, paint, or ThunderScan files on any Mac. GIFConverter also allows you to save files to any of these formats or to EPS or print them to any Mac printer. It’s a great connectivity tool. Author: Kevin

Mike O’Connor

Author of the CompuServe Navigator program

TattleTale. I like TattleTale best, probably because I’m a Mac developer. It has the most useful information about what is installed on your system (TATAPP.SEA, Library 1).

DOCMake. I like DOCMake because with it you don’t have to worry that others can’t read your important documents, even if you don’t know what text editors they have (DOCMAK.SEA, Library 1).

UnZip. I recommend the version with the extra command that automatically sets the proper Mac Type and Creator codes on the files it expands — I wrote that added command but not the rest of the program (UNZIP.SIT, Library 1).
Mitchell. Shareware, $40; 295K (GIFCON.CPT, Library 1).
Honorable mention goes to . . .
UnZip. UnZip lets Mac users de-archive Zip files, allowing access to material compressed in the DOS world’s equivalent of Stuffit. Authors: Samuel Smith and others. Freeware; 40K (UNZIP.SIT, Library 1).

**Children’s/Educational**

Children and monks may not seem to go together, but they both showed up on our voters’ list of favorite children’s or educational shareware programs.

And the winner is . . . **Kid Pix.** Kid Pix 1.0 is the free version of the popular children’s painting program (see Figure 5). It doesn’t have all the bells and whistles of the commercial version (no color, not as many wacky brushes, and no digitized sounds), but it’s still wildly fun and fully functional. An enhanced color version is available from the author for $25. Author: Craig Hickman. Freeware; 44K (KIDPIX.CPT, Library 1).

Honorable mention goes to . . .

**If Monks Had Macs . . .**

If Monks Had Macs, a collection of several stacks, is one of the most beautiful and elaborate works in HyperCard. The stacks range from a medieval religious work to messages on a contemporary bulletin board on the meaning of life. The entire collection is too large to provide for downloading, but ZipNet/Mac has four sample stacks in Library 6: The White Rose (MONKS1.SIT); Passing Notes (MONKS2.SIT); Haiku Master (MONKS3.SIT); and Meat & Conversation, which is actually a delightful adventure game (MONKS4.SIT). Each stack includes instructions on ordering the entire collection. Authors: Philip Mohr and Brian Thomas. Freeware.

**Trivial Pursuits**

All work and no play would make even our extremely likable balloters dull boys and girls.

And the winner is . . .

**Klondike.** Klondike is a straightforward simulation of real solitaire, which may not sound like much to get excited about unless you’re very, very lonely, but this is an elegantly designed program.

If you even get color suits on the Mac II. It’s a classic. Author: Michael Casteel. Shareware, $10; 50K (KLONDIL.SIT, Library 1).

Honorable mentions go to . . .

**Solarian II.** A high-quality color arcade game set in an outer-space environment where you’re attacked by a zoo of interesting characters. Author: Ben Haller. Shareware, $25; 528K (SOLARI.SEA, Library 1).

**Pacman.** This version of Pacman is the best we’ve seen. It’s vivid and colorful and brings back great memories of the arcade video-game classic. Requires a 13-inch Apple color monitor set to 256-color mode. Author: M. Tsuji. Freeware; 26K (PACMAN.CPT, Library 1).

Gregory Wasson is the chief sysop for ZipNet/Mac’s Download & Support Forum and is writing a book about Macintosh shareware and freeware for ZD Press.
600 reasons why your  
should be

No Apple LaserWriter  
delivers more than  
300 dpi—no matter how  
much you spend.

Announcing the first 600 dpi printer that's in­stantly compatible with your Macintosh and your  
budget: the new IBM LaserPrinter 10A.  
For just under $4000,  
it delivers what no Apple LaserWriter can at any price:  
true 600 x 600 dpi PostScript® printing. Up to four times  
the resolution of a LaserWriter printer,  
in a compact desktop package. High  
resolution, without the high finance.  
Beneath the unlikely nameplate  
of the IBM LaserPrinter 10A beats  
the heart of a born Macintosh printer:  
speedy Motorola 68020 processor,  
built-in LocalTalk connector, ample  
5MB memory and PostScript soft­ 
ware from Adobe.°  
You also get the razor-sharp print quality,  
superb paper handling and reliability that won the
next Macintosh printer an IBM.

But the IBM Laser Printer 10A gives you true 600x600 dpi output—for under $4000.

The IBM Laser Printer 10A for the Macintosh. Insanely great printing, at a surprisingly rational price.

The new IBM Laser Printer 10A won't monopolize your desk. Or your budget.

IBM Laser Printer 10
a host of major awards from PC Magazine, Windows Magazine and PC Digest. Plus compatibility with System 6 and 7, elegant documentation, even a customer-support phone line, just in case.

The IBM Laser Printer 10A comes to you from Lexmark:

IBM Personal Printers by
LEXMARK™

Make Your Mark

worldwide developer, manufacturer and distributor of IBM personal printers, typewriters, keyboards and related supplies. For your nearest dealer, call 1 800 358-5835 (in Canada, 1 800 663-7662).

The new IBM Laser Printer 10A for the Macintosh. Insanely great printing, at a surprisingly rational price.

IBM Personal Printers by
LEXMARK™

Make Your Mark
Output Devices

PostScript Printing

That Won't Break the Bank

Can the average small-business user afford PostScript compatibility?
We test 21 printers that say yes.

BY BRUCE FRASER

Personal PostScript printing was once reserved for big-wigs in big companies with big budgets. In most offices, a PostScript printer was a shared resource. Like the office photocopier, one printer was shared by an entire workgroup, and you walked a mile for your printouts. Today, as the price of PostScript plummets, printers are more like typewriters than like photocopiers — they're becoming part of each office worker's standard arsenal: desk, chair, computer, wastebasket, printer. Even if your company's budget is limited, you can now afford to put a PostScript printer onto your own desk without bringing on bankruptcy.

To help you make this move toward personal productivity, MacUser Labs tested 21 personal PostScript printers for speed, image quality, and ease of use. Each printer costs less than $3,000. Each offers a resolution of at least 300 dpi. Each is suitable for use by an individual or by a workgroup of ten people or fewer. Each produces monochrome images acceptable for day-to-day business documents.
Personal PostScript Printers

If you require higher-quality output — for desktop publishing, for example — we recommend that you use a high-resolution printer (see "Practically Perfect Printing: High-Resolution PostScript Printers," February '92, page 172). If you need your printer to run all day, every day, churning out reams of reports and correspondence, buy a heavy-duty workgroup printer (see "Getting Down to Business: Workgroup Printers," September '91, page 128). But if you need fewer than 20,000 PostScript-quality pages each month, wait no longer.

Smart Printing

All PostScript-compatible printers — whether they're high-resolution, workgroup, or personal — include an interpreter, which is a combination of hardware and software that creates a printable image from information sent by the Mac. The printer’s internal microprocessor manages this imaging process, so your Mac is free to do other work while the printer RIPs (raster-image-processes) the page. By contrast, QuickDraw printers have no interpreters or microprocessors; they rely on the QuickDraw driver in the Mac and the Mac's microprocessor to RIP the image, tying up the Mac during printing.

Many of the printers we tested use a RISC (reduced-instruction-set computing) processor (see Table 1). RISC processors use simpler low-level instructions than do CISC (complex-instruction-set computing) processors such as the Motorola 68000-series processors found in many printers and in your Mac. RISC processors are faster as a result.

Most of the printers we tested use PostScript interpreters licensed from Adobe, earning them the name true Adobe PostScript printers. The others — the Bézier BP4040, Brother HL-4PS, Everex LaserScript LX, and NewGen Personal Series Turbo PS/300P and PS/400P — use non-Adobe interpreters that are compatible with the PostScript page-description language. They’re known as PostScript-clone printers. What’s the difference for users? We’ll get to that a little later.

Of the 16 true Adobe PostScript printers, 5 — the Dataproducts LZR 960, Hardware That Fits RealTech Laser, MacFriends QuickorTS, NEC Silentwriter Model 95, and Texas Instruments microLaser Turbo — use Adobe’s new PostScript Level 2 interpreter. We tested the Hewlett-Packard LaserJet IIIIP with its optional PostScript Level 2 upgrade cartridge. The rest use Adobe’s PostScript Level 1 interpreter (see the “What Is This Level 2, Anyway?” sidebar).

We compared each printer’s performance with that of the familiar Apple Personal LaserWriter NT, a PostScript Level 1 printer. The results were clear: PostScript printers — those using Adobe PostScript as well as those using PostScript clones — are getting faster and less expensive. Almost all the printers we tested were significantly faster in all-around performance than the NT was (see Figure 1). By the time you read this, Apple will have phased out the venerable NT. Look for a report on its replacement, the Apple Personal LaserWriter NTR, in a future issue.

Who Are You?

No one personal printer is right for everyone. A model that cranks out letters with blazing speed might reduce the pie charts in your financial reports to ellipsoidal smudges. Another printer that produces clean, beautiful graphics might print your correspondence at a snail’s pace. Several
Designated Drivers

Your Mac’s operating system includes an imaging model called QuickDraw that ensures that what’s on-screen will match what’s printed. This one-to-one correspondence between screen and printer is called WYSIWYG (what you see is what you get).

From an application’s point of view, drawing text and graphics on your Mac’s screen is virtually identical to sending the same images to a printer. The basic difference is the size and shape of the area to which the application draws.

QuickDraw provides the “paper” onto which the application can draw text and graphics. This virtual paper is called a grafPort and is made available to the application through QuickDraw by the driver software provided for each screen or printer used by your Mac. Each grafPort has a specific size and shape, depending on the output device; a grafPort for a video screen, for example, has a different size and shape from a grafPort for a printed page.

The LaserWriter driver provides a printer grafPort to the application. The driver translates QuickDraw commands into PostScript commands for the printer.

The path from the application to the screen is similar, except that the video grafPort is a different size and the video driver translates QuickDraw into video information.

The same QuickDraw commands, drawn into different grafPorts, cause the same text and graphics to be output to two different devices with different resolutions.
Overall Performance:

To arrive at an overall ranking of the 21 printers, we gave equal weight to the subjective and objective scores. Because of its exceptional speed, the Texas Instruments microLaser Turbo came out on top. The MacFriends QuicKor TS edged out the Texas Instruments microLaser Plus PS35 in the race for second place.

15-Page Word Document:

Our technicians printed a 15-page Microsoft Word document that used a single printer-resident font: 12-point Times Roman. The Texas Instruments microLaser Turbo and the Panasonic KX-P4455 led the pack, and the Hewlett-Packard LaserJet IIIIP turned in the slowest time. (Average print times in minutes and seconds are shown at the beginning of each printer’s bar.)

Centronics

5-Page Excel Spreadsheet:

We printed a simple Excel 3.0 spreadsheet to see how the printers handled simple graphics elements such as cell borders and screened cells, tasks that call on processing power in addition to engine speed. The Texas Instruments microLaser Turbo again took first place, followed closely by the microLaser Plus PS35. The Hewlett-Packard LaserJet...
5-Page Persuasion Document: Our pièce de résistance: A five-page Persuasion document that included text in a variety of font formats plus placed PICT, gray-scale-TIFF, and EPS files pushed the printers’ processors to their limit. One PostScript Level 1 printer, the GCC BLP II, was unable to finish the job (its unique — but memory-hungry — edge-to-edge-printing feature proved to be the culprit), and all the PostScript Level 2 printers required additional RAM. Once again, the Texas Instruments microLaser Turbo was the fastest. The next-fastest speed was turned in by the Epson EPL-7500, followed closely by three more RISC-based printers. The Hewlett-Packard LaserJet IIIP took more than half an hour to print this document. (Average print times in minutes and seconds are shown at the beginning of each printer’s bar.)

Text Quality: Our jury scrutinized a variety of output samples from each printer, checking for smooth edges of large fonts and readability at small point sizes. The slow-going Hewlett-Packard LaserJet IIIP produced the cleanest text. The NewGen Personal Series Turbo PS/300P failed to impress.

Graphic-Image Quality: The jury pored over graphics that included a gray-scale image, solid-black areas, and large reversed type, looking for the crispest output. The NewGen Personal Series Turbo PS/300P’s 400-dpi output easily took first place, but its 300-dpi sibling, the NewGen Personal Series Turbo PS/300P, trailed the pack.
variables influence printer performance, and their relative importance varies, depending on the number and kind of documents you need to print.

Speed, for example, is a product of several factors. One is engine speed, which is measured in pages per minute (ppm). Another is processor speed, which is rated in megahertz (millions of cycles per second). Yet another is the type of PostScript interpreter the printer uses: In our tests, the clone printers, even those with fast-rated processors, were slower than the true Adobe PostScript printers.

If you work mostly with text and use the printer's resident fonts (the fonts contained in your printer's ROM) to print simple text documents, then a printer's engine speed should be high on your list of buying considerations.

If, on the other hand, much of your output contains graphics such as bar graphs, pie charts, line drawings, or gray-scale images, engine speed is an almost meaningless factor: Printers never achieve anywhere near their rated engine speeds on such complex documents, because the engine has to wait for the printer's microprocessor.

In theory, the faster a printer's processor, the faster the printer performs when printing complex graphics. In practice, however, things aren't that simple, as evidenced by the lackluster performance of some of the RISC-based printers in our speed tests. If you need a printer that turns in speedy performance for complex graphics, you should pay particular attention to the results of our Persuasion file test, which incorporates graphics imported from other applications as well as several nonresident fonts (which must be downloaded from the Mac) in a variety of point sizes.

Paper capacity is a consideration that's often overlooked. The Bézier BP4040, Brother HL-4PS, Hewlett-Packard LaserJet IIP, NewGen Personal Series Turbo PS/300P and PS/400P, and QMS-PS 410 come with a single multipurpose foldout paper tray capable of handling 50 sheets of 24-pound stock. Some manufacturers describe these as 70- or 75-sheet trays, but such capacity is the case only if you use lighter paper, such as 16-pound stock. Standard xerographic paper is 20-pound stock, and most letterhead paper is 24-pound stock.

These small paper trays may be sufficient for a single user producing short documents. But if you do a significant amount of printing or if you plan to share your personal printer in a multiuser office that cranks out lots of text, someone probably the unlucky soul who sits nearest the printer will get plenty of exercise refilling the paper tray. All of these printers do offer optional 250-sheet second trays at additional cost. The other printers come standard with 150-, 200-, or 250-sheet trays — a much more convenient configuration.

We found that loading consumables — toner, drum, developer — into the

How We Tested

To test these 21 Personal PostScript printers, we created a suite of documents designed both to simulate a typical business user's requirements and to highlight various aspects of printer performance. We then used a stopwatch to time each printer's performance on each of the documents, from the time we clicked on the Print button to the time the last page landed in the tray — the "click to clunk" time, in printer-testing jargon.

To make sure our timing tests were consistent, we standardized several factors. We used Mac IIs with 80-megabyte hard drives running System 7.0.1 installed with the Standard selection and revised with Tune-Up 1.0. We used Apple's LaserWriter driver 7.1 printer driver — except when testing the Bézier BP4040 and the Brother HL-4PS, which proved incompatible with the LaserWriter driver 7.1; for their testing, we substituted the previous driver, LaserWriter driver 7.0. We also made sure that the RAM-cache setting in the Memory control panel remained unchanged from test to test (we set it to 128K) — the cache size can make a significant difference in the performance of the printer driver and hence to printing speed.

Before we commenced testing, we printed a "break-in" page on each printer. This ensured that the printer was initialized (we had already sent the Apple PostScript dictionary to the printer) before we started our tests. We ran each test three times and took the average of the printing times. We then calculated our results relative to those of an Apple Personal LaserWriter NT, which was given a score of 1.0 on every speed test. These normalized scores (with the averaged print times superimposed on the bars) appear in Figure 1.

Our test suite consisted of a 15-page Microsoft Word document formatted in 12-point Times Roman, a printer-resident font; a 5-page Microsoft Excel spreadsheet that contained some simple graphic elements such as cell borders and shaded cells; and a 5-page Aldus Persuasion document. This document contained type in both small and large sizes; PICT, EPS, and gray-scale-TIFF graphics; and downloadable fonts in both Adobe Type 1 and Apple TrueType formats. We also output the first page of the Persuasion file to 3M overhead transparencies to see how the printers handled this medium. All were able to print on it without jamming and without melting the material.

Finally, we used the Persuasion file to judge image quality. We used a "blind" jurying system, in which the print samples were identified to the jury only by number. We looked at five type samples per printer: 10-point type, 48-point type, 18-point reversed type, a gray-scale image, and a solid-black area. We then compared the image quality produced by each printer with that produced by an Apple Personal LaserWriter NT, assigning the latter a score of 1.0 for all the tests.

Here are some guidelines for testing printers yourself. First, make sure that the only variable in your test is the printer. It's important that you use an identical setup, in terms of both hardware and software, to drive each printer. Differences in the CPU, hard-disk speed, and in system-software versions can make big differences to print times. Try to emulate your office setup as closely as possible, because that's the configuration you'll ultimately be using.

Second, create test documents that typify your actual use of the printer and try to include a good mix of text and graphics. Very often, a printer excels at printing one type of document but not another. By using a mix of different document types, you can obtain a good sense of a printer's overall capabilities.
printers was easy, except in the case of the Panasonic KX-P4455, which uses toner from a bottle — a potentially messy operation. The Epson EPL-7500, the NEC Silentwriter Model 95, and all the printers based on the Canon engine use a single cartridge containing the drum, the developer, and the toner. The others use separate drum, toner, and developer.

**Are We Compatible Yet?**

Your Mac’s operating system provides a **printer driver** to convert QuickDraw information from the computer into PostScript for the printer (see the “Designated Drivers” sidebar). As Apple updates the Mac’s operating system, the driver gets updated as well. For example, when we began testing these printers, we used the most current driver then available, which was LaserWriter driver 7.1, distributed with System 7 Tune-Up 1.0. (As this report went to press, LaserWriter driver 7.1.1 had been announced.)

Two of the PostScript-clone printers — the Bézier BP4040 and the Brother HL-4PS — could not print with LaserWriter driver 7.1, although they worked perfectly with the previous driver, 7.0. Another clone, the Everex LaserScript LX worked with LaserWriter driver 7.1 but not with the previous driver, 7.0. Given that Apple replaced the 7.0 driver with 7.1 rather quickly, it may be safe to conclude that the problem with the Everex printer was with Apple’s driver and not with the printer. However, we were unable to get a definitive policy statement from Apple on whether it plans to accommodate PostScript clones when it delivers future printer drivers.

**Thanks for the Memory**

PostScript printers are equipped with RAM to accommodate the commands sent from the computer, the calculations performed by the interpreter, and the bit map created at the last stage before printing. Each of the printers in this report ships with a standard configuration of 1.5 to 4 megabytes of RAM.

We ran into some memory problems in printers that use Adobe PostScript Level 2. When we attempted to print our complex graphics file, the Level 2 printers with 2 megabytes of RAM — the Dataproducts LZR 960, Hewlett-Packard LaserJet IIIP, Mac-Friends QuicKor TS, and NEC Silentwriter Model 95 — failed to finish printing the five-page Persuasion document. Some stopped printing after one or two pages, some after four. Increasing their RAM to 4 megabytes each solved the problem.

The other Level 2 printer, the Texas Instruments microLaser Turbo, ships with 2.5 megabytes of RAM — .5 megabyte soldered onto the motherboard and 2 megabytes soldered onto a daughterboard (a card that plugs in to the motherboard). Texas Instruments also offers 1-megabyte and 4-megabyte upgrades, which plug in to the daughterboard. When we installed a 1-megabyte upgrade, for a total of 3.5 megabytes of RAM, the microLaser Turbo printed the Persuasion file faster than any of the other printers did.

Despite Adobe’s claims of PostScript Level 2’s improved memory management, 2 megabytes of RAM may be inadequate in a Level 2 printer — unless you print only relatively simple pages like our Word and Excel documents. It’s worth noting that Apple has increased the minimum RAM configuration of its LaserWriter IIIf and IIg, both Level 2 printers, to 4 megabytes — without increasing the base price.

**The Tests**

Because different users have different needs, we ran speed tests on three types of documents. The first was a 15-page Microsoft Word document using a single printer-resident Adobe Type 1 font, Times Roman. The second was a 5-page Microsoft Excel...
spreadsheet containing some simple graphics: screened and bordered cells but no bar charts. The third was a 5-page Aldus Persuasion file that contained complex graphics imported from other applications as well as downloadable fonts — fonts that do not reside in printer ROM and therefore must be downloaded or fed to the printer by the computer — in Adobe Type 1 and Apple TrueType formats.

The Word-file test proved what we suspected all along: The most significant factor affecting performance in printing a simple word-processed document is engine speed. The 4-ppm printers finished behind the 6-ppm printers, which in turn finished behind those with faster engines. Only two printers, the 4-ppm Bezier BP4040 and the 4-ppm Hewlett-Packard LaserJet IIIIP, were slower than our baseline printer, the 4-ppm Apple Personal LaserWriter NT. As expected, the 11-ppm Panasonic KX-P4455 turned in one of the fastest times, sharing first place with the 9-ppm Texas Instruments microLaser Turbo. Both were followed closely by the 9-ppm Texas Instruments microLaser Plus PS/35, which was just a few seconds slower.

However, we were struck by the fact that the printers based on Okidata’s 8-ppm engine — the GCC BLP Elite 8 and BLP IIIS and the Okidata OL-830 and OL-840 — all finished ahead of three 9-ppm PostScript Level 2 printers — the Dataproducts LZR 960, the Hardware That Fits RealTech Laser, and the MacFriends QuicKor TS, the latter two of which are private-label versions of the Dataproducts printer.

To check for compatibility, we repeated this test with Apple TrueType fonts loaded instead of the Adobe Type 1 bit maps. In many cases, we noted a slight delay in printing TrueType, although all the printers were able to handle it.

### Simple Graphics

If you print documents that include simple graphics, such as borders and screened cells in a Microsoft Excel spreadsheet, the speed of the PostScript interpreter and the processor will be almost as important as the printer’s rated engine speed. For example, the Panasonic KX-P4455, with a slow Motorola 68000 processor, slipped down into the middle of the pack in our tests, despite its 11-ppm engine. The winners were the two Texas Instruments 9-ppm printers, followed closely by the 8-ppm GCC and Okidata printers and the 9-ppm Dataproducts LZR 960, Hardware That Fits RealTech Laser, and MacFriends QuicKor TS Level 2 printers. The NEC Silentwriter Model 95 turned in a disappointing performance, finishing behind several 4-ppm printers, despite its 6-ppm engine. This may indicate that the Silentwriter’s 16-megahertz Motorola 68000 processor is underpowered for a PostScript Level 2 printer.

Four of the PostScript-clone printers — the Bezier BP 4040, the Brother HL-4PS, and the two NewGen printers — were slower than the baseline Apple Personal LaserWriter NT, even

### On the Horizon

Despite the plethora of high-quality personal PostScript printers flooding the market, even more vendors are jumping into this fast-growing field. The long-established Mac-peripherals vendor Mirror has joined the growing list of companies selling a version of the Dataproducts LZR 960 PostScript Level 2 printer. The 9-ppm MirrorImage 309 is offered at $1,699 with a single 250-sheet paper tray or at $1,999 with two paper trays. Mirror Technologies, Inc., 2644 Patton Road, Roseville, MN 55113; 612-933-4490.

Samsung Electronics America has entered the laser-printer market with the Finalé 9600. The base model, priced at $1,995, uses a 300-dpi 8-ppm print engine developed by Samsung and includes two 250-sheet paper trays. This PostScript-compatible printer uses a 16-megahertz Intel i960 RISC processor and ships with 2 megabytes of RAM. Slated for October availability, Samsung’s $995 ImageKit upgrade package will add PostScript Level 2 compatibility, 600-dpi resolution, gray-scale and line-art resolution enhancement, and an extra 4 megabytes of RAM. An additional $795 provides plain-paper fax printing too. Samsung Information Systems, 301 Mayhill Street, Saddle Brook, NJ 07668; 201-587-9600.

IBM spin-off Lexmark International now offers the $2,695 IBM LaserPrinter 6A, targeted specifically at the Mac market. In addition to the Big Blue logo, the 6A features a 6-ppm Lexmark engine and an Adobe PostScript interpreter driven by a 10-megahertz Motorola 68000 processor. POET (Print Quality Enhancement Technology) is standard, and this 300-dpi printer can be upgraded to true 600-dpi resolution with the addition of a $799 4-megabyte RAM upgrade. A further option is a performance upgrade that increases the speed to 10 ppm in 300-dpi mode. Unlike other IBM laser printers, the 6A has only one interface, LocalTalk. Lexmark International, 7401 New Circle Road N.W., Lexington, KY 40511; 606-232-2000.

Given the speed with which they turn trees into wastepaper, environmentally friendly laser printers may seem like an oxymoron. But Kyocera has developed an entirely new printing technology for its Ecosys aSi printers, cutting down on toxic wastes by doing away with disposable cartridges entirely. The printer drum’s surface is coated with amorphous silicon, an extremely hard material that lasts much longer than the selenium used in disposable laser-printer cartridges. The aSi drum is combined with a long-life developer/fuser/LED imaging system that Kyocera guarantees for three years or 300,000 pages — equivalent to the life of about 60 disposable printer cartridges. And the microfine toner, dubbed Ecotone, is embedded with ceramic particles that continuously consolidate and polish the aSi drum. The toner container is made of a special plastic that, when burned, releases only water vapor and carbon dioxide, further reducing the amount of solid waste produced.

Kyocera claims that the first Ecosys printer, the 10-ppm FS-1500A, has a per-page cost of only .78 cent, as opposed to 3.1 cents per page for comparable laser printers. The base price of the FS-1500A is $2,385. A LocalTalk interface and a PostScript-compatible interpreter that uses Kyocera’s own PostScript clone are optional extras. Kyocera, 100 Randolph Road, Somerset, NJ 08875; 908-560-3400.
Prices for a fully-configured PostScript®-language printer start here.

Compatible with PCs and Macs® simultaneously, the NEC Silentwriter Model 95 sets itself to the active interface port and appropriate language—Adobe PostScript Level 2 or HP's PCL3—and prints sharp-edged images using microfine toner at six pages per minute.

Some bargain down to here.

Or, even here.

But NEC's Silentwriter Model 95 starts here and ends here. $1,749.

For information, dial 1-800-NEC-INFO (in Canada, 1-800-343-4418). Or via fax, call NEC FastFacts® at 1-800-366-0476 and request # SWM95.

Because upward is the way you want to go.
though most of them had fast RISC-based processors. The Bézier BP4040, which uses Microsoft’s TrueImage PostScript-clone page-description language, was particularly sluggish. But the Hewlett-Packard LaserJet IIIP turned in by far the slowest time of all, taking two and a half times as long as the winner, the Texas Instruments microLaser Turbo. We believe that Hewlett-Packard’s use of a cartridge for providing PostScript Level 2 slows this printer down.

**Complex Graphics**

Our Persuasion document tested performance on complex processor-intensive graphics-laden print jobs — just like the quarterly financial report you might distribute at an in-house presentation or the brilliantly conceived prospectus that’s sure to woo that new account. Here the fast processors won out, but with one caveat: As we explained earlier, RAM is important too. We had expected the Texas Instruments microLaser Turbo to do extremely well on this test, as it did on the others. But like that of the other Level 2 printers, its standard RAM configuration proved insufficient for printing the document. More on-board RAM, please?

The GCC BLP II was the only Level 1 printer that was unable to print the document with its standard 2-megabyte RAM configuration — but only because of its unique edge-to-edge printing feature. Most printers must reserve minimum top-, left-, and right-margin areas for grasping the paper and feeding it through the mechanism. GCC’s BLP II-series printers grasp the page only at the top, which permits full-bleed printing — all the way to the right and left edges of the paper, with no margins. This larger print area requires more RAM for imaging the page — and users can’t turn this feature off. The GCC BLP IIS, which ships with 4 megabytes of RAM, was able to print the file without having any problems.

The fastest time of all was turned in by the Texas Instruments microLaser Turbo with its RAM upgraded to 3.5 megabytes. The Epson EPL-7500, which combines PostScript Level 1 with a fast 8-megahertz Weitek XL 8200 RISC processor, placed second. Next came the MacFriends QuicKor TS, the Hardware That Fits RealTech Laser, and the Dataproducts LZR 960, each with PostScript Level 2 and a slightly slower 6.25-megahertz Weitek RISC processor. The QMS-PS 410, NewGen Personal Series Turbo PS/300P, Bézier BP4040, and both GCC Elites also turned in respectable performances, as did the NewGen Personal Series Turbo PS/400P. And considering that the 400-dpi NewGen printer had to process considerably more information than did the 300-dpi printers, it performed impressively.

Three printers — the Okidata OL-830; the Brother HL-4PS; and bringing up the rear again, the Hewlett-Packard LaserJet IIIP — were slower at printing the Persuasion file than the baseline Apple Personal LaserWriter NT was. The Panasonic KX-P4455, despite its 11-ppm engine, was only marginally faster than the Apple printer.

**Engines and Image Quality**

The time required to print any page is important, but it’s only a part of the total picture. How the page looks is also important. Image quality is mainly a function of the print engine, the mechanism that transfers the toner to the page, and its controller, the electronics that manage the print engine. In the 21 printers we looked at, eight different print engines were used. Sometimes the same engine produced different image-quality results in different printers, but those differences were minimal. The NewGen Personal Series Turbo PS/400P was the only one of the printers that stood out from the rest of the pack in terms of graphic image quality, clearly because of its...
THE NEW COLORSTREAM/DS DYE-SUB PRINTER MAKES HANDLING FUTURE UPGRADES OR MIXED HARDWARE ENVIRONMENTS AS EASY AS INSERTING A ROM CARD.

A photo-quality dye-sub printer shouldn't just be state-of-the-art today; it should be able to stay state-of-the-art tomorrow. Which is why we've developed the new Shinko CHC-S446i ColorStream/DS. Designed with enormous memory capacity (up to 38 Megabytes of RAM), the ColorStream/DS can outpace any printer in its price range. And the prints? With 16.7 million colors available at every pixel, dazzling 300 DPI resolution and a full 8.5" x 11" printing area, the ColorStream/DS produces images that are astonishingly vivid, crisp and true. But we've also built the ColorStream/DS to fit beautifully into the future. Its two Function Card slots let you take full advantage of innovations like Pipeline's PowerPage 24-bit PostScript®-compatible interpreter — or accommodate other future font and emulation upgrades — by simply inserting a new ROM card. And as for hardware compatibility, the ColorStream/DS knows virtually no limits. Equipped with printer ports for AppleTalk, Centronics, RS-232 and SCSI interfaces, it continuously scans all ports for new Am29050 RISC processor for high-performance, high-speed color imaging. The new ColorStream/DS. For the future of color printing in a printer you can own...right now.

To learn more, or to place your order, call Mitsubishi International at (914) 997-4900 or (408) 980-1100.
Personal PostScript Printers

The Bottom Line

Our all-around favorites are the Dataproducts LZR 960 ($2,195 list, $1,800 street) and its two private-label cousins the Hardware That Fits RealTech Laser ($1,695 direct) and the MacFriends QuicKor TS ($1,588 direct). All three feature PostScript Level 2 interpreters based on the Weitke XL 8200 RISC processor and fast 9-ppm Sharp engines. Standard features include 250-sheet paper trays, SCSI ports for connecting hard-disk drives, and automatic switching between serial and parallel ports — enough standard equipment to make these printers sturdy and talented workhorses. Dataproducts and Hardware That Fits offer second trays at $389 and $199, respectively. An optional legal-sized tray, two additional toner cartridges, and a cable are available from MacFriends for $100. But remember, with PostScript Level 2 printers, the standard 2-megabyte RAM configuration is inadequate for printing complex documents: If you print lots of graphics, be prepared to spend an additional $200 to $350 to upgrade to 3.5 or 4 megabytes.

If pure speed is what you need, consider the Texas Instruments microLaser Turbo ($2,349 list, $1,950 street). It's a Level 2 upgrade of the Level 1 Texas Instruments microLaser Plus PS35 ($1,849 list, $1,400 street) — also a top performer. Kudos also go to the GCC BLP 11S ($2,599 direct). It features edge-to-edge printing and an 8-ppm engine, and it was the only printer we tested that comes standard with 4 megabytes of RAM. It also ships with two 200-sheet paper trays and is a great small-business printer.

Honorable mention goes to the NewGen Personal Series Turbo PS/400P ($2,595 list, $2,195 street). It's no speed demon, but in our tests, its 400-dpi resolution produced graphic images that were noticeably superior to those of any of the other printers, which were limited to 300-dpi resolution. (The Hewlett-Packard LaserJet IIIP scored the highest marks for text quality but was painfully slow.)

Let's Get Personal

After we tested, prodded, and peered at the output from these 21 personal PostScript printers, the results were clear: PostScript printing is faster and less expensive than ever before. However, when our expert jury examined output samples from each printer, it found one difference that was attributable to the PostScript interpreter rather than to the engine or its controller. One component of our test page was a 48-point Optima headline. The printers from Bézier, Brother, Everex, and Panasonic; the NewGen Personal Series Turbo PS/300P; and the Okidata OL-840 all had intermittent difficulty reproducing the curved indentations, or cups, in Adobe's Type 1 Optima font family (see Figure 2).

In the case of the clone printers, this may indicate a problem with reading the hinting, the special instructions built in to PostScript Type 1 fonts for improving a font's appearance on 300-dpi laser printers. The Okidata OL-840 and the Panasonic KX-P4455 — both true Adobe PostScript Level 1 printers — lack the ATM font rasterizer, a software routine that converts outline data into scalable curves and that is built in to later versions of Adobe's PostScript interpreter. By the time you read this article, however, Okidata should be selling the OL-840 with the same PostScript ROM as the OL-830, which includes the font rasterizer.

Top personal-PostScript-printer honors are shared by the fast PostScript Level 2-equipped Hardware That Fits RealTech Laser (top), MacFriends QuicKor TS (middle left), and Dataproducts LZR 960 (bottom right). The Texas Instruments microLaser Turbo (middle right) is our choice for high-speed printing; the dual-tray GCC BLP 11S (bottom left) is ideal for a small office or workgroup.

But be forewarned: PostScript-clone printers still have a way to go before they can rival true Adobe PostScript printers. Even ignoring compatibility problems with newer Apple drivers, the clones we tested couldn't compete in terms of speed and price, even though many use fast RISC-based processors. The one exception is the NewGen Personal Series Turbo PS/400P, which offers superior image quality, because of its 400-dpi resolution. Look at "The Bottom Line" for our picks.

Bruce Fraser is the author of Adobe Illustrator 3.0 Complete and Using Fredland 3.0. He lives in San Francisco's foggy Sunset district and eats free fonts for breakfast.
THE RASTEROPS CORRECTPRINT 300.
ITS OUTPUT IS YOUR INCOME.

The RasterOps CorrectPrint 300 is the truly affordable photorealistic color printer that’s as good as gold. It saves you time and money because you no longer have to send out for color prints. And its beautiful, high-resolution output helps you sell your ideas more successfully. Whether you use the RasterOps CorrectPrint 300 for presentation overheads, layouts, comps or image retouching, its output will ensure your ideas don’t go flat on paper.

This high quality color printer is 300 dpi PostScript® language compatible and network ready. The RasterOps CorrectPrint 300.

Things have never looked so good for your business! Call 1.800.SAY.COLOR for the dealer nearest you.

NEW!
ONE YEAR EXTENDED WARRANTY!
## Table 1: Features of Personal PostScript Printers

<table>
<thead>
<tr>
<th>Company</th>
<th>Apple Personal LaserWriter NT</th>
<th>Brother HL-4PS</th>
<th>Dataproducts LZR 960</th>
<th>Epson EPL-7500</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$2,599</td>
<td>$2,595</td>
<td>$2,195</td>
<td>$2,999</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$1,399</td>
<td>$1,600</td>
<td>$1,800</td>
<td>$2,000</td>
</tr>
<tr>
<td></td>
<td>Convenient consumables.</td>
<td></td>
<td></td>
<td>Two-year warranty.</td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpreter</strong></td>
<td>PostScript Level 1</td>
<td>BzScript</td>
<td>PostScript Level 2</td>
<td>PostScript Level 1</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td>Canon LX</td>
<td>Canon LX</td>
<td>Sharp</td>
<td>Microra SP101</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td><strong>Engine life</strong></td>
<td>150,000 pages</td>
<td>150,000 pages</td>
<td>not rated</td>
<td>180,000 pages</td>
</tr>
<tr>
<td><strong>Monthly duty cycle</strong></td>
<td>not rated</td>
<td>5,000 pages</td>
<td>25,000 pages</td>
<td>3,000 pages</td>
</tr>
<tr>
<td><strong>Microprocessor, speed</strong></td>
<td>Motorola 68000, 12 MHz</td>
<td>AMD 29005, 16 MHz</td>
<td>Tieltek 6200, 6.25 MHz</td>
<td>Tieltek XL 6200, 8 MHz</td>
</tr>
<tr>
<td><strong>Engine speed</strong></td>
<td>4 ppm</td>
<td>4 ppm</td>
<td>9 ppm</td>
<td>6 ppm</td>
</tr>
<tr>
<td><strong>Memory (standard, max.)</strong></td>
<td>2 MB, 6 MB</td>
<td>2 MB, 6 MB</td>
<td>2 MB, 10 MB</td>
<td>2 MB, 6 MB</td>
</tr>
<tr>
<td><strong>Memory upgrade, price</strong></td>
<td>4 MB, $1,249</td>
<td>none</td>
<td>1 MB, $495; 2 MB, $990; 4 MB, $1,980</td>
<td>2 MB, $499; 4 MB, $999</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td>LocalTalk, serial</td>
<td>LocalTalk, parallel, serial</td>
<td>LocalTalk, parallel, serial</td>
<td>LocalTalk, parallel, serial</td>
</tr>
<tr>
<td><strong>Printing emulations</strong></td>
<td>HP LaserJet Plus, Diablo 830</td>
<td>HP PCL 4</td>
<td>HP PCL 4</td>
<td>HP PCL 4</td>
</tr>
<tr>
<td><strong>Resolution enhancements</strong></td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td><strong>No. of ROM-resident fonts</strong></td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td><strong>Bundled software</strong></td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td><strong>Paper handling</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paper weight</strong></td>
<td>28 lb</td>
<td>28 lb</td>
<td>28 lb</td>
<td>30 lb</td>
</tr>
<tr>
<td><strong>No. of trays, page/tray</strong></td>
<td>2, 50 and 250</td>
<td>1, * 50</td>
<td>1, * 250</td>
<td>1, 250</td>
</tr>
<tr>
<td><strong>Paper sizes</strong></td>
<td>letter, envelope</td>
<td>letter, legal, envelope, executive, A4, B5</td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
</tr>
<tr>
<td><strong>Envelope-tray option</strong></td>
<td>$89</td>
<td>none</td>
<td>$99</td>
<td>none</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Consumables (price, copies)</strong></td>
<td>$99, 3,500</td>
<td>$79, 3,500</td>
<td>$119, 3,500</td>
<td>$199, 50,000 (drum)</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>18.3 x 15 x 9.8 in.</td>
<td>15.9 x 13.8 x 8 in.</td>
<td>13.6 x 16 x 8 in.</td>
<td>15 x 13.3 x 10.5 in.</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>32 lb</td>
<td>26 lb</td>
<td>26.5 lb</td>
<td>33.1 lb</td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>2 years</td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td>Apple Computer, Inc.</td>
<td>Bepler Systems, Inc.</td>
<td>Brother Dataproducts Corp.</td>
<td>Epson America, Inc.</td>
</tr>
<tr>
<td></td>
<td>20265 Mariani Ave.</td>
<td>1150 Saratoga Ave.</td>
<td>200 Covertail Ln.</td>
<td>6219 Desoto Ave.</td>
</tr>
<tr>
<td></td>
<td>Cupertino, CA 95014</td>
<td>San Jose, CA 95129</td>
<td>Somerset, NJ 08575</td>
<td>Woodstock Hills, CA 91365</td>
</tr>
<tr>
<td></td>
<td>408-996-1010</td>
<td>408-345-0345</td>
<td>998-356-8880</td>
<td>800-334-3174</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>818-887-8000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>818-887-4789 (fax)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>310-782-5220 (fax)</td>
</tr>
</tbody>
</table>

*Optional second 250-sheet tray available.
Mac or PC. Design studio, advertising agency, service bureau or print shop.

Let's face it: you're not completely satisfied with the traditional 300 dpi scanner standard, but you don't want to spend a fortune on higher quality. That's what we call the gap between DTP and DTP.

Arcus closes that gap. A superbly designed 10 bit flatbed CCD scanner with 1200 dpi resolution, fast one pass and over 1 billion colors. Plus software, a fully integrated transparency module and of course Agfa service.

Let your Agfa representative or dealer show you how. Just call 1-800-685-4271 to arrange a visit (In Canada, call 1-800-387-9533) or send us the attached coupon.

Arcus. The ultimate quality standard in affordable color and black/white scanning. Now.
### Table 1: Features of Personal PostScript Printers, continued

<table>
<thead>
<tr>
<th>Everex LaserScript LX</th>
<th>GCC BLP Elite</th>
<th>GCC BLP Elite B</th>
<th>GCC BLP II</th>
<th>GCC BLP IIS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$1,995</td>
<td>$1,399</td>
<td>$1,899</td>
<td>$1,799</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$1,500</td>
<td>$1,399</td>
<td>$1,699</td>
<td>$1,799</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>Some minor PostScript incompatibilities. Only 17 resident fonts. Insufficient standard RAM for some complex graphics. Expensive. No RAM upgrade available.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Specifications**

<table>
<thead>
<tr>
<th>Interpreter</th>
<th>Microsoft-Bauer PDL</th>
<th>PostScript Level 1</th>
<th>PostScript Level 1</th>
<th>PostScript Level 1</th>
<th>PostScript Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>TEC OkiLaser 400</td>
<td>OkiLaser 800</td>
<td>OkiLaser 400</td>
<td>OkiLaser 800</td>
<td>OkiLaser 800</td>
</tr>
<tr>
<td>Resolution</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td>Engine life</td>
<td>350,000 pages</td>
<td>180,000 pages</td>
<td>300,000 pages</td>
<td>300,000 pages</td>
<td>300,000 pages</td>
</tr>
<tr>
<td>Monthly duty cycle</td>
<td>3,000 pages</td>
<td>3,000 pages</td>
<td>5,000 pages</td>
<td>5,000 pages</td>
<td>5,000 pages</td>
</tr>
<tr>
<td>Memory upgrade, price</td>
<td>2 MB, $200</td>
<td>2 MB, $199</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Interfaces</td>
<td>LocalTalk, parallel, serial</td>
<td>LocalTalk, serial</td>
<td>LocalTalk, serial</td>
<td>LocalTalk, SCSI</td>
<td>LocalTalk, SCSI</td>
</tr>
<tr>
<td>Printing enhancements</td>
<td>HP PCL 4</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Resolution enhancements</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>No. of ROM-resident fonts</td>
<td>35</td>
<td>17</td>
<td>17</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Bundled software</td>
<td>none</td>
<td>QuickEnvelope</td>
<td>QuickEnvelope</td>
<td>QuickEnvelope</td>
<td>QuickEnvelope</td>
</tr>
<tr>
<td>Paper handling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper weight</td>
<td>27 lb</td>
<td>34 lb</td>
<td>34 lb</td>
<td>34 lb</td>
<td>34 lb</td>
</tr>
<tr>
<td>No. of trays, pages/tray</td>
<td>1, 150</td>
<td>1, 150</td>
<td>1, 200</td>
<td>1, 200</td>
<td>2, 200</td>
</tr>
<tr>
<td>Envelope-tray option</td>
<td>standard</td>
<td>$89</td>
<td>$99</td>
<td>$89</td>
<td>$89</td>
</tr>
</tbody>
</table>

**Miscellaneous**

<table>
<thead>
<tr>
<th>Consumables (price, copies) (drum and developer)</th>
<th>$150, 10,000 (drum and developer)</th>
<th>$289, 15,000 (drum and developer)</th>
<th>$289, 15,000 (drum and developer)</th>
<th>$289, 15,000 (drum and developer)</th>
<th>$289, 15,000 (drum and developer)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(price, copies) (toner)</td>
<td>$40, 1,500 (toner)</td>
<td>$33, 2,500 (toner)</td>
<td>$33, 2,500 (toner)</td>
<td>$33, 2,500 (toner)</td>
<td>$33, 2,500 (toner)</td>
</tr>
<tr>
<td>Dimensions (L x W x H)</td>
<td>15.4 x 16.1 x 8.3 in.</td>
<td>17.7 x 17.7 x 5.24 in.</td>
<td>17.7 x 17.7 x 5.24 in.</td>
<td>17.7 x 17.7 x 5.24 in.</td>
<td>17.7 x 17.7 x 5.24 in.</td>
</tr>
<tr>
<td>Weight</td>
<td>35.3 lb</td>
<td>24 lb</td>
<td>24 lb</td>
<td>24 lb</td>
<td>24 lb</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Address</td>
<td>48431 Millmont Dr.</td>
<td>580 Winter St.</td>
<td>580 Winter St.</td>
<td>580 Winter St.</td>
<td>580 Winter St.</td>
</tr>
<tr>
<td>City</td>
<td>Fremont, CA 94538</td>
<td>Waltham, MA 02154</td>
<td>Waltham, MA 02154</td>
<td>Waltham, MA 02154</td>
<td>Waltham, MA 02154</td>
</tr>
<tr>
<td>Zip</td>
<td>94538</td>
<td>02154</td>
<td>02154</td>
<td>02154</td>
<td>02154</td>
</tr>
<tr>
<td>Phone</td>
<td>800-821-0806</td>
<td>800-422-7777</td>
<td>800-422-7777</td>
<td>800-422-7777</td>
<td>800-422-7777</td>
</tr>
<tr>
<td>Fax</td>
<td>510-498-1111</td>
<td>617-890-0880</td>
<td>617-890-0880</td>
<td>617-890-0880</td>
<td>617-890-0880</td>
</tr>
<tr>
<td>Fax (fax)</td>
<td>510-867-0520</td>
<td>617-890-0822</td>
<td>617-890-0822</td>
<td>617-890-0822</td>
<td>617-890-0822</td>
</tr>
</tbody>
</table>
In Tinsel Town, we’re the printers to the stars.

When C. David Piña created the graphics for the 63rd Annual Academy Awards, he cast his NewGen™ printer to play a vital supporting role.

Why NewGen? “We print a lot of grey scale, line and type images. NewGen delivers — beautifully. What I see on the screen is precisely what I get. And it’s fast too; we don’t wait for documents anymore.”

Resolution close up, 13 point Courier enlarged 500%.

With features like Image Enhancement Technology (IET)™, NewGen delivers some of the smoothest lines, characters and curves since Casablanca. Plus, Automatic Recognition Technology (ART)™ which actually selects the right interfaces and emulations for you. “And it’s got Program Updating, so my printer stays virtually obsolescence-free. And that’s important in this business.”

As for NewGen technical support, Piña put it this way, “We’ve never had problems, only a few questions, and they were there — instantly.”

The NewGen line offers a complete cast of PostScript®-compatible printers to fill any role. With resolution from 300 to 1200 dpi plus IET. A range of speeds from 4 to 12 pages per minute. Even paper sizes of up to 11” x 17” for simply unequaled graphics and prepress capability.

All at prices that will make you a star with accounting.

Piña summed up his choice eloquently. “The NewGen was the only printer that offered everything I needed — with features I couldn’t get from anyone else.”

To learn more, or for your nearest NewGen Dealer, call 1-800-756-0556. We’ll be happy to show you just how well our high-resolution printers can play a leading role in your business.
### Personal PostScript Printers

#### Table 1: Features of Personal PostScript Printers, continued

<table>
<thead>
<tr>
<th>Hardware That Fits</th>
<th>Hewlett-Packard LaserJet IIIIP</th>
<th>MacFriends QuickKor TS</th>
<th>NEC Silentwriter Model 95</th>
<th>NewGen Personal Series Turbo PS/300P</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$1,995</td>
<td>$2,495 w Level 2 cartridge</td>
<td>$1,588</td>
<td>$1,749</td>
</tr>
<tr>
<td>Street price</td>
<td>$1,895</td>
<td>$1,800</td>
<td>$1,500</td>
<td>$1,695</td>
</tr>
</tbody>
</table>

#### Specifications

<table>
<thead>
<tr>
<th>Interpreter</th>
<th>PostScript Level 2</th>
<th>PostScript Level 2</th>
<th>PostScript Level 2</th>
<th>PostScript Level 2</th>
<th>Weitek</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>Sharp</td>
<td>Canon LX</td>
<td>Sharp</td>
<td>NEC Modell 90</td>
<td>Weitek</td>
</tr>
<tr>
<td>Resolution</td>
<td>300 dpi</td>
<td>200 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td>Engine life</td>
<td>50,000 pages</td>
<td>not rated</td>
<td>300,000 pages</td>
<td>180,000 pages</td>
<td>150,000 pages</td>
</tr>
<tr>
<td>Monthly duty cycle</td>
<td>5,000 pages</td>
<td>6,000 pages</td>
<td>3,000 pages</td>
<td>6,000 pages</td>
<td>3,500 pages</td>
</tr>
<tr>
<td>Microprocessor, speed</td>
<td>Weitek XL, 6200, 6.25 MHz</td>
<td>Motorola 6800, 16 MHz</td>
<td>Weitek XL, 6200, 6.25 MHz</td>
<td>Motorola 68000, 16.67 MHz</td>
<td>Weitek XL, 6200, 6 MHz</td>
</tr>
<tr>
<td>Engine speed</td>
<td>9 ppm</td>
<td>9 ppm</td>
<td>6 ppm</td>
<td>4 ppm</td>
<td></td>
</tr>
<tr>
<td>Memory, (standard, max.)</td>
<td>2 MB, 10 MB</td>
<td>2 MB, 1 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB</td>
<td>2 MB, 1 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB</td>
<td>1 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB</td>
<td></td>
</tr>
<tr>
<td>Memory upgrade, price</td>
<td>1 MB, $159; 2 MB, $159; 4 MB, $399; 8 MB, $699</td>
<td>1 MB, $159; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB</td>
<td>1 MB, $159; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB</td>
<td>1 MB, $159; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB; 2 MB, 1 MB</td>
<td></td>
</tr>
<tr>
<td>Interfaces</td>
<td>LocalTalk, parallel, serial, SCSI</td>
<td>LocalTalk, parallel, serial, serial, SCSI</td>
<td>LocalTalk, parallel, serial, serial, SCSI</td>
<td>LocalTalk, parallel, serial, serial, SCSI</td>
<td></td>
</tr>
<tr>
<td>Printing emulations</td>
<td>HP PCL 4</td>
<td>HP PCL 4</td>
<td>HP PCL 4</td>
<td>HP PCL 5, HP GL</td>
<td>HP PCL 4, HP GL</td>
</tr>
<tr>
<td>Resolution enhancements</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>No. of ROM-resident fonts</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td>Bundled software</td>
<td>software tray selector</td>
<td>software tray selector</td>
<td>software tray selector</td>
<td>software tray selector</td>
<td></td>
</tr>
<tr>
<td>Paper handling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper weight</td>
<td>30 lb</td>
<td>28 lb</td>
<td>31 lb</td>
<td>41 lb</td>
<td>28 lb</td>
</tr>
<tr>
<td>No. of trays, pages/tray</td>
<td>1, 259</td>
<td>1, 250</td>
<td>1, 259</td>
<td>1, 250</td>
<td>1, 250</td>
</tr>
<tr>
<td>Paper sizes</td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
<td></td>
</tr>
<tr>
<td>Envelope-tray option</td>
<td>$269</td>
<td>$99</td>
<td>$329</td>
<td>standard</td>
<td>$99 (needs lower tray, $195)</td>
</tr>
</tbody>
</table>

#### Miscellaneous

<table>
<thead>
<tr>
<th>Consumables (price, copies)</th>
<th>$139, 30,000 (drum)</th>
<th>$95, 3,500</th>
<th>$169, 20,000 (drum)</th>
<th>$129, 10,000 (developer)</th>
<th>$54, 2,500 (toner)</th>
<th>$199, 6,000</th>
<th>$399, 3,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (L x W x H)</td>
<td>14.2 x 13.4 x 10.9 in.</td>
<td>16 x 13.9 x 9 in.</td>
<td>14.2 x 13.4 x 10.9 in.</td>
<td>15 x 18.9 x 9.5 in.</td>
<td>16 x 13.5 x 7.5 in.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>33.5 lb</td>
<td>22 lb</td>
<td>33.5 lb</td>
<td>37.5 lb</td>
<td>24 lb</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warranty</td>
<td>2 years</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>610 S. Frazier</td>
<td>19310 Pruneriadi Aven.</td>
<td>8239 N. Vancouer Ave.</td>
<td>17590 Newhope St.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Conroe, TX 77301</td>
<td>Custartino, CA 95014</td>
<td>Portland, OR 97217</td>
<td>Fountain Valley, CA 92708</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>800-972-3918</td>
<td>800-752-9600</td>
<td>800-331-1322</td>
<td>800-756-0556</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>409-539-3959</td>
<td>208-323-2551</td>
<td>503-286-8888</td>
<td>714-641-8600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>409-539-4141</td>
<td>208-344-4809</td>
<td>503-286-8710</td>
<td>508-264-8673 (fax)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Optional second 250-sheet tray available.

*3 MB after June 1.
Perfect printing.
Your work deserves it and ColorMaster® Plus was specifically designed to deliver it.
ColorMaster Plus has the right resolution: 300 dpi.
You get PostScript® language compatibility, and instant access to a wide range of software.
For accurate color, it’s PANTONE® approved.
Size selection? Letter or tabloid with full bleed—giving you the largest live image of any cut-sheet desktop printer.
Plenty of ports, too. SCSI, Appletalk, RS-232 and Centronics parallel so you can mix and match different computers on one ColorMaster Plus printer.
Plus, there’s something you just can’t get anywhere else: CalComp product quality and long term commitment to service, support and supplies. Our 1-year on-site warranty is only one example.

New ColorMaster Plus

Incomparable Comps.
Outstanding Overheads.
Fantastic Finish.

See us at MacWorld, World Trade Center, Booth #8338
Ask About Our New, Low-Cost 600 dpi 11 X 17 Laser Printer!

©1992 CalComp Inc. P.O. Box 3250, Anaheim, CA 92803. ColorMaster Plus and We draw on your imagination are trademarks of CalComp. PostScript is a registered trademark of Adobe Systems, Inc. AppleTalk is a registered trademark of Apple Computer Inc. Pantone is a registered trademark of Pantone Inc.
### Table 1: Features of Personal PostScript Printers, continued

<table>
<thead>
<tr>
<th></th>
<th>NewGen Personal Series Turbo PS/400P</th>
<th>Okidata OL-630</th>
<th>Okidata OL-640</th>
<th>Panasonic KX-P4455</th>
<th>QMS QMS-PS 410</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$2,595</td>
<td>$1,999</td>
<td>$2,599</td>
<td>$2,995</td>
<td>$1,995</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$2,195</td>
<td>$1,299</td>
<td>$1,599</td>
<td>$1,850</td>
<td>$1,500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpreter</strong></td>
<td>Weitek PostScript Level 1</td>
<td>PostScript Level 1</td>
<td>PostScript Level 1</td>
<td>PostScript Level 1</td>
<td>PostScript Level 1</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td>Canon LX</td>
<td>Okilaser 800</td>
<td>Okilaser 800</td>
<td>Panasonic LX</td>
<td></td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>400 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td></td>
</tr>
<tr>
<td><strong>Engine life</strong></td>
<td>150,000 pages</td>
<td>300,000 pages</td>
<td>300,000 pages</td>
<td>300,000 pages</td>
<td></td>
</tr>
<tr>
<td><strong>Monthly duty cycle</strong></td>
<td>3,500 pages</td>
<td>16,000 pages</td>
<td>16,000 pages</td>
<td>20,000 pages</td>
<td></td>
</tr>
<tr>
<td><strong>Microprocessor, speed</strong></td>
<td>Weitek XL 8220, 16 MHz</td>
<td>Motorola 68000, 12 MHz</td>
<td>Motorola 68000, 12 MHz</td>
<td>Motorola 68000, 16 MHz</td>
<td></td>
</tr>
<tr>
<td><strong>Engine speed</strong></td>
<td>4 ppm</td>
<td>8 ppm</td>
<td>11 ppm</td>
<td>8 ppm</td>
<td></td>
</tr>
<tr>
<td><strong>Memory (standard, max.)</strong></td>
<td>4 MB, 16 MB</td>
<td>2 MB, 4 MB</td>
<td>2 MB, 4 MB</td>
<td>2 MB, 6 MB</td>
<td></td>
</tr>
<tr>
<td><strong>Memory upgrade, price</strong></td>
<td>1 MB, $149; 2 MB, $399; 4 MB, $599</td>
<td>2 MB, $399</td>
<td>2 MB, $275</td>
<td>1 MB, $345; 2 MB, $495; 4 MB, $795</td>
<td></td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td>LocalTalk, parallel, serial</td>
<td>LocalTalk/serial ($199), parallel</td>
<td>LocalTalk, parallel, serial</td>
<td>LocalTalk, parallel, serial</td>
<td></td>
</tr>
<tr>
<td><strong>Printing emulations</strong></td>
<td>HP PCL 4, HP GL</td>
<td>HP PCL 4, Diablo 630</td>
<td>HP PCL 4, Diablo 630</td>
<td>HP PCL 4</td>
<td></td>
</tr>
<tr>
<td><strong>Resolution enhancements</strong></td>
<td>IET</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td></td>
</tr>
<tr>
<td><strong>No. of ROM-resident fonts</strong></td>
<td>35</td>
<td>17</td>
<td>35</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td><strong>Bundled software</strong></td>
<td>none</td>
<td>LaserTools</td>
<td>LaserTools</td>
<td>PS Executive Utilities</td>
<td></td>
</tr>
<tr>
<td><strong>Paper handling</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paper weight</strong></td>
<td>28 lb</td>
<td>32 lb</td>
<td>32 lb</td>
<td>24 lb</td>
<td></td>
</tr>
<tr>
<td><strong>No. of trays, pages/tray</strong></td>
<td>1, 50</td>
<td>1, 200</td>
<td>1, 200</td>
<td>2, 250</td>
<td>1, 50</td>
</tr>
<tr>
<td><strong>Paper sizes</strong></td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope</td>
<td></td>
</tr>
<tr>
<td><strong>Envelope-tray option</strong></td>
<td>none</td>
<td>$59</td>
<td>$59</td>
<td>$59</td>
<td></td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Consumables (price, copies)</strong></td>
<td>$99, 3,500</td>
<td>$289, 15,000 (drum and developer)</td>
<td>$289, 15,000 (drum and developer)</td>
<td>$190, 13,000 (drum and developer)</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>16 x 13.5 x 7.5 in.</td>
<td>17.7 x 17.7 x 8.5 in.</td>
<td>17 x 28 x 14.5 in.</td>
<td>13.5 x 16 x 7.5 in.</td>
<td></td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>24 lb</td>
<td>29 lb</td>
<td>37 lb</td>
<td>59.6 lb</td>
<td></td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td></td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td>NewGen</td>
<td>Okidata</td>
<td>Okidata</td>
<td>Panasonic</td>
<td></td>
</tr>
<tr>
<td></td>
<td>17580 Newhope St.</td>
<td>532 Fellowship Rd.</td>
<td>532 Fellowship Rd.</td>
<td>2 Panasonic Way</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fountain Valley, CA 92708</td>
<td>Mount Laurel, NJ 08054</td>
<td>Mount Laurel, NJ 08054</td>
<td>Mobile, AL 36618</td>
<td></td>
</tr>
<tr>
<td></td>
<td>800-756-0556</td>
<td>800-654-3282</td>
<td>800-222-0584</td>
<td>800-631-2692</td>
<td></td>
</tr>
<tr>
<td></td>
<td>714-641-8600</td>
<td>609-235-2600</td>
<td>201-348-7000</td>
<td>205-633-4300</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Optional second 250-sheet tray available.</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Optional second 250-sheet tray available.*
Finally. A PostScript® compatible printer that delivers high resolution with speed and flexibility like you've never seen.

**It's about Speed.** You'll get 8 MB RAM (expandable to 16 MB), an AMD 29000 RISC processor, Xante's Advanced Memory Management and 8 page-per-minute print speeds to break through the bottlenecks typically found on PostScript printers.

**It's about Resolution.** There is no substitute for true 600 x 600 dpi. The Accel-a-Writer 8000 provides high-quality, consistent output without the side effects of artificial smoothing. Your scanned and other gray scale images will dramatically improve with Xante's Advanced Gray Scale Technology — you'll get 850 x 850 dpi equivalent gray scales.

**It's about Flexibility.** In addition to the standard 35 fonts on the Accel-a-Writer 8000, Xante's Virtual Disk Technology enables you to load, and reload up to 30 of your download fonts permanently on the printer. If you need to store more than 30 fonts, you can attach a disk to the SCSI interface.

**It's about Peace of Mind.** Xante's Quality Assurance Guarantee protects your investment. If within 30 days of purchase you are not completely satisfied, you can return it and be fully refunded. You are also provided with a one year warranty on all parts and labor.

**It's about Value.** Only $3,995. And the Accel-a-Writer 8000 makes it easy to share among Mac® and PC users with standard Serial, Parallel, and AppleTalk® interfaces — all able to be used simultaneously without requiring keypad or switch setting changes.

**It's about Time.** Finally. Everything you need in a printer, at a price you can afford, and with the purchase protection you deserve. Compare the Accel-a-Writer 8000 to any other printer and we think you'll agree.

1-800-926-8839
Fax 205-476-9421
### Table 1: Features, continued

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Texas Instruments microlaser Plus PS35</th>
<th>Texas Instruments microlaser Turbo</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$1,849</td>
<td>$2,349</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$1,400</td>
<td>$1,950</td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td>Fast for text and simple graphics.</td>
<td>Fastest printer tested.</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td>Insufficient standard RAM</td>
<td>Insufficient standard RAM for some complex graphics.</td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Interpreter</strong></td>
<td>PostScript Level 1</td>
<td>PostScript Level 2</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td>Sharp</td>
<td>Sharp</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td><strong>Engine life</strong></td>
<td>Indefinite</td>
<td>Indefinite</td>
</tr>
<tr>
<td><strong>Monthly duty cycle</strong></td>
<td>10,000 pages</td>
<td>10,000 pages</td>
</tr>
<tr>
<td><strong>Microprocessor, speed</strong></td>
<td>Motorola 68000, 12 MHz</td>
<td>Weitek XL 8220, 16 MHz</td>
</tr>
<tr>
<td><strong>Engine speed</strong></td>
<td>9 ppm</td>
<td>9 ppm</td>
</tr>
<tr>
<td><strong>Memory (standard, max.)</strong></td>
<td>1.5 MB, 4.5 MB</td>
<td>2.5 MB, 10.5 MB</td>
</tr>
<tr>
<td><strong>Memory upgrade, price</strong></td>
<td>1 MB, $239</td>
<td>1 MB, $239; 4 MB, $389</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td>LocalTalk, parallel, serial</td>
<td>LocalTalk, parallel, serial</td>
</tr>
<tr>
<td><strong>Printing emulations</strong></td>
<td>HP PCL 4</td>
<td>HP PCL 4</td>
</tr>
<tr>
<td><strong>Resolution enhancements</strong></td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td><strong>No. of ROM-resident fonts</strong></td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td><strong>Bundled software</strong></td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td><strong>Paper handling</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Paper weight</strong></td>
<td>24 lb</td>
<td>24 lb</td>
</tr>
<tr>
<td><strong>No. of trays, pages/tray</strong></td>
<td>1, * 250</td>
<td>1, * 250</td>
</tr>
<tr>
<td><strong>Paper sizes</strong></td>
<td>letter, legal, envelope</td>
<td>letter, legal, envelope,</td>
</tr>
<tr>
<td><strong>Envelope-tray option</strong></td>
<td>$275</td>
<td>$275</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Consumables</strong></td>
<td>$110, 50,000 (drum)</td>
<td>$110, 50,000 (drum)</td>
</tr>
<tr>
<td>(price, copies)</td>
<td>$90, 25,000 (developer)</td>
<td>$90, 25,000 (developer)</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>14 x 13.5 x 10.5 in.</td>
<td>14 x 13.5 x 10.5 in.</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>33.5 lb</td>
<td>33.5 lb</td>
</tr>
<tr>
<td><strong>Warranty</strong></td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td>Texas Instruments, Inc.</td>
<td>Texas Instruments, Inc.</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 202230</td>
<td>P.O. Box 202230</td>
</tr>
<tr>
<td></td>
<td>Austin, TX 78720</td>
<td>Austin, TX 78720</td>
</tr>
<tr>
<td></td>
<td>800-527-3500</td>
<td>800-527-3500</td>
</tr>
<tr>
<td></td>
<td>B17-771-5856</td>
<td>B17-771-5856</td>
</tr>
<tr>
<td></td>
<td>B17-774-6660 (fax)</td>
<td>B17-774-6660 (fax)</td>
</tr>
</tbody>
</table>

*Optional second 250-sheet tray available.

### Table 1 Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>The vendor's suggested retail price for the printer in its standard configuration.</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>The price of the printer through mail order or at dealers surveyed across the U.S. in June 1992.</td>
</tr>
<tr>
<td><strong>Interpreter</strong></td>
<td>The printer's interpreter, either an Adobe PostScript Level 1 or Level 2 interpreter or a PostScript-compatible interpreter from the printer's manufacturer or from another vendor.</td>
</tr>
<tr>
<td><strong>Engine</strong></td>
<td>The make and model of the printer's engine.</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>The resolution of the printer's engine, in dpi (dots per inch).</td>
</tr>
<tr>
<td><strong>Engine life</strong></td>
<td>The estimated number of pages the printer's engine can print in its lifetime.</td>
</tr>
<tr>
<td><strong>Monthly duty cycle</strong></td>
<td>The manufacturer's recommended maximum number of pages to be printed per month.</td>
</tr>
<tr>
<td><strong>Microprocessor, speed</strong></td>
<td>The processor, or chip, that powers the printer and the processor's clock speed, in megahertz.</td>
</tr>
<tr>
<td><strong>Engine speed</strong></td>
<td>The rated speed of the engine, in ppm (pages per minute).</td>
</tr>
<tr>
<td><strong>Memory (standard, max.)</strong></td>
<td>The amount of on-board RAM shipped with the printer and the maximum amount of memory the printer can accommodate, in megabytes.</td>
</tr>
<tr>
<td><strong>Memory upgrade, price</strong></td>
<td>The RAM-upgrade configurations available, in megabytes, and the price of each.</td>
</tr>
<tr>
<td><strong>Interfaces</strong></td>
<td>The standard ports available for connecting computer cables to the printer.</td>
</tr>
<tr>
<td><strong>Printing emulations</strong></td>
<td>The page-description languages (in addition to PostScript) that the printer is able to support.</td>
</tr>
<tr>
<td><strong>Resolution enhancements</strong></td>
<td>Any special technology the printer uses to improve the appearance of output, such as smoothing jagged edges.</td>
</tr>
<tr>
<td><strong>No. of ROM-resident fonts</strong></td>
<td>The number of outline fonts in ROM that are shipped with the printer.</td>
</tr>
<tr>
<td><strong>Bundled software</strong></td>
<td>The additional software controls provided with the printer.</td>
</tr>
<tr>
<td><strong>Paper weight</strong></td>
<td>The heaviest paper stock the printer can handle, in pounds.</td>
</tr>
<tr>
<td><strong>No. of trays, pages/tray</strong></td>
<td>The number of paper trays shipped with the printer and the number of sheets of 24-pound paper each tray can hold.</td>
</tr>
<tr>
<td><strong>Paper sizes</strong></td>
<td>The paper sizes the printer can handle.</td>
</tr>
<tr>
<td><strong>Envelope-tray option</strong></td>
<td>The price for an optional tray for feeding envelopes to the printer.</td>
</tr>
<tr>
<td><strong>Consumables (price, copies)</strong></td>
<td>The cost and life expectancy of replacement all-in-one consumables or of separate drum, developer, and toner.</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>The length, width, and height of the printer, in inches, without the paper tray installed.</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>How heavy the printer is, in pounds.</td>
</tr>
</tbody>
</table>
Mirror Introduces Desktop Performance For Your Powerbook...

With Mirror’s exciting new peripherals, your PowerBook can function just like a desktop machine, with a high resolution monitor and plenty of storage.

The Mirror PowerVision™, an internal video board for the PowerBook 140 or 170, works with a variety of standard monitors, including our NEW 14-inch Color Display and 15-inch Gray-scale Display. With 0, 2 or 4 MB of on-board RAM, the PowerVision’s pass-thru connector lets you use existing RAM, and our installation video makes setup a snap (professional installation also available).

The Mirror ViewPort™ is a 15-inch monochrome display with a built-in SCSI video controller and QuickDraw acceleration for performance rivaling internal video boards. Ideal for PowerBooks, the ViewPort brings big screen power to any Mac with a SCSI port. (continued)

The NEW Mirror 14-inch Color Display
$399

Mirror PowerDock™
battery powered base unit and charger.
$199

Mirror Pocket Hard Drives
40 MB $449
80 MB $649

PowerVision internal video adapter board includes tools and a comprehensive installation video. from $549

Systems including PowerVision board and display from $948

Mirror ViewPort™
full-page display with built-in video controller. Works on any Mac with a SCSI port.
$799

*Uses your PowerBook battery and AC adapter. *Call for other options.
...And A Line Of Powerhouse

The NEW Mirror 14-inch Color Display is the latest version of our best selling color monitor. Designed to work with the built-in video of your Mac LC, IIci, LCi, or Quadra—or with Mirror's PowerVision video board for PowerBooks; this display features razor-sharp focus and brilliant color and it's still only $399!

The Mirror Pocket Hard Drives and optional Mirror PowerDock** redefine storage convenience. For moving data between machines, or to expand your PowerBook's capacity, these tiny drives fit anywhere. Slip the Pocket Drive into the PowerDock and use a standard PowerBook battery to power the drive while you travel. When you're back home, the PowerDock does double duty and charges your spare battery.

Whatever your need, whatever Macintosh model you use, Mirror has high performance peripherals to match.

Our complete line of storage systems can handle any task. From our critically acclaimed hard drives and CD-ROM, to our high performance 128 MB Optical Drive.

<table>
<thead>
<tr>
<th>Drives</th>
<th>Int.</th>
<th>Ext.</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 MB</td>
<td>$249</td>
<td>$299</td>
</tr>
<tr>
<td>50 MB (Q)</td>
<td>$279</td>
<td>$339</td>
</tr>
<tr>
<td>105 MB (Q)</td>
<td>$419</td>
<td>$479</td>
</tr>
<tr>
<td>120 MB (Q)</td>
<td>$469</td>
<td>$529</td>
</tr>
<tr>
<td>210 MB (Q)</td>
<td>$699</td>
<td>$749</td>
</tr>
<tr>
<td>240 MB (Q)</td>
<td>$799</td>
<td>$799</td>
</tr>
<tr>
<td>330 MB</td>
<td>N/A</td>
<td>$1,199</td>
</tr>
<tr>
<td>425 MB</td>
<td>N/A</td>
<td>$1,299</td>
</tr>
<tr>
<td>425 MB (Q)</td>
<td>$1,299</td>
<td>$1,349</td>
</tr>
<tr>
<td>595 MB</td>
<td>N/A</td>
<td>$1,599</td>
</tr>
<tr>
<td>1 GB</td>
<td>N/A</td>
<td>$2,099</td>
</tr>
<tr>
<td>45 MB Portable Drive</td>
<td>$269</td>
<td></td>
</tr>
<tr>
<td>50 MB (Q) Portable Drive</td>
<td>$299</td>
<td></td>
</tr>
<tr>
<td>105 MB (Q) Portable Drive</td>
<td>$449</td>
<td></td>
</tr>
<tr>
<td>240 MB (Q) Portable Drive</td>
<td>$769</td>
<td></td>
</tr>
<tr>
<td>128 MB Optical Drive</td>
<td>$1,199</td>
<td></td>
</tr>
<tr>
<td>600 MB Optical Drive</td>
<td>$2,299</td>
<td></td>
</tr>
<tr>
<td>44 MB SyQuest Drive</td>
<td>$449</td>
<td></td>
</tr>
<tr>
<td>88 MB SyQuest Drive</td>
<td>$549</td>
<td></td>
</tr>
<tr>
<td>DAT Tape Drive</td>
<td>$1,399</td>
<td></td>
</tr>
<tr>
<td>CD-ROM Drive</td>
<td>$599</td>
<td></td>
</tr>
</tbody>
</table>

20-inch ProView Trinitron Display, 8-bit w/ 24-bit video card $2,499
20-inch ProView V Color Display, 8-bit w/ 24-bit video card $1,799
16-inch Trinitron Display w/ 8-bit video card $1,599
16-bit video card $1,699
24-bit video card $1,999
16-inch Color Display w/ 8-bit video card $899
16-bit video card $1,299
24-bit video card $1,699

*You pay shipping costs (and consumables for printers). **PowerDock available September 1992. Prices are F.O.B. origin. Prices are for US orders only; call for international pricing. All prices subject to change.
Peripherals For The Desktop.

and DAT Tape Drives, Mirror offers the capacities, speed, features and prices you want.

Once you've used a Mirror high resolution display, you'll wonder how you ever lived without it. Our monochrome full-page and two-page displays deliver bright, sharp screen images for word processing, spreadsheets, database management and publishing.

For graphic design, illustration or pre-press, choose a Mirror color display. Available in 14-inch, 16-inch and 20-inch models, there's a Mirror color display that's right for every job.

The top-rated Mirror Color Scanner makes it easy to add sharp, vivid color images to your work at an unbeatable Mirror price; just $1199 including Adobe Photoshop.

If you need a printer, take a close look at the MirrorImage 309 Laser Printer and the MirrorImage 415 Tabloid Laser Printer. With Postscript Level 2, RISC processors, sophisticated paper handling and durable, high-speed printing engines, these printers work hard, so you don't have to.

All Mirror products are backed by our famous 30-day, "love it or return it" policy*, and the best customer support in the business. Call today to see for yourself.

---

*Mak'in Tracks

MirrorImage 415, Tabloid Laser Printer, features dual paper trays and a 15 pages-per-minute print engine. Leases available. $4,499

MirrorImage 309, Postscript 2 laser printer $1,699

Order Direct

1-800-654-5294

MACWORLD EXPO BAYSIDE BOOTH 1300

19-inch Two-page Display w/ monochrome video card $799

21-inch Two-page Display w/ monochrome video card $799

15-inch Analog Portrait Display $399

Makin' Tracks


Circle 118 on reader service card.
**Big-Screen Monitors**

Versatile, sharp, and bright, these two large-screen color display systems will catch the eye of every graphics professional.

If you use a top-flight graphics or desktop-publishing application, you need a high-quality color display system. If you use a large-screen color display system, you need an accelerated-video card to keep your applications from slowing to a crawl. Two new two-page color display systems — the NEC MultiSync 6FG and the Radius PrecisionColor Display/20 — give you both. What’s more, each has the added versatility of *autosynchronous* operation — they’re equally at home on Macs, PCs, or workstations.

**What You Get**

Although the PrecisionColor Display/20 has a 20-inch tube and the MultiSync 6FG comes with a 21-inch tube, the displays’ active-screen areas are basically the same. The NEC monitor uses a shadow-mask technology, which has shed its once-deserved second-class status and can now compete with the Sony Trinitron tube used by the Radius monitor, crisp pixel by crisp pixel.

As we went to press, NEC lowered the price of its MultiSync 6FG monitor to $2,899. The 24-bit NEC MultiSync 6FG display system — monitor and display card — costs $4,798, and the Radius PrecisionColor Display/20 display system is $5,298. An 8-bit display system is available from each manufacturer at a lower cost.

Each system is bundled with an accelerated-video card manufactured by Radius (see “Chasing Rainbows: Accelerated-Video Cards,” May ‘92, Buyer’s Guide page 16). NEC’s card uses a different ROM and different standards than are used by Radius; Radius calls its card the PrecisionColor 24X, and NEC’s is called the MacFG 24X. Each system includes software for on-the-fly switching among multiple resolutions, including 640 x 480, 1024 x 768, and 1152 x 870 pixels, and front-panel digital controls remember settings for image position and size at each resolution. NEC ships a software-only version — a monitor with software but no display card — that provides Quadra users with multiple resolutions while running off the built-in video port (see Figure 2).

The PrecisionColor Display/20 also includes a *convergence control* for precision color adjustments, and the MultiSync 6FG features NEC’s AccuColor System, which allows you to change the display colors to closely approximate those of your output device. NEC provides a MacroMind Director-based tutorial for its AccuColor System — you can even run it while you make adjustments.
How They Look

We used precision monitor-testing equipment at ZD Labs, the new multimillion-dollar testing facility of Ziff-Davis Publishing, MacUser's parent company, to test both of the display systems along with our reference standard, the 13-inch AppleColor High-Resolution RGB Monitor. After reviewing data on focus, image quality, color accuracy, and brightness, we found that neither large-screen system was as sharp as the smaller AppleColor. The MultiSync 6FG was brighter than the Precision Color Display/20, and each was brighter than the notoriously dim AppleColor (see Figure 3).

The Bottom Line

The NEC MultiSync 6FG and the Radius Precision Color Display/20 are both bright and sharp—a difficult achievement for large-screen monitors—so choosing between them depends on your needs. If your work requires highly saturated colors and better overall color quality than that produced by the AppleColor, the Precision Color Display/20 is for you, but if color accuracy is critical in your work, you'll need to add a Radius Precision-Color Calibrator, which costs $599 extra.

Color accuracy is less of a problem with the NEC MultiSync 6FG. Although its colors are less vivid, its AccuColor System provides good out-of-the-box accuracy for image scanning and other color-critical work. Also, if you're on a tight budget, bear in mind that the MultiSync 6FG is the less expensive of the two systems—a list-price difference of $600. And for those who use a Quadra, NEC's software provides cost-effective multiple resolutions when the monitor's connected to the Quadra's built-in video port.

— Jeď Pittelkau

---

**Table 1: Features**

<table>
<thead>
<tr>
<th></th>
<th>NEC MultiSync 6FG</th>
<th>Radius Precision Color Display/20</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>8-bit, $3,798; 24-bit, $4,798</td>
<td>8-bit, $4,198; 24-bit, $5,298</td>
</tr>
<tr>
<td>Street price</td>
<td>8-bit, $3,198; 24-bit, $3,998</td>
<td>8-bit, $3,746*; 24-bit, $4,575</td>
</tr>
<tr>
<td>Cons</td>
<td>Glare protection optional. One-year warranty to original purchaser only.</td>
<td>Degauss on power-up only. Color calibration a $599 option.</td>
</tr>
<tr>
<td>Company</td>
<td>NEC Technologies, Inc. 1255 Michael Dr, Wood Dale, IL 60091</td>
<td>Radius, Inc. 1710 Fortune Dr, San Jose, CA 95131</td>
</tr>
</tbody>
</table>

* *A nonupgradable 8-bit system is available for $3,898.*
Ray Dream Designer's edge-smoothing technology, JAG, produces superior quality images. JAG can be used as-is or with edge-blurring filters. GRA0291 $79.

JAG or Ray Dream Designer 2.0*
- Remove jagged JAG smears in the background, removing jagged edges from PICT files automatically, producing pixel perfect 8-bit and 24-bit still images and animations. It works with images created in color paint applications and with scanned images. With its sophisticated edge-detection scheme, JAG produces sharp, clear images of superior quality to those produced by edge-blurring filters. GRA0292 $99.

Ray Dream Designer's drawing and text tools for creating lines, circles, ellipses, polygons, Bezier, curves and shadings, are virtually the same as those in most 2D illustration programs. But now your objects have the realistic look of three dimensions. It even comes with a library of 3D solid textures to be used as is or customized. Lighting, shadows, transparency, reflections and perspective are handled automatically. Publisher: Ray Dream Design GRA0293 $285.

Jaggy's Are Gone
- Fractal Design's Painter 1.2 simulates the tools and features of natural media. Painter's revolutionary approach has earned it 5 Macworld's Editor's Choice Award. MacPaint, MacWrite and MS Word. They can be edited, sent electronically or printed and used as paper facsimiles. (80 facsimiles, 30-day MBG.) GRA0294 $59.

WristSaver/ WristSaver MousePad
- The WristSaver cradles your wrist with a contoured neoprene rubber pad and a nylon coating. 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: 18 Innovations WristSaverMousePad ACC0655 $15. WristSaver ACC0550 $15. Bundle RN6085 (Available in Gray, Black, Red or Navy) $25.

FaxMania, Business fax cover sheets
- Faces that really get noticed! FaxMania 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, Announcements, 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 facsimiles. (80 facsimiles, 30-day MBG.) GRA0295 $45.

Sprout!
- Sprout is a complete computer painting tool for vegetable gardeners. Its unique painting tool detects contour lines that can be edited, sent electronically or printed and used as paper facsimiles. (80 facsimiles, 30-day MBG.) GRA0296 $39.

MacGlobe or MacUSA *
- MacGlobe, the extraordinary geography tool for the Macintosh, provides vibrant maps, extensive geographic and an annually updated database for 100 countries and dependencies all in your fingertips. It delivers a variety of maps, including each country's major cities, topography and major geographical features as well as regional maps. Perfect for preparing overheads and presentations. GRA0297 $45.

MacUSA Every Mac user who wants fast, accurate information on 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 flags and entire state songs. Publisher: PC Globe GRA0298 $39.

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, presentation, multimedia and general business graphics. Canvas 3 offers unparalleled productivity. Create illustrations from scratch with your own freeware tool, or scan existing artwork and let Canvas auto trace its outlines for you. System 7 Savant 1991 MacUser Editor's Choice Award. Publisher: Deenea Software GRA0299 $249.

AccuZip 6
- AccuZip is the most advanced, professional-level postage reducing software on the market for the Macintosh. This extremely powerful mailing list management software provides the most accurate mailing lists possible from your database. AccuZip extracts, parses and standardizes every address in your database. It adds carrier Route, Zip+4, and a Postnet bar code to every deliverable address. Thoroughly tested against millions of addresses throughout the United States, AccuZip is CASS (Coding Accuracy Support System) certified by the U.S. Postal Service. AccuZip doesn't stop there. AccuZip produces 1st, 2nd and 3rd class postage, produces all applicable bulk mail forms, each tag and label necessary to do bulk mailing. A built-in word processor and database of millions of words make all of your mail merging tasks easy. Publisher: Software Publisher, Inc. $499.

Sprout!, MacGlobe or MacUSA *
- MacGlobe, the extraordinary geography tool for the Macintosh, provides vibrant maps, extensive geographic and an annually updated database for 100 countries and dependencies all in your fingertips. It delivers a variety of maps, including each country's major cities, topography and major geographical features as well as regional maps. Perfect for preparing overheads and presentations. GRA0297 $45.

MacUSA Every Mac user who wants fast, accurate information on 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 flags and entire state songs. Publisher: PC Globe GRA0298 $39.

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, presentation, multimedia and general business graphics. Canvas 3 offers unparalleled productivity. Create illustrations from scratch with your own freeware tool, or scan existing artwork and let Canvas auto trace its outlines for you. System 7 Savant 1991 MacUser Editor's Choice Award. Publisher: Deenea Software GRA0299 $249.

AccuZip 6
- AccuZip is the most advanced, professional-level postage reducing software on the market for the Macintosh. This extremely powerful mailing list management software provides the most accurate mailing lists possible from your database. AccuZip extracts, parses and standardizes every address in your database. It adds carrier Route, Zip+4, and a Postnet bar code to every deliverable address. Thoroughly tested against millions of addresses throughout the United States, AccuZip is CASS (Coding Accuracy Support System) certified by the U.S. Postal Service. AccuZip doesn't stop there. AccuZip produces 1st, 2nd and 3rd class postage, produces all applicable bulk mail forms, each tag and label necessary to do bulk mailing. A built-in word processor and database of millions of words make all of your mail merging tasks easy. Publisher: Software Publisher, Inc. $499.
System 7... Now from MacWAREHOUSE!

for only $79

and get these Valuable Extras

FREE!*

FREE! with your order!

Make System 7 even easier with this Personal Training Systems

System 7 Tutorial!

Get up and running with System 7 in a flash! This Personal Training Systems Tutorial is the fastest, easiest way to put all the power of System 7 right to work on your Macintosh desktop. And it's yours FREE* with your order for any product from MacWAREHOUSE! Just ask for item AAA0037 when you place your order. $2.00 shipping and handling charge applies.

CPU Connectix PowerBook Utilities

Put more power into your PowerBook!

- Get more power from your PowerBook with Connectix PowerBook Utilities (CPU), the first software utility created specifically for your PowerBook. CPU extends your battery life and performance capacity. CPU protects your sensitive data whether your PowerBook is running, shut down or asleep. Custom menu bar displays show accurate battery level, remaining battery life, date and time. CPU gives you much more. Instant sleep and wake, LCD screen saver, keyboard shortcuts, user and screen saver settings, menu bar control and over a dozen other enhancements make your PowerBook more effective. Get the power of CPU and put more power into your PowerBook today! Publisher: Connectix UT00097

$69

FREE* when you order System 7 from MacWAREHOUSE!

ATM with four FREE fonts!

Get the Adobe Type Manager program disk, video guide and registration card FREE from MacWAREHOUSE when you order System 7! You'll also get a bonus, four Adobe Garamond typefaces from the Adobe Originals. When you place your order for System 7 just ask for item AAA0022.

$2.00 shipping and handling charge applies.

Virex

- Virex is a comprehensive solution to the threat of Macintosh computer viruses. Virex automatically detects and repairs files infected by all known Macintosh viruses. Virex continuously monitors and reports on all known virus threats. Virex updates virus definitions monthly. All registered users receive one free update. Publisher: Microcom UT00093

$49

IntelliDraw

- Aldus IntelliDraw defines an exciting new category of drawing program, with intelligent features that give you an easy new way to virtually experiment, refine, and draw your ideas. Innovative smart tools link graphics in your drawing, so they respond to your commands automatically. Create visual "what-if" scenarios with features like intelligent clip art & templates, automatic symmetrical objects, and dimensions lines. Auto-adjust, shape blending, powerful text handling capabilities, unlimited layers, color gradients, standard drawing tools and more. GR0354 Publisher: Aldus $199

We carry over 3000 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 MUIJ

MacWAREHOUSE

1-800-255-6227

1-800-445-9677

Midnight Express service available weekdays.

I'm Kerry, call me at 1-800-255-6227

MacWAREHOUSE

1-800-255-6227

1-800-445-9677

Midnight Express service available weekdays.

NEW! Express Customer Service Number: 1-800-445-9677

($2.00 shipping and handling charge applies)

MacWAREHOUSE

1-800-255-6227

1-800-445-9677

Midnight Express service available weekdays.

I'm Kerry, call me at 1-800-255-6227

System 7 brings new capabilities and ease of use to everyone who uses a Mac...

System 7 builds on the Mac basics you already love, and paves the way for a whole generation of powerful new software. A simple click of the mouse installs the software. Then advanced features take over, letting you work faster, easier, and more productively. Now it's easier than ever to get System 7 up and running on your Mac, because you can get it right from MacWAREHOUSE! Join the generation of System 7 power users!

Order System 7 today!
**MacWAREHOUSE**

**1-800-255-6227**

---

**ACCESSORIES**
- ADO Software, Inc.: Macintosh Card Reader...
- CD Technology, Inc.: CD-ROM Drive Replacement...
- Fujitsu: MDEC 100K Disk On-The-Go...
- Gateway: MEGX 64 Pin Stack Disk w/Laser...
- Advanced Software: Virtual Clone DOS & Windows...
- Synergy Designs: DataFinder-3 3.5" Disk System...
- Cybertek: Universal Power/Book Case...

**BUSINESS & PRESENTATION**

<table>
<thead>
<tr>
<th>Application</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macware</td>
<td>199</td>
</tr>
<tr>
<td>Acrobat</td>
<td>199</td>
</tr>
<tr>
<td>Microsoft Word</td>
<td>199</td>
</tr>
</tbody>
</table>

**DISK DRIVES & BOARDS**

<table>
<thead>
<tr>
<th>Board/Component</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MF200 100PK Disks w/Labels</td>
<td>59</td>
</tr>
<tr>
<td>MF2HD 50PK Disks w/Labels</td>
<td>59</td>
</tr>
</tbody>
</table>

**NETWORKING**

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuperCard 1.6</td>
<td>195</td>
</tr>
<tr>
<td>SuperCard 3.0</td>
<td>399</td>
</tr>
</tbody>
</table>

**GRAPHICS & MULTIMEDIA**

<table>
<thead>
<tr>
<th>Application</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PhotoShop 2.0</td>
<td>549</td>
</tr>
<tr>
<td>Illustrator 3.1</td>
<td>369</td>
</tr>
<tr>
<td>PageMaker 4.2</td>
<td>495</td>
</tr>
</tbody>
</table>

---

** utensils**

---

**SOFTWARE**

<table>
<thead>
<tr>
<th>Vendor</th>
<th>Application</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>Acrobat X</td>
<td>199</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Word</td>
<td>199</td>
</tr>
<tr>
<td>Macware</td>
<td>Acrobat</td>
<td>199</td>
</tr>
</tbody>
</table>

---

**UPGRADES & ACCELERATORS**

<table>
<thead>
<tr>
<th>Component</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerCache 40 MHz w/882</td>
<td>1139</td>
</tr>
</tbody>
</table>

---

**UTILITIES & PROGRAMMING**

<table>
<thead>
<tr>
<th>Category</th>
<th>Application</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>Quicken 5</td>
<td>99</td>
</tr>
<tr>
<td>Geometry &amp; CAD</td>
<td>Inventor 5</td>
<td>99</td>
</tr>
</tbody>
</table>

---

**Guarantee**

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Please refer to your purchase order for details.
CalendarMaker

For creating presentation-quality calendars—from dignified corporate calendars to beautiful personal calendars—quickly and easily. These professional calendars can be printed to the ImageWriter®, laser printers, and even to files for inclusion in page layout programs. Choose from three different calendar types: pictorial, full page (tall or wide) or two months to a page. Date boxes hold up to 254 characters of text be centered, left or right justified. Easy setup of preferences for page style, text style, monthly pictures, printing colors and monthly icons. Import graphics, add color, even highlight important dates with personalized icons and floating notes. It's a must for anyone who publishes, creates or uses monthly calendars. GRA0070

KaleidaGraph 2.1

Analyze and present complex data the easy way... KaleidaGraph simplifies the process of analyzing and presenting statistical information. Provides increased productivity for the engineering, scientific and business user who analyzes large amounts of data. Also imports data and allows the user to mathematically analyze it. KaleidaGraph provides 16 different graph structures, including scatter, histogram, probability plot, polar, as well as more common types, such as line, bar, and pie. You can crunch large amounts of data (up to 2,000 points per column), and plot up to 20 variables at once. Supports PostScript compatible printers including the DeskWriter C.

Publisher: Synergy STM018

M.Y.O.B. 3.0

M.Y.O.B., winner of the Macworld World-Class Award (1991 and 1992), is a fully-integrated, small business accounting software program containing GL, AP, AR, Checkbook, Inventory and Card File. M.Y.O.B. is extremely powerful yet easy to set up and use. Command Centers are arranged in a flowchart form making the program unlike all others. Version 3.0 features: Importing, Backorder Tracking, Increased Password Protection and more.

Publisher: Teleware, Inc. TN0087

MacGolf Classic 1.1

MacGolf Classic 1.1 challenges one to four players to match their skills against sand and water traps, deep roughs, winds, and undulating greens. Six tough courses are brought to life with full screen color graphics, five enlargement options, and digitized sound effects. Control your stance, ball position, club direction, swing power and club choice. Supports Hoover between holes and allows hard disk installation.

Publisher: XOR Corporation EN0274

From QuickKeys™ 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.

Improving your environment is our business™.

Publisher: CE SOFTWARE

The UnMouse

The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (60 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Manufacturer: Microtouch IN0084

Virtus WalkThrough 1.11

The latest version of this award winning 3-D drawing program provides everything you need to quickly capture and explore your ideas in 3-D. The intuitive interface and complete set of drawing and presentation tools make Virtus WalkThrough ideally suited for designers of all types including graphic artists, architects, space planners and theater and film professionals. Multiple windows and extensive drawing aids provide and interactive environment for editing and reviewing your ideas. Interactive 3-D presentations, QuickTime® and PICT animated movies, and perspective pictures dazzle your audiences. Balanced data exchange capabilities include: Imports of 3D DXX and trace layers for PICT, Claris® CAD and MacDraw; Exports of 3D DXX, 3D DXY, PICT, EPS, Claris® CAD and MacDraw. Winner of MacUser breakthrough Product of the Year Award 1990.

Publisher: Virtus Corporation GR0030

$31

$45*

$159

$149

$309

$139

$52
**MacEKG 2.0**

- MacEKG can warn you of computer failure before it happens. EKG monitors over 250 aspects of your system, logging and reporting failures every time you boot. EKG features advanced chip-level test made available to authorized Apple Technicians. Now, using EKG's Reactor to continuously re-boot simulates several days of heavy use to quickly diagnose intermittent failures. EKG can automatically run at startup or shutdown, making sure you are the first to know if your computer has a problem or slow down.

*Price: $99*

**MacPrint 1.3**

- Use a Macintosh with non-Apple printers. Print Mac applications on HP Laserjet, DeskJet or compatible printers including all Series 65, 850, and the DeskJet 850. Print text and graphics at the printer's maximum resolution. Does not require PostScript.

*Price: $95*

**RésumExpert**


*Price: $49 ea.*

**Design Your Own Home:**

- Design Your Own Home: Architecture, Interiors, or Landscape. Create floor plans, elevations and building plans with structural details that you can hand right to your contractor. Design individual room plans and kitchen/bath designs. Then complete your dream house with graphic landscape plans. Interiors and landscape programs generate 4-view and 8-view from top-view perspective. Sample plans are included.

*Publisher: Abracadabra*  

*Price: $59 ea.*

**FileGuard or MaccessCard Reader**

- FileGuard is a state-of-the-art software-based security solution that you can leave on your computer. Protect your Mac from unauthorized access (including security bypass with a system disk), copying and measuring applications and files. FileGuard (including System Folder) from unauthorized access, deletion, and/or illegal copying desktops from alterations by unauthorized users. Single UT0135 $19.99.

- MaccessCard Reader is a convenient security add-on for your Mac. Forget about passwords. Working with Fileguard, a card reader is a Mac using magnetically stamped cards. Two cards come with the reader and you can quickly insert it to recognize any IC or credit card. *Publisher: ASD Software, ACO9539*  

*Price: $295*

**FolderBolt**

- FolderBolt protects your folders (including your System Folder) with a password. Create completely locked folders, read-only folders, or password-protected root boxes. No one without the password can open, duplicate, delete, or move them. FolderBolt can unlock all your folders at once and re-lock them on re-boot. It also generates a complete audit trail of failed attempts. Combine FolderBolt with other security products from Kent Marsh Ltd. for comprehensive protection second to none. System 7 compatible. *Publisher: KentMarsh, Ltd.* UT0121  

*Price: $75*

**Dynodex or DynoPage**

- Dynodex or DynoPage is the latest, most full-featured contacts manager for the Mac. Give you speed access to all your contacts on your PowerBook and completely personalizes your address book in printed form. Both the DA and application versions are included. You can print double-sided address book pages to your Dynodex or DynoPage cards, envelopes, labels or any other custom form. MacWAREHOUSE Target award winner for Best Contact Management Software, BUS0101 $75.

- DynoPage lets you print any Macintosh file to any page size, including pages for your personal organizer. Carry printed graphs, reports, daily "To-Do" lists, spreadsheets, or even Mac files with you! This System 7-aware version also lets you create "instant booklets" by simply printing and folding your sheets. Over 100 layouts are included. *Publisher: Portfolio Systems DTP0055*  

*Price: $75*

**Turbo Mouse 4.0**

- "The next generation" of Kensington's award-winning Turbo Mouse® trackball. Advances in trackball technology give you smoother, superior cursor control. Introducing the Brilliant Corner™ command, it lets you automatically jump to user-defined areas on screen. Offer new software features include advanced acceleration and "enhanced mouse button" commands, plus other user-programmable features. You can even save different sets of commands or different applications and different users. In an improved design, the Turbo Mouse hardware includes a large ball for greater control and smoother movement, and comfortably positioned buttons with a light, easy-to-click feel. Two Apple Desktop Bus (ADB) connectors let you chain other input devices. Fully System 7 and AUIX compatible. Limited Lifetime Warranty. *Manufacturer: Kensington INP0060*  

*Price: $109*
A Power User Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your kit in your hands tomorrow!

MORE BRAIN POWER
FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spreadsheet. Install extra memory and you can leave a letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You'll find installation at home easy when you follow our free step-by-step installation video instructions. Just open your Mac, slide out the main circuit board and plug in your SIMMs.

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs—(2 @ $39 ea.).

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single Inline Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 120ns SIMMs is $39.

SPEED

Do you need 80, 100 or 120 nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100ns chip. The original Mac used relatively slow 150ns memory chips. The 68020 processor needs 120ns (or faster) chip, and the 68030 Macs like the speedy model.

OVERNIGHT DELIVERY

Install a MacWarehouse Expansion Kit and working with your Mac will never be the same! Call us now. We'll help you select just the right Memory Upgrade, and we'll ship it overnight for just $3.

MacWAREHOUSE
1-800-255-6227
Overnight Delivery Only $3.00!
Call 24 hours a day, 7 days a week
©1992 MacWarehouse Inc.

MACWAREHOUSE
30-DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your Power User Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY.

MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

* SIMM prices vary. Call for latest information. ** Limited offer! Two sides with purchase of 2 or more SIMMs.

FREE!
STEP-BY-STEP VIDEO INSTRUCTIONS**
Quicklime Starter Kit

Macintosh PC Exchange

Plus Your FREE System 7 Tutorial from MacWAREHOUSE!

Finder 7
The new Finder 7 is worth the cost alone. Access, organize, and view your folders, documents and applications faster and easier with the new improved finder.

Balloon Help
Use the new Balloon Help for interactive help while you work. Turn this feature on and point to anything on your screen - a menu item, icon, or tool - and a "balloon" appears, telling you what it is and what it does.

File Sharing
With the new File Sharing features you can share hard drives, folders, and files, with others on your network; it has never been easier. You can even set passwords so that only specific individuals or groups can see your files and work with them.

Fonts in System 7
Apple's new advanced font technology gives you clear, crisp type on screen in any size plus the ability to print to many different kinds of printers. No more struggle with font compatibility.

Multitasking
With System 7 Multitasking is always optional. Now you can run multiple applications at the same time, and switch from one to another with a click of the mouse. System 7 also supports background processing, so that while you're working in your word processor, you can print a document and have your spreadsheet recalculating.

System Folder Simplicity
Apple has completely redesigned and improved the System Folder, making it much easier to organize. Predefined subfolders are created automatically, to reduce clutter. The new System Folder includes a Control Panel Folder, Extension Folder, Apple Menu Folder, Preference Folder and Startup Folder.

Publish and Subscribe
You can "publish" any part of your document (a graphic, chart or piece of text), to another document even in another application - which "subscribes" to the original. Any changes you make to the original document will automatically appear in the other, even across a network. Now that's live copy and paste!

AccessPC 2.0
With AccessPC 2.0, your Macintosh can make MS-DOS files look just like Mac files, instantly. Pop any DOS floppy in your drive, and in a couple of clicks, the PC files are on your Mac desktop, looking and acting perfectly Mac-like. Edit, copy, save, print, play with the numbers, point, and click, and give the PC people back their diskette. It's that easy to use any PC file in any Mac application.

DiskFit Pro
Fast, efficient, easy backup. For Finder-readable backup to hard drives, cartridges or other hard disks, get DiskFit Pro. DiskFit Pro copies files from a hard disk to a "SmartSet" of floppy disks, and then updates that "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. Backup stay fast and backup sets compact. And since files stay in Finder format, retrievals are a breeze. Don't leave your data at risk, backup with DiskFit Pro. System 7 Savvy, System 6.x compatible.

SAM 3.0 or NUM 2.0*
SAM 3.0 detects viruses by monitoring the suspicious activities that characterized them. Version 3.0 has enhanced diagnostic and repair capabilities, faster scanning, and more. The CODEV portion operates during normal Mac usage, and offers a number of options for checking disks and folders as you work. UTI0214 $65

NUM 2.0 combines and integrates two outstanding collections of Mac utilities: SUM 2.0 (GNUM 1.1 plus automatic backup, data security (both DES and FastCrypt), and many productivity enhancements. Other utilities recover lost or accidentally deleted files, restore crashed hard disks and more. Publisher: Symantec UT10151

的成本为$3.00! Call 24hrs. - 7 days!
System 7 brings dynamic new capabilities and ease of use to everyone who uses a Mac...

- TrueType gives you crisp, clear type of any size
- Multitasking provides effortless switching between applications
- Finder lets you customize your desktop to the way you work
- File Sharing allows access to any folder and its contents among workgroups
- Publish & Subscribe lets you update several documents by only changing one
- TrueType gives you crisp, clear type of any size

And that's just for starters! Now it's easier than ever to get System 7 up and running on your Mac, because you can get it right from MacWAREHOUSE! Join the generation of System 7 power users!

Order System 7 today!

FREE with your order!

Make System 7 even easier with this Personal Training Systems Tutorial!

Get up and running with System 7 in a flash! This Personal Training Systems Tutorial is the fastest, easiest way to put all the power of System 7 right to work on your Macintosh desktop. And it's yours FREE* with your order for any product from MacWAREHOUSE! Just ask for it when you place your order.

FREE* when you order System 7 from MacWAREHOUSE!

ATM with four FREE fonts! Get the Adobe Type Manager program disk, user guide and registration card FREE* when you order System 7. You'll also get four Adobe Garamond typefaces from the Adobe originals®. When you place your order for System 7 just ask for it.

FREE* shipping and handling charge applies.

System 7 Group Upgrade Kit
SYs0002 .................................. $279

System 7 Personal Upgrade Kit
SYs0001 .................................. $79

*Limited Offer – Not Available to Resellers.

QuickTime Starter Kit
Play QuickTime movies right on your Mac! Pause, fast-forward, rewind, advance frame by frame. Copy video and animation clips and paste them together. Transform still images and information into a single movie. Use a video capture card and sound digitizer to record movies with the touch of a button. QuickTime brings Multimedia to the Mac! GRA0347 Publisher: Apple Computer, Inc. .......................................................... $169

AppleTalk Remote Access
Gain direct access to information and resources from your AppleTalk network. Simple to set up and use. High performance is optimized for a broad range of modems. Provides multiple security levels, and requires only System 7 and a high-speed modem. No special hardware required. COM0121 Publisher: Apple Computer, Inc. .......................................................... $175

AppleShare 3.0
Connect up to 120 users using a variety of cabling choices. New version offers faster server start up, improved integrity and error handling. Plus the ability to mount and unmount removable media while the server is running. NET0250 Publisher: Apple Computer, Inc. .......................................................... $1059

QuickTime brings Multimedia to the Mac! GRA0347 Publisher: Apple Computer, Inc.

To order, call MacWarehouse at 1-800-255-6227.
PostScript Printers

Du Pont PPI 600

Speedy performance, stunning high-resolution images — and proof of the old adage: You get what you pay for.

If you’re using an everyday laser printer to produce your company’s brochures, reports, or newsletters, the results will be less than professional. What should you do? If professional image-setting equipment is beyond your means or repeated trips to your friendly neighborhood service bureau are a scheduling nightmare, try a high-resolution solution.

The last two times MacUser Labs tested high-resolution Postscript-compatible laser printers (see “Practically Perfect Printing: High-Resolution PostScript Printers,” February ’92, page 172, and “The Letter-Perfect PostScript Printer,” October ’90, Buyer’s Guide page 4), our choice for best heavy-duty production-environment printer was the Varityper YT600. Its reign, however, is coming to an end. There’s a new king of the high-resolution hill: the Du Pont Plain Paper Imagesetter 600.

The Plain Paper Imagesetter 600 — more commonly and conveniently known as the PPI 600 — is a 600-dpi 12-ppm workhorse that produces some of the sharpest letter- and tabloid-sized output we’ve ever seen. A Motorola 88000 RISC (reduced-instruction-set computing) processor enables the PPI 600’s Hyphen PostScript-clone RIP (raster image processor), housed in a unit separate from the printing engine, to process complex images faster than any of its competitors’ RIPS can. The PPI 600 features auto-sensing serial, parallel, and LocalTalk ports, a real plus for multiplatform environments. This power and precision isn’t inexpensive: The heavy-duty PPI 600 has an equally heavy-duty price tag of $18,990.

Good and Fast

The PPI 600’s image quality is more than sufficient for producing camera-ready art for low- to-medium-resolution offset printing. Text is crisp and sharp, and 85-to-105-lpi halftones are clear, without sacrificing subtle shades of gray (see Figure 2). However, if you need 133- or 150-lpi halftones, a higher-resolution — and very expensive — imagesetter is required.

If the first criterion for a high-resolution printer is image quality, speed is a very close second — especially in a production environment (see Figure 3). Our tests showed the PPI 600 to be very swift indeed — even faster than the speedy Hewlett-Packard LaserJet IIISi — at processing complex graphic images. This is especially impressive when you consider that the 600-dpi PPI 600, with its 12-ppm engine, has to process four times as much information as the 300-dpi 17-ppm IIISi does.

The PPI 600 can process a page in two ways: RIP-to-disk and RIP-on-the-fly. With RIP-to-disk, the page is buffered on the
PPI 600's internal hard disk, processed, and then printed. With RIP-on-the-fly, the PPI 600 prints the page while processing it. Its software estimates the complexity of a page and which method to use. The RIP-on-the-fly method speeds up simple text and graphic documents and can turn itself off if it cannot process a page with complex graphic images fast enough. Our graphics test page — easy to process in the beginning and extremely complex in the middle — confused the RIP-on-the-fly software, making it stop processing before the page was finished. Du Pont claims that new software, which should be available now, has fixed this problem.

**On the Horizon**

Du Pont will update the PPI 600 to the PPI 1800. The PPI 1800 interpolates a 900-x-900-dpi printer engine to achieve 1,800-x-900-dpi output, features a faster interface than its predecessor's, and will cost approximately $25,000. Lexmark International (606-232-3000), a former division of IBM that manufactures printers under license from IBM, has introduced a true-600-dpi printer, the LaserPrinter 10A, for $3,995. Xante (205-476-8189), known for its cost-effective upgrade boards for the LaserWriter series, has released its first printer, the 600-dpi Accel-a-Writer 8000, at $4,495. NewGen Systems (714-641-8600) has added the $5,995 TurboPS/880 to its line of high-resolution printers, using Image Enhancement Technology to achieve 800-x-400-dpi output. LaserMaster (612-944-9330) has introduced the $6,995 Unity 1000 — its first printer that does not connect to the Mac through a NuBus card — with LocalTalk, serial, and parallel ports and an optional Ethernet port. LaserMaster uses its proprietary TurboRes technology to modulate a 400-dpi engine into 1,000 dpi in the horizontal and vertical directions.

**The Bottom Line**

The PPI 600 — fast, precise, and powerful — sets a new standard in the growing market of high-resolution printers. If your printing and production needs require camera-ready text or 85-to-105-lpi halftones, the Du Pont Plain Paper Imagesetter 600 can do the job.

— Paul Yi

![](image)

**Figure 2: Gray-Scale Quality**

<table>
<thead>
<tr>
<th>Description</th>
<th>Du Pont Plain Paper Imagesetter 600</th>
<th>Varityper VT600</th>
<th>Hewlett-Packard LaserJet IIIi</th>
</tr>
</thead>
<tbody>
<tr>
<td>Banding</td>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Color</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Overall</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

**Figure 3: Overall Speed**

<table>
<thead>
<tr>
<th>Product tested</th>
<th>Apple LaserWriter I1N1X</th>
<th>Faster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference standards</td>
<td>Du Pont Plain Paper Imagesetter 600</td>
<td>Hewlett-Packard LaserJet IIIi</td>
</tr>
<tr>
<td>50%</td>
<td>100%</td>
<td>150%</td>
</tr>
</tbody>
</table>

**Table 1: Features**

<table>
<thead>
<tr>
<th>Company</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Du Pont Printing and Publishing</td>
<td>Barley Mill Plaza #15</td>
</tr>
<tr>
<td>Wilmington, DE 19880</td>
<td>800-538-7668</td>
</tr>
<tr>
<td>302-733-9480</td>
<td></td>
</tr>
</tbody>
</table>

---

**List Price**

<table>
<thead>
<tr>
<th></th>
<th>List price</th>
<th>Street price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserWriter I1N1X</td>
<td>$8,990</td>
<td>$7,250</td>
</tr>
<tr>
<td>Du Pont Plain Paper Imagesetter 600</td>
<td>$18,990</td>
<td>$17,250</td>
</tr>
</tbody>
</table>

**Pros**

- Very fast, excellent text and gray-scale output.

**Cons**

- Very expensive.
- Lacks true Adobe PostScript.

**Company**

- Du Pont Printing and Publishing
- Barley Mill Plaza #15
- Wilmington, DE 19880
- 800-538-7668
- 302-733-9480

---

**Figure 2:** A smooth gray ramp is a tough test of a printer's image quality, but the Du Pont Plain Paper Imagesetter 600 passed with flying colors. The Varityper VT600 showed only slightly greater banding (obvious transitions between gray steps) but took much longer to print. The Hewlett-Packard LaserJet IIIi showed clear bands — an unavoidable disadvantage of 300-dpi technology.
Inkjet Printers

New software gives Apple's StyleWriter a performance boost. But can it catch up to the Hewlett-Packard DeskWriter?

Low-cost high-quality inkjet printers provide quality printing to those of us who can't afford laser printers. Although laser-printer prices have fallen dramatically, so also have the prices of the two inkjet alternatives to lasers: the Hewlett-Packard DeskWriter and the Apple StyleWriter. Not only are they more affordable but their performance is also improving: Hewlett-Packard and Apple have each recently released new software that adds features and increases printing speed.

The DeskWriter's 300-dpi resolution, respectable speed, and support for AppleTalk made it an instant hit. It wasn't until Apple introduced the StyleWriter that the DeskWriter had some serious competition (see "Personal Best: Two New Apple Printers," May '91, page 90). The StyleWriter was small and light, its 360-dpi resolution made for beautiful output, and it retailed for only $599. Unfortunately, it was numbingly slow, taking two minutes to print a single page of 12-point text.

Those two minutes per page could add up to a hefty chunk of time if you used your StyleWriter to do any serious quantity of printing. This resulted in a lot of unproductive idle time, because the StyleWriter — like the DeskWriter — didn't work with PrintMonitor, the background print spooler that comes with system software.

Diverse Drivers

Recently, the picture changed significantly. HP lowered the list price of the DeskWriter to $599, and Apple cut the list price of the StyleWriter to $399. Street prices are even closer: around $350 for the StyleWriter and $400 for the DeskWriter. Apple and HP also have released new drivers for their printers. (A driver is a system extension that handles a Mac's communication with a particular type of printer.) HP's new DeskWriter driver, version 3.1, is primarily a feature enhancement. It now provides a print-spooling feature and a page-preview function as well as improved gray-scale printing.

Apple's new StyleWriter driver, version 7.2.2, although primarily a performance release, lets the StyleWriter work with PrintMonitor, so printing can take place in the background. This new driver comes as part of System 7 Tune-Up version 1.1.1.

Productive Printing

We used a Mac IIci with the new driver and found that the StyleWriter was 40 to 60 percent faster than it was with the older driver (version 7.0) when printing a simple ten-page Word file or a MacDraw II graphics document, and it was 2.5 times as fast on a complex PageMaker
Figure 2: We connected a Hewlett-Packard DeskWriter and an Apple StyleWriter to a Mac Iie and compared their performance, using each printer’s new driver. We also ran tests with the older drivers. Although the StyleWriter’s new driver offers significant improvements, the printer can’t match the DeskWriter in terms of performance. We then connected the printers to a Mac Classic and retested them. Printing a Word document with the new StyleWriter driver is more than three times as fast as with its predecessor, but the DeskWriter is nevertheless nearly twice as fast as the StyleWriter. All results are shown relative to those of the Apple StyleWriter with System 7.0.1 driver 7.0.

Figure 3: Each printer produces very good text, as these samples (at 2x magnification) show. The StyleWriter’s 360-dpi resolution gives it a slight edge—but is such a tiny improvement worth nearly twice the printing time?

Table 1: Features

<table>
<thead>
<tr>
<th></th>
<th>Apple StyleWriter</th>
<th>Hewlett-Packard DeskWriter</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$399</td>
<td>$599</td>
</tr>
<tr>
<td>Street price</td>
<td>$350</td>
<td>$400</td>
</tr>
<tr>
<td>Cons</td>
<td>Still slow despite improved performance of 7.2.2 driver.</td>
<td>Large footprint, Ink warps page when printing large solid areas.</td>
</tr>
<tr>
<td>Company</td>
<td>Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408-996-1010</td>
<td>Hewlett-Packard Co., Direct Marketing Organization, P.O. Box 58099, MS 511-L-SJ, Santa Clara, CA 95051, 800-752-0900, 408-738-6856 (driver upgrades)</td>
</tr>
</tbody>
</table>
THE AGFATYPE™ CD-ROM VERSION 3.1
THE BEST TYPE CD WITH THE ADOBE® LIBRARY,
AGFA POSTSCRIPT® LIBRARY AND MORE.

3.1

There’s no Type CD in the industry that compares with the AGFATYPE CD-ROM.

Features:
- On-line catalog lets you view over 2000 Typefaces
- Adobe, Agfa PostScript and TrueType™ Libraries
- Easily unlock fonts with a single call to our toll-free customer service hotline
- 7 MB Shareware
- Multimedia Type Tutorials
- Logos & Symbols library (over 11,000 characters)
- Free Typeface Included: Garth Graphic
- New Agfa software — KernEdit™ & TypeChart™
- Multilingual user interface

Prices listed are for USA only. See us at MacWorld—Boston. Also available through Ingram Micro and Tech Data.

Worldwide acclaim for the leading Type CD-ROM publishing toolkit

"Agfa is the best of the new breed of unlockable CD-ROMs.”
MacUser, March 1992

"Agfa’s CD-ROM is chock-full of goodies and makes a complete package. Put simply, AGFATYPE is a good deal — and its interactive, on-line material makes it fun to use.”
Publish, July 1992

"Agfa is one of the few CD-ROM vendors to make use of the medium’s wide open spaces, and should be applauded.”
Prepress (U.K.), May 1992

"All in all, the new AGFATYPE CD-ROM is hard to fault. The icing on the cake is more than 7 MB of public domain and shareware utilities...”
MacWorld (U.K.), March 1992

Get the AGFATYPE CD-ROM v3.1 with 20 exclusive Agfa headline typefaces unlocked plus one Logos and Symbols font of your choice. An $830 retail value.

ORLANDO
PL Benguiat Frisky
Metropolis
TC Jasper
Bernhard Modern
PL Davison Americana
Quirinus Bold
PL Futura Maxi Demi
Modern Twenty
TC Europa Bold
PL Futura Maxi Light
Siena Black
SECTION BOLD CONDENSED
PL Behemoth Semi-Cond.

WOODBLOCK
Egiziano Black
PL Westerveldt
Stratford Bold
PL Tower Condensed
Beton Extra Bold

Get the best Type CD, Toshiba’s best CD drive, AND 20 free headline faces.
A $1,920 value for only...

Circle 223 on Reader Service Card.
If you need to keep track of who did what when to which file — and why — VersionMaster, from AStar Technologies, can help you sort things out. This $199-per-user utility works from within any application, allowing you to track documents through multiple revisions and coordinate editing changes among networked users. It also keeps compressed archives of previous versions of a file, so you’ll never lose another hard day’s work because you edited or overwrote the wrong file. 508-486-8532.

By Aileen Abernathy

**Uncalibrated color:** Electronics for Imaging (EFI) has finally released Cachet, a $395 color-editing package that lets anyone produce good-looking color images without calibrating monitors or learning a secret handshake. You simply match the screen appearance of a scanned photo to that of an already corrected reference image, using an ingenious point-and-click approach. No worries about monitor calibration or ambient light, because both images are on the same screen. A gamut alarm highlights unprintable colors, based on the selected output device, and color separations are optimized for the printing method (SWOP Matchprint, for example). Cachet’s **not-so-secret ingredient** is EfiColor, a system-level color-management system that maintains color consistency from scanner to monitor to printer. 415-742-3400.

**PageMaker piecemeal:** Aldus promises that incremental rotation will be part of PageMaker 5.0, but Equilibrium (415-332-4343) has an interim Addition for the impatient. Rotate This! ($49) twirls bit-mapped graphics (TIFF, PICT, and paint) in \( \frac{\pi}{400} \)-degree increments. Alas, it can’t handle EPS images or text. A second Equilibrium Addition, Import That! ($149), enables PageMaker to directly import Photoshop, Pixar, and QuickTime graphics as well as non-Mac image formats such as BMP (Windows), GIF (CompuServe), PCX (DOS), and TGA (Targa). The Utility Company’s MouseTrap, also $149, is a stand-alone utility that **traps PageMaker files.** You first save each page to disk as an EPS file and then open it in MouseTrap, which lets you select the objects you want to trap. Trapped files can be processed through PrePrint or Adobe Separator. 714-754-1087.

**Faster, smoother:** If you’d like 24-bit quality at 8-bit sizes, Fast Eddie’s got a deal for you. This superslick $169 utility, from Paradigm Concepts, reduces 24-bit images to one-third their original size — without compression — by creating optimized 8-bit images with colors closely matching those in the originals. 505-888-0112. Smoothie, from Peirce Software (408-244-6554), sounds like a Lothario or loan shark, but it’s a $149 utility for quickly removing (anti-aliasing) the jagged edges in drawings and presentation files. Although it’s superficially similar to Ray Dream’s JAG, Smoothie works only with object-oriented PICT images, such as those produced by Persuasion or MacDraw, and converted files are four to ten times as large as the originals. Smoothie does offer a batch-conversion mode, however, and it can turn groups of images into a QuickTime movie or a SlideShow file.
Pixar Typestry

The Greatest Software for Creating Dimensional Type

IT'S EASY
Pixar® Typestry™ turns your Type 1 and TrueType fonts into dimensional text. You work in a familiar 2-D space so you can't get lost. It's a 2-D design experience with 3-D results.

IT'S AMAZING
Pixar Typestry is great for adding pizzazz to your documents, creating riveting presentations, and designing classy logos.

You can place your text wherever you want it and dress it with any number of interesting Looks. You can choose lights to add highlights or cast shadows and use dingbat-type fonts as decorative ornaments.

IT'S POWERFUL
Just by picking from a menu, you can add motion blur, perforations, shadow patterns and gels to your picture. If you want, you can even animate your text and make a QuickTime™ mini-movie.

IT'S PRACTICAL
Typestry images can be gracefully imported into other applications like Photoshop™, PageMaker™, and Quark™. Our alpha channel eliminates the need for time-consuming editing. High resolution images can be generated for slides, print or video.

IT'S RENDERMAN
Within Typestry is Pixar's powerful RenderMan®. This invisible wizard will transform your image into a professional quality masterpiece that will amaze you. It's the very same RenderMan that was used to create the special effects in some of your favorite films.

Pixar Typestry is a RenderMan family product. It is fully compatible with Pixar's Showplace™, MacRenderMan™ and NetRenderMan™ for faster rendering. It can also be used with many other fine RenderMan products including the wonderful Looks libraries offered by third parties such as The VALIS Group.

Pixar Typestry retails for $299 at your favorite Macintosh store or call 1-800-888-9856.

©1992 Pixar. All Rights Reserved. Pixar and RenderMan are registered trademarks of Pixar. Typestry, Showplace, MacRenderMan and NetRenderMan are Trademarks of Pixar. All others are Trademarks of their respective companies. Prices subject to change without notice.
Plugging In to Photoshop

Extending the capabilities of Photoshop — as well as SuperPaint, Painter, StrataVision 3d, and seven other programs — is a snap, thanks to the dozens of plug-in modules now available.

By Michael Roney

As the first monster application of the 1990s, Adobe’s Photoshop defined a new level of sophistication and power for image processing on the desktop. And long before the Mac’s system software went modular, Photoshop popularized the concept of plug-in modules.

These little add-on programs let Adobe and third-party vendors extend the capabilities of Photoshop without bulkling up the main application. Plug-in modules provide links to scanners, printers, and video-capture cards; access to calibration and compression systems; special-effects filters; and more. Using a plug-in couldn’t be simpler: You just drop it into the folder containing the Photoshop Preferences file, and when you next launch Photoshop, you have seamless access to the plug-in’s functions from within the program.

But the real beauty of Photoshop’s plug-ins is that they work with more than just Photoshop. In a classic case of "if you can’t beat ‘em, join ‘em," many competing graphics vendors have adopted Photoshop’s plug-in technology, making it the unofficial standard for increasing the power of Mac graphics applications. Programs that accept Photoshop plug-ins include Premiere 1.0, from Adobe; SuperPaint 3.0, from Aldus; Cachet 1.0, from EFI (Electronics for Imaging); ColorStudio 1.5 and Painter 1.2, from Fractal Design; Color It! 1.0, from MicroFrontier; QuarkXPress 3.1, from Quark; StrataVision 3d 2.5, from Strata; PixelPaint Professional 2.0, from SuperMac; and Oasis 1.1, from Time Arts.

Photoshop’s plug-in format is an expansion of an open specification that Silicon Beach Software (now a subsidiary of Aldus) developed in the late 1980s for Digital Darkroom and SuperPaint. Adobe has defined three types of plug-in modules: Acquire modules let you decompress a JPEG (Joint Photographic Experts Group) document or control scanners and video-frame-capture systems from within Photoshop. Export modules let you save images in file formats not normally supported by Photoshop, print images optimized for particular printers, and perform JPEG compression. Filters enable you to apply special effects to images. Certain applications support only some of these categories. For example, neither QuarkXPress nor Cachet supports special-effects filters.

Two dozen plug-ins come bundled with Photoshop, and third parties offer dozens more for Photoshop and its ten plug-in-savvy colleagues. This overview discusses what’s available; for more information on specific products, see the 3rd Party Software Guide that comes with Photoshop or contact the companies listed in the “Directory” sidebar.

Hardware Links

The largest (and least exciting) group of plug-ins are the acquire and export modules that come bundled with scanners, video-digitizing systems, printers, and film recorders.

Scanner plug-ins, which let you scan
images directly into Photoshop, are the most common acquire modules (see Figure 1). Scanner modules are great time-savers, because you don’t have to leave the program to make a scan or save your scanned image in a universal graphics format to work on it. With Quark’s new Plug-In XTension, for example, you can use a Photoshop plug-in to drive a scanner from within QuarkXPress and place the resulting scanned image directly into a page layout. Nearly every scanner manufacturer except Hewlett-Packard bundles a Photoshop plug-in with its products.

The number of acquire plug-ins for video-digitizing systems is on the up-swing, thanks to the advent of QuickTime and Photoshop’s increasing popularity in television, film, and desktop multimedia production. Companies such as Advent Computer Products, Canon, Computer Friends, Mass Microsystems, and Nikon offer plug-in interfaces that let you bring video images directly into Photoshop.

Diaquest goes beyond simple video capture with its DQ-Animaq board and plug-in, a professional system that lets you bring a video frame into Photoshop, add a special effect, and then save it as a PICS file or record it to videotape. When you use DQ-Animaq with a macro generator such as QuickKeys, you can automate the process over a range of frames, a technique called electronic rotoscoping. The plug-in lets you precisely control the frame origin and destination as well as the capture and record rates.

Export modules for printers and film recorders are less common. Eastman Kodak, Nikon, and RasterOps are among the companies that offer printer plug-ins. For example, Eastman Kodak’s plug-in module for the XL.7700, its high-end color printer, optimizes certain Photoshop features. A dialog box lets you adjust hue and saturation, check which colors in an image are printable, scale images to fit the output medium, or lighten or darken images by predetermined increments.

**Special Effects**

Want to add a rainbow or reflection to a mundane photograph? How about fracturing a person’s face into five easy pieces or turning a boat scene into a watercolor painting? No problem. Special-effects filters let you enhance or transform entire images or selected areas with just one or two mouse clicks. Whether you lack the requisite artistic skills or simply like instant gratification, special-effects filters can quickly turn humdrum artwork into something special.

Photoshop comes with around two dozen filters, some (Blur, Sharpen, Add Noise) built-in to the main program and others (Lens Flare, Radial Blur, Solarize) bundled as plug-in modules.

Several companies have released their own packages of Photoshop-special-effects filters, some of which boast a significant improvement to Adobe’s filter interface: a preview window that lets you quickly see the effect the filter will have on an image before you render it.

Gallery Effects, developed by Aldus’ Silicon Beach Software subsidiary, is the best-known series of filters. The first collection, Classic Art, provides 16 plug-ins that simulate traditional media: Chalk & Dashes, Charcoal, Pastel, Pencil, Graphite, Oil, Watercolor, etc. Special-effects filters, some of which boast a significant improvement to Adobe’s filter interface: a preview window that lets you quickly see the effect the filter will have on an image before you render it.

Gallery Effects, developed by Aldus’ Silicon Beach Software subsidiary, is the best-known series of filters. The first collection, Classic Art, provides 16 plug-ins that simulate traditional media: Chalk & Dashes, Charcoal, Pastel, Pencil, Graphite, Oil, Watercolor, etc.

**Directory**

**Advent Computer Products**

449 Santa Fe Drive, Suite 213
Encinitas, CA 92024
619-942-8456
619-942-0648 (fax)

**Neotech Image**

Compressor, $999

**Aldus Corp.**

411 First Avenue S.
Seattle, WA 98104
800-367-1892
206-622-5500

**Gallery Effects: Classic Art, $199**

**Gallery Effects: Texture Art, price unavailable**

**Andromeda Software**

846 Old Farm Road
Thousand Oaks, CA 91360
800-547-0055
805-379-4109

**Series 1: Photography Filters, $99**

**Series 2: 3-D Special Effects, $99**

**Candela**

1676 E. Cliff Road
Burnsville, MN 55337
612-894-8800
612-894-8840 (fax)

**ColorCrypt, $200**

**PrintCalPl, $2,500**

**Scan-Cal (reflective art only), $1,500**

**Transmissive-art option for Scan-Cal, $250**
From the Macintosh desktop to Film, PrePRESS DIRECT! has the products and knowledge to bring your press prep applications in house. From the all new Varityper 2990 Color Publishing System (based on the Macintosh Quadra 950), to the Varityper 4990A Imagesetting System, we make in house press prep affordable and easy. Since electronic publishing is the only market we serve, our sales consultants understand your press prep questions and are able to provide you with an informed response. One source for all your electronic press prep needs... PrePRESS DIRECT!

2990 Color Publishing System
The Varityper 2990A and 2990B are entry-level systems that are capable of high-quality color production and are ideal for use in the preparation of sales promotion materials, pamphlets, brochures, annual reports, and other printed matter.

Macintosh Hard Drives & Opticals

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest 44 with Cartridge</td>
<td>$599</td>
</tr>
<tr>
<td>SyQuest 88 with Cartridge</td>
<td>$699</td>
</tr>
<tr>
<td>3.5 Sony Optical-130 MegaByte</td>
<td>$1,599</td>
</tr>
<tr>
<td>5.25 Sony Optical-850 MegaByte</td>
<td>$2,799</td>
</tr>
<tr>
<td>MaxOptical - 1 Gigabyte</td>
<td>$3,599</td>
</tr>
<tr>
<td>External 240 MegaByte Fast SCSI-2</td>
<td>$919</td>
</tr>
<tr>
<td>External 330 MegaByte Fast SCSI-2</td>
<td>$1,349</td>
</tr>
<tr>
<td>External 425 MegaByte Fast SCSI-2</td>
<td>$1,599</td>
</tr>
<tr>
<td>External 520 MegaByte Fast SCSI-2</td>
<td>$1,659</td>
</tr>
<tr>
<td>External 1.0/1.2/2.1 GigaByte Fast SCSI-2</td>
<td>$2,799</td>
</tr>
<tr>
<td>External 2.1 GigaByte Fast SCSI-2</td>
<td>$4,955</td>
</tr>
<tr>
<td>External 240 GigaByte Array</td>
<td>$1,659</td>
</tr>
<tr>
<td>External 480 GigaByte Array</td>
<td>$2,659</td>
</tr>
<tr>
<td>External 1 GigaByte Array</td>
<td>$5,099</td>
</tr>
</tbody>
</table>

Blank Optical & Syquests

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest 44 MegaByte</td>
<td>$79</td>
</tr>
<tr>
<td>SyQuest 88 MegaByte</td>
<td>$129</td>
</tr>
<tr>
<td>Optical 130 (3.5) MegaByte</td>
<td>$55</td>
</tr>
<tr>
<td>Optical 160 (5.25) MegaByte</td>
<td>$129</td>
</tr>
</tbody>
</table>

RasterOps

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CorrectPrint 300 with 36 MegaByte</td>
<td>$9,995</td>
</tr>
<tr>
<td>Tektronix Phaser III PVI with 14 MegaByte &amp; Extra color sticks</td>
<td>$9,995</td>
</tr>
<tr>
<td>Varityper VT-400 Tabloid Printer with 70 fonts and 40 MegaByte font drive</td>
<td>$5,455</td>
</tr>
<tr>
<td>VT-600 Tabloid Printer with 35 fonts and 20 MegaByte font drive</td>
<td>$9,955</td>
</tr>
</tbody>
</table>

Scanners

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microtek ScanMaker 1650</td>
<td>$1,849</td>
</tr>
<tr>
<td>UMAX UC-600 (300x600 dpi)</td>
<td>$1,359</td>
</tr>
<tr>
<td>UMAX UC-1200S (600x1200 dpi)</td>
<td>$3,455</td>
</tr>
<tr>
<td>UMAX Transparency option</td>
<td>$739</td>
</tr>
</tbody>
</table>

Monitors

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweet 19&quot; 15&quot; Color Hitachi (1024 x 788)</td>
<td>$1,295</td>
</tr>
<tr>
<td>20&quot; Color Dual Scan Trinitron</td>
<td>$1,669</td>
</tr>
<tr>
<td>21&quot; Color Hitachi (1920 x 1080)</td>
<td>$2,599</td>
</tr>
<tr>
<td>CorrectColor Calibrator</td>
<td>$2,999</td>
</tr>
<tr>
<td>PaintMatch (24-Bit)</td>
<td>$2,049</td>
</tr>
<tr>
<td>ProColor 32</td>
<td>$3,299</td>
</tr>
<tr>
<td>SuperMac 26&quot; Color SuperMatch</td>
<td>$1,799</td>
</tr>
<tr>
<td>21&quot; Color SuperMatch</td>
<td>$3,299</td>
</tr>
<tr>
<td>Spectrum 8+24 PDQ</td>
<td>$879</td>
</tr>
<tr>
<td>Thunder24</td>
<td>$3,195</td>
</tr>
</tbody>
</table>

Memory Upgrades

<table>
<thead>
<tr>
<th>Option</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 MegaByte Upgrade (80ns)</td>
<td>$189</td>
</tr>
<tr>
<td>6 MegaByte Upgrade (80ns)</td>
<td>$279</td>
</tr>
<tr>
<td>16 MegaByte Upgrade (80ns)</td>
<td>$549</td>
</tr>
<tr>
<td>64 MegaByte Upgrade (80ns)</td>
<td>$2,759</td>
</tr>
<tr>
<td>Spectrum 8+24 PDQ</td>
<td>$99</td>
</tr>
</tbody>
</table>

Varityper 4990A
PrePRESS DIRECT! is proud to offer the best value in the imagesetting market, the Varityper 4990A. At an amazing $21,995, the 4990A offers a PostScript 8 MB Adobe Atlas RIP, 35 built-in fonts, 42MB RIP/font disk, 100+MB page buffer, and both 1200 and 2400 dpi resolutions. Whether you’re a desktop publisher, design agency, quick printer, newspaper, or magazine publisher, you’ll appreciate the quality and functionality of the 4990A. Call today for more information on the 4990A and other affordable imagesetting solutions from PrePRESS DIRECT!

Price includes installation, training, annual service and helpline contracts.

PrePRESS DIRECT! Catalog—
Call or write today for your FREE copy of PrePRESS DIRECT!'s catalog. Featuring complete Varityper Publishing Systems, hard drives, memory expansion, accelerators, DTP software, fonts, monitors, laser printers, imagesetters and accessories. One source, one catalog for all your electronic publishing needs.

Name
Address
City
State
ZIP+4
TEL.

CIRCLE 228 ON READER SERVICE CARD.
Finally...affordable color. Breaks the price barrier for 19" Trinitron color systems!

<table>
<thead>
<tr>
<th>CPU</th>
<th>Video</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac II, llx, llcx, llci, llfx, SE/30 LC, Quadra 700 &amp; Quadra 950</td>
<td>8-bit system</td>
<td>$2195</td>
</tr>
<tr>
<td>Mac II, llx, llcx, llci, llfx, Quadra 700 &amp; Quadra 950</td>
<td>24-bit system (accelerated)</td>
<td>2749</td>
</tr>
<tr>
<td>Quadra 700 &amp; Quadra 950</td>
<td>On-board video</td>
<td>1895</td>
</tr>
</tbody>
</table>

*llci solution retains PDS slot for the RealTech cache card.

RealTech Color Systems
AT LAST... A 75 Hz ACCELERATED 24-BIT, 19" Trinitron SOLUTION!

RealTech Full-Page Displays

<table>
<thead>
<tr>
<th>CPU</th>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac II, llx, llcx, llci, llfx, SE, SE/30, LCII</td>
<td>GS 256</td>
<td>879</td>
</tr>
<tr>
<td>Mac II family, SE/30, llci, LCII</td>
<td>GS 16</td>
<td>449</td>
</tr>
</tbody>
</table>

Only $449!

Look at us for monitors...
Seiko SpectraPoint 800 DPI Color Scanner

Flatbed color scanner offers high-quality output at an affordable price. Plus it’s easy to set up and use! Single-pass scanner allows color matching between scanner and monitor. Custom gate arrays perform image processing functions like shading, scaling, edge emphasis, and color correction at high speeds. JPEG-compatible image compression and decompression software permits image compression without perceived loss of image quality. Scans in portrait and landscape modes.

- 24-bit color (16.8 million colors); 8-bit grayscale (up to 256 grayscale levels)
- 1 scanning pass
- 14 brightness settings for each color plane
- Scanning speed 28 seconds at 400 dpi

Microtek Scanmaker 600ZS Color Scanner

Scanmaker 600ZS Color Scanner includes Adobe Photoshop — full version, with 24-bit color editing and color separation capabilities.

- 16.8 million colors
- 3 scanning passes (red, green and blue filters)
- 14 brightness settings for each color plane
- Scanning speed 150 seconds

Microtek Scanmaker Slide Scanner.

The affordable 35mm color slide scanner! Scans landscape or portrait slides at 1850 dpi. Captures 24-bit color and 8-bit grayscale. Bundled with Photoshop, you’ll be able to produce 4-color separations from your color slides.

NEW! “LEASE TO FIT” Programs*

1 True Lease...with 10% buy-out option
2 Installment Lease...with $1.00 buy-out option
3 Speed Lease...90- or 180-day terms, with buy-out or conversion to other leases
4 20/20 Lease...10% security deposit, 20 equal payments, 10% buy-out
5 90-day Deferred Lease...no payment for 90 days; first and last payment in advance

*All leases are subject to credit approval. All lease payments in our ads are based on the “True Lease” program at 48 months. Prices, lease prices, and rates are subject to change without notice.

NOTE: Minimum lease payment is $50 per month.
**CM-1445 Trinitron**

 Lease: $16/mo.

 Resolution Trinitron tube... 6 million shades of color!
 480 resolution, 72 dpi. 14" / has integrated tilt & swivel base.

 Brighter than the leading competitor!

---

**SOLR Nitron**

 $1295

 Lease: $36/mo.

 Contrast, for exceptional color and clarity. Virtually flat Trinitron tube design and maintains focus out 1024 x 768 resolution, 75 Hz. Anti-static, MPR II combines both VLF and ELF. Extra features for the most demanding jobs.

---

**Seiko CM-2070 $Call for price**

 20" Trinitron is America's best source for monitors of all sizes and prices.

 Super sharpness for desktop publishing, presentations and CAD. The 1152 x 882 (75 Hz) ultra-fine resolution sharpens type, smooths curves, and reduces eye strain. Superior color saturation... and the linear tracking design ensures video board compatibility.

---

**NEC 21" MultiSync 6FG Color Monitor**

 Lease: $90/mo.

 $3279

 1024 x 768 (75 Hz) resolution, 75 Hz refresh rate. 800 x 600 resolution. 15" display has tilt and swivel base. 16.8 million colors, 72 dpi, 73 Hz refresh rate. 21" display has integrated tilt and swivel base.

 Hours: 8 am-7 pm Central Standard Time

 30-DAY MONEY-BACK GUARANTEE. Before returning merchandise, you must ask that you call our Customer Service Dept. and obtain a returned merchandise authorization number (RMA). This number must be included with any products you return. No C.O.D. orders, please. Thank you for your cooperation. All prices are subject to change without notice. Hardware that is located at 610 S. Foster in Corpus Christi, Texas 77411.
RasterOps 24XLI
21" Color System

$5819
Lease: $160/month

The latest in 24-bit technology.
On-board acceleration, 16.8 million colors, 72 dpi, 75 Hz refresh rate. 1152 x 870 resolution. A full two pages of vibrant color!

We've been an authorized RasterOps dealer for 5 years; we support these excellent products with top-of-the-line service and warranties.

ColorBoard 24Sx .................. 639
ColorBoard 24Mx .................. 1199
ColorBoard 24MxQ ................. 1199
ColorBoard 24XLI ................. 1999
ColorBoard 24STY ................. 799
ColorBoard 264E/30 ............... 719
ColorBoard 8LC .................. 599
ColorBoard 8XL .................. 479
PaintBoard Li .................... 1599
VideoTime ....................... 1199
ImagePak Still Compression ....... 319
TV Tuner Classic ................ 299
ClearView Classic 21* ............ 1439
MediaTime ...................... 1599
Video Expander .................. 479

Other cards available.
Please call for prices.

RasterOps Sweet
16" Color Monitor

$1249
Lease: $34/month

Value-priced big screen color!
With fully accelerated 24-bit video card .... $2049
With RealTech 8-bit video card ........... $1579

RealTech and the RealTech logo are trademarks of MBM. All other trademarks used in Hardware That Fits ads are the properties of their respective owners. Hardware That Fits is located at 18 S. Frazier, Conroe, TX 77301.
Toll-free ordering in the U.S. & Canada
8 am-7 pm CST
30-DAY MONEY-BACK GUARANTEE. ALL PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE.

1-800-364-USER

This versatile scanner can handle flat art AND transparencies or slides...just add our Transparency Option.

$1299
Lease price: $36/month

EASY TO USE!
• 24-bit color
• 8-bit grayscale or black and white
• 200 brightness & contrast levels!
• scales at 12.5% to 800% (most scanners adjust only up to 400%)

Transparency Option available for scanning transparencies and negatives!
Transparency Option lets you scan slides, transparencies, film, or negatives. Exposure time is adjustable for scanning dark film. Scanning speed 9.1 seconds at 300 dpi (black and white or gray scale; 75 seconds for color scanning.

Scans in 24-bit color, 8-bit grayscale or black & white.
Developed for graphic design studios, ad agencies, publishers...anyone who needs high-quality images for publishing and printing.

The RealTech is one of very few scanners that feature gamma-correction, which lets you adjust contrast and brightness without losing details in highlight and shadow areas.

Includes gamma-correction and Savitar’s ScanMatch color-calibration software.
ScanMatch software ($199 retail value—included FREE!) adjusts color scan files so the colors are true when displayed on the Mac.

RT Scan 800
w/Adobe Photoshop $1499
w/Color Access Call
Transparency Option 495

The examples above were scanned by an independent service bureau at the default settings, separated using Color Access, and color corrected with Adobe Photoshop.

RealTech and the RealTech logo are trademarks of MBi. All other trademarks used in our ads are the properties of their respective owners.

HARDWARE THAT FITS
FAX: 1-409-539-4141
Call: 1-409-760-2400
TOLL-FREE TECH SUPPORT: 1-800-364-MACS
Charcoal, Charcoal, Chrome, Craquelure, Dark Strokes, Dry Brush, Emboss, Film Grain, Fresco, Graphic Pen, Mosaic, Poster Edges, Ripple, Smudge Stick, Splat­ter, and Watercolor. (Gallery Effects also is available as a stand-alone application for those who don’t have a plug-in-compatible graphics program.)

The effects are easy to apply and can produce stunning results (see review, April ’92, page 58). Each filter provides a dialog box that contains filter-specific controls, a thumbnail of the entire image, and a preview window for checking how the filter looks after it has been applied to a section of the image (see Figure 2). By experimenting with the controls, you can create countless variations of any effect, and you can save as many as 25 custom settings for each filter. You can create some interesting effects by applying filters to individual color channels. For example, you could use Graphic Pen just on the red channel, Smudge Stick only on the green, and Chrome on the blue. You can also apply single or multiple effects to all or part of a PICS animation file with a bundled utility called Animator.

Gallery Effects’ drawbacks are minor: The preview area is limited to a small portion of the overall image, and the effects take quite a long time to apply — adding the watercolor effect to a 1.1-megabyte image took six minutes on a Mac.

The latest Gallery Effects package, Text­ure Art, supplies 125 photographic-quality texture images of surfaces and materials, including brick, fabric, gravel, ground cover, marble, metal, roofing, stone, tile, walls, and wood. The textures, developed by Pixar, can be seamlessly tiled across any image or object; you can also open existing TIFF or PICT files for tiling. The tiled format means that the texture files themselves require only about 512K each. The basic package provides the textures in 8-bit, 72-dpi TIFF and PICT formats on floppy disks and CD-ROMs. (The price wasn’t set at press time but should be between $200 and $300.) The 24-bit, 300-dpi versions of the textures must be purchased separately; they can be ordered directly from Aldus or unlocked on the CD-ROM.

If you hanker for optical effects, check out Series 1: Photography Filters, from Andromeda Software, which also develops Streamline, Adobe’s auto-tracing program. The 11 filters create reflections, diffractions, halos, rainbows, prisms, motion blurs, glowing stars, textures and patterns, multiple copies (for kaleidoscopic effects), and mezzo line screens for gray-scale images. One of the filters, cMulti, is bundled with Photoshop 2.0.

Like the Gallery Effects filters, the Andromeda filters are accessed through a dialog box with a preview window (see Figure 3). However, the Andromeda
software lets you preview an entire image almost instantly, and the parameter controls are more extensive than in Gallery Effects. Applying an effect takes less than 30 seconds on a 68030 Mac, but the results are less spectacular than those you can get with Gallery Effects.

At press time, Andromeda was preparing Series 2: 3-D Special Effects, which will let you create 3-D perspectives without dedicated 3-D software. It contains geometric molds — including a sphere, cone, cylinder, and plane as well as a user-customizable shape — onto which you can wrap images and then look at them from different viewpoints.

Performance Resources created RazzaMaTazz Filters to provide the graphic effects favored by advertising agencies. The eight filters alter color values or image geometry (see Figure 4). Tremor supplies an earthquake effect; Fade darkens images; Modulus produces radically altered images with infrared or neon looks; RGB Swap switches the values of selected pixels between color channels; Sepia tints images an old-fashioned brownish gray; Split 128 creates a subtle posterized effect; FrameMaker lets you create “moldings” through a multistep process; and Trig creates patterns based on user-specified values for the sine, cosine, and tangent.

We found the RazzaMaTazz filters less intuitive than the other packages', and although they do provide a potentially greater range of results, they require a bit more experimentation. Instead of providing detailed instructions and examples, Performance Resources exhorts users to “experiment, experiment, experiment.” (They must not know about the time constraints most artists and advertising agencies work under.) The filters have no preview windows, and only a couple have user controls. Each takes as much as 30 seconds to apply.

**Speed Boosters**

Photoshop’s standard filters — Unsharp Mask, Sharpen, Gaussian Blur, JPEG Compression, Image Size, Rotate, and so forth — can take a long time to do their stuff. Spectral Innovations, Newer Technology, SuperMac, and RasterOps are addressing the problem by pairing special versions of computation-intensive filters with dedicated accelerator cards. If you regularly sharpen, blur, or compress images, the soupied-up filters can make these operations up to ten times as fast as their Adobe counterparts, cutting your waiting time from minutes per operation to just seconds.

Lightning Effects, from Spectral Innovations, provides alternative plug-ins for 11 Photoshop filters, coupled with a DSP (digital signal processing) board. The plug-in software is available separately for those who already own a Spectral DSP board. Quadra and IIfx owners will be pleased to hear that Newer Technology offers both PDS (processor-direct slot) and NuBus versions of Image Magic, its DSP card/filter package. SuperMac’s ThunderStorm package contains two parallel DSP cards and alternative plug-ins for nine Photoshop bottlenecks. The company claims that its implementation produces results that more accurately match those of the Adobe filters. It may have a point — ThunderStorm was developed in collaboration with Adobe and Storm Technology, the

---

**Directory, continued**

<table>
<thead>
<tr>
<th>RasterOps</th>
<th>Spectral Innovations</th>
<th>Storm Technology</th>
<th>SuperMac</th>
<th>Total Integration</th>
</tr>
</thead>
<tbody>
<tr>
<td>2500 Walsh Avenue</td>
<td>1875 Lundy Avenue</td>
<td>1961 Landings Drive</td>
<td>485 Potrero Avenue</td>
<td>155 E. Wood Street</td>
</tr>
<tr>
<td>Santa Clara, CA 95051</td>
<td>San Jose, CA 95131</td>
<td>Mountain View, CA 94043</td>
<td>Sunnyvale, CA 94086</td>
<td>Palatine, IL 60067</td>
</tr>
<tr>
<td>800-729-2656</td>
<td>408-243-0300</td>
<td>800-275-5734</td>
<td>800-334-3005</td>
<td>708-776-2577</td>
</tr>
<tr>
<td>408-862-4200</td>
<td>415-243-3080 (fax)</td>
<td>415-691-1111</td>
<td>408-245-2202</td>
<td>708-776-2378 (fax)</td>
</tr>
<tr>
<td>408-862-4065 (fax)</td>
<td>ScanMatch, $149</td>
<td>415-691-6825 (fax)</td>
<td>408-735-7200 (fax)</td>
<td>Combine/CTLW, $795</td>
</tr>
<tr>
<td>ImagePro, $999</td>
<td>PicturePress 2.0, $199</td>
<td>PicturePress 2.0, $199</td>
<td>StormCard, $999</td>
<td>Handshake/LW, $895</td>
</tr>
<tr>
<td>CorrectColor Management System, $2,399</td>
<td>StormCard, $999</td>
<td>Lightning Effects, $1,295</td>
<td>SuperMac</td>
<td>Iris/CT, $495</td>
</tr>
<tr>
<td>Precision Color Transformation Engine, $3,999</td>
<td>Plug-in software only, $295</td>
<td>Plug-in software only, $295</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The floppy turns 21

The floppy has finally grown up with the arrival of the Floptical disk drive. Floptical drives provide a combination of the best qualities of both magnetic and optical technology.

Each Floptical disk holds 21MB of text (or graphics, or spreadsheets, or anything). And because the Floptical disk drive reads and writes ordinary 720K and 1.44MB floppy disks, you can renew your system instead of redoing it.

Though the outside looks like an ordinary 3.5" floppy, the inside is a highly refined super floppy. Unique stamped optical servo tracks give the Floptical drive very accurate positioning of the read/write head, allowing track densities of 1245 tracks per inch, almost ten times the track densities of ordinary floppies. Even better, these embossed servo tracks can't be erased or damaged, making Floptical disks safer than any other servo-based media.

But the Floptical drive is more than just a better floppy; it's a whole new standard. The media are from Hitachi Maxell and 3M, two world-class companies providing a world-class product. Their commitment to excellence is your assurance that Floptical disks are safe enough for your most valuable data.

Floptical's high density storage and low cost, ultra-high reliability and convenience are features you'll never outgrow.

PLI Floptical storage products are also available for the PC, Atari & NeXT platforms.

®Floptical is a registered trademark of Insite Peripherals. All products are trademarks or registered trademarks of their respective companies.

foremost developer of JPEG-compression routines. Meanwhile, RasterOps is offering a similar board/filter package called ImagePro, which relies on RISC technology for its speed boosts.

Calibration

Assuring color consistency among scanners, monitors, and output devices is one of the greatest challenges in desktop publishing. Some companies—Pantone, TruMatch, and Focoltone—offer electronic versions of paper-swatch systems to solve the problem. Others, such as Radius, RasterOps, and SuperMac, sell monitor-calibration systems that employ optical sensors.

Several companies offer calibration setups that depend partly on Photoshop plug-ins. Such calibration systems have many similarities: They gather color information on specific scanners, monitors, and/or printers and calibrate the data with a device-independent color definition established by the CIE (Commission Internationale de l’Eclairage). The calibrated color data is stored in a file called a transform or a profile. To apply the calibration data to a scanned or printed image, you select the appropriate image-correction filter. Candela and Savitar, for example, supply scanner-calibration software based on Photoshop plug-ins. Candela’s Scan-Cal system, which costs a hefty $1,500, uses two plug-ins to gather and apply calibration data. To calibrate a scanner, you scan the supplied target with an acquire module called ScanCalAnalyze, which analyzes the scan, computes the necessary color correction, and stores calibrated values for both the gray-scale and the RGB modes. You can then apply the values to any scanned image with the ScanCalExecute filter, which also lets you tweak highlights and shadows.

Savitar’s ScanMatch operates almost exactly as Scan-Cal does—it includes an acquire plug-in for calibrating the scanner and a filter module for applying the corrected values—but ScanMatch costs a mere $149. The package includes a 24-color Pantone swatch sheet to use as a

macINTERCOMM is the first and only communications program with built-in, true multitasking. That means you can now download and upload files at full speed while you go back to your regular work.

Let’s repeat that.

SEND A FILE, INVISIBLY.

You can now compress a file, search a database, or even play a game during a file transfer. While true multitasking in a telecom program makes perfect sense to us, the truth is that no other program can do this.

Combine this with everything you’d expect in a first rate telecommunications package, including Zmodem, an advanced Kermit with extended packets, a complete scripting language with compiler, and support for all popular emulations, and you have the next generation of interpersonal telecommunications.

To learn more about macINTERCOMM, call us at (310) 553-0881.

macINTERCOMM is a trademark of Mercury Systems, Inc., 10000 Santa Monica Boulevard, Suite 123, Los Angeles, California 90067 (310) 553-1291 fax

CIRCLE 217 ON READER SERVICE CARD.
Why 8 out of 10 professionals choose OmniPage Professional.

Weekly Report

Only OmniPage accurately scans words and images up to 256 shades of gray with the Graphic Editor."

Only OmniPage reaches scanning speeds of up to 2000 words per minute with Caere's 32-bit OCR.

Only OmniPage reads 11 different languages, including French (oui!), German (ja!), and Italian (si!).

Only OmniPage gets the read on the most unusual characters with OmniTrain."

Only OmniPage features AnyFont, HP AccuPage, and Caere AnyPage technologies, so it handles any page of text—even when your coffee cup gets in the way.

Only OmniPage features direct input through DDE or Apple Events, enabling you to scan directly into popular business applications.

When it comes to OCR (optical character recognition), no other product can match the overall performance of OmniPage Professional. That's why 8 out of 10 business professionals consistently choose OmniPage Professional over all other options. Only OmniPage Professional has the full capabilities to accurately scan virtually any document into almost any word processor, spreadsheet, or database file. So you can use OmniPage Professional to accurately scan newspaper articles, business reports, journals or legal documents. It's not surprising then that 8 out of 10 scanners in the world ship with a trial version of OmniPage, including those from Hewlett-Packard, Microtek, and Apple. Why would they be any different than the rest of us?

For a few more reasons why you should consider OmniPage Professional, call us now at 1-800-535-SCAN.

Caere, the Caere logo and OmniPage are registered trademarks of Caere Corporation. The Graphic Editor, OmniTrain and AnyPage are trademarks of Caere Corporation. All other ® and ™ trademarks are of their respective corporations. ©1992 Caere Corporation.

Circle 30 on Reader Service Card.
target scan. Calibration is based on Tektronix's TekColor color-management system, so the TekColor extension and a variety of precalibrated monitor profiles are included in the package.

Candela also offers PrintCal-PI, which lets you build calibration tables for printers. A trimmed-down version of a stand-alone program, it has plug-ins that supply a test pattern, figure the correction, and apply the calibrated values to images.

A truly comprehensive solution to the color-consistency problem, however, requires electronically calibrating the entire production chain — scanner, monitor, and printer — at the system level. Two companies, Kodak and EFI, are offering the first complete color-management systems, and both have Photoshop tie-ins.

The Kodak Color Management System (KCMS) is a developer-level approach that must be implemented by individual vendors. The first KCMS-based product to reach the market is the RasterOps CorrectColor Management System. It consists of color-management software, a set of device profiles, the CorrectColor Calibrator (an optical-sensor system for calibrating monitors), and three Photoshop plug-ins for color-correcting images — Scanner-to-Monitor, Print Preview, and Monitor-to-Printer. A NuBus accelerator board called the Precision Color Transformation Engine is an option that makes the system 60 times as fast, according to RasterOps.

EFI plans to offer two Photoshop plug-ins as access points for EfiColor, which is an impressive-looking color-management system that presents KCMS with some serious competition. Details had not been finalized at press time, but current plans call for an acquire plug-in that lets users select which scanners and printers to calibrate and an export plug-in for saving color-corrected files. The pair of plug-ins should cost less than $200.

**Compression**

A 24-bit-color image may look great, but it's incredibly cumbersome to edit, store, and transfer. A relatively small...
Lower prices on brand name fonts.

Price!
Genuine ITC & brand name faces at a fraction of what you've been paying.

Quality!
We design our fonts to meet the high standards our customers demand. All fonts are
Type 1 PostScript® format, and compatible with Adobe Type Manager™. Are you using
System 7 or Windows® 3.1? Many fonts are available in TrueType® format too.

Selection!
PC Magazine (09/90) 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 650 typefaces for
your Macintosh®/ IBM® PC on CD ROM. Be sure to check out our new arrivals above.

Service!
We do anything to keep your business.
And that means before, during & especially after you place your order.

The 30 Day No Risk Guarantee!
If you are not satisfied with our software, simply return it to Image Club within
30 days of purchase and we will promptly refund every penny! We guarantee it.

Order it today... Use it tomorrow!
1. To order, carefully select all the fonts you want. Fonts must be purchased in
complete families. Minimum font order is $9. Add $9 for shipping & handling.
2. Have your credit card number & expiration date handy.
3. Call our nation wide toll free order desk.

Phone 1800 661 9410

Call for Your Free Catalog Today!
Featuring: • Hundreds more brand name fonts not shown in this ad!
• CD ROM products for both Macintosh & IBM PC!
• 24 volumes of stunning EPS clip art!
• And much, much more!

Image Club Graphics, Inc. Suite 5 - 1902 Eleventh Street Southeast, Calgary, Alberta, Canada T2G 3G2 / Visit us at Macworld Boston, Booth 1625, Bayside Expo Center
Orders (800) 661 9410 / Phone (403) 262-8008 / Fax (403) 265-703 / Appletalk: CDA01573 / Compuserve: 72502,3238 In Europe contact Kagema AG / Phone 01/331 06 00 / Fax 01/331 06 42
Graphics

(3 x 4 inch) 24-bit-color file scanned at 300 dpi takes up more than 3 megabytes of disk space. Larger color files can hog as much as 100 megabytes apiece.

Luckily, companies such as Storm Technology and Radius offer extremely efficient file-compression hardware and software that use algorithms developed by JPEG. JPEG compression can reduce files from a tenth to a hundredth of their original size without any perceptible loss of quality. These companies also market plug-in modules that provide rapid image compression and decompression from within Photoshop, supplementing — and often improving upon — Adobe's JPEG and LZW routines.

At first glance, Storm Technology's PicturePress 2.0 plug-ins look similar to Adobe's own JPEG-compression and decompression modules. Both are available from Photoshop's Acquire and Export submenus, and both offer varying levels of compression. But there are key differences. PicturePress has an optional hardware accelerator that greatly enhances performance. Adobe's software-only JPEG implementation is slower but has two advantages: First, it's the only product that can compress CMYK as well as RGB images. Second, it can save compressed files in EPS format, which can be placed — still compressed — in a page layout and automatically decompressed inside a PostScript Level 2 printer. This technique is much faster than sending uncompressed files to the printer.

The chief claim to fame of Radius' ImpressIt plug-ins is their very fast software-only compression. Compression is much faster when some of the work is done in hardware. Advent Computer Products' NeonTech Image Compressor board and plug-in module is designed to compress a 2-megabyte file to 200K in less than a second, with no loss of quality. Storm's StormCard can accelerate PicturePress compression by 10 to 30 times. And as mentioned, RasterOps, Spectral Innovations, and SuperMac offer board/plug-in combinations that speed up JPEG decompression.

Alone in Their Class

As if all this weren't enough, there are several new, one-of-a-kind modules that further enhance Photoshop and other plug-in-savvy programs.

Fast Eddie, from Paradigm Concepts, can cut 24-bit images to one-third their original size — without compression. The secret? It exchanges the 24-bit palette for an optimized 8-bit one, using a special algorithm developed at Los Alamos National Scientific Laboratory. A pair of plug-ins lets you perform the conversion either on existing images or on the fly during scanning.

If you work with confidential images, you can protect them from prying eyes with Candela's ColorCrypt plug-in, which provides multiple levels of image encryption by using a personal-password scheme.
PC To Mac File Exchange Without Translators Is Like A Foreign Film Without Subtitles.

Sharing files between PCs and Macs is no longer a luxury, it is a necessity. But it doesn’t have to be a foreign concept.

Lots of products on the market claim to solve your problems of sharing files across platforms, but take a careful look before you buy. Some, such as disk mounting utilities only give you a partial solution; and when your file appears on screen, you get a big surprise. You can’t read a word of it - not your text, not your formatting - it looks like garbage.

You see, transferring your files only gets half the job done. What you need to finish the job is translation. What good is it to simply transfer a file from a PC if you can’t decipher it once it hits your Mac?

MacLinkPlus from DataViz is the total solution for both file transfer and translation.

It’s been on the market since 1984 and has led the way in bridging the gap between PCs and Macs. With over 600 translation combinations for the most popular word processing, spreadsheet, database and graphics applications, you’ll find it the strongest translation product with the widest breadth of translation possibilities anywhere!

MacLinkPlus is the solution to virtually any problem you may encounter in moving files between PCs and Macs. And being able to read them - with their formatting intact - once they get there.

Call (800) 733-0030 for more information; We’re the one translation company that won’t leave you sitting alone in the dark.
Introducing the only 16-inch displays compatible with the new Macintosh Quadra 700 and 900, E-Machines ColorPage E16 and ColorPage T16. Just plug-n-play for affordable full-page color up to 24-bits. No interface card necessary! Need more room to work with large spreadsheets, desktop publishing layouts or multimedia applications? E-Machines 16-inch color solutions are just right for the Mac IIci, IIgs, LC — The Entire Office.

Add on E-Machines Futura interface card and turn your Mac into a high performance, accelerated color machine complete with pan and zoom, virtual screens and video output capabilities. Go ahead, experience high performance color and see how affordable 16-inch color solutions have become.
(see Figure 5). Encrypted images are displayed as electronic “snow” and can be saved in any file format. When you re-open an encrypted image, you reselect the plug-in and enter the password; the image is then reconstructed. You can encrypt the image to deeper levels by repeating the process, using a new password each time. ColorCrypt lets you encrypt an RGB image in one pass, but for other color modes, you must encrypt each channel individually.

Total Integration is bringing the abilities of Scitex systems to the Mac through a series of Photoshop plug-ins. Photoshop can open Scitex CT (continuous-tone) files, but it can’t handle Scitex Linework (page geometry) files. Handshake/LW solves that problem, allowing you to open all or part of a Linework file in CMYK format, edit it, and then resave it in Linework format (see Figure 6). This allows you to make last-minute text and color changes without tying up a Scitex workstation. Combine/CTLW can merge Scitex CT and Linework files into a single Photoshop CMYK file, which can then be proofed on a color printer such as the Iris Ink Jet Proofer. Iris owners will want Iris/CT, which lets you edit CMYK files from the Iris FEP (Front End Processor). All Photoshop formats can be saved to the Iris FEP format.

The MacCompress package, from NDC (National Digital Corp.), lets you receive stock color photos by modem from seven top stock-photo agencies. MacCompress includes the ZTerm telecommunications program; Tiff Maker, a utility that decompresses received images (which are sent in a proprietary compression format) into usable TIFF files; and a plug-in that can decompress files on the fly when you import them into Photoshop. MacCompress+ lets you recompress files into NDC’s proprietary format when you’ve finished with them.

Kodak has developed a plug-in that lets Photoshop users access images directly in the new Photo CD format. The plug-in allows you to preview and crop an image and adjust its color balance in any of the five Photo CD resolutions before opening the image. At press time, however, Kodak had not decided whether the Photo CD plug-in would be bundled with Photoshop, sold as a stand-alone utility, or included with its Photo CD Access utility.

The plethora of plug-in modules attests not only to Photoshop’s irresistible power but also to the trend toward modularity in the way we use software. Applications are becoming increasingly flexible, allowing us to add and subtract elements to suit our needs rather than forcing us to tailor our work habits to the software.

And wasn’t that the original idea behind the Mac? 🤔

While waiting for his TIFF files to open, Michael Roney does developmental editing of computer books for Bantam Electronic Publishing.
Introducing Microsoft Excel spreadsheet today, because

We've been making Microsoft Excel for the Mac since 1985. Which is probably why we've gotten pretty good at making both routine and complex spreadsheet tasks easy to do.

Take our new Microsoft Excel 4.0. We've added floating Toolbars. Including six new ones which sensibly relate to a set of tasks, such as charting. You can move them around, resize them, and customize them easily.

With Drag and Drop, you can "grab" a piece of information with your mouse and drop it wherever you'd like to see it on-screen. No need to cut-and-paste.

Autofill intelligently helps you build a worksheet. Type JAN in a cell, for instance, and Autofill enters FEB, MAR—as many months as you need.

And meet Wizards, step-by-step guides that walk you through complex tasks. The CrosstabWizard, for example, creates summary tables from a database for you: it prompts you, takes the information you give it, and creates a crosstab. It's that easy.

For a $99 upgrade, call us at (800) 541-1261, Dept. B35, by Sept. 30, 1992. And discover one of the reasons that the older you get, the smarter you get.

Microsoft
Making it easier

*Only for registered users of Microsoft Excel for the Macintosh® plus freight and applicable sales tax. © 1992 Microsoft Corporation. All rights reserved. Printed in the USA. Offer good only in the 50 United States. In the 50 United States, call (800) 541-1261, Dept. B35.
Excel 4.0. It's the smartest it wasn't born yesterday.

3-D charts, along with surface, radar and picture charts. With the help of the Chart Wizard, you can look like you were born making charts.
PowerBooks speak in big screen color with BookView Imperial.

“Color Me a Rainbow.” 256 colors displayed from the PowerBook 140 and 170. Full 8-bit color support for most monitors with exclusive Computer Care design.

“Color Me Big.” Put the PowerBook display on a 19” color monitor if you have one. Look at the big picture.

“Color Me Tidy.” BookView Imperial fits entirely within the PowerBook case and connects to the outer world with a convenient fixed socket. No dangling boxes or bags. Connect to your monitor of choice with cables by Computer Care.

“Color Me Versatile.” Connect your PowerBook to:
- Standard VGA (640 x 480)
- Super VGA (800 x 600)
- Apple 12” mono (640 x 480)
- Apple 12” color (512 x 384)
- Apple 13” RGB (640 x 480)
- Apple 15” mono (544 x 678)
- Apple 16” color (832 x 624)
- Overhead color (VGA or Apple Compatible)
- NTSC color & mono (544 x 416)
- 19” color (1024 x 768)

“Want a Mono Presentation?” Standard BookView reproduces the mono screen on Apple, VGA, NTSC monitors and on Overheads. One card fits all PowerBooks (Models 100, 140, & 170) and it tucks inside the case. Costs fewer magic beads than the BookView Imperial.

Call for other news and while you’re on the phone, ask about prices on BookRam for the PowerBooks, 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. A Mac product company since 1987.

Computer Care

Dealer Inquiries Welcome. Visa, MC, AMEX, Discover Accepted.

All trademarks displayed are the property of the trademark holders and their respective companies.
Organizing the Olympics

The Associated Press used FreeHand to produce complex yet eye-catching Olympic graphics.

By Janet Ashford

The Associated Press' Graphics Net service produces infographics, charts, and maps for more than 1,000 newspapers. After years of using MacDraw II, the AP recently switched to FreeHand 3.1, because of increasing demand for color graphics and PostScript output. One reason the news service chose FreeHand rather than Illustrator is that FreeHand can export files in PICT format, which can be opened and edited in MacDraw II, easing the transition for member newspapers.

The first major project using the new software was a series of infographics for the 1992 Winter Olympics. Working under art director Karl Gude, news artists Cynthia Greer, Jeff Magness, and Ross Toro spent four weeks creating 22 complex color graphics, each packed with information on Olympic sports terminology, techniques, and history.

After a break to produce graphics for other stories, such as the presidential election, the team began developing a new set of colorful infographics for the Summer Olympics. They appeared in many newspapers during the Summer Olympics, July 25 through August 9.

Graphic designer Janet Ashford coauthored The Verbum Book of PostScript Illustration.

The Background Grid

Each Olympic infographic has an underlying grid to help unify and organize the many elements. For the bobsled/luge graphic, Greer creates a grid of blue, gray, and yellow squares by drawing large rectangles, filling them with color, and overlaying a grid of white .5-point lines. The gray and yellow rectangles have solid fills, and the blue rectangles contain graduated fills. The grid lines are grouped into two- and three-square units, so they can be easily copied and pasted over backgrounds of varying sizes.

Adding Graphic Elements

Illustrations, diagrams, and maps are created as separate FreeHand documents and then pasted into the composite image. The strict horizontal and vertical orientation of the grid contrasts with the strong diagonals of some of the illustrations, heightening the sense of drama and movement. All the graphic elements, including the background grid, are kept together in a single layer. Text is stored in a separate layer to make editing easier.
STEP-BY-STEP

3 Organizing the Text

1992 Winter Olympics

BOBSLED

At speeds approaching 90 mph, two-man and four-man sleds race down an icy, curved track. Fastest combined time of four runs wins.

THE START

Watch for an explosive start. Standing 50 meters behind the starting line, the driver and his brakeman (and two pushers in the four-man) rock their bodies and the sled back and forth in unison, then throw the sled forward. A tenth of a second saved pushing can translate into a third of a second of the run time.

The infographics contain three types of text — headlines with decks, subheads with text, and captions — and just two typefaces, Times and Helvetica. Headlines and subheads are set in Times Bold, which is condensed by applying a horizontal scale of 64 percent. The captions are enclosed in boxes that have arrows pointing to the item being explained. To create the arrows, Greer uses the corner tool to add three points to one side of the box and then pulls out the center point.

4 Special Icons

Three distinctive icons highlight certain sections of the infographics. An eye is placed next to "Watch for" text, which describes a feature of the Olympic event that warrants special attention. An eight-pointed red star containing the word "New!" flags text that describes changes in an event, such as new rules. Both the eye and the star are drawn on-screen with the pen tool. A white snowflake on a colored background highlights scheduling information. To create the snowflake, Greer groups three circles at the ends of three thick lines, copies and rotates the unit in 60-degree increments, and positions the rotated elements at the six points of a hexagon.

5 Sports Symbols

Each sport has its own black-and-white symbol, which appears to the left of the headline. The symbols were designed on paper by a French design firm as part of the Olympics signage-and-design package. To obtain electronic versions of the symbols, the AP artists scan the printouts at 300 dpi. Each symbol is then auto-traced, edited, and saved in PICT as well as EPS formats. (MacDraw and Canvas are used for the PICT work.) Shown here are the symbols for (from upper left) bobsled, luge, freestyle skiing, ski jumping, Alpine skiing (three symbols), and figure skating.

6 Shortcuts in Schematic Drawings

Most of the smaller drawings are simple schematic diagrams, to contrast with the larger, more realistic illustrations. For example, the diagram of the bobsled crew and sled features four simple black figures placed inside a cross-section outline of the sled (a). Each figure is a clone of the same original (b).

A three-part diagram called "Guiding the Luge" shows the underside of the rider and the luge (c). The same figure is used for each part, but the black symbols on the blades are moved to different positions. The figures are placed on orange arrows, which indicate the steering direction. The two outside arrows are clones, one of which has been flipped across the vertical axis.
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.

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.

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

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 your existing SUM II or Norton Utilities for Macintosh for just $39,* or for the name of your nearest dealer, call 1-800-343-4714 ext. 719-F.

© 1992 Symantec Corporation. *Offer valid only in the U.S. and Canada — price in U.S. dollars. International phone: Canada, 1-800-455-2269; Europe: 31-71-351111; Australia: 2-873-6577; others, 1-408-252-3570. All trademarks or registered trademarks are those of their respective holders.
Making a Textured Drawing

Toro's drawing of a rider on a luge is based on a pencil sketch. The sketch is scanned at 300 dpi and auto-traced in Adobe Streamline, with a loose tolerance that minimizes the number of points in the outlines. Streamline faithfully copies the original by filling enclosed shapes with black or white. The auto-tracing is saved in Illustrator 1.1 format so that it can be opened in FreeHand.

Creating a Blend

To create a blend for the rider's body, Greer draws two rectangles, assigns a different color to each, and executes a blend between them. Because the front tip of one luge blade is part of the white shape that defines the body, Greer draws a separate shape to fit the blade tip, fills it with solid pink, and positions it over the blend. (The outline of the entire shape to be filled is shown in red.)

Merging the Blend and Figure

The blend and the pink shape are selected, cut, and pasted inside the white shape of the rider's body, the line weight for which is set to None. The Paste Inside command turns the rider's body into a mask, hiding the areas of the blend that are outside the shape.

Locating Open Areas

If we place a colored background behind the auto-tracing of the luge rider, we can see that some of the "white" areas are simply open and therefore transparent, whereas others are opaque shapes filled with white. The opaque shapes are easily filled with solid colors or blends, using the technique just described.

Adding Color to Open Areas

To add color to the open areas, Greer draws shapes to fit, loosely following the existing outlines. She fills each shape with a solid color or a blend and then sends it behind the corresponding black outline. Because the open areas are transparent, the filled shapes can be seen through them, and the black outlines mask the shapes' edges.

A Graphic Centerpiece

Each infographic for the Winter Olympics has a similar textured drawing as its centerpiece. Shown here are Toro's illustrations for figure skating and freestyle skiing.
Apple PowerBooks are the ultimate – and now you can get the ultimate power upgrade for your PowerBook from Microtech International.

For maximum storage capacity, the ultimate power upgrade includes the Roadrunner 120i internal drive featuring the highest capacity available in 2.5" disk technology – with a 19ms access time and ultra low power consumption. For your convenience System 7™ comes preinstalled. For protection from the dangers of the road, we've included Symantec's respected virus checker SAM. And we've added the acclaimed DayMaker PIM from Pastel to keep power users heading in the right direction.

For maximum RAM, the ultimate power upgrade includes Microtech's Coyote 6 memory expansion board. Unlike some PowerBook memory upgrades, Microtech's Coyote boards fully comply with Apple's specifications and for trouble free usage incorporate the same low profile, low power, rigid board, pseudo-static design as Apple's own 2MB upgrade.

Microtech Roadrunner drives are also available in 40 and 80MB capacities and Coyote memory upgrades in 2 and 4MB configurations.

Power without dependability is no power at all. Since 1985, Microtech's Commitment to Quality has meant reliable products backed by the longest warranties in the industry. Our dedicated service and support teams are winners of Macworld Magazine's Service Hero Awards and ensure your satisfaction – guaranteed.

When you need the latest technology today with the confidence you will be supported tomorrow, call Microtech International and Power Up.

Proudly distributed by INGRAM MICRO

For your nearest dealer call: 800-325-1895
International inquiries: 203-468-6223/Fax 203-467-8124

©1992 Microtech International, Inc. 158 Commerce Street, East Haven, CT 06512. All trademarks or registered trademarks are the property of their respective owners. System 7 is a trademark of Apple Computer, Inc. Microtech reserves the right to change specifications without notice.
Where's the first place you should turn for productivity-boosting software, plus the latest information and advice about computing? ZiffNet/Mac, the on-line information service from the publisher of the leading Mac and PC publications, including *MacUser*, *MacWEEK*, *PC Magazine*, *PC Computing*, *PC Week*, *Computer Shopper* and *PC Sources*.

For starters, choose from the best in downloadable software from a library of more than 1,000 free or inexpensive shareware or public domain programs—everything from games, to *MacUser* utilities, business applications, education titles and more. Unlike many other on-line services, only the best and most reliable programs are selected for the library. And all are ready to download and use immediately.

On ZiffNet/Mac, you can access interactive forums organized by specific topics—many hosted by the leading columnists and editors in the computer industry. Ask for advice, find a solution to a technical problem, debate the issues or exchange information with the experts or your colleagues on-line.

Ziff Magazines on-line add a new dimension to your favorite magazines with custom software and detailed information linked to the current printed issues. Plus select editorial on-line becomes a powerful and convenient reference tool—including...
ALL ABOUT COMPUTING. ON-LINE.

product reviews, listings of award-winning products and support information. You’ll also get direct access to the people behind the magazine.

ZiffNet/Mac helps you shop smarter, with a broad range of services offering information and advice on buying desktop computer products. You’ll find the Buyers’ Guide database, synopsis reviews of more than 4,000 Macintosh products; as well as Computer Select™ on-line, with information on more than 70,000 products from over 10,000 companies.

As for technical support, ZiffNet/Mac provides software tools and technical advice to help you, or the users you support, work more effectively and productively. Consult the Tech Support database for tips, tricks and hints. Or download utilities that automate tasks, add functionality, save you time and more.

And finally, ZiffNet/Mac gives you the news. Weekly news summaries from MacWEEK—the Friday night before they’re published. Daily news from Newsbytes™. All so you can keep pace with, and make sense of, computer industry trends and events.

Add it all up and you’ll see why ZiffNet/Mac is the first place to turn for what you need to get the most out of computing.

*Product names and services are trademarks or registered trademarks of their respective companies. ©Ziff Communications.*

Call 1-800-666-0330 today for your free sign-up kit.
In 1975, the world looked on in awe as the Soyuz and Apollo space capsules broke down traditional barriers and joined together in space. The link-up was hailed as a marvel of technology. Today's technological marvels come in smaller packages. Introducing PathFinder from Dayna. The first AppleTalk router to break the $1,000 price barrier. As well as bringing glasnost to the Ethernet and LocalTalk sides of your network.

PathFinder has connectors for LocalTalk and all Ethernet cable systems, from thick and thin Ethernet to 10BASE-T. It supports AppleShare and NetWare for Macintosh, the most popular Macintosh network operating systems, as well as any other AppleTalk-based communications software. All for the remarkably low price of $899.

But the biggest breakthrough is PathFinder's amazing ease of use. For small networks, PathFinder is ready to plug and play right out of the box. On larger networks, it can be configured to suit any need. And unique to PathFinder is an “Automatic” setting that combines LocalTalk and Ethernet segments automatically into one seamless network.

Trust the connectivity experts at Dayna to make a product this good, so easy to use and so affordable. If you're used to routers that sell at prices that are out of this world and require a rocket scientist to set up and maintain, it's time you hooked up with Dayna. Call (801) 531-0600 extension 351 today and ask about connecting with PathFinder.

Dayna

We Connect People And The Computers They Use.
**Macs do DOS:** Despite somewhat misleading ads claiming that PowerBooks “can run MS-DOS software,” Apple only recently shipped a utility that even lets you mount DOS disks on the Mac’s desktop. It’s called Macintosh PC Exchange, and it costs $79. Some people think Apple should have built this capability into the system when it first introduced the SuperDrive. **My advice:** Buy Dayna’s DOS Mounter ($89.95) or Insignia’s AccessPC ($99.95). They’re more powerful and run under both System 6 and System 7; Macintosh PC Exchange runs only under System 7.

**Sharing modems:** International Transware offers a couple of three-port serial servers for LocalTalk and EtherTalk networks. Attach as many as three serial devices to IT’s SerialWay (modems, serial printers, plotters) and attach the SerialWay to your net, and users on your entire network can access the serial devices from the Chooser. The SerialWay supports communication speeds as high as 57.6 Kbps. Bundled management software provides some password security and networking capability. 415-903-2300. SerialWay EN, $999; SerialWay LT, $599. ◆ Applied Engineering takes a different approach to sharing serial devices. It offers a $149 control panel with which you can share on your network a device connected to one of your Mac’s serial ports. You can also check out Applied Engineering’s QuadraLink DMA ($499), which gives your Mac four additional high-speed (57.6 Kbps) serial ports. Buy both products, and save $50. 214-241-6060.

**Year of the rack:** Farallon has finally announced its rack-mountable hubs and routers. The Farallon Concentrator ($2,990) is a 19-inch chassis with 11 slots, into which you can place StarController, StarRouter, and InterRoute/5 modules. The StarController modules are based on the 12-port LocalTalk and Ethernet hubs available today as stand-alone devices. The StarRouter is a combination device that contains a LocalTalk-to-Ethernet router, 12 LocalTalk ports (all on a single LocalTalk network), and one Ethernet port. InterRoute/5 is a multiport LocalTalk-to-Ethernet router that routes data among one Ethernet and four LocalTalk networks. Each router product works with TCP/IP networking protocols, the SNMP management protocol, and AppleTalk. Expect a price tag of less than $3,500 for each. 510-596-9000. ◆ Shiva has also put the FastPath on the rack, with the FastPath 5R. One or two FastPath 5s can fit in a 1.75-inch-high enclosure, which can be mounted in a 19-inch rack. 617-252-6300. Single-unit model, $2,799; two-unit configuration, $5,399. ◆
Now, MS-DOS Files Can Look Just Like Mac Files.

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-Drive™ 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.
Probing for Problems

Product updates from three major packet-analyzer vendors make it easier for you to probe your network for problems—from near or far.

By John Battelle

When Superman needed to uncover hidden evil doings in Metropolis, he just turned on his X-ray vision. If you lack the built-in superpowers to be SuperNetworkManager, you can always take the Batman approach and keep the right tools handy for tackling whatever problem you might encounter. When it comes to network problems, a pair of network-X-ray specs—that is, a packet analyzer—is a tool no network manager can do without.

Packet analyzers probe your network at the deepest level, collecting and unwrapping data packets to see where the packets came from, where they’re headed, what might be wrong with them, and what flavor they are (in other words, what protocol they are: AppleTalk, NetWare, and so on). Packet analyzers present summary statistics on error types, network usage, and protocol types. Because they can pinpoint areas of trouble on your network, packet analyzers can be one of your most powerful tools.

Since we last reviewed their LocalTalk and Ethernet analyzers (see “Tools of the Trade,” February ‘92, page 233), the three major packet-analyzer vendors—AG Group, Distributed Technologies Corp. (DTC), and Neon Software—have released upgrades to their products. In addition to improving the interfaces and playing catch-up with each other on features such as filtering, protocol support, and real-time packet-header display, these vendors have made their products more useful for network managers who work remotely: All the products now support the PowerBook, and depending on the product you pick, you may also get a remote-data-capture utility or built-in pager support.

LocalTalk Analyzers

LocalTalk analyzers are designed to probe smaller, LocalTalk-only LANs, but don’t think these products are small-time—they can give you a wealth of information about the health of your network.

TalkSpy 1.6.1. DTC’s TalkSpy is sold as part of TalkManage, a $695 integrated network-management package. It’s also available separately with its companion, TalkStat, DTC’s traffic-analysis module, for $495.

TalkSpy now sports a new control bar intended to simplify its use. The Start, Stop, Clear, and Filter buttons are prominently displayed (see Figure 1). The control bar also has a Display button that lets you open a window and view packet headers one by one as they are collected.

The most notable addition in the current version of TalkSpy is the filtering feature, which helps you focus on certain types of packets to isolate problems. Previous versions had no filtering at all; version 1.6.1 allows you to filter packets based on their protocol: ADSP (AppleTalk Data Stream Protocol), AEP (AppleTalk Echo Protocol), ATP (AppleTalk Transfer Protocol), NBP (Name Binding Protocol), RTMP (Routing Table
Maintenance Protocol), and ZIP (Zone Information Protocol). A filter window offers a check box for each of the supported protocols, but you can’t save multiple configurations of filters for easy recall, as you can with either LocalPeek or NetMinder LocalTalk.

This version of TalkSpy also lets you choose incremental- or continuous-data-collection mode, using a toggle switch. If you select incremental mode, TalkSpy collects packets at an interval predetermined by the software (you can’t set it yourself). If you select continuous mode, TalkSpy makes what the documentation calls a “best effort” to collect all packets on the network (processor speed and available RAM affect your results). A display window shows packet information, but TalkSpy displays only packet-header information, so you can’t use it to test the integrity of the data within packets and do extensive error checking, as you can with LocalPeek or NetMinder LocalTalk.

Some of the other new features include PowerBook support, the ability to save and print packet-header information, and the ability to collect and process data in the background.

Although TalkSpy 1.6.1 sports many new features, it has several drawbacks. The documentation is still sparse (the new version gets only a two-page update) and difficult to navigate. The new, prettier interface (see Figure 1) is somewhat confusing: For example, the Display On/Off switch (which performs the same function as a standard close box) is enclosed in the Mode box even though the display choice has nothing to do with the data-collection mode, and the mode switch isn’t always in sync with the current mode.

DTC also clings to its original copy-protection scheme, which lets you install only two copies of TalkSpy from the floppy onto a hard disk. Finally, TalkSpy cannot run on a Mac IIx.

LocalPeek 1.1.1. AG Group has significantly updated LocalPeek, adding many new features borrowed directly from EtherPeek, AG’s Ethernet packet analyzer. The best of these is the Packet Selection feature, which lets you sift through a batch of previously collected packets and select a subset based on various criteria. For example, you can choose to view a subset of just those packets that were headed for a particular LaserWriter or all packets of a particular length.

AG has also added an echo mode to the new version of LocalPeek, allowing the program to double the load on a network (echo mode creates a double of each packet on the network). This mode is particularly useful for network stress testing. Also new is LocalPeek’s ability to save and load any number of configuration files (a configuration file includes your program-specific preferences, such as filters, triggers, and alarms). Because LocalPeek lets you save and load as many configuration files as you want, you can create different files for different network

---

**Figure 1:** DTC gave TalkSpy a major interface overhaul in version 1.6.1, including a new control bar and packet-header window, but the new interface isn’t as intuitive as it looks—for example, the mode switch isn’t always in sync with the current mode.

**Figure 2:** One of LocalPeek’s many new features is a Network Statistics window that summarizes activity on the network in real time.

**Figure 3:** Both NetMinder LocalTalk and NetMinder Ethernet contain a new feature that’s a boon for neophyte network managers: By clicking on an Explain button, you can get details about the protocol of the currently selected packet.
Hallmark isn't the only one with cards for every occasion.

A birthday. An anniversary. The purchase of a new Mac LC. All good reasons to buy a card. And even though we can't help you with the first two, we do have a great selection for the third. In fact, Farallon now has every Ethernet card you'll ever need. Cards for any Mac slot. And any media. Including new 3-way adapters with thick, thin and 10BASE-T ports. You'll also find our new EtherMac™ line has cards with 64K RAM for blazing performance and no dropped packets—even under A/UX.

Yet although our line expanded, our prices shrank. A lot. Of course, you get proven reliability and compatibility with major protocols. Not to mention auto-install under Apple System 7, free technical support and a 5-year warranty. All of which will have you smiling. Make no mistake, with over three million users installed, Farallon knows Mac networking like no one else.

So call 1-800-995-7760 for details. Because for those special Ethernet occasions, there's only one place to shop. Farallon.

Choose Farallon and you can choose any Ethernet media—thick, thin or 10BASE-T. That's friendly greetings indeed.
The fastest, easiest way to write on the Macintosh...

—Heidi Roizen, CEO, T/Maker Company

A dramatic claim. And one we feel confident in making.

You see, WriteNow 3.0 is different from the word processing or word-oriented software that you're using.

WriteNow is fast... the fastest Macintosh word processor available. WriteNow is like a writing 'turbo charge' for your Mac.

...Guaranteed!

WriteNow is also compact... the most compact Mac word processor available. With WriteNow, you can write and still use your other software without getting the dreaded "Out of Memory" message.

As important, WriteNow has all the features you need to do powerful word processing, yet WriteNow is incredibly easy-to-use.

WriteNow comes with a 60 day, 100% money-back guarantee. At half the price of the competition, you owe it to yourself to check out what fast and easy writing is really like!

WriteNow

<table>
<thead>
<tr>
<th>Feature</th>
<th>WriteNow 3.0</th>
<th>Word 5.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default Memory Setting</td>
<td>49K</td>
<td>2,048K</td>
</tr>
<tr>
<td>Application Size</td>
<td>210K</td>
<td>852K</td>
</tr>
<tr>
<td>Runs comfortably with</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>System 7 &amp; 2 MB RAM</td>
<td>135,000</td>
<td>38,000</td>
</tr>
<tr>
<td>Spell Checker (words)</td>
<td>1.4 Million</td>
<td>191,000</td>
</tr>
<tr>
<td>Paragraph Style Sheets</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Character Style Sheets</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Spell check</td>
<td>5.9 sec</td>
<td>3 min 30.5 sec</td>
</tr>
<tr>
<td>Count words</td>
<td>16.2 sec</td>
<td>1 min 39.3 sec</td>
</tr>
<tr>
<td>Copy and paste</td>
<td>5.7 sec</td>
<td>18.4 sec</td>
</tr>
<tr>
<td>Under formatting</td>
<td>1.6 sec</td>
<td>34.5 sec</td>
</tr>
<tr>
<td>Suggested Price</td>
<td>$249</td>
<td>$495</td>
</tr>
</tbody>
</table>

To upgrade, call 1-800/688-2850 or visit www.TMaker.com

CIRCLE 87 ON READER SERVICE CARD.
"The whole thing about quality is how little room you leave for interpretation,"

He said as he scooped up a handful of freshly made diskettes and fanned them like a deck of cards. At Kao, we feel the only measure of performance is perfection. Maybe that's why we're already the USA's #1 supplier of diskettes to the OEM market, with such notable customers as Microsoft® and Lotus®. And maybe that's why we should be your #1 supplier of diskettes as well. For more information call 1-800-759-2590.

Kao is a registered trademark of Kao Corporation. All other company names are registered trademarks of their respective manufacturers. © 1992 Kao Industries Company.
Network Management

Ethernet Analyzers

With its myriad protocols and support for an almost unlimited number of network devices, Ethernet is far more complex than LocalTalk. You need to have an industrial-strength analyzer to make sense of this environment, and Neon and AG each provide such a solution.

Both companies see their market as changing: Instead of chasing each other, both are chasing the likes of the Sniffer, a $12,000+ hardware-based protocol analyzer from Network General that has a high-performance card that guarantees capture of every single packet. The Sniffer...

Notification: The Network That Finds You

Like Batman with his batphone, many network managers know what it's like to get late-night phone calls from citizens in distress. In the network managers' case, the citizen might be an executive who is trying to print a proposal for the next morning, can't find the printer in the Chooser, and hasn't a clue about what's wrong. It might be a bad router, a broadcast storm, anything.

As if such calls weren't enough, three companies have introduced network-management tools that automatically beep your pager when the network acts up. They can also leave E-mail messages detailing what went wrong.

AG Group's NetWatchman ($295), Dymon's Network Vital Signs ($449), and Caravelle Networks' NetWORKS ($695) are network-monitoring and alarms applications. That means you can leave them running while you do other things, and they'll alert you when certain set conditions occur — for example, when a server disappears or when a printer jams. (Network Vital Signs includes specialized device-monitoring modules, so it can tell you more than just the "up" or "down" status of a device.)

These programs used to alert you with an audible beep and a flashing icon on your screen, but the manufacturers realized that network problems often occur when managers are away. To handle this situation, all three companies incorporated paging capabilities into their products. (AG incorporated paging into its packet analyzers as well — see the main story.)

AG and Dymon use System 7's Apple Events to link their products to Ex Machina's Notify! paging software ($149 for a single-user version, $249 for a network version). Caravelle's product comes with its own internal paging software, which has extensive scripting and scheduling capabilities. For example, you can tell it when you'll be on vacation and have it notify someone else about problems that occur while you're gone. (These extra capabilities, along with its ability to monitor TCP/IP as well as AppleTalk network segments, account for NetWORKS' higher price.)

NetWatchman, Network Vital Signs, and NetWORKS don't just beep and...
is powerful, but if you don't have 140 protocols and don't need such features as fiber-optic and token-ring packet decoding, the Neon and AG products are a much better deal at a fraction of the cost.

Caravelle Networks Corp., 301 Moodie Drive, Suite 306, Nepean, ON K2H 9C4, Canada; 613-596-2802.

Dayna Communications, Inc., 50 S. Main Street, Fifth Floor, Salt Lake City, UT 84144; 801-531-0600.

Ex Machina, Inc., 45 E. 89th Street, Suite 39-A, New York, NY 10128; 800-238-4738 or 212-831-3142.

NetMinder Ethernet 2.1. Perhaps the most significant improvement in NetMinder Ethernet 2.1 is the addition of real-time packet-header display during collection (an important feature included in all the other programs covered in this review). Version 2.1 also sports a redesigned packet window (a great improvement over the multiwinedow interface of previous versions) and new controls over how a particular packet is decoded. Pop-up menus let you choose three levels of decoding: source, destination, and type. You can also now display more than one decoded-Ethernet-packet window at a time.

Roll Call, NetMinder Ethernet's address-to-name utility, has been updated and renamed NetMinder Addresses.

NetMinder Ethernet retains its predecessor's sophisticated mimicking of the seven-layer OSI (Open Systems Interconnection) networking model developed by the ISO (International Standards Organization), as does NetMinder LocalTalk. This feature is a real plus in multiprotocol sites, because you can view packets using the same framework used for other OSI-compliant networks.

Neon has included an Ethernet version of the NetCapture utility (see NetMinder LocalTalk description) in the new version of NetMinder Ethernet. The company has also included an Ethernet version of its Explain button, which has plenty of explaining to do with all the new protocols the latest version can decode: AFP (AppleTalk Filing Protocol), AURP, Banyan VINES, SNMP, RARP (part of the AppleTalk stack), Cayman Systems' Tunneling protocol, and better support for the Internet Protocol and AppleTalk ZIP.

Like NetMinder LocalTalk, NetMinder Ethernet can now print and export packet information, and it offers PowerPoint support. Like AG's EtherPeek, NetMinder Ethernet supports numerous new Ethernet cards. Unlike AG, however, Neon does not support a modular architecture for new Ethernet or protocol drivers, so you can't add new drivers without installing a new version of the program.

with the high quality you want. Users on AppleTalk networks find this to be the smart choice for big-time business, or for those who want to move into the big time without a huge budget. Priced at only $3,749**.

5. It's reliable.

When you buy a printer, you want it to print. And print. And print. That's just what the microLaser does — the first time, every time, for years.

And, of course, with AppleTalk, PostScript and TI's Paper Tray Manager, microLaser is instantly compatible with whichever Mac you've got.

It's incredible. So pick up the phone and call for details and the name of a dealer near you.

1-800-527-3500.

CIRCLE 168 ON READER SERVICE CARD.
**If Printing is a Pain... you need strong medicine!**

LaserMerge is the best feel-good product for the Macintosh in years!

Don't be satisfied with problem printing, pump up with the power of LaserMerge... and get out of that rut—If your
- Diet is full of re-feeding paper
- Printing speed is run down
- Documents are obese
- Forms generation is out of shape
- Applications can't bring it all together

...then you need a change of diet!

**With LaserMerge You Gain without Pain!**

LaserMerge is a new approach to printing... If you like what Suitcase did for your fonts and desk accessories, then pack your bags because you'll love what LaserMerge does for printing.

LaserMerge is a full meal of solutions to your everyday printing needs. Each course is easy to digest, works up to eight times faster, is guaranteed not to upset your stomach, and is compatible with your System 7.

A LaserMerge workout includes importing EPS, PostScript, PICT, and other images; along with the date, time, and page numbers. You can also generate:
- Page numbers across jobs
- Multi-up layered output
- Printer-resident forms
- Thumbnails mini-pages
- Smaller document files
- Less network traffic

A LaserMerge workout puts layers together at the printer!

For each of 63 layers you control:
- X & Y origin
- X & Y scale
- Rotation
- Clipping
- Gray level
- Fill & negative
- Job name
- Time & date
- Page numbers
- Serialization

You can also generate:
- Smaller document files
- Less network traffic

LaserMerge is good medicine for PostScript and QuickDraw printers and can give any application a performance boost without pain!

So what are you waiting for? With our 30-day "shape up or your money-back" guarantee, you can't afford to wait any longer!

Call for our Free Idea Book at 1-800-MGT-6840

---

**Table 1: Features of Protocol Analyzers**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>LocalTalk 1.11</th>
<th>NetMinder LocalTalk 1.1</th>
<th>TalkSpy 1.61</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$495</td>
<td>$305</td>
<td>$495</td>
</tr>
<tr>
<td><strong>Triggers</strong></td>
<td>time, offset, address, protocol</td>
<td>time, offset, traffic, filters</td>
<td>none</td>
</tr>
<tr>
<td><strong>Alarms</strong></td>
<td>node, protocol, threshold, trigger</td>
<td>threshold</td>
<td>none</td>
</tr>
<tr>
<td><strong>Protocols</strong></td>
<td>AppleTalk, including AppleTalk, including SNMP, AURP, and MacIP</td>
<td>SNMP, AURP, and MacIP</td>
<td>AppleTalk (headers only)</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

**Company**
- AG Group: 2540 Camino Diablo 510-937-7900
- Neon Software: 1009 Oak Hill Rd. 510-283-9771
- Distributed Technologies Corp.: 275 Wyman St.
- Apple Software: 1096 Oak Hill Rd. 617-684-0060

- Farallon, and Asante, among others. (including new cards from Apple, Dayna, Flin7~Pi1~~~N~l335, and the Ethernet card when collecting packets—they require drivers for every Ethernet card over which they might run.) Unfortunately, neither AG nor Neon added a driver for the Kinetics/Excelan card we wanted to use for our testing, forcing us to change our plans.

**Table 1: Features of Protocol Analyzers**

**LOCALTALK**

<table>
<thead>
<tr>
<th>Protocol</th>
<th>LocalTalk 1.11</th>
<th>NetMinder LocalTalk 1.1</th>
<th>TalkSpy 1.61</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$495</td>
<td>$305</td>
<td>$495</td>
</tr>
<tr>
<td><strong>Triggers</strong></td>
<td>time, offset, address, protocol</td>
<td>time, offset, traffic, filters</td>
<td>none</td>
</tr>
<tr>
<td><strong>Alarms</strong></td>
<td>node, protocol, threshold, trigger</td>
<td>threshold</td>
<td>none</td>
</tr>
<tr>
<td><strong>Protocols</strong></td>
<td>AppleTalk, including AppleTalk, including SNMP, AURP, and MacIP</td>
<td>SNMP, AURP, and MacIP</td>
<td>AppleTalk (headers only)</td>
</tr>
<tr>
<td><strong>Support</strong></td>
<td>yes</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

**Company**
- AG Group: 2540 Camino Diablo 510-937-7900
- Neon Software: 1009 Oak Hill Rd. 510-283-9771
- Distributed Technologies Corp.: 275 Wyman St.
- Apple Software: 1096 Oak Hill Rd. 617-684-0060

---

**Network Management**

With its latest version, Neon includes several sample configuration files, templates with preset triggers and filters that automatically configure NetMinder to ferret out particular network problems such as broadcast storms.

Despite all these improvements, you still can't create traffic or cut and paste directly from the packet-decode window. We'd like to see these features included in future versions of both Neon products.

**EtherPeek 1.5**. This version of EtherPeek doesn't differ much from the version we reviewed in February, but AG has added much-needed support for the Macintosh LC, Quadras, and Ibn, as well as the PowerBooks. And, like LocalPeek, EtherPeek is now able to support messaging to alphanumeric pagers.

In addition, the company has added support for numerous Ethernet cards, including new cards from Apple, Dayna, Flin7~Pi1~~~N~l335, and Asante among others. (Programs such as EtherPeek and NetMinder Ethernet essentially take over your local Ethernet card when collecting packets—they require drivers for every Ethernet card over which they might run.) Unfortunately, neither AG nor Neon added a driver for the Kinetics/Excelan card we wanted to use for our testing, forcing us to change our plans.

The latest version of EtherPeek also supports three new protocols: Apple's AURP, Banyan's VINES, and DEC's LAT (Local Area Transport).
AG’s unique modular architecture separates protocol and Ethernet interfaces from the main application. New drivers are delivered as separate files that you copy directly into the appropriate interface folder, making EtherPeek simple to update.

The Bottom Line

Although greatly improved, TalkSpy can’t be considered in the same class as its more sophisticated competitors. AG’s and Neon’s products are simply more powerful and easy to use. For those who don’t need to create traffic or cut and paste packet information, Neon’s pricing structure makes its products a better buy (see Table 1) — and the new Explain button and remote-capture utility are a boon to understanding and managing a far-flung network. For a wealth of features that include built-in pager support as well as traffic-creation and cut-and-paste capabilities, you can go with AG and get the added convenience of easy-to-update modular architecture. Updated interfaces, new feature sets, and support for even more protocols make both packet-probers worthy contenders for your network-management dollar. And unlike Superman’s X-ray vision, they’re not affected by kryptonite.

John Battelle travels almost as much as Superman but still manages to write frequently on networking topics.
Perfect It.

MarkUp 2.0
Document Editing and Review

You've put a lot of work into that document. Now you just need to show it to a few people, get their comments, and it will be golden. Unfortunately, this usually means passing out copies to each reviewer in a group, then waiting to get the copies back, only to end up with a stack of papers covered with scribbled marks and little stick-on notes. So much for feedback.

With MarkUp, this process is Mac-based, making it automatically easier. Instead of passing out paper, a review version of any document is sent—through e-mail, over a network, or even on a disk—to each person in your group or just to the guy down the hall. The review version is an electronic copy, created by MarkUp, that looks exactly the same as the original would look on paper.

Instead of marks on paper, MarkUp offers two full palettes of tools and proofreader's marks. There's a highlighter tool, a strikeout tool, note windows to replace those stick-on tags, even a voice-annotation tool and QuickTime support to convey a message as only sound or pictures can.

Instead of collating multiple paper-based versions, MarkUp shows each reviewer's edits on a named overlay. These can be viewed individually or merged together into a single review document—with each set of revisions still identifiable.

Now you won't have to wade through the paper flood again. Review a single MarkUp file, choose the edits you want to implement, then just do them.

MarkUp helps you and your co-workers review and improve your documents. Buy MarkUp today and create winning documents—easier than ever before.

For a free demo disk and catalog, phone, write, or fax Mainstay today.
How desperate are PowerBook owners for accessories? Well, there’s always the Knee Pad, a $49.95 contraption from Flat Folding Technologies (800-728-0302 or 515-581-4114) that you can attach with Velcro to your thigh so your laptop won’t have to sit in your lap. The company’s brochure shows a businessman wearing one while sitting astride a Harley. No, he isn’t driving; the woman in the spiked heels and leather miniskirt is.

By James Bradbury

Choose the write mentor: If you want to write with your Mac, you buy a word processor. If you want to write creatively, you still need a word processor, but other software assistance is available. If you suspect that a novel or screenplay might be lurking somewhere in your CPU, you can get a writing teacher in a box with the Stein Creative Writing Program’s WritePro or with Storyline from Truby’s Writers Studio. The former is a $149.95 creative-writing tutorial that interactively teaches you the same tricks of the trade that writing instructor Sol Stein uses to instruct best-selling authors. 800-755-1124 or 914-762-1255. The $345 Storyline, designed specifically to help you structure and write a screenplay, is based on the accumulated wisdom of script doctor John Truby. 310-575-3050.

Red menace: The latest from the world of input-device accessories is the little red Corvette Mouse, a $19.95 plastic shell from Suntime that slips over your mouse and turns it into what looks like a Mazda RX-7. You can click by pressing on the hood, but be forewarned: This Corvette is no ergonomic Volvo. Use it for long, and you might end up driving through the carpal tunnel. 813-886-1145.

From Corvettes to Volkswagens: Kensington’s Turbo Mouse is the VW Beetle of input devices. The company hasn’t changed the basic design since it was introduced more than five years ago. Now, with the Turbo Mouse 4.0, Kensington’s taken the radical step of moving the ADB ports from the sides of the trackball to the rear. At the same time, it’s gotten rid of the dopey DIP switches for configuring buttons and unveiled some amazingly slick control-panel software. Neatest innovation: something called Brilliant Cursor, which teleports your cursor to preset screen locations. 800-535-4242 or 415-572-2700. $169.95.

Read-only classics: If you’d rather read books on your Mac than write them, Voyager’s recent agreement with Random House to publish classic titles from the Modern Library series as Expanded Books is welcome news. The Picture of Dorian Gray is the first fruit of the collaboration. Titles will be priced between $19.95 and $24.95. 310-451-1383. Readers who are still too young for Oscar Wilde are also in luck: Discis Books is rereleasing its series of titles at prices between $39.95 and $54.95. These won a MacUser Editor’s Choice award in 1991, when they cost almost twice as much. 800-567-4321 or 416-250-6537.
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.

Y
o
u've got to love the PowerBook.

It's 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.

CIRCLE 70 ON READER SERVICE CARD.
The Game's Afoot

All work and no play makes for a dull computer. Here are the games that prove that the Mac can play with the best of them.

By Steven Bobker

The Mac is not a Sega or a Super Nintendo, but as a game machine, it beats the pants off PCs. The reason is simple, and it's as valid today as it was in 1984, when all Macs had small black-and-white screens. Games are the ultimate expression of the graphical user interface. In the best games, you're part of the action, part of the screen. It's not by chance that flight and car-racing simulations have always been among the most popular computer games.

I'm going to tell you about some great games for the Mac — but first a little background on some important issues in the Mac game industry.

Makin' Copies

Copy protection has vanished from most segments of the Mac software market. That's good news. Copy protection penalizes the innocent and, at most, inconveniences the larcenous. Games, unhappily, remain one of the last refuges of copy protection. Vendors offer all the standard reasons: history, ease of piracy, young users (does youth equate to dishonesty?), and so on. The reasons are as absurd now as they ever were. Yes, software piracy exists, but copy protection doesn't do much to stop it. It does cut down on sales, though, and thus probably reduces the gross number of pirated copies.

Many game publishers have resorted to something they call nondisk copy protection. That's simply program code that demands some snippet of information you can find in the manual or other documentation before it lets you proceed. This system isn't dangerous like "hard," or on-disk, protection, which often fouls up backups and can physically destroy data elsewhere on your disk if it goes amiss. But it's still copy protection. Can you imagine carrying a stack of manuals or code wheels around in case you decide you want to play your favorite game? I can't either. Occasionally I'm stupid enough to buy a game with this sort of protection. I figure that this time I'll keep track of the manual. Hah.

Helcats over the Pacific, an excellent flight-simulator game from Graphic Simulations, uses this sort of protection, but it sends you an unlocking code when you register. That's marginally acceptable.

Don't expect great publisher support for games either. Because games are inexpensive, support is a luxury, and you should appreciate any you can find. Probably the best place to get game support is from online services, where users as well as company representatives congregate. The best two places are America Online, where you'll find company-sponsored bulletin boards, and the MacFun forum of MAUG on CompuServe, which is the ultimate answer source.

Users of Apple's inexpensive 12-inch RGB monitor have their own special problem. Far too many game designers assume that the smallest possible Mac color screen is that of
MacUser examines the state of the art of Desktop Publishing — where it is and where its going. This Buyer's Guide delivers mouse-rated reviews of four high-end page layout programs, pitting new challengers against old favorites on the basis of features, quality and ease of use.

Also: a look at drawing programs and slide scanners; DTP and Graphics MiniFinders, too. MacUser makes sure that buyers look good!

AND TALKING ABOUT MODEMS...

Here's a Labs Report you can really connect with! Covering 14,400 bps, V.32bis Mac-specific modems, MacUser tests and awards mouse ratings to a number of these speedy peripherals for error checking, line noise, and data compression. Make sure you receive uncorrupted data every month — in MacUser.

MAC-TO-PC CONNECTIVITY

is the subject of a new Bridges section being launched in our November issue. Don't miss out!

NOVEMBER AD CLOSE:  
Tuesday,  
August 25, 1992

the 640-x-480-pixel 13-inch AppleColor High-Resolution RGB Monitor. The 12-inch version is 512 x 342 pixels. If the game uses fixed 640-x-480-pixel screens, it is unplayable on the 12-inches (yes, you can use Berkeley Systems' Stepping Out virtual-screen utility, but it's a painful solution and doesn't work with arcade-style games). Far too many games have this failing. If you have a 12-inch monitor, be sure the games you buy work with it. Some that do are InLine Design's Mutant Beach and Tesserae, Microsoft's Flight Simulator 4.0, and Activation's Shanghai II: Dragon's Eye.

Great Games

What are the best Mac games? Hard question to answer. Fashion in games changes almost as fast as hemlines or the color of a power tie. What's in this month may well be passé by Christmas. Arcade-game players have different preferences than strategy-game players do. To merely list the best games in each category would require more space than I have here.

For starters, though, here's a list of enduring classics and some personal favorites. Shanghai II: Dragon's Eye, from Activision, is the sequel to the still-great Shanghai. It's one of the best, most addictive products ever, and it belies the adage that a sequel can never be as good as the original. Also showing great staying power is the Tetris series (Tetris and WordTrix) from Spectrum HoloByte. By the time you read this, SuperTetris for the Mac may be out. If the DOS version is any indication, it's going to uphold the Tetris tradition.

On the noncommercial side, one game stands out for playability and longevity. It's Klondike, by Mike Casele. Originally issued as a commercial product in 1984, it thrives today as a $10 shareware package (KLONDI.SIT in Library 1 of the ZiffNet/Mac Download Forum). Klondike is the most addictive game I've ever played, and it makes the similar solitary game Windows is famous for look lame by comparison.

Given my age and slowing reflexes, I prefer strategy games to speed games these days. My current favorites include Micro Bridge Companion, from Great Game Products (800-426-3748 or 301-365-3297), a decent if not inspired opponent and far better than Artwork's Bridge 6.0. InLine Design's Tesserae will also challenge you for hours if not days or weeks. Casady & Greene is a great game publisher, but even winners such as Mission Thunderbolt, which is basically an old-style adventure/role-playing game with a graphical front end, fail to top its classic Crystal Quest. Yeah, I know, it's an arcade game, but it still draws me in. SimCity is still the best of the Maxis simulation games. Even if it's not the wonder education tool that all the newswires made it out to be, it's still a great game. (Special SimCity tip: Try FUND as a tax rate.)

Microsoft's Flight Simulator usually tops the game best-seller lists, but better flight simulators are out there. Try Bullseye's Fokker Triplane for an easy-to-fly plane. And for something completely different, give Wesson International's Tron II a shot (800-634-9808 or 512-328-0100). It'll likely change all your ideas about commercial flight and air traffic control. If you have Microsoft's program, check out the extra scenery packages that are available from Mallard Software (214-436-0044).

In the realm of educational games, you'll find the Carmen Sandiego series, from Bynderbund. These games teach geography, history, and other subjects, albeit in small doses. The MECC series (Word Munchers, Number Munchers, and Super Munchers) is fun and instructive. MECC's Oregon Trail and its groupware version, Wagon Train 1848, make fine introductions to a fascinatin past of U.S. history.

The game market is still wide open, and great games are appearing faster than ever, as developers realize how quickly the market is growing. I'd like to make a request: Please, someone, publish a great backgammon game. Backgammon is eminently computer-playable. Indeed, a computer playing against all the best human players won the world championship a few years ago. I recently broke one of my own rules and bought a disk-protected backgammon program. The package promised quite a bit of playability that I hoped would offset the protection. Alas, the protection and my system environment clashed bitterly, and I never did find out if the game was any good.

Road Tips

When hard-disk space is at a premium, you can turn to products such as AutoDoubler, More Disk Space, and SpaceSaver (the latter was still in beta at press time) for dramatic savings and some
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 the hardware diagnostic.

MAXA and SNOOPER are trademarks of MAXA Corporation. Other product and company names are trademarks of their respective owners. © 1992 MAXA Corporation. All rights reserved.

Circle 239 on Reader Service Card.
It can take any paper you feed it.

Have you ever wondered what your design would look like printed on a grocery bag? Okay, maybe not. But when you're working with a Phaser™ III color printer, your thoughts do tend to go a little wild.

Because you can feed the Phaser III any kind of paper, from 80 lb. bond to acetate. Even paper towels. It also takes sizes up to 12" x 18" for printing tabloid bleeds. And with 16.7 million colors delivered at 300 dpi, you get gorgeous color on any media.

It's driven by a 24 MHz RISC chip with 10 MB RAM. Fast enough for you? And with Adobe's PostScript™ Language Level 2, your message will come out loud and clear.

The only thing you need is a well-fed imagination. Call 1-800-835-6100 Dept. 21A for your free output sample.
performance degradation and risk. However, good these programs are, and the jury is still out on at least MDS and SpaceSaver — the safest way to get more space is to buy a larger hard drive. As I’m writing this, 80-megabyte drives are the largest PowerBook-sized hard drive units, but 120-megabyte units may be available by the time you read this.

You’ll get the most-efficient space use and best performance from your big (80-megabytes-plus) PowerBook hard drive by partitioning by the disk. The reason is simple. All hard disks have a standard block size, the smallest division of a hard disk that data can use. If the block size (sometimes called the allocation block size or the clump size) is 2K, which is typical of 64- to 80-megabyte hard drives, a 10-character message will use the same 2K physical block size that a 1,900-character message does.

Your goal is to work with the smallest reasonable allocation block size. For all practical purposes, these sizes are fixed and depend on the total size of the partition. Here are the numbers:
- Up-to-32-megabyte partition, 512 bytes.
- 32 to 64 megabytes, 1K.
- 64 to 98 megabytes, 1.5K.
- 98 to 130 megabytes, 2K — and so on.

If you typically create lots of small files, using partitioning to reduce the allocation block size can save space. It can also improve performance by reducing the amount of index and positioning data that the system must wade through while working. The performance gain will probably be too small to see, less than 15 percent, but it will be there.

Two free tools are available that make using your PowerBook easier. Although not written specifically for PowerBooks, MICN turns your menu titles into icons, leaving more room for battery indicators, modem-status bars, and the many icons at the right end of your menu bar. MICN 1.3 is freeware by M. Valence. Its ZiffNet/Mac filename is MICN.CPT, and you’ll find it in Library 3 of the Download & Support Forum.

Also wonderful is ExtendIt!, which converts Command-Shift-5, -6, -7, and -8 to Home, End, Page Up, and Page Down, respectively. This long-needed free tool is by Andreas Atkins; its ZiffNet/Mac filename is EXTEND.CPT. You can find it in Library 3 of the Download & Support Forum.

The Eggs of Summer

The original Macintoshes had signatures of the original development team engraved inside the cases. Eventually Apple dropped the names, but the idea has resurfaced with the release of a few later machines.

Beginning with the SE, some Macs have contained development-team pictures buried within the ROM. Here’s how to get to several of them.

To see the pictures on the SE, you must have the programmer’s switch installed. That’s the small plastic thing that sits on the left side of the computer near the lower back corner. Without it, you’re out of luck, at least as far as this egg is concerned. Press the interrupt switch, the rearmost button. This gets you into the machine-level debugger (the plain white window that overlays everything else on your screen) and gives you a > prompt. Type the following sequence: G 41D89A (the space between the G and the 4 is essential), then press Return.

You’ll be rewarded with three bit-mapped scans of the SE’s development team. To get back to real work, you need to reboot your Mac by pressing the reset switch, the frontmost part of the programmer’s switch. You can also simply turn the main power switch off and then back on.

To see the IIci’s goodies, bring up the General Controls control panel and set the date to September 20, 1989, which was the IIci’s release date. Then reboot the computer while holding down Command-Option-C-I.

To see the IIfx’s treats, follow the same procedure as you did for the IIci but set the date to March 19, 1990. The four keys to hold down are Command-Option-F-X.

The Classic’s special treat is the simplest to see: Just hold down Command-Option-O-X as you start up the computer. Wait a while, and the Mac will create a RAM disk that holds System 6.03 and Finder 6.1x. If you have a utility, such as ResEdit or MacTools, that lets you see invisible folders, you’ll see one in the RAM disk’s System Folder. Inside is a list of people who worked on the Classic.

Steven Kober, a former editor-in-chief of MacUser, currently keeps busy acting as system operator (sysop) for MacUser’s on-line service, ZiffNet/Mac, among other projects. He can be reached at 72511,45 there and welcomes all comments.
3.5" ERASABLES JOIN THE INDUSTRY'S BIGGEST OPTICAL LINE-UP.

If you find hard drives too limiting, tape too cumbersome and removables too small, we have the answers. Because nobody can show you more ways to add the speed and flexibility of optical storage to your system or network.

Our newest optical drive, the 3.5" LF-3000/LF-3004 erasable makes big storage a small task indeed. Our 1 gigabyte erasable opticals are the answer for overburdened file servers and Desktop Publishing applications. Our WORM drives are the perfect answer for mass storage where permanence and audit trails are required. And our jukebox options give larger networks 50 gigabytes of room between changes. Of course, every Panasonic® optical storage product is equally happy in DOS, OS/2, Macintosh, UNIX* and other environments.

So, since nobody else offers the advantages of direct-overwrite technology, or a broader line of optical products, or greater optical storage capacity, you should be talking to nobody else but Panasonic.

You can reach us toll-free at: 1-800-742-8086.

Panasonic Office Automation

Peripherals, Computers, Printers, Copiers, Typewriters and Facsimiles

* All other brands and company/product names are trademarks or registered trademarks of their respective companies.

THE NEW LOOK OF OPTICAL.

CIRCLE 130 ON READER SERVICE CARD.
How to Buy a Laser Printer

Buying a laser printer is a little like buying a car. Will the sturdy economy printer really be enough, or do you need the zippy little sports model that spits out page proofs in no time flat but puts a big dent in your budget? And what about such extras as fonts, memory, and special paper trays? To start making your buying decision, see “Getting Down to Business: Workgroup Printers,” September ’91, page 128; then try the following tips.

By Victoria von Biel

There are two types of laser printers: PostScript and QuickDraw. PostScript printers can be used on a network, and they let you print outline fonts and graphics created with Adobe’s PostScript page-description language. QuickDraw printers, such as the Apple LaserWriter LS, can not be used on a network or to print PostScript documents.

Do you really need a PostScript printer? If simple text files or spreadsheets are all you print, the answer is definitely no. You can print graphics on a QuickDraw printer, but you need PostScript to print graphics that were created with a PostScript application, such as Illustrator or PageMaker.

Consider inkjet printers, which have resolutions comparable to those of QuickDraw laser printers but cost about half as much. And some inkjet printers can be used on a network.

If you do want PostScript, you can save as much as $400 by buying a printer that uses cloned PostScript technology instead of the real thing licensed from Adobe. Printing very complex graphics requires true PostScript, however.

Before you buy, make a comprehensive list of which applications you use, what you print, and what page sizes you need. Then create test documents that typify what you print. Include PostScript graphics, rotated and filled text, and any unusual fonts you use regularly. If you’re buying from a dealer, use the sample files to see how the printer copes with them. If you’re buying by mail, call the printer manufacturers and see if you can arrange a demonstration in your office.

Buying a secondhand printer? You can find out how many pages it has printed by checking the startup sheet it prints out when you turn it on.

Beware of manufacturers’ speed claims. Most printer ads cite a page-per-minute speed, which doesn’t take the document-imaging time into account. For documents with elaborate graphics, that can be a long, long time.

If you need an especially fast printer, be sure to purchase one with a RISC (reduced-instruction-set computing) processor.

Find out what the printer’s consumables cost. Also find out what other components need to be regularly replaced.

Even if you don’t need special paper trays now, make sure they’re available if you want to add them later.

Plugging a ROM card into a PostScript printer is a new way to add fonts and provides quick access to several fonts for less than $300 per card. A card’s main advantage is speed, in that you don’t have to download the fonts each time you want to use them.

If you use several fonts regularly, buy a printer that can be connected to a hard-disk drive in which you store the fonts.

Ask how much memory the printer has and whether you can upgrade it. Low memory configurations (less than 2 megabytes) may affect what page sizes you can print (important if you print legal-sized documents) and how many fonts you can use.

Don’t buy memory upgrades directly from a dealer or manufacturer. Check out third-party companies for the best prices.

Make sure the printer you choose is compatible with your network. Tell the dealer what platforms and network configuration you’ll be using with the printer. Ask what cabling and connectors are required. If possible, try the printer on your network to see how it performs.

If you’re considering a printer that is not designed exclusively for Macs, make sure the price includes an AppleTalk interface kit.
Envelopes, file folders, floppy disks, video cassettes, art boards, tape cassettes, luggage tags, bar codes, notebooks, name tags—these are just a few of the thousands of uses people have found for the LabelWriter® II label printers.

These tiny marvels connect to your Macintosh® with ease and use thermal printing technology to produce laser sharp labels in just 3.5 seconds.

There are two LabelWriter II models. The standard LabelWriter II prints on either white or clear 1½" x 3½" labels. The LabelWriter II Plus also handles 2¼" x 4" and 3.5" disk labels.

Both come with easy-to-use software (an application and DA) that lets you create, format and print a label at any time, without interrupting your main programs. You can combine text with clip art and graphics. Or manage mailing lists, print postal bar codes, bar code 39, and serialized labels. There's even a print driver so you can print directly from your favorite programs.

The LabelWriter II printers are compatible with System 7, ATM®, and TrueType®. An AppleTalk® interface is even available.

Call 1-800-4-COSTAR or 1-203-661-9700 for the dealer nearest you.

The Envelope and Label Printer Experts.

©1992 Costar Corp. Costar, the Costar logo and LabelWriter are trademarks of Costar Corp. All other trademarks acknowledged.
Quick video: Try your hand at digital video with the QuickTime Starter Kit. Apple has packaged the QuickTime extension with a CD-ROM containing more than 400 megabytes of video, animation, and still images and four utilities: MoviePlayer, which plays QuickTime movies; Picture Compressor, which provides JPEG compression for still images; Movie Converter, which converts existing material into Movie format; and Movie Recorder, which lets you directly access video-digitizing cards. 800-776-2333 or 408-996-1010. $169.

Rules of attraction: At first glance, Magnet, from No Hands Software, simply looks like a run-of-the-mill file-management utility; look a little closer, and you'll find a utility that uses agents to automate your humdrum tasks — from putting away files to updating versions of documents you have on your office Mac and on your PowerBook. You can set magnets to run at preset times or when certain conditions (shutdown or volume mounting, for example) exist, and because magnets run in the background, you can keep working on important stuff while your Mac gets on with the dirty work. 415-321-7340.

Answers by phone: Got questions about Microsoft's most popular products? The folks in Redmond have set up recorded "fast tips" messages for Word (206-635-7200), Excel (206-635-7080), and Mail (206-637-9307), among others. If that doesn't help, you can talk to a real, live support person. And if you do end up on hold, at least Microsoft can afford a live DJ to play tasteful music and provide up-to-the-minute reports on phone-wait times.

Fast and free: Adding a logo or letterhead to a document not only inflates the file's size but also turns printing into a long, drawn-out experience. LaserMerge, from MindGate Technologies, slims files and trims printing time by pulling static text or graphics out of documents and into templates that are downloaded to your printer and merged with your documents at printing time. Each template can hold as many as 63 rearrangeable, rotatable, and clippable elements. LaserMerge works with QuickDraw and PostScript printers, although only PostScript printers let you use its forms-generation mode. 800-648-6840 or 615-937-8004. $95. For those who store such documents on SyQuest cartridges, SyQuest/SCSI Probe 3.4 lets you easily mount the correct driver. You can get it for free from SyQuest (800-245-2278 or 510-226-4000) or download it from America Online, GEnie, or SyQuest's own BBS (510-656-0473).
Two things in life we all want are unlimited riches and a fast hard-disk drive. The first may not be possible; the second is — to a degree. Try the following three steps, and you'll be living life in the fast lane, at least as far as your hard drive is concerned.

By Victoria von Biel

If your Macintosh seems a little sluggish, you've got a couple of options: Go out and buy the fastest CPU and hard-disk drive money can buy, or try to improve the performance of what you've already got. Assuming that your budget doesn't allow for the purchase of a Quadra 950 and a solid-state drive, there are ways to improve your present hard drive's performance. You'll need to know a little bit about how drives work and you may have to buy one or two utilities, but that's a small price to pay to get your drive up to speed.

**Tidy up**

Both you and your hard drive will get bogged down if your disk is chock-full of files and folders you never use. And if your disk is full to capacity, it’s more likely that files will be fragmented, meaning that it will take longer to open and save them. If that’s the case, it’s time to clean house. Start by going through all your files and trashing anything you definitely don’t need (temporary files, old preferences files, duplicates). Next, create a folder called Archive and transfer into it any files you want to save but that you don’t use regularly (old reports, letters, and charts, for example). Copy these files onto another medium — floppy disks, tape, removable cartridges — and then delete the files in the Archive folder. Keep the folder on your hard disk, however, so that you can archive files as you’re done with them. Back them up and remove them from the hard disk on a regular basis. (Note: This is just a way to move files you don’t use off your hard disk. It is not a substitute for regularly backing up the contents of your hard disk.)

**Defragment**

Files become fragmented when the free spaces on the disk aren’t big enough to save all of a file’s data. As a result, part of the file will be saved in one chunk of free space and the rest will be saved in other chunks of space. That means that the disk’s read/write heads have to skip all over to read a file. When you defragment a disk, you’re rearranging the data clusters so that each file’s data is stored in one space on the disk.

If you want to defragment your hard disk yourself, copy the contents of the disk to another hard disk (or tape) and remove the cartridge; reformat the hard disk. Because disks write from the center of the disk (the partition you’re self, copy the contents of the disk, using the software that came with the drive; and then copy the original data back onto the disk. That’s the hard way.

The easy way is to buy a utility such as DiskExpress II, from Fifth Generation Systems, or The Norton Utilities for Macintosh (which now includes SLIM II), from Symantec. If you’ve partitioned your disk, defragment the partition containing your working files frequently — about once a month.

Always back up the contents of your hard disk before defragmenting. There’s a slight chance that the process can cause you to lose data.

**Partition**

If you have a large hard-disk drive, say bigger than 100 megabytes, you should partition your disk. You can do this with the formatting software that came with your drive or with programs such as Silverlining, from La Cie; Drive7, from Casa Blanca Works; or Hard Disk Toolkit, from FWB. Just make sure the software lets you create real partitions, not “file” partitions. Partitioning your hard disk means you’re dividing it into sections the Mac treats as volumes, or separate disks. By partitioning, you create two or more separate disks for storing information. The volume that contains the System Folder will mount as usual when you start up (you can have System Folders on more than one partition; use the Startup Disk control panel to determine which will mount at startup); you can then mount any volume you want to access and dismount it when you’re finished with it.

There are plenty of advantages to partitioning a hard disk. As far as performance goes, partitioning limits the area in which the drive has to look for files, so it speeds up access time. And because you’re dealing with a smaller space, files don’t fragment as much; when they do, it takes less time to defragment a volume than to defragment an entire hard disk.

The main advantage, however, is determined by the partitions’ placement on the hard disk. Because disks write from the outside in, the first partition you create resides on the outer edge of the disk, meaning that the heads pass over more data as they circumnavigate the disk. Because anything on this part of the disk is accessed more quickly than files stored on other areas, use this partition to store working files you use frequently as well as disk-intensive applications such as graphics programs. The partition closest to the center of the disk (the partition you create last) should contain those programs and files that are usually held in memory — the System Folder and most applications, for example. In this position, the heads pass over less data with each revolution, so it may take a little longer than usual for these files to open, but because they’re stored in RAM, that shouldn’t slow you down too much.
We're not interested in one-shot product sales. Our whole business is based on customer service, and on building relationships.

That's why we've come to be known as America's ONE-STOP SOURCE FOR CUSTOM SOLUTIONS!

Talk to one of our friendly sales or customer service folks, and they'll help you figure out the right solution for your business, whether you need an SI or a Quadra 950. We'll help you anticipate future requirements, so you don't feel like you're on an upgrade merry-go-round. We won't try to sell you more than what you need. But don't settle for less, either!

We offer the right solutions at the right price with our S "Lease-to-Fit" programs.

NEW! Customized leasing solutions
All leases are subject to credit approval. Lease payments in our ads are based on the “True Lease” program at 48 months. Prices, lease prices, and rates are subject to change without notice. Minimum lease payment is $50 per month.

Toll-free information:
1-800-364-LESS

<table>
<thead>
<tr>
<th>Price</th>
<th>Lease Price</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10,819</td>
<td>$289/mo.</td>
<td>Quadra 950</td>
<td>RealTech 19&quot; 24-bit Trinitron System, 36 Mb RAM, 425 Mb Fujitsu, Apple Extended Keyboard</td>
</tr>
<tr>
<td>$8,499</td>
<td>$233/mo.</td>
<td>Quadra 700</td>
<td>RealTech 19&quot; 24-bit Trinitron System, 20 Mb RAM, 240 Mb Quantum, Apple Extended Keyboard</td>
</tr>
<tr>
<td>$2,195</td>
<td>$60/mo.</td>
<td>Mac LCII 4/80 Sony 8-bit Trinitron System, MacPro Plus Keyboard</td>
<td></td>
</tr>
<tr>
<td>$3,139</td>
<td>$86/mo.</td>
<td>Mac Ilsi 14&quot; 8-bit Trinitron System, 5 Mb RAM, 105 Mb Quantum, MacPro Plus Keyboard</td>
<td></td>
</tr>
<tr>
<td>$4,339</td>
<td>$119/mo.</td>
<td>Mac Ilsi 14&quot; Seiko 8-bit Trinitron System, 8 Mb RAM, 240 Mb Quantum, MacPro Plus Keyboard, Cache Card</td>
<td></td>
</tr>
<tr>
<td>$3,009</td>
<td>$83/mo.</td>
<td>Mac Ilsi Full Page, 5 Mb RAM, 105 Mb Quantum, MacPro Plus Keyboard</td>
<td></td>
</tr>
</tbody>
</table>

ALL LEASES ARE SUBJECT TO CREDIT APPROVAL. LEASE PAYMENTS IN OUR ADS ARE BASED ON THE "TRUE LEASE" PROGRAM AT 48 MONTHS. PRICES, LEASE PRICES, AND RATES ARE SUBJECT TO CHANGE WITHOUT NOTICE. MINIMUM LEASE PAYMENT IS $50 PER MONTH.

Toll-free information:
1-800-364-LESS

HARDWARE THAT FITS
Meet a few of our friendly networking experts: Barbara, Mike, Lew, Real. They’re ready to answer your questions...

Are you afraid of networking? DON’T BE!

We make networking easy!

We’ve dealt with networking issues for more than seven years. We use Shiva, Farallon, Dayna, and Asanté networking products in our day-to-day operations, and we know from experience how they work. We can tell you firsthand how a twisted pair Ethernet network is configured and interfaced with a LocalTalk network. If you already have a sticky network issue, our sales consultants will team up with one of our technical specialists to find a custom solution for you. Give us a call!

<table>
<thead>
<tr>
<th>ASANTE</th>
<th>Farallon</th>
<th>Shiva</th>
<th>Software</th>
<th>Cabling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Ethernet products at affordable prices...if you don’t know whether you need 16 or 64K call us—we’ll tell you! 16K Cards (NuBus).............169 64K Cards (NuBus)..............216 Mini 10T Hub.....................265</td>
<td>Star Connector.............17 Star Controller EN.............145 Star Controller 24 Port.......1389 Star Controller EN.............1369</td>
<td>Ethergate..................1399 Fastpath S..................2049 Netbridge.....................449 NetModem 9600 v.32........1269 NetModem/E.................1849 Netserial.................299</td>
<td>AppleShare/File Server 3.0........980 AppleTalk Internet Router.......330 Carbon Copy Mac, 2 User........189 Data Club, 3 User............279 GraceLAN (50 User)...........285 Liaison v3.0..................289 QuickMail, 10 User...........335 Timbuktu Remote v3.1.........139 Timbuktu v3.1...............139 Topp..........................199</td>
<td>Hypernet Din 6 Connectors.......27 Hypernet DB-9 Connectors.......27</td>
</tr>
</tbody>
</table>

Printed on recycled paper to show our concern for the environment.
When the long-awaited Macintosh notebook computer finally came on the market, I told my staff:

'I WANT TO BE THE NO. 1 SOURCE IN AMERICA FOR NOTEBOOK COMPUTERS!'

My staff told me we should ask other Macintosh users what they'd like with their new notebooks. And you told us exactly what you want. (Mac users have never been shy about voicing an opinion.) You want: your choice of RAM and hard drive, price, support...and ACCESSORIES!

We located some great accessories (sold at left)—everything from RAM upgrades to modems to hard drives created specifically for notebook computers.

Everyone at our office loves the high-quality cases we found. Judging from response to this ad, customers love them, too! They were designed to protect and transport any notebook computer in style.

We also offer a full-page monitor for your PowerBook. With our 15" SCSI display, you can turn any PowerBook into a desktop Mac. Why transfer data back and forth when you have the option of using the PowerBook as your portable and desktop computer?

Réal Provencher
President, Hardware That Fits

30 DAY MONEY-BACK GUARANTEE*
Apple® Macintosh® PowerBook™ 170
25 MHz 68030 microprocessor. 4 or 8 Mb of RAM. Backlit 640 x 400 active matrix display. 40 or 80 Mb hard drive, 1.44 floppy drive. Call for more information. (Modem not included.)

- PowerBook 170 4/40: $3799
- PowerBook 170 8/80: $4099
- PowerBook 170 8/80 with 14" Trinitron monitor: $5895

Apple® Macintosh® PowerBook™ 140
16 MHz 68030 microprocessor. 4 or 8 Mb of RAM. Backlit 640 x 400 Supertwist display. 40 or 80 Mb hard drive, 1.44 floppy drive. Call for more information.

- PowerBook 140 4/40: $2649
- PowerBook 140 8/80: $2999

Notebook Carrying Cases

- A. Executive Leather Attache (Genuine leather case protects notebook computer, accessories & more.) - $139
- B. Companion Case (Holds notebook computer and some accessories) - $59
- C. SuperBrief Carryall (Double-sided case holds notebook computer, accessories, and papers) - $79

Pocket Hard Drives

- Hitch Hiker 80 (80 Mb HD; compatible with all PowerBooks) - $669
- RealTech PD 80 (shown at right) - Supports all Macs with SCSI bus interface - $649
- Optional Power Supply - $29
- Optional External Battery - Call

Ram Upgrades

- 2 Mb RAM - $179
- 4 Mb RAM - $269
- 6 Mb RAM - $359

Pocket Fax Modems
- MAssim 24/96 Modem
- Solectek Pocket Fax Modem
- ProModem 24/96 Rem
- Global Village Teleporl

Macintosh PowerBooks
- Auto Power Adapter
- Envisio Display Adapter
- Charger/Reconditioner
- Auxiliary Power Pack

RealTech 15" SCS
- $875
Lease: $24/month

Optional Portable Display
- A complete system. Requires no video card. Quality, flicker-free image price that lets you experience the convenience of large screen, 15" portrait display, 640 resolution, 80 dpi, refresh rate of 74 Hz, capability, and flat CRT screen. One-year warranty. (Works with PowerBooks other desktop Macs.)

Call: 1-800-760-2400
Toll-free phone ordering in the United States and Canada.
Fast, friendly service.

ZOOM MODEMS

$75

- Zoom 2400...
- Zoom FX 96/24v...
- Zoom 9600 v.32/v.42 bis...

QUANTUM & FUJITSU HARD DRIVES

Reliable drives backed by a two-year warranty.

Internal Hard Drives
- Q 52LP...
- Q 105LP...
- Q 240S...
- Q 425S...
- FJ 425 Mb...

External Hard Drives
- Q 52LP...
- Q 105LP...
- Q 240S...
- Q 425S...
- FJ 520 Mb...

QUANTUM & FUJITSU HARD DRIVES

- $75
- $149
- $329

APPLIED ENGINEERING

For 13 years Applied Engineering has sold and installed more products for Apple computers than any other company except Apple. After selling over one million units, they're simply the best in the business!

$279

- 1.44 Plus Super Drive (for Mac Plus, SE and MacII).
- No SWIM upgrade needed!
- TransWarp NuBus 68040-25Mhz
- TransWarp SE 68030-25Mhz (with 25MHz68682).
- TransWarp SE 68030-40Mhz (with 40MHz68682).
- TransWarp LC 33Mhz w/FPU
- TransWarp LC 40Mhz w/FPU
- Quadra w/AE Shadow
- LC Heavy-Duty Power Supply
- Quick Silver for IIsi

NEWER TECHNOLOGY

Significant productivity enhancements.

- Quadra 900/Overdrive. Increases processor speed by 25% to 33Mhz...
- SCSI DART-2 Mb System. Solid state; access time: 5ms. 1Mb, 4Mb, or 16 Mb SIMMS. Built-in UPS.
- SCSI-II DART-0 Mb System. Solid state; access time: 1ms.; transfer rates up to 12 Mb/sec. Uses 1Mb, 4Mb, or 16Mb SIMMS. Built-in battery backup.
- fx/Overdrive. Variable speed accelerator for the Mac II. Operates up to 25MHz for a 25% increase in performance.
- fx/Powerstation w/16 Mb. Increases processor speed by 25% and memory-intensive functions by 80%...
- fx/Overdrive II. Accelerates 40MHz 68030 to 50MHz for a 25% increase in speed.
- fx/Powerstation II w/16 Mb. Increases processor speed by 25% and memory-intensive functions by 80%.
- Classic II FPU-B82. Motorola 68882 floating point unit increases speed of math-intensive applications by 1000%.

WACOM TABLETS

- Standard 12 x 12...
- Standard 12 x 12...
- Standard 12 x 18...

HARDWARE THAT FITS

When you buy from us, you order from computer experts, not clerks!

All of our salespeople have a minimum of three years of computer experience. They’ve trained in Apple’s intensive program, as well as our own. We’re proud of our team of sales and service experts. They’re ready to help you both before AND after the sale. When you need service, advice, or a new piece of equipment...

call us for all your hardware needs!

FAX: 1-409-539-4141  Call: 1-409-760-2400

30 day money back guarantee. Prices are subject to change.

Ho...
More Power to You

You've never read a manual, you spend all day gabbing on a BBS, and your Mac plays the "Marseillaise" when you empty the Trash. You're a power user, right? Well, maybe. Take this test to see if you qualify to join the ranks of the enlightened.

By Bob LeVitus

These days the term power user is used to describe anyone who knows just enough to choose Shut Down from the Special menu before turning off the Mac. But my definition of power user is a little more rigorous. You qualify only if you have a massive working knowledge of the Macintosh and its system software, you read trade magazines (MacUser or MacWEEK, for example) from cover to cover every month, you know your Macintosh Reference Manual backward and forward, you own at least one book about mastering the Mac (The Macintosh Bible, The Apple Macintosh Book, or my epic Dr. Macintosh, second edition), and you never stop lusting after some new piece of hardware or software. And, of course, you've spent a king's ransom supporting your obsession.

But if you're not sure just how powerful a power user you are, take this test. Just answer each question honestly; then add up your points and compare them with the ratings at the end of the quiz. And with any luck, you'll learn something as you go along.

1. The system-software version I use is:
   a. What is system software? (0 points)
   b. 5.x (1 point)
   c. 6.x (2 points)
   d. 7.x (3 points)
   Give yourself 1 bonus point if you have the latest version of System 7 Tune-Up installed.
   Power users gravitate toward the latest and greatest of everything; System 7 is no exception. However, there are exceptions to every rule. Here's one: If you have a slower Mac (a Plus or an SE) or less than 4 megabytes of RAM, you'll probably be happier with System 6.x, which runs slightly faster and uses significantly less memory.

   On the other hand, if you're really a power user, you've already bought a faster Mac with more memory so you can run System 7. And of course you've installed System 7 Tune-Up (available from dealers, user groups, and on-line services).

2. I read software manuals:
   a. Never. (0 points)
   b. Sometimes. (1 point)
   c. Often. (2 points)
   d. Always. (3 points)
   Give yourself 1 bonus point if you own at least one third-party book about the Macintosh or Mac software.

   Power users can never learn enough about the Mac and know that they can't master the software without reading the manual.

   Although some so-called power users pride themselves on never reading documentation or working through tutorials, they're the ones who are missing out. A real power user reads the manual from cover to cover (no matter how bad it is) and works through all the tutorials (no matter how basic they seem). That's the only way to truly learn a program's features.
3. I attend Macintosh user-group (MUG) meetings:
   a. What is a user group? (0 points)
   b. Occasionally. (1 point)
   c. Most of the time. (2 points)
   d. Regularly. (3 points)

   Give yourself 1 bonus point if you're active in your user group, are an officer, or contribute to its newsletter.

A user group is a bunch of Mac fanatics who hold regular meetings, demonstrate the latest software, exchange shareware and public-domain software, and usually publish an informative newsletter. Power users love their user group and never miss a meeting if they can help it. Those who don't attend meetings can still benefit from the newsletter—it's probably a gold mine of tips and reviews.

To find the user group nearest you, call Apple at 800-538-9696, ext. 500, or call your local Apple dealer.

4. My Apple menu:

   a. Looks like a logo. (0 points)
   b. Looks exactly like it did the day I bought my Mac. (1 point)
   c. Is chock-full of stuff I use a lot. (2 points)
   d. Is chock-full of stuff that I use a hierarchical utility to help me find things easily. (3 points)

   Give yourself 1 bonus point if you put one or more spaces in front of some file or folder names to make them appear at the top of the Apple menu.

Power users get a lot of mileage out of the Apple menu. Utilities such as Now Software’s NowMenus, Connectix’s HandOff II, Microseeds’ HAM, and the shareware utilities BeHierarchic and MenuChoice let you put folders (or aliases of them) into the Apple Menu items folder and then access their contents directly through hierarchical menus. They’re one of the coolest additions to System 7 you can buy.

5. The size of my hard drive is:

   a. I don’t have a hard drive yet. (0 points)
   b. 40 megabytes or less. (1 point)
   c. 41 to 80 megabytes. (2 points)
   d. 81 megabytes or more. (3 points)

   Give yourself 1 bonus point if you have more than 120 megabytes of storage available and 1 bonus point if your hard disk is partitioned (and you know why you partitioned it).

Power users need gobs of storage. They know that partitioning a big disk generally improves drive performance, because it tricks your Mac into thinking that one big disk is really several smaller "pseudo-disks"—the partitions. Not only does partitioning improve hard-drive performance but, if you’ve got a large disk with thousands of files, it also makes finding things a lot easier.

6. I back up:

   a. Only after checking the rearview mirror. (0 points)
   b. Infrequently. (1 point)
   c. Frequently. (2 points)
   d. Religiously. (3 points)

   Give yourself 1 bonus point if you back up to a medium other than floppy disks: SyQuest or Bernoulli cartridges, tape, or another hard disk.

Power users know that Murphy’s Law is actually Murphy’s Law of Computing and that the only foolproof way to protect your work is to back up diligently by copying files onto floppy disks, tape cartridges, or another hard disk. All it takes is a little time.

I’ve said it before, and I’ll say it again: there are only two kinds of computer users—those who have lost data and those who will. Don’t wait until it’s too late to begin your backup regimen.

7. ResEdit is:

   a. A dessert topping. (0 points)
   b. Some kind of utility program I’ve read about but never used. (1 point)
   c. A free utility from Apple for editing resources in Macintosh software. (2 points)
   d. A free utility that lets you customize your software and the greatest thing since sliced bread. (3 points)

   Give yourself 1 bonus point if you have a version later than 2.1.

ResEdit is Apple’s resource-editing utility, available from on-line services and user groups. It lets you modify most applications and system software, add keyboard command equivalents to menu items, modify dialog boxes, and so on. Be aware that ResEdit can cause irreparable damage and is often less than intuitive, but every power user I know keeps a copy handy and isn’t the least bit afraid to use it.

8. When I start up my Mac:

   a. I rarely turn the thing on. (0 points)
   b. I hear a chord and see a dialog box that says “Welcome to Macintosh” and then the desktop. (1 point)
   c. I hear a chord and see a dialog box that says “Welcome to Macintosh,” a few icons at the bottom of the screen, and then the desktop. (2 points)
   d. I hear a chord, see a custom startup screen, see two or three rows of icons at the bottom of the screen, hear a custom startup sound, and then see the desktop. (3 points)

   Give yourself 1 bonus point if you use a custom beep or SoundMaster (shareware) and 1 bonus point if you use a custom desktop pattern or Wallpaper (from Thought I Could software).

Power users love to customize their Macs with extensions, control panels, startup screens, and startup sounds. To keep those extensions and control panels from misbehaving and causing system crashes, most power users depend on an extension manager such as the freeware Extensions Manager, Now Utilities’ Startup Manager, or Microseeds’ INIT-Picker. These essential utilities let you turn individual extensions and control panels on and off at startup; some of them are even savvy enough to diagnose conflicts.

9. How many SCSI devices can you connect to your Mac?

   a. How dare you talk about my devices that way! (0 points)
   b. One. (1 point)
   c. Six. (2 points)
   d. Seven. (3 points)

   Give yourself 1 bonus point if you remember the 512K, 512Ke, and 128K Macs, which didn’t even have SCSI ports.

Every Mac since the Plus has been able to accommodate as many as seven attached SCSI devices, one of which is commonly an internal drive. Most Macs let you have as many as six external devices connected at once. Among your choices: CD-ROM, erasable optical, SyQuest, Bernoulli, and tape drives as well as scanners.

10. Shareware is:

   a. A line of clothing marketed by Sonny Bono’s ex-wife. (0 points)
   b. Software. (1 point)
   c. Try-before-you-buy software. (2 points)
   d. Try-before-you-buy software that you get from user groups, on-line services, and bulletin-board systems. (3 points)

   Give yourself 1 bonus point if you’ve
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 INC., 526 CLYDE AVENUE, MOUNTAIN VIEW, CA 94043 FAX: (415) 964-5434 CALL: (415) 964-7600
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 152 ON READER SERVICE CARD.
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 short-cuts 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. MU 992 477 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.

<table>
<thead>
<tr>
<th>Adobe Illustrator 3.2 Part 1</th>
<th>Adobe Illustrator 3.2 Part 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Illustrator 3.2 Part 3</td>
<td>Adobe Photoshop Part 1</td>
</tr>
<tr>
<td>Adobe Photoshop Part 2</td>
<td>Adobe Photoshop Part 3</td>
</tr>
<tr>
<td>Adobe Photoshop Part 4</td>
<td>Canvas 3.0 Part 1</td>
</tr>
<tr>
<td>Canvas 3.0 Part 2</td>
<td>Canvas 3.0 Part 3</td>
</tr>
<tr>
<td>Canvas 3.0 Part 3</td>
<td>Claris Resolve Part 1</td>
</tr>
<tr>
<td>Claris Resolve Part 2</td>
<td>Claris Resolve Part 3</td>
</tr>
<tr>
<td>ClarisWorks Database</td>
<td>ClarisWorks Graphics</td>
</tr>
</tbody>
</table>

To Order: Call Toll Free 1-800-527-1914

FAX Orders Call 1-904-677-6717

48 Hour Shipments

sent one or more shareware authors a check this year. Shareware, as you've probably guessed, is try-before-you-buy software you get from user groups, on-line services, and BBSs. If you use a shareware program regularly, you're honor-bound to send the program's author a check. Some of the best power-user utilities, such as Helium, Screen Flipper, and StuffIt Classic, are distributed as shareware.

11. The minimum memory requirement for System 7 is:
   a. 250 milligrams a day. (0 points)
   b. More than I have. (1 point)
   c. 2 megabytes. (2 points)
   d. 4 megabytes. (3 points)
   Give yourself 1 bonus point if you have 8 megabytes or more.

   Power users know that to actually use System 7, you need at least 4 megabytes of RAM. Apple used to claim that you could run System 7 on a 2-megabyte Mac, but it's now accepted that you'd have trouble using most applications on a machine with that little RAM. And if you use a power user's assortment of extensions and control panels, you'll need even more than 4 megabytes.

   Remember the old saying: "You can never be too rich, too thin, or have too much RAM."

12. RAM speed is measured in:
   a. Miles per hour. (0 points)
   b. Seconds. (1 point)
   c. Milliseconds. (2 points)
   d. Nanoseconds. (3 points)
   Give yourself 1 bonus point if you know the speed of the RAM installed in your Mac.

   RAM speed is measured in nanoseconds (billionths of a second). Hard-disk access times are measured in milliseconds (thousandths of a second). Most Macs require RAM that runs at 80 nanoseconds or faster.

   Scoring

   More than 45 points: You're an Exalted Grand Pooh-bah Power User. Even John Sculley and the two Steves could learn a thing or three from you.
   36 to 45 points: You're a Power User Guru. Other power users bow at your feet and beg you for advice.
   24 to 35 points: You're a Power User. Congratulations.
   12 to 23 points: You're a PIT (Power User in Training). Close but no cigar. Keep reading, spending, and paying attention, and someday you too may be a Power User.
   Less than 12 points: You're a Power User Wannabe. Nothing short of total dedication (and a little cash) will push you over the brink. Good luck.

Bob LeVitus is an Exalted Grand Pooh-bah Power User and the author of Dr. Macintosh and Stupid Mac Tricks.

The Time Has Come...

...to send for the latest copy of the free Consumer Information Catalog.

It lists more than 200 free or low-cost government publications on topics like money, food, jobs, children, cars, health, and federal benefits.

Don't waste another minute, send today for the latest free Catalog and a free sample booklet. Send your name and address to:

Consumer Information Center
Department TH
Pueblo, Colorado 81009

A public service of this publication and the Consumer Information Center of the U.S. General Services Administration.
You know all those things you wish your Mac did? Like let you get at files immediately, or load new extensions without making your system blow up. Well, it can. With Now Utilities 4.0, an updated version of the collection awarded Best Utility last year by Macweek and MacUser, its 7 components are designed, tested and guaranteed to work together. And it simplifies using your Mac in so many ways, it would be impossible to mention them all in one ad. So here’s the Reader’s Digest Condensed Version.

| NowSave | Automatically saves your work. And it can record every keystroke in a special back-up file, just as you typed it. So even if your system crashes, your work is saved. As is the hair you would have torn out.

| WYSIWYG Menus | Makes what you see is what you get. Will it let you see font names in their actual typefaces? Yes. Will it let you change the order, size and color of fonts in their menus? Absolutely.

| Boomerang | Saves you time and hassles by keeping track of your most frequently used files and folders. Then it presents them to you in the “open” and “save” dialogs of every application. And it finds lost files with ease—even if they’ve been compressed.

| NowStartups | Controls the loading of extensions and control panels. It helps prevent crashes. It disables extensions that do crash. It even links together extensions that require each other and keeps disagreeable extensions apart so they won’t bloody each others’ proverbial noses.

| NowScrapbook | Organizes graphics, text, sounds and QuickTime movies and stores them in catalogs. It also shows you “thumbnail” views and lets you sort, zoom, scale, resize and drop images just like a real, live art director. Even if you don’t have a ponytail.

| NowProfile | Isn’t exciting. But it does provide a detailed analysis of your system and its configuration. So if you ever run into trouble, all the info is right there. Sexy, no. Smart, yes.

| NowUtilities | Isn’t it. Now Utilities 4.0. Or at least as much of it as we can fit in one ad. For the rest of the details, call 1-800-237-3611.

Oh, and just in case you’re still wondering, Palatino looks like this.
As great as the Mac operating system is, it can’t do everything. Users of DOS and other operating systems have a feature called a batch file to help them manage their files on disk. In DOS, a batch file is a text file containing a series of commands that are executed sequentially when you type the name of the file at the prompt. You can do a lot of nifty things with batch files, such as deleting all the files that have a certain suffix, or extension — .tmp for temporary files or .bak for backup files, for example. Mainly because it has no operating-system prompt, the Mac has never had batch-file capability. The new scripting program UserLand Frontier changes all that. Its language, UserTalk, has a set of commands, called verbs, that give us something like batch files on the Mac. And because Frontier has a scripting language, it gives you the power to use logic, variables, IF/THEN statements, and more.

Frontier lets you access scripts in several ways: You can type the name of a script into the Quick Script window (similar to HyperCard’s Message Box), you can attach the script to custom menus, or you can create small (around 2K) files called desktop scripts. Double-clicking on a desktop script opens Frontier (if it’s not already open), passes the name and pathname of the desktop script to the program, and triggers the script inside the desktop file. This is where the similarity to DOS batch files comes in. The body of the handler in the desktop script can determine what folder the file is in and perform some action on the files in that folder.

One of Frontier’s most important components is its Object Database, which stores everything that Frontier knows how to deal with (including scripts, text strings, outlines, and numbers). The Object Database is hierarchical: Each item in the database can be a value or a separate set of items. These sets of items are called tables, and they look something like spreadsheets. The first column lists the name of the object being stored, the second lists the value being stored there, and the third shows the type of value at that location. You address the various elements in the database by providing addresses that are paths to each element. You’ll get a better feel for working with tables and the Object Database as you work with the scripts in this article.

Removing Suffixes

Here’s a simple application of Frontier’s abilities: removing the alias suffix from a set of aliased files. I developed this script after I had made aliases of all my applications. The one annoying result was that I ended up with a core of files whose names all ended in alias.

Manually removing the suffixes was a nuisance, so I wrote the script shown in Example 1 to strip text from the end of a filename. I’ve also used this script to remove suffixes — such as .txt — from downloaded files.

To create this script, open your own table by choosing the Open People item from
POWER PROGRAMMING

Setting File Types by Suffix

You can also use Frontier to write a script that alters a file's creator ID based on the file's suffix. For example, you can change the creator of all .txt files to MSWD, for Microsoft Word, or MWII, for MacWrite II.

This script also uses a table in the Object Database. This table stores the suffixes and file types you want to change. It stores it as a writable of your personal table, which Frontier automatically created for you. You can also place it in the scratchpad. Use the Table menu to create another writable; I've called this writable Extensions. For each suffix you want to map to a file type and creator, create a new writable; give it the name of the suffix you want to map; and create two string items in each of those wriables, one named Creator and the other named Type. Enter into those writable's the new values you want Frontier to assign.

As with the previous script, type the script in Example 2 exactly as shown, carefully reproducing the indenting. Note that the third line of this script begins with an. In this instance, we are defining a local handler that will be available to the fixFileTypes handler as it executes. You can also define this as a separate handler and store it elsewhere, but in our example, this is the only place where we want to use it. The getSuffix handler simply returns any period-delimited suffix that is part of the filename. Note that the previous script didn't rely on the period as a suffix delimiter.

The getSuffix handler uses the stringPatternMatch verb to find a period in the filename. This verb is similar to HyperTalk's offset function—you pass to it the string you are looking for and the string you are looking in, and it returns a number indicating the location of the first string in the second. If stringPatternMatch returns -1, there is no period-delimited suffix in the filename and getSuffix returns false; otherwise it returns the characters beginning with the period and extending to the end of the filename.

As before, the fileLoop portion of
The one drive to have when you’re having more than one.

Introducing the SledgeHammer Arrays

They’re blindingly fast, and they’re unerringly reliable. And no matter what capacity you choose from—100 MB to 4 gigabytes—the new SledgeHammer Arrays from FWB are the first and only drives that offer Macintosh both speed and security in a single RAID* system.

When you need the high performance demanded by applications such as color prepress or multimedia, simply configure your SledgeHammer for data striping, which virtually doubles the unit’s speed by splitting the data onto two drives. And when you need fault-tolerant networking, just set the array for disk mirroring, in which the same data is written to two identical drives; if one fails, the other takes over on the fly.

When you need both at the same time, just configure different partitions within the drive exactly the way you want them, using FWB’s exclusive MatrixArray™ technology.

The SledgeHammers incorporate new SCSI-2 technology, and deliver sustained transfer rates as high as 8.3 MB/s, and seek times as low as 5 ms—without requiring separate cards or special hardware. And without forcing you to use up a valuable slot.

And, no matter which SledgeHammer you purchase—including the internal array for the Quadra 900 family—you also get FWB’s industry-leading Hard Disk ToolKit Professional™ software, as well as a two-year warranty and Hammer PremiumService.™

So if you’re thinking about getting other high-capacity drives, think twice. Because there’s only one drive you really need to have.

SledgeHammers start as low as $899, and are available exclusively at authorized Hammer dealers worldwide. For more information and the name of the Hammer dealer nearest you, call FWB at (415) 474-8055, or fax us at (415) 775-2125.

© 1992 FWB, Inc., SledgeHammer, Hammer, MatrixArray, Hard Disk ToolKit Professional, and PremiumService are trademarks of FWB, Inc. All other trademarks are property of their respective holders. *Redundant Array of Inexpensive Disks.

Circle 84 on reader service card.
GCC Technologies has been marketing quality Macintosh peripherals since 1985. We’re advertising driven, and to determine the most cost-effective advertising vehicle, we thoroughly track every media buy GCC makes.

“In terms of return on dollars spent, MacUser gives us the best buy. MacUser’s return on investment is approximately 20% better than the competition.

“The MacUser readers are oriented toward understanding the product and the marketplace. They’re more careful customers. That’s why MacUser reaches a higher fraction of business buyers and brand specifiers. MacUser’s superior editorial clearly attracts the buyers in a way that other publications simply can’t. The key to advertising is results, which nobody produces like MacUser.”

For GCC, MacUser has been our number one monthly publication.”

the script works on every file in a folder. It first gets the suffix and, if there is one, checks to see if there’s a suitable for that suffix in the Extensions table, using the defined verb. The file.setType and file.setCreator verbs then actually handle the file.

Referring to tables can be a little tricky. Earlier I mentioned that you refer to a location in the Object Database by using the @symbol. Here, however, we’re keeping addresses in local variables and need to refer to them not as strings of text but as addresses. We use the curat symbol @, when we refer to a variable containing an address. The call to the defined verb is saying, “Is there a table whose address is stored in the variable extTable?” A similar thing happens in the following two lines. The second arguments to the file.setType and file.setCreator verbs are saying, “Use the value stored in the address that is stored in the variable newType or newCreator.”

These two scripts’ actions on files are based on characters contained in the filenames. Front office also gives you tools for performing actions based not only on filenames but also on creation and modification dates, file types and creators, comments, and version information and even on the contents of text files.

You can download the scripts I’ve described here from MacUser’s on-line service, ZiffNet/Mac. They’re in Library 5 (Scripts & Templates) of the Download & Support Forum, under the filename FRONSC.CPT. Contained in the same file is a script for a user interface that lets you add new entries to the Extensions table.

Steve Michel writes regularly on user scripting and other topics for MacWEEK.
You got a computer to help you work smarter, not harder—right? So why keep doing the same tasks again and again? Enter QuicKeys®, the software that watches what you do, then does it for you. With two ways to record your actions and over 50 ready-to-use shortcuts, QuicKeys makes short work of everything from auto-typing your return address to complex sequences like logging onto E-mail—all in a single keystroke or mouse click. And now we’ve added Instant QuicKeys®, a “jump-start” program that sees how you work, then creates personal QuicKeys in a flash. For more information or the name of a dealer near you, call 1-800-523-7638, Dept. CE20. Then prepare to bask in some well-deserved glory. Improving your environment is our business.”
Superior Quality Digital Display Type Fonts In TrueType™ and PostScript® Type 1 Formats On One Disk.

- Superior typographic quality—faithful to the library's original type designs in every detail, on screen and in print.
- Unique fonts in classical and innovative styles from Letraset's world-renowned display type library—typefaces that are unavailable from any other type foundry!
- Each FONTEK Digital Display disk features a complete character set, alternatives, accents and contains both TrueType and PostScript Type 1 formats.

$39.95 per typeface

Do you have our latest FONTEK specification brochure, featuring many typefaces never before released? Call us at 1-800-343-TYPE, or write Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653 and ask for our latest brochure and FREE demo disk.

Ad design and digital illustration by Marcelina Design Inc., Philadelphia, PA

CIRCLE 190 ON READER SERVICE CARD.
A tip from the Visalia, California, MUG: Don’t slide your hard drive across a desk. The rubber feet cause stuttering vibrations, which can crash your hard drive. Turn it off, pick it up, set it down, and turn it back on.

• Ligatures, which join letters such as fi and fl, look nice, but if you’re like most of us, you forget the appropriate keyboard command equivalents that create them (Option-Shift-fi and Option-Shift-fl, respectively). Type the letters normally, and then do a search and replace to change them to ligatures before you print.

• Do you ever slide a reused disk into your Mac when you’re using System 7 and find that it doesn’t have the correct amount of empty space available? Check the Trash. It’s probably bulging, because it remembers that you didn’t empty it the last time you used this disk.

• Speaking of Trash, my System 7 Trash doesn’t bug me for permission to empty itself. I highlighted the Trash, typed Command-I (Get Info — also accessible on the Finder’s File menu), and unchecked the box that tells the Trash to give me a warning. It’s up to you. How careful are you? What chances do you want to take?

• Do not buy one of those disk punchers that lets you make 1.4-megabyte disks out of 800K disks. You will lose data eventually. It may take a few months, but you will be sorry. I don’t know how those punch people get away with their claims.

• Sometimes novice Mac owners are afraid they’ll plug the wrong cable into the wrong place. For these folks, I fold a simple address label over the cord. On the label, I draw an arrow and an icon and print the name of the port to which the cable should be attached. Can’t go wrong this way.

• Here’s how to speed up screen redraws and typing in many applications, particularly database programs: Make the application window very small by pulling up the bottom of the window so that only a few lines show.

• Do you ever get the “PostScript Error: Undefined Offending Command” message when printing? This error can be caused by too much grouping in a graphic. Ungroup it, replace it, and try again.

• A tip from the Association of Apple 32 Users: Do you find that opening a DA under System 7 defaults you to the Apple Menu Items folder in any ensuing Open dialog box? Here’s a fix: Place the DA in the folder you’d prefer to see opened, and put an alias of it into the Apple Menu Items folder.

• When you’re copying files, does the Copy dialog box get in your way? Grab its title bar with the cursor, and hold down the mouse button until the cursor turns into an arrow. Drag the box to where you would like to see it. Release the mouse button, and this position is now the default. Move the Empty Trash and Find dialog boxes to new default positions the same way.

• If you get messages under System 7 saying you’ve unexpectedly quit, try increasing the memory allocation for the offending program. Go to the application’s Get Info box (Command-I), and alter the Current Size field.

• Option-click on the desktop in System 7, and all open applications will be hidden.

• If a keyboard command equivalent created with CE Software’s QuicKeys selects the wrong menu item, because two menus
have similar names (PageMaker’s Reverse and Reverse Line commands, for example), check the By Position button instead of the By Text button in the QuickKeys control panel before selecting the keystroke combination.

- Unless you have a good reason to do so, don’t create self-extracting files when compressing small files. You’ll add unnecessary kilobytes, no matter which compression program you use.

- The more I sit at my computer, the more I exercise. If that sounds like an oxymoron, listen up: I set a reminder program such as JAM Software’s Smart Alarms or CE Software’s Alarming Events to tell me to do some simple exercises each hour.

- Put your ImageWriter ribbons into a plastic bag and store them in the freezer. This prevents the ink from drying out.

- Under System 6, 800K disks hold 779K, but they can hold 785K if you erase the disks under System 7. You’ll have 785K even if you subsequently use the disks under System 6.

- A tip from the Apple Corps MUG, of Memphis, Tennessee: You can address multiple envelopes by using the sheet feeder on a StyleWriter. Set an empty 3.5-inch disk box on the left of the sheet feeder to act as a stop. Set the page orientation to horizontal, and set the top margin to 6 inches and the left margin to 4 inches. Now load 30 or so envelopes (return address at the bottom, facing you), and the box provides a bottom guide for the envelopes.

## Reader Tips

### AppleTalk Remote Access

If you do a lot of communicating with a network, using ARA (AppleTalk Remote Access), here’s how to dial a server, mount it, and go directly to any folder, no matter how deeply it’s buried.

First, connect with the host network. Then select the server (don’t forget to select “Save My Name Only” in the Chooser when mounting the server). Now select the folders you access the most, especially the ones that are really deep within your server’s hierarchy, and create aliases for them. Drag the aliases to your desktop.

The next time you want to connect to your server and want to avoid double-clicking through a bunch of subdirectories, just double-click on the aliases. After entering your ARA and server passwords (if applicable), you’ll be where you want to be, minus a slew of double-clicking and waiting.

Karim Reum
Scarborough, ON
Canada

### ZTerm 0.9

If you have a Hayes-compatible modem and use the shareware program ZTerm (version 0.85 or 0.9), here’s how to deal with phone numbers that are constantly busy — toll-free numbers for concert-or sports-ticket ordering, radio stations running contests, or the police when there’s an armed intruder in your house. Enter the number
in the directory list, and the next time you need to call that number, just dial it with ZTerm, which keeps dialing the number until it rings. When it rings, pick up your regular phone and quit ZTerm or turn your modem off.

Make certain that your modem speaker is on so you can hear when it starts ringing. Type at_ml to turn on the speaker and at_13 to have it at maximum volume. Type at_11=50 so the modem dials at maximum speed.

Saurabh Misra
Raleigh, NC

Clipboard (System 7)
When you double-click on System 7’s Clipboard file, in the System Folder, the Clipboard window appears on your desktop. To access the Clipboard in applications that don’t have a Send Clipboard menu command, select the Clipboard File and make an alias of it. Put the alias on your desktop or in the Apple Menu Items folder. For easy access from the Apple menu, put one or two spaces before the Clipboard alias’ name, and it will appear at the top of the menu.

David Black-Schaffer
Winchester, MA

FileMaker Pro
Here’s a hint for anyone who enjoys using buttons in FileMaker Pro but doesn’t like making them from scratch. In System 7’s Finder, select an attractive or representative icon and choose Get Info from the File menu (Command-I). The laser-printer icon in the Extensions folder makes a great Print button, for example. Select the icon in the upper left corner of the window, and copy it. Switch to FileMaker Pro, and paste the icon into your layout. Finally, choose Define Button from the Scripts menu and attach the icon to a command or script.

Brian Ballek
San Jose, CA

Excel 3.0
Excel 3.0 has a big-time bug. If you try to copy a lovely 3-D graph and paste it into a drawing program such as MacDraw or Canvas, all you’ll get are a few miscellaneous lines and some garbled text. You can fix this problem with a shareware extension called ChartPaste. It works like magic — toss it into the System Folder, and suddenly you can cut and paste Excel charts with no trouble.

Howard Tiersky
Los Angeles, CA

Note Pad (System 7)
Make an alias of the Note Pad DA, and drop it into the Startup Items folder. Whenever you turn on your Mac, the Note Pad will pop up and display whatever reminders you’ve jotted down.

Nicholas Lusa
North York, ON
Canada

New Aldus SuperPaint 3.0.

Let’s put this argument to rest. It’s both. SuperPaint® is the all-in-one program that makes it easy to do it all — combining paint, draw, and image enhancement — saving you time and money.

As you can see, its range of capabilities makes it perfect for either business users or graphic designers. And now with the added color capabilities, EPS import and export, textures, and gradients, it gives you even more creative options (by the way, it still works great in black and white).

Of course, the best way to settle any argument over SuperPaint is to try it.

See your Aldus dealer or call 1-800-685-3939 for more information.
Now You Have A Choice

Whether you want a bigger screen, a better screen, or a more affordable screen, there’s a Lapis™ display product that’s perfect for you. Choose a Lapis display board for your new Macintosh® computer, and you’ll find your options in monitors have suddenly multiplied. Choose Lapis to upgrade your older system, and you’ll be very pleased by all of the unexpected possibilities. No matter what kind of monitor you want to use with your Mac®, Lapis gives you more choices than any other display company.

Call 1-800-43-LAPIS.
We have display products for every Mac.

With over 50 products, Lapis extends the display compatibility of all Macintosh computers. In addition to Lapis’ own line of low-cost, high-quality monitors, Lapis boards let you use your Macintosh with displays from virtually all manufacturers including Apple, E-Machines, Ikegami, NEC, Radius, RasterOps, Sampo, Samsung, Seiko, Sony, and SuperMac.

<table>
<thead>
<tr>
<th>Monitor Type</th>
<th>Color</th>
<th>Gray Scale</th>
<th>Monochrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh Computer Type</td>
<td>19&quot; 21&quot;</td>
<td>16&quot; 17&quot; Apple 15&quot;</td>
<td>VGA</td>
</tr>
<tr>
<td>Classic &amp; Plus (in black &amp; white)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE (in black &amp; white)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LC &amp; LCII</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SE/30 &amp; III</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>QuaDRA and II-family</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PowerBooks &amp; Classic II</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Supported by Lapis board  ■ Supported by Lapis PowerBase (external adapter)

Trademark Owner: Apple, Classic, Mac, Macintosh, PowerBook, QuadrA, Apple Computer Inc. DisplayServer, Lapis, PowerBase/Lapis Technologies, Inc. Company names are the trademarks of their respective companies.

CIRCLE 124 ON READER SERVICE CARD.
Questions anyone?

Here’s where to get the other from Bob (76004,2076), Andy Ihnatko

See the masthead in this answer. Post your thing Macintosh.

By Bob LeVitus and Andy Ihnatko

Words to Build On

Q. I can’t open a document without first opening the application that created it. If I double-click on a document on the desktop, I get a message that says the application can’t be found. What’s going on?

Bob: I guess it’s time for our annual rebuild-the-desktop answer. Hold down the Command and Option keys when your Mac starts up, and keep holding them down until you see a dialog box that asks, “Are you sure you want to rebuild the desktop file?” Click on OK.

In case you’re wondering how something so simple can be the solution, here’s the scoop: On every disk, the Mac stores an invisible file called the Desktop (under System 7 it stores two invisible files — Desktop DB and Desktop DF), which keeps track of where things are stored and which applications are available for opening documents. However, the Desktop file isn’t a very good housekeeper — it sometimes retains information about files that have been deleted. Desktop files also tend to become corrupted or damaged over time, which can lead to system crashes, disks that don’t mount (which means that their icons don’t appear in the Finder), or “Application can’t be found” messages.

For years I’ve advised users to rebuild their desktops every month or two — it’s an excellent form of preventive maintenance. The only ill effect is that you lose any comments typed in the Get Info windows (the ones that appear when you select an icon and type Command-I or choose Get Info from the File menu) of everything on the disk. It’s a small price to pay, however.

Andy: And now that we’ve answered a desktop-rebuild question, our liquor license is good for another year. Sorry for the inconvenience, readers, but state law is state law.

The Bermuda Rectangle

Q. Please apply your superior mental capacities to my problem with FreeHand 3.0. Recently I noticed a tiny gray rectangle just to the left of the left arrow on the bottom scroll bar. Clicking on this mysterious rectangle once makes its top half turn white or disappear. Clicking a second time makes the whole rectangle disappear, and clicking a third time restores it to its original gray. You probably think I’ve spent hours clicking on this stupid gray box and watching it change color. Well, OK, I have. I can’t get any work done because this ghastly thing is sitting snugly in its corner, daring me to figure out what it’s doing there. I’ve even read the manual from cover to cover, but no luck.

Linda Horn
Vancouver, BC
Canada

Bob: Linda, I hate to tell you this, but the

do there, and what’s the proper way to get rid of it?

Porringer
A type of shallow cup

Andy: You wouldn’t know by just looking at it, but that black crud is actually bad karma, the tangible psychic residue of evil thoughts and vile deeds. The sheer intensity of the bad karma in the Mac community often sublimates into nasty black bands around the mouse’s rollers.

Normally, eliminating bad karma means spending your next lifetime in a lower state of existence, but getting it out of your mouse merely involves unscrewing the base plate and gently picking the crud off with a toothpick. It should slide off the rollers easily — in one continuous strip, if your fingers are nimble enough. Or you can buy a mouse-cleaning kit at a computer store, which does basically the same thing but costs more.

To avoid buildup of unsightly bad karma in the future, try using a clean mouse pad instead of rolling your mouse around on that filthy bare desktop of yours.
Figure 1: FreeHand's puzzling smooth-dragging control in all three of its states (from left): completely gray (elements draw and move smoothly), half-gray and half-white (elements may flicker a little if they are complex), and white (insufficient memory to draw elements perfectly smoothly). This control lets you determine how the program uses memory.

Figure 2: The regular TeachText icon (left) changes to the "neat" version (right) when you create a read-only version of a document. To perform this magic, you need to know how to change the file type by using ResEdit or a similar program. Alternatively, if you have System 7, you can copy and paste the icon of the TeachText document.

answer is right there on page 45 of the user manual, in the first chapter, "Alas FreeHand Basics." It seems that the Bermuda rectangle is nothing more sinister than FreeHand's smooth-dragging control, which lets you control how the program uses memory. When it's completely gray, elements draw and move smoothly; when it's white, not enough memory is available to draw elements perfectly smoothly, so they may flicker when you release the mouse button; when it's half-gray and half-white, elements generally draw smoothly but may flicker a little if they are complex (see Figure 1).

If the control is half-gray or all gray, you can change its state by clicking on it (as we both discovered), with little or no visible effect on-screen. By default, FreeHand sets it to all gray, but it automatically switches to half-gray or white when program operations require more memory.

I Think Icon

Q. How can I get TeachText to save files with the neat icons that developers use for their Read Me files?

Paul Schreiber

Burlington, ON

Canada

Andy: The TeachText icons are "neat"? Neat? To paraphrase Madonna in her magnum opus, Truth or Dare, anyone who thinks the TeachText icon is neat has got to go!

Well, Paul, there are two kinds of TeachText-document icons, because there are two kinds of TeachText documents. The plain-vanilla document you create and save has the dull icon shown on the left in Figure 2. The newspaperlike deal on the right is a special read-only document that can be opened, read, and printed but not edited. That's why it's used for Read Me files in commercial software — so your kids can't replace that essential, last-minute info with their reports on the solar system.

Saving a file as read-only is just one of the many TeachText features you can't get at from any menu. To make a read-only file, save the document as usual and then use Apple's resource-editing software, ResEdit, to change the document's file type from TEXT to txet (lowercase — it matters). (ResEdit is available from user groups or on-line services, in CE Software's DiskTop, or in any other file-diddling utility.) To change the document's file type by using ResEdit 2.1.x, open the file and then choose Get Info from the File menu. Select the letters TEXT in the Type field, press the Delete key, and type txet. Don't change the Creator (it should be text). Save the file and quit. The file will now have that beloved newspaper-like graphical entity you covet so.

Bob: Although the worst thing you can do if you follow our instructions is lose a text file, I feel obligated to include our standard ResEdit disclaimer: Never use ResEdit on a master or original file; always work on a copy.

(There's a simple, although nonautomatic, solution to this problem that's even safer. Because Paul wants only the TeachText document's icon, he can take advantage of the fact that System 7 lets you copy and paste document icons. With a read-only TeachText document's icon selected, go to Get Info, on the Finder's File menu; click on the icon in the top left corner; and choose Copy from the Edit menu. Do the same to the document whose icon you want to change, but choose Paste instead of Copy. You now have a new icon on your document. — Ed.)

SuperDrive Time

Q. I recently purchased a Mac Classic II. It's great, except that my disks have a compatibility problem with two of the four Mac SEs I use at school. The two Macs fail to recognize any disk I try to use as Macintosh-based, so I get a dialog box asking if I would like to initialize it. What's the problem?

Kenny Wilson

Winston-Salem, NC

Andy: Well, first off, this is a good spot to mention that if your Mac ever asks you if you want to initialize what you thought was a perfectly good disk, don't do it! One of the many differences between a Mac and the Pope is that only the latter is infallible. When a Mac says a disk is unreadable or isn't in Macintosh format and blah, blah, it's just saying that it can't make sense of the disk and thinks reformating would help immeasurably — much as four out of five dentists agree that a good swift beating is your best defense against tooth decay.

Anyway, the point is that most of the problems that result in a "Would you like me to reformat this disk?" dialog box are easy to solve with a disk-recovery tool. And in your case, the problem isn't even as complicated as that. You see, the Mac SE began life with drives that read standard double-density 800K disks. Then somewhere around the Middle Ages (late 1990 or so), Apple began outfitting SEs with high-density 1.4-megabyte disk drives (SuperDrives, in marketing weasels' parlance). As the owner of a thoroughly modern Mac, you have a SuperDrive, which can read and write both formats. Older Macs, such as Mac SEs, are usually outfitted with drives that can use only disks formatted for 800K drives. When you stick a high-density disk into an 800K drive, the Mac can make neither head nor tail of it and asks if you want to destroy all your hard- earned data.

It sounds as if two of your school's SEs were either
Introducing Automatic Data Protection For People Who Hate Being This Popular.

If you're getting too much attention, MacTools 2.0 can help. It protects and repairs data automatically, so you don't have to.

INTEGRATED VIRUS PROTECTION, BACKUP AND DATA RECOVERY.

To make sure that today's minor disk problems don't turn into tomorrow's disasters, MacTools is the only data protection package to offer scheduled disk analysis and repair.

It includes an anti-virus program that can detect and remove known viruses automatically. And it even protects against unknown viruses.

When it's time to back up, MacTools can use tape or network drives at the times you schedule. Or it will remind all your users to back up to disks.

MACTOOLS PERFORMS THE CHORES YOU USED TO DO.

Just configure MacTools once for your entire group, then customize it for individual users. And only MacTools recovers data from damaged Excel files.

Give us a call to upgrade from MacTools Deluxe for only $49, and save $100. If you own any other Macintosh utility, upgrade for $59 by calling us or visiting your local dealer. Because no one person deserves to be that popular.
Pick Up a HitchHiker.

What's big enough to store an entire armload of data, yet fits in the palm of your hand?

The answer is, of course, HitchHiker™ - the smallest of the many new, exciting storage solutions from Mass Microsystems. And the keenest way to transport Macintosh files and applications that's ever been tucked into your pocket.

But don't let the small size fool you. Whether you choose our 40, 80 or 120MB version, you'll find that HitchHiker's small size delivers big time performance. It's compatible with nearly every desktop Macintosh system, and it's a snap to use. And, if you're a PowerBook owner, we've designed a special suite of HitchHikers to match perfectly.

So, call the folks who have thought of everything you'll need to put all your Macintosh storage needs right in the palm of your hand.

manufactured late enough to have SuperDrives or were upgraded at some later point in life. Here are your solutions: Either use the school's SuperDrive SEs, or, before you leave the house, copy the files onto a disk formatted in the standard double-density format. (When your Mac asks you how you want a new disk formatted, click on the 800K button. That way the disk can be read by any Mac made since 1986.)

Bob: All of what Andy says is correct. If the disks you've been using are 800K disks, however, call a qualified repairperson. The drive on your Mac at home may be out of alignment.

Most Overvalued Players?

Q. Why are CD-ROM drives so much more expensive than CD players? The cheapest CD-ROM drives are more than twice the price of an audio-CD player.

Andy Johnson

Ely, MN

Bob: You know, I've always wondered about that, so I went straight to the horse's mouth (an Apple spokesperson) and was told that the high prices reflect that CD-ROM drives are "used in data environments that stress reliability and performance." Translated, that means that when you play an audio CD, you probably don't notice if a note or two is lost, but you'd definitely notice if your CD-ROM didn't read data accurately.

You also want your CD-ROM to be fast, whereas audio should be played at a constant rate. So you're paying for reliability, performance, and the additional electronics needed for error detection and correction. Plus there's a SCSI controller (or comparable interface) for connecting a CD-ROM drive to a computer and a data buffer for improving data-transfer rates.

And then there are good old economies of scale: Millions of audio-CD drives are produced per month, whereas there is not yet a CD-ROM drive on every desk. Pay particular attention to this last point—as the market for CD-ROM drives grows, prices will drop. Mind you, they'll never be as cheap as audio-CD drives, but you can bet they'll be cheaper a year from now and even cheaper a year after that.

My advice is that if you want or need one, buy a CD-ROM drive now. They're not going to get that much better or cheaper in the next couple of years. John McWade, publisher of one of my favorite newsletters, Before & After, says, "There is no 'right' time to buy. Tomorrow's equipment will always be better and faster. It doesn't matter." I couldn't agree more strongly.

Andy: That's so true. If you need something and can afford it, then buy it. It's always a little depressing to see the price of an audio-CD player go twice as high as expected. Plus there's a SCSI controller (or comparable interface) for connecting a CD-ROM drive to a computer and a data buffer for improving data-transfer rates.

Hear my sad song, and learn well: I'm writing this missive on a Mac Plus. It's my main Mac, chiefly because for the past three years, every time I made plans to upgrade to new equipment, I got a phone call from someone with rumors about what would be coming out next year and wound up holding on to my money. Sure, the Mac IIs I almost bought would've been obsolete as of two years ago, but at least I wouldn't have spent the past three years on a slow-as-hades, black-and-white computer that doesn't even have a Control key on the keyboard. The gas money alone that I've spent having to go to the BCS•Mac office every time I need to do color work could've paid for a Quadra 700!
Together Again

Seybold San Francisco

September 22-25, 1992 • Moscone Center

Seybold (sē'bold), n. 1. the definitive conference and exposition for people who use computers to communicate information; 2. the company which creates and produces these milestone events; 3. The Jonathan.

San Francisco (san'fran sis'kō-) n. 1. seaport on the coast of north central California, separated from Oakland by an inlet, and from the rest of the U.S. by a state of mind; 2. setting for fabulous restaurants, entertaining diversions and memorable encounters; 3. where Seybold (see' above) will be this September.

Plan to get together with industry leaders, fellow computer publishers and other communications professionals as Seybold and San Francisco get together again this September.

Seybold San Francisco
By definition, the place to be.

Call 800-777-6650 or 310-457-8500 for the complete event brochure. Or download it from the Seybold board on AppleLink.
CIRCLE 225 ON READER SERVICE CARD.
Have 12 monthly issues of the ultimate resource for Macintosh users delivered right to your door at an unbelievably low price.

- One year (12 issues) for $19.97. Save 44%.
- Two years (24 issues) for $35.40. Save 50%.

Plus, with your paid order you'll receive a very special bonus! It's our exciting pop-up, power-tip resource—1,001 Hints & Tips Disk for the Macintosh—FREE.

Call toll-free to place your order.

1-800-627-2247

Savings based on annual newsstand price of $35.40. Add $18 per year for postage to Canada and all other countries outside the U.S., U.S. currency only. Please allow 30 to 60 days for delivery of first issue. Your disk will be shipped upon payment.

---

**PageMaker/Quark Détente**

Q. I am trying to cure myself of what a friend thinks is an ill-founded allegiance to PageMaker, so I'm thinking of buying QuarkXPress. Before I give it any more thought, however, I need to know if there's a way to translate my PageMaker spreads to QuarkXPress. As far as I know, neither program can open a file created by the other. Is that true?

Jon Kirsch
Hartford, CT

**Andy:** The disadvantage of having two major DTP programs out there is that the Mac world is full of Quarkians and PageMakerites, each one sure the other group is nuts and, even worse, each possess of such rabid evangelism as to make the Crusades look like an extended PR campaign. I'm a Quark guy, and Bob favors PageMaker. I have seriously suggested he have his house tested for radon pronto.

And I am not just saying that because I'd like Quark to send some of their cool T-shirts to me. Andy Ihnatko, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. One of the many things I like about Quark is its XTension system. The program itself has many cool features, and you can add new ones anytime by getting an XTension file for that feature and dropping it into your Quark folder. There are commercial, shareware, and public-domain XTensions for every task imaginable, from adding dippy sounds to certain Quark activities to automatically preparing an entire classified-ad section. But the XTension that gave me an excuse to launch into the preceding screed on QuarkXPress' niftiness is an XTension from Quark itself: Aldus PageMaker Import. You can get Aldus PageMaker Import XTension free from on-line services such as America Online or CompuServe or from Quark (1800 Grant Street, Denver, CO 80203; 800-788-7835 or 303-894-8888) in a $25 package that includes some other cool XTensions.

As its name implies, the Aldus PageMaker Import XTension enables QuarkXPress to translate a PageMaker publication into QuarkXPress format. The XTension was written without Aldus' involvement, so it's not completely foolproof, but it transmogrifies most PageMaker documents just fine, allowing you to edit and modify everything exactly as if it had been created in QuarkXPress.

There's now way to convert a QuarkXPress document to PageMaker format, but here's a handy tip for transferring pages from one page-layout program to another: Individually print each page you want to export, using the LaserWriter driver's Print to PostScript option (you'll usually find it right in the Print dialog box). Then place the PostScript files as full-page graphics in the foreign DTP program. You won't be able to edit any of the page elements, but this method is perfectly suitable for using a QuarkXPress page as part of a PageMaker document.

**Bob:** Aldus includes Aldus Additions, a technology similar to XTensions, in PageMaker 4.2. Although there isn't an Addition for importing QuarkXPress documents into PageMaker, there are already several cool Additions, with many more on the way. I have nothing against QuarkXPress. I know lots of people who swear by it. I just find PageMaker better suited to the kind of work I do — creating very long documents. If my job were to create four-color ads for glossy magazines, I might feel differently: but because it's not, I don't.

Have my house tested for radon? Sheesh! ☹
Corporate Computing™

THE SINGLE MOST IMPORTANT NEW DEVELOPMENT IN COMPUTER PUBLISHING

WATCH FOR IT.
Ms. Karen Milne, Director of Marketing, Insignia Solutions

Insignia Solutions

"SoftPC is the best selling software solution for bringing PC compatibility to the Macintosh. Thanks to its success, Insignia Solutions is growing at a phenomenal rate.

"We've been running one ad every month for quite a while in MacUser—which is a large commitment for a company of our size. But when you look at advertising as an investment in growth, there's no alternative. We concentrate on getting the most profitable return on that investment, which is why we never miss an issue of MacUser.

"With MacUser, the editors understand that product information is of utmost importance to business buyers who need to know about available products...and which ones they should purchase.

"Our MacUser advertising has been getting such overwhelming sales that we have to add phone lines on a regular basis to take the extra inquiries. It seems like every time we add a phone line, it's busy. So, that's how we know that MacUser is pulling.

"The ads work so well because MacUser is, first and foremost, a business publication. MacUser is the number one source for unbiased editorial reporting on the products that are vital to business. And based on the responses from people calling in, our marketing plans lean heavily toward MacUser. The ads that we've run have generated the response we need. We know the best way to go is by putting our dollars in MacUser."

MacUser

is a sign of profit for Insignia.
This Month on ZiffNet/Mac

ZMAC UTILITY

PowerBook on PowerBooks

PowerBook power user Rich Wolfson is on-line this month to answer questions from MacUser Forum users about the quirks and advantages of using Apple’s littlest (but not least) computer. Wolfson, a MacUser Forum regular, recently completed a book on the PowerBook called PowerBook Companion (Menlo Park, California, Addison-Wesley, 1992, $24.95). Wolfson will host a discussion from August 10 to 15 and be available for questions — anything as general as how to conserve battery power or as complex as how to take a PowerBook apart. Leave your questions in Message Section 9 (Guest of the Month) of the MacUser Forum (GO ZMC:MACUSER).

Hot PowerBook Files

This month’s selection of shareware and freeware features a set of utilities and files to make using your PowerBook easier and help optimize its battery life. To make locating the files easier for you, the CompuServe filenames are in parentheses. All the files listed here can be found in the Download & Support Forum (GO ZMC:DOWNTECH).

Boston II (BOSTON,CPT) is generally considered the most legible bit-mapped font available for the ImageWriter. Although it is a relatively older font, Boston II has recently been rediscovered by PowerBook users, who find it highly legible. Shareware, $10.50.

Caps Lock Notify Extension (CAPSLO,CPT) indicates whether the Caps Lock key is pressed. Freeware. 2K.

Cursor Beacon (CURBEA,CPT) is a System 7 control-panel extension that lets you easily find the cursor when it disappears on PowerBook LCD screens or large monitors — a ZiffNet/Mac exclusive. Freeware. 24K.

CursorFixer v.1.0 (CURFIX,CPT) is a system extension (INT) that replaces selected cursors with user-configurable substitutes. It was written specifically to help PowerBook users who have complained about the thin I-beam text-entry cursor. Freeware. 6K.

iContraption (ICONTR,CPT), the “Icon Family Moving Machine,” is a System 7 utility designed to make using and manipulating Finder icon resources relatively easy. It requires no ResEdit hacking and includes a FatBits editing feature. Shareware, $20. 84K.

PBTools (PBTOL,CPT) contains two programs: SafeSleep and SpinD. SafeSleep is a system extension that blanks the screen when the PowerBook goes to sleep and requests a password when a sleeping Mac is awakened. SpinD is an Fkey that spins down the PowerBook’s hard disk to conserve battery power. Freeware. 8K.

PowerBook Numeric Keypad Keyboard Layouts (PBKEYS,CPT) remaps your PowerBook’s keyboard layout so you can have a numeric keypad by using the Option and Control keys. Freeware. 6K.

PowerOrgasm (PORGAS,CPT) is a novelty extension for PowerBooks that plays a sound whenever you plug in the power adapter. The default sound comes from a famous scene in When Harry Met Sally, but you can customize it with ResEdit to play any sound you want. Freeware. 93K.

Zmac Tip of the Month: Access on the Road

Have you ever unplugged the phone in your hotel room and gotten your modem and PowerBook all hooked up, only to realize that you didn’t know what the local CompuServe access number was? Instead of reconnecting the phone to call CompuServe, find the right access number with your PowerBook and modem: Using your telecommunications program, dial 800-346-3247.

At the Host Name: prompt, type PHONES and press Return to get into a database that gives you the local access number based on the number you’ve called from. This search method is not an exact science, however, so you should always recheck the number once you’re on-line to see if there is a closer access number.

CIM users can do this trick with CIM’s built-in terminal emulator (on the Special menu), but you have to type the letters ATDT followed by the access number to make a call.

If you remember you need a local access number while the phone is still hooked up, call CompuServe at 800-635-6225.
No one can give you a better introduction to System 7 than Don Crabb, the leading expert on Macintosh and popular MacWEEK columnist. This book offers the tips and techniques you need to get the most from Macintosh's innovative operating system. It covers everything from memory management to working across networks, including customizing the System 7 environment, improving type quality (both on-screen and printed), and developing new system management strategies.

Expertly written and illustrated, MacWEEK Guide to System 7 is your guided tour of the completely reworked Macintosh environment. Whether you're a novice who needs to walk through each feature step-by-step, or a veteran looking for the best ways to take advantage of the new technology, you'll find this book an invaluable companion. Available at booksellers, through Ziff-Net Online Services (command lines: GO ZNT, GO ZDBOOKS), or call 1-800-688-0448

"He never pulls his punches; his commentary is the genuine article. . . Crabb has a splendid way with the technical prose required to tell someone how, when, and why to do something."

ROGER EBERT

ISBN 1-56276-029-7
$24.95
For many of you, mail order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section.

It's what you've been demanding — a convenient place to quickly find the products you need from the vendors you want to buy from. MacUser's Direct Line to products is just one more reason to turn to MacUser for relevant information aimed at the serious user.
Five Claris Titles. One Sleek Container.
Introducing ClarisWorks, The Only Software Package You'll Ever Need.

ClarisWorks has redefined the concept of integration. In the past, other products have been assembled under a menu system and labeled "integrated." They were in the same box, but they didn't really work together. These packages were often far, requiring too much memory, and slow, because moving between them meant closing one and opening another. Why Bother? ClarisWorks has developed the ultimate integrated environment, wherein all six programs live and work together. Create great-looking newsletters, your document will look like when it's printed - and them meant closing one and opening another.

Engineered elegantly into Just $599, ClarisWorks is a superior work tool users and the perfect package for new users. Creating a document with text, graphics and charts is truly simple, and you'll do it as if you were working in one program. The ingenious integration makes it very comfortable. And of course, there's context-sensitive and balloon help for just about everything.

The programs themselves are not trimmed down, also-ran programs. They are from Claris, a leader in the Macintosh market. These programs feature the same proven interface you'll see in dedicated Claris applications like MacWrite II, MacDraw Pro, Claris Resolve and FileMaker Pro.

Word Processing. The Heart Of ClarisWorks. The heart and soul of your system. Your word processor. ClarisWorks features one of the best in the business. Bring it up and format a page in no time flat - set up custom tabs, margins, indents, line spacing and justification. Use your choice of fonts for just the right look. Quickly create pro-quality mail merged letters, using the database, and send them to everyone on your mailing list. Ready to get fancy? It's easy with ClarisWorks' multiple columns, headers and footers, link frames so type flows smooth as silk between columns, around graphics and more.

Spreadsheet. Power. Would you believe there's over 90 built-in features? You can construct sophisticated models using the mathematical, statistical and financial features. You'll answer tough questions fast with ClarisWorks' powerful, time, date and logic capabilities. You also get full formatting control to create various column widths, row sizes, character formats and borders. Formulas are extremely easy to create and use - to unleash the power that you need for nested complex functions.

You'll also love the ability to perform manual and automatic recalcualtions and the ability to control the execution of calculations locally and globally.

Charting: It's A Snap! Pictures speak louder than numbers, and your spreadsheets will sing with great looking charts. Just highlight the data you want to chart - then a couple of clicks and you've created a sleek, visual display of the information. And you can choose from seven different chart types - with 280 possible combinations of colors, grids and legends. Whenever you change the data, your chart will be automatically updated. Plus other powerful features.

Database Magic! ClarisWorks features a full-blown database with pro-quality reports and management features. Searching and sorting functions are world-class. You can isolate the data you need by quickly specifying the search parameters. Quickly organize information with automatic sorting. If you've never used a database before, you'll love how easy ClarisWorks makes organizing your data. If you're a seasoned database veteran, there's plenty of power under the hood to satisfy even the most demanding tasks.

You can easily create mailing labels, using any one of the standard layouts that included in the package, or customize them as needed.

Create Grand-totals and sub-totals quickly and accurately. If you're a seasoned database veteran, there's plenty of power under the hood to satisfy even the most demanding tasks.

You'll also love the ability to perform manual and automatic recalcualtions and the ability to control the execution of calculations locally and globally.

Risk-Free Return Guarantee: We proudly stand behind every product we sell with our incredible, 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, resaleable 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 by 3:00 p.m. EST, then an 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.

Standard Federal Express Shipping:

<table>
<thead>
<tr>
<th>Merchandise Total</th>
<th>Add</th>
<th>$4.95</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100.00 to $199.95</td>
<td>$6.95</td>
<td></td>
</tr>
<tr>
<td>$200.00 to $399.95</td>
<td>$8.95</td>
<td></td>
</tr>
<tr>
<td>$400.00 to $499.95</td>
<td>$12.95</td>
<td></td>
</tr>
<tr>
<td>$500.00 to $999.95</td>
<td>$14.95</td>
<td></td>
</tr>
<tr>
<td>$1000.00+</td>
<td>$16.95</td>
<td></td>
</tr>
</tbody>
</table>

Shipping for Printers, Monitors, CD-ROM sets are billed actual cost.

ALL PRICES ARE SUBJECT TO CHANGE.


HOW TO PLACE AN ORDER:

Ordering: Just call 1-800-866-2852 Monday-Friday 8AM-Midnight, Saturday 8:30AM-11PM and Sunday 11AM-5PM (eastern) and one of our representatives will be happy to take your order. Or simply complete the order form and return to us — your order will be promptly processed.

New Corporate Number: 800-678-8437.

Fax Orders: For faster service, FAX your order form or PO to us on our TigerSoftware ExpressFAX Order Line - 305-529-2990.

How to Pay: Pay with VISA, MasterCard, American Express, Discover Card, by check (personal checks held 10 days), or money orders. 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).

The Fastest CD-ROM Reader In The World: Just $399!

REVIEWER'S NOTEBOOK: If you're ready to get into CD-ROM, Tiger has a spectacular offer on the fastest reader in the business. The NEC CDR-73, with a remarkable 350 milliseconds response time — for just $399! Compare — you won't find a CD-ROM reader with this much muscle with a price tag this modest.

The only thing left to buy is the Interface kit (deeply discounted to just $70, including cables, terminator software and earphones) and you have the hottest drive in the business, growing, shouting and ready to rip into hundreds of megabytes of data.

Tiger is making this offer because we want to bring the magic of CD-ROM to everyone, and at this price you can afford to put this great technology on your desktop.

We've also assembled a low-cost bundle of the most popular CD-ROM titles into what we call the Tiger Reference Pack. It includes: The CIA World Fact Book, TIME'S Desert Storm on CD,essaIworks Illustrated Encyclopedia, World Atlas, US History, Time Table of History: Science and Innovation and Family Doctor. Plus, we'll throw in a pair of Persona Micro Speakers for the Mac so you can hear the sounds of these great CDs. That's over $1400 worth of current CD-ROM software and accessories for just — are you ready for this? — Just $79!

There's simply NEVER been a better deal on CD-ROM. Don't even bother looking anywhere else. You've always trusted Tiger to do the shopping for you — give this the best price.

If you add the whole thing together — the CDR-73, Reference Kit and Interface, you've got the hottest bundle in the business for just $637. Retail on these items is over $2000!

REFERENCE KIT INCLUDES

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persona Micro Speakers</td>
<td>$80.00</td>
</tr>
<tr>
<td>CIA Fact Book</td>
<td>$99.95</td>
</tr>
<tr>
<td>Desert Storm</td>
<td>$99.95</td>
</tr>
<tr>
<td>Toolworks Illustrated Encyclopedia</td>
<td>$395.00</td>
</tr>
<tr>
<td>World Atlas</td>
<td>$79.95</td>
</tr>
<tr>
<td>U.S. History</td>
<td>$395.00</td>
</tr>
<tr>
<td>Timetable: Science &amp; Innovation</td>
<td>$99.95</td>
</tr>
<tr>
<td>Family Doctor</td>
<td>$149.95</td>
</tr>
</tbody>
</table>

Total Value ................ $1400.00

YOURS FOR ONLY $179!

NEW! OrgChart Express

REVIEWER'S NOTEBOOK: The fastest, easiest way to create organizational charts on your Mac. So powerful, it makes drawing downright simple. So flexible and feature-rich, it becomes an important personnel management tool.

Create color-coded org charts, move employees, revise structures and more — all with sleek drag and drop ease. A powerful database keeps track of all your essential employee information like job description, office phone number, salary and more. OrgChart Express' search and sort capabilities can find just the right person for any assignment.

OrgChart Express is System 7savvy and offers definable styles, zoom in and out, one time data entry, aliases (a person occupying more than one position), password protection, auto alignment and more.

- Personnel vs. Position Information: When creating a field, you can specify whether the fields pertain to the position or the person.
- Sort in a List View: Personnel window is sorted using the same criteria. Provides an easy way to make mailing or phone lists.
- Occupying Multiple Positions: Allows you to create org charts that are grouped by function rather than by person.

KAETRON

BCC2909 FlowChart Express .......... $94.90
BCC2906 TopDown .................... $315.90
BCC2908 TopDown Upgrade ......... $129.95
BCC2911 OrgChart Express .......... $125.90

WE SHIP FEDERAL EXPRESS

MacUser September 1992 291
AVOID SIMPLE CONFLICTS - AND LETAL FAILURES!

New MacEKG Spots Trouble Before It Strikes!

REVIEWER'S NOTEBOOK: The Mac used to be a simple machine. It was a 128K write-and-paint wonderland, the system folder was just a boot-up utility and the applications were limited. It was a computer for the rest of us... People who bought Macs way back when, circa 1984, paid more than they would have for a stodgy DOS machine, but they didn't mind—they knew the potential of the evolving Mac with the monitor built in and the cute little icons.

The Mac has grown up, becoming a powerful and mature business tool in its own right. Today, the Mac enjoys a starring role in a variety of businesses, from graphic designers, to CEOs to television producers. The Mac can run spreadsheets with the big boys, produce pro-quality type, 3D animation and more.

With this amazing growth, the Mac now has some serious responsibilities. It must handle CDEVs, extensions, scanners, viruses, magnetic drives, virtual memory and voice recognition. That means your Mac must be modified for the way you work and what type of work you do. And with helpful suggestions on how to improve performance while eliminating the possibility of intermittent system failure.

Unless you're still running a vintage 128K Mac, you need the advanced, automatic diagnostics of MacEKG.

MacEKG is like having a highly trained technician on a diskette. Although you won't need to know the inner workings of your Mac to get the most from it, you'll find yourself becoming a Mac expert in just a few short sessions. MacEKG is a must for the Mac user who wants a trouble-free, high performance system.

MacEKG tests individual hardware components to seek out possible faults—before they become major problems. The VIA (Versatile Interface Adaptor) chips handle all user inputs like the mouse and keyboard. A faulty VIA can cause inconsistent cursor movement, and if allowed to get worse, system crash and more.

MacEKG knows about performance vs. functionality. It knows the difference between a hardware problem and a software problem. Often, a seemingly unsolvable problem is hidden in some unusual or white bang code in a program, although it shows signs of being a hardware problem. MacEKG could tell you in a second.

Another great MacEKG feature is its ability to "road test" RAM before you actually unleash it on your system. You don't need to be a technician to look at the Histogram and tell if your system is losing performance or not. Each test is summarized in a bar and the Histogram is like a month-at-a-glance health report for your Mac.

MacEKG tests individual hardware components to seek out possible faults—before they become major problems. The VIA (Versatile Interface Adaptor) chips handle all user inputs like the mouse and keyboard. A faulty VIA can cause inconsistent cursor movement, and if allowed to get worse, system crash and more.

MacEKG is the most advanced, easiest-to-use system diagnostic program we've seen, helping you prevent problems before they even think about occurring. You can run a series of tests and get immediate, understandable results on what's going on and what's going wrong. MacEKG watches your system with a set of features that used to be available only to Authorized Apple technicians. Moreover, some of the routines included in MacEKG are not available anywhere else.

Apple has served up a tempting celeryball with System 7. It's advantages fulfill many of the promises that the Mac made in the early days. But there's a funny
Bone-crushing Radius Rocket Speed!

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 Color Pivot Display

The amazing 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!

ACCELERATORS: The Rocket 25i provides lightning quick speed for Mac page layout and publishing applications. The Rocket 25i strap on 25MHz 68040 processing capability and includes floating point instructions. Then there's the Rocket 33 — featuring the blazing pace of Motorola's 33MHz 68040 processor. The Rocket 33 clocks in at over 32% faster than the 25MHz "O40" (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 3D modeling, like Pixar's MacRodender, popular animation applications, publishing and image processing programs and more.

THE RADIUS ROCKETS

This is hot new Motorola 'O40 speed technology at an unprecedentedly low price. After dramatically enhancing our QuarkXPress, Adobe Illustrator and Microsoft Word. Growing 25MHz 'O40' processing performance for the Mac II, III, Ic, IIc and IIfc. At just $1,395, the Revolutionaries have had 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, NuBus 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 'O40 cache mode — actually making the Rocket more compatible with existing Macintosh software than the Quadras themselves! But, Radius has always been on the top 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. It's an excellent value. Consider this — the only other way to see a full page in size without scrolling would be to buy a 19" or larger display — many hundreds of dollars more than the Color Pivot.

NEW VIDEOVISION!

High-quality video directly from your Macintosh!

This one amazing board drops a bomb on the Mac world with a new dimension in multimedia. Introducing the new VideoVision NuBus card from Radius. Its 24-bit technology delivers 16.8 million colors and crisp image resolution. Produce anything from QuickTime slide presentations to sophisticated multimedia presentations with full motion video. VideoVision supports S-video along with multi-timings and resolutions. Sounds technical, but it means that your video output is compatible with a wide range of applications: Apple and other computer displays and video formats.

The professional presenter will be born again with the unmatched quality and resolution of the VideoVision NuBus card. It is a giant leap in multimedia technology.

Upgrade Or Switch to Publish-It! Easy 2.1 For Only $99.90

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 wading through hundreds of 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 dozens of programs and professional tools (including Microsoft Word/Works, WordPerfect, MacWrite II and III, WriteNow and others) — with all type styles and fonts intact! Touch-up scanned images with extensive professional tools and import graphics from Adobe Illustrator, MacPaint, SuperPaint, Freehand, FullPaint or any other drawing or painting program with PICT, PICT2, EPS, TIFF or PAINT file formats.

Includes FREE File-It Database... File-It is an incredibly useful database and merge program built right into Publish-It! Easy. Now you can integrate customized information (names, addresses, phone numbers, personal notes, even entire paragraphs) into form letters you create in Publish-It! Easy.

Corporate Network & CD-ROM Versions Available!

Call Us: 1-800-666-2562

We Ship Federal Express

Int'l Orders: 305-443-8212 Fax: 305-529-2990

Circle 139 on Reader Service Card.
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 Macintosh interface. Revolutionizing financial software, Lotus 1-2-3 for the Mac is a Mac application to the core: The numbers don't lie. With 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 strategic analysis. Proposals and presentations ring with clarity 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 interface, 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, toolbars 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.


<table>
<thead>
<tr>
<th>Features</th>
<th>Lotus 1-2-3 for Macintosh</th>
<th>Microsoft Excel 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optimized for Macintosh</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Supports system 7 features</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Floating toolboxes and palettes for custom workspace</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Directly manipulates chart elements</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>In-cell editing</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Context-sensitive, graphical help</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Select ranges before or after starting commands</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Supported colors/fill patterns/256/49/230 styles and thicknesses</td>
<td>256/49/230 styles and thicknesses</td>
<td>16/18/32 styles and thicknesses</td>
</tr>
</tbody>
</table>

Powerful Spreadsheet Features

- True 3-D worksheets
- Pop-up functions and range names
- Same menus, tools, and file formats across worksheets, graphs, and macros
- Adobe Type Manager included
- Automatic compression on all files
- Macro recorder always active
- Customizable database forms
- Relational joins and queries
- Directly reads Excel files and creates Excel files (XBF)

Compatibility

- Reads and writes all 1-2-3 files
- 1-2-3 macro support

Finally, a real Macintosh spreadsheet. For the Mac that's because...
POSTSCRIPT FONTS: 40C

REVIEWER’S NOTEBOOK: What’s wrong here? Was that a typo in the headline or has TigerSoftware lost their minds? No typo. No mind loss. Just a great value on a complete (and we mean complete) library of 250 Type 1 (the best) display faces for use with any application that supports PostScript (including ATM). You already know the value of great looking type in your documents. Now you can use it for free. These faces can be used with more than 4,000 Macintosh applications and run beautifully with all Macs. Includes screen fonts as well as printer fonts. Why pay more for foundry-quality type?

Type 1 PostScript fonts — the best you can buy. Smooth and crisp on the screen and on the page. The standard for Macintosh and adopted by Microsoft for Windows. Take advantage of FontBank’s staggering array of quality fonts at down-to-earth prices. You’ll create attention grabbing documents and eye-stabbing graphic elements for any graphics programs and desktop publishers. With such a wide variety of faces available to you, creating incredible headlines is fast, fun and surprisingly professional. The headline is the face of your design, make it count. Its own distinct character. Some you may never have seen before. And FontBank display faces can be easily manipulated with programs like TypeStyler, Adobe Illustrator, Aldus FreeHand and others. Combining FontBank’s 250 faces with the capabilities of these programs offers the opportunity for an unlimited number of special effects. And FontBank display faces are compatible with all major page layout applications like Quark XPress, PageMaker, DesignStudio, Multi-Ad Creator and others. Regardless of what the design assignment, from flyers, posters, ads, coupons and greeting cards, to presentations, notices, menus and packaging, FontBank display faces give you the typographic tools you need to look your creative best. And, when converted to editable outlines using FontMonger, these faces can be used to produce special text and design effects to create stunning documents.

Thinking of upgrading to a Quadra? Because of the new 040 processor, a lot of software won’t run. The unique simulation feature actually tells you what will and won’t run with virtually any new hardware upgrade! Owen Linzmayer, writing in MacUser Magazine, said, “This impressive technical support program belongs in the ship pocket of every system administrator” and gave Help! a 4 mouse rating.

HELP!

Just a sample of the FontBank library of pro-quality Type 1 typefaces. Each is smooth and clean on-screen — and on paper!

FREE DESIGNING WITH TYPE BOOK

FONTBANK

BCC2425 FontBank

Can be used with any Macintosh.
Keep Schedules in Sync with Mac’s Best Calendar

**REVIEWER’S NOTEBOOK:** Computerized calendars have been with us for a long time (they’re a natural for any computer), and I’ve seen more than I can count. So when one comes around that really makes my shoulders above the rest, it’s something to get excited about. It started out as a project at Claris Corp., moved on its own to Now Software (makers of the popular Now Utilities), and finally culminates in Now Up-to-Date – the only calendar that keeps your appointments and your associates up-to-date, in the office, at home, or on the road.

Now Up-to-Date reminds me of important appointments (even when the application is off and I’m only running my spreadsheet). It shows me daily, weekly, monthly and yearly views that make visual sense. It even lets me take my PowerBook on the road and make schedule changes for both myself and my associates, and when I return to the office, it automatically updates both my personal and the centralized Public calendars – that’s smart.

The goal was to combine the timeless functionality of the appointment calendar with the power of the Mac. To take the age-old appointment/calendar book, which people instinctively know how to use, and place it on the screen, infused with powerful capabilities that simplify as well as automate. That’s a relatively easy task when talking about power and new features — practically any professional program can do that. The hard part is to make it really useable. To make it easy enough and intuitive enough for a novice to sit down and really use it. After all, who wants to have more appointment keeping on their schedule than absolutely necessary?

That was the star high goal, and it’s our privilege to announce the goal’s finally been reached. Introducing Now Up-to-Date, the premier calendar tool that’s both powerful enough to fully schedule any individual or group, plus straightforward enough to be easy-to-use and intuitive for every user.

From the unique “Public Calendars” that coordinate your schedule with your associates’ schedules automatically, to the powerful “Reminder” feature that notifies everyone about a meeting far enough in advance to ensure everyone shows up on time, Now Up-to-Date is one-of-a-kind software you can’t do without. Check out what Now Up-to-Date can do for you...

Even with the new PowerBooks, there are still times when the old-fashioned, printed appointment book (on which Now Up-to-Date is based) best serves the purpose. That’s when you’ll love the printing options with all the popular appointment Book formats like DayTimer, Dayrunner, Franklin Planner and Filofax. Plus you can print your calendar in a variety of other formats.

Customize Your Calendar. Now Up-to-Date’s flexible Views and Styles let you customize your calendars, so you can see and edit them any way you want.

- View a day, multiple days, a week, multiple weeks, a month, multiple months, or a year at a glance.
- Edit any event in any view
- Draw extra attention to big or important events with Electronic Sticky Notes and colorful Banners
- Control how many hours are displayed per day
- Create (and easily switch among) multiple style groups
- Display multiple views of the same calendar at the same time

---

The Informative, Intuitive Mapping Software.

**REVIEWER’S NOTEBOOK:** How many years have you been looking at your business in rows and columns? And realizing that it just isn’t laid out that way? Twenty minutes with GeoQuery will change all that. Providing you with a new, and much better view.

GeoQuery instantly transforms your customer and prospect lists — or any business data — into interactive maps. It lets you do things that are impossible with your spreadsheet, database, or contact manager. Things like making that extra sales call you would otherwise miss, choosing the best location for a seminar or service center, and assigning optimal sales territories. Making your business sites clear and compelling.

GeoQuery is the only software that lets you do these things quickly, easily and affordably. It’s the perfect get-it-done tool for anyone whose business extends further than the eye can see...

---

Map Mountains Of Data. GeoQuery knows the location of every 5-digit ZIP code in the US — all 43,301 of them. So, in the blink of an eye, your customer lists, prospects, corporate facilities, any ZIP-coded data, are magically pinpointed on GeoQuery’s built-in maps.

But GeoQuery shows you a lot more than just your business sites. It lets you see how your data relates to each other. Sales territories to customers. Prospects to dealers. Service personnel to equipment installations. Not to mention the Interstate Highways, over a thousand cities, and extensive census data — all included in the basic package. You’ll gain new insights on ways to service accounts better. Reduce travel time and costs. And spot the opportunities for growth that others are missing.

Know Where You’re Going. How many times have you driven hundreds of miles, and made only one call? How many accounts did you drive past on the way? How would you know? Well, those days are over. Team up GeoQuery with your contact manager or prospect database and a quick glance at the map will tell you who’s next door. Or choose the Find First command and GeoQuery will instantly identify your closest account. You will make more calls in less time, sell more, and maybe get home a little earlier on Friday.

Sell Your Ideas. Maps are powerful tools to present and sell your ideas. Whether it’s showing a client why you can service their accounts better, explaining that redistricting plan to the board of directors, or just reviewing sales results at the monthly meeting, GeoQuery’s maps will help you present your results and sell your ideas. Quickly and effectively.

Free with purchase of GeoQuery: DYNODEX

A perfect place to organize your names and addresses. A $129 VALUE

---

**Call Us 1-800-666-2562**

**Int'l Orders: 305-443-8212**

**Fax: 305-529-2990**

**CIRCLE 139 ON READER SERVICE CARD.**

**GUARANTEED LOWEST PRICES ON ANY MACINTOSH PRODUCT**

**WE SHIP FEDERAL EXPRESS**

---

**Now Up-to-Date**

**NOW UP-TO-DATE**

**BCC200A Now Up-to-Date**

**BCC2008 Now Up-to-Date 5 User**

**BCC200C Now Up-to-Date 10 User**

**BCC2000 GeoQuery w/ Dynodex**

---

**GEOQUERY**

**BCC2006 GeoQuery w/ Dynodex**

$395.00

---

**SALES FORCE EXPANSION FOR CONTINUED GROWTH**

---

**Includes maps for US, Alaska and Hawaii with Interstate Highways and all 43,000 + ZIP code locations. High resolution maps with county boundaries are also included for the 11 largest metro areas.**

---
Gut-Wrenching WW II Airborne Action!

You And Your B-17 Crew Fly A Pre-Dawn Raid On Nazi Germany...

REVIEWER'S NOTEBOOK: Two Rene Vidmer classics, recreating the great air clashes in the history of warfare. Bomber is not a wimpy flight simulator or silly adventure that takes you and a young B-17 crew on 25 missions over Nazi-occupied Europe. Your plane, a seasoned Flying Fortress and your ten man crew communicate during one of the most vicious campaigns of the war. Great animated sequences keep you in the heat of the action, as you descend on a Magdeburg oil field.

The Battle of Britain is the historically accurate situation game of strategic skill and military instinct. The year is 1940, over the skies of Britain, the relentless Nazi air assault continues. You track incoming raids using radar screens and ground observer reports. You evaluate your resource of men and machines to carefully plan your missions. It's you versus the uncanny ability of the German Luftwaffe - are you ready at any moment to scramble pilots to their mighty Hurricanes or legendary Spitfires?

Historically accurate recreation of the two greatest air battles in the history of warfare. Employs the identical plotting map actually used by RAF Fighter Command in the summer of 1940 to track incoming raids; and the identical tote-board system to quickly vector the precious few Hurricane and Spitfire Squadrons to intercept those raids. The player will have his hands full tracking Radar and Ground Observer reports, analyzing the size and potential threat of "UNIDENTIFIED CAR & CRAFT 2000+ SPOTTED VICINITY BIGGEN HILL...", interpreting the daily "Ultra" interceptsand coping with the weather, dwindling resources, and the Luftwaffe's sometimes uncanny ability to outfox you at every turn. By "Bomber" author, Rene Vidmer.

---

Design Your Vegetable Garden On Your PC.

REVIEWER'S NOTEBOOK: The modern gardener's way to plan a vegetable garden! A great idea, crafted beautifully into a wonderful piece of software. SPROUT! combines the power of your Mac with advanced gardening techniques to produce great vegetable garden plans.

A planting tool organizes your garden's layout, change scales to see your garden in different views, add vegetables to the existing database and create your own custom design and figure in your climate (7 regions are provided).

SPROUT! is a complete planning tool for vegetable gardeners. Its unique planting tool produces a graphic, scalable garden plan with correct plant and row spacing.

In addition, SPROUT! contains a full editable database of vegetables for 7 climate regions which includes: planting and harvesting times, yield, soil pH, seed requirements, plant and row spacing, cool versus warm climate seasons, growing tips, and other information.

Create vegetable symbols and customize your own garden designs with text, drawing and editing tools. Design layouts in four scales with drawings up to 8x8 pages large. Prints out garden layouts, calendars, shopping lists, and reports.

• Special planting tools snaps to correct row and plant spacing.
• Ruler, Ruler lines, and on-screen measurements aid in layout design.

SPROUT!

BCC207 SPROUT! $59.00
Any Macintosh with minimum of 1MB, mouse, hard drive, and printer.

---

Design Your Dream House on Your Mac.

Go ahead - design that new addition to your home! Put your imagination to work on the interior, then plan the perfect landscape. Experiment with different layouts, colors, shapes and arrangements with the Design Your Own Home Series. It's fast, easy and fun - the results are clean, precise and professional. It's your home, who could design it better than you?

These three simple-to-use computer aided design systems include a dozen of sample floorplans, pre-drawn furnishings, plants, flowers, trees and shrubs. You can modify plans to suit your taste, or start from scratch to create just the environment you've been dreaming of.

REVIEWER'S NOTEBOOK: The mod...
**The Finest Removable Hard Drives Made.**

Tiger Presents The PLI 44Mb And 88Mb Cartridge Drives

**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 — there’s the PLI Infinity 44 and 88mb drives. The PLI Cartridges carry a full 5 year warranty. One other note: The PLI drives and cartridges are thoroughly tested, far exceeding industry standards.

With much of the design and layout work done at Tiger, 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 massive 400 hour MTBF (Mean Time Between Failure) rating. That’s over 6 years between down time! It features the highest level of filtration, quality-engineered circuitry and is virtually impossible to damage by incorrect cartridge insertion (a leading cause 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). 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.

**NEW PLI “FLOPTICAL”**

The Infinity Floptical, it’s the way to make sure backups get done. If you know how to use floppy, you already know how to use the Infinity Floptical. Back-ups are fast and reliable. You do not have to restore data to use it. The backup files are instantly accessible.

**Convenient & Secure Data Sharing.** To transfer large files or volumes between computer systems with Infinity Floptical drives, just remove the disk from one and insert it in another. Each Floptical diskette holds the equivalent of 14 HD 1.44Mb diskettes.

**PLI RELIABILITY, SERVICE AND SUPPORT.** After more than 6 years of bringing innovative SCSI storage solutions to personal computer users, PLI has become the most trusted name in SCSI storage solutions.

---

**Quality Memory — at Just a Fraction of the Price You’d Pay for Apple Memory!**

**REVIEWER’S NOTEBOOK:** Here at Tiger we love our Mac LC and II computers, but we kept getting "The application could not be opened" and "Application has run out of memory", when we want to perform fast imaging. Even been stopped from printing a page with several different fonts or perhaps a large graphic image? Then you need more memory. Adding memory to a Laserwriter increases the space in which you can print in more fonts, bigger graphics, and faster printing in many cases.

Z.COM designs, assembles, tests, and packages their memory upgrade products. With a multi-million dollar assembly facility, including a Class 10000 Clean Room, Z.COM products are manufactured using the highest quality equipment under the tightest tolerances and the strictest controls. Everything is double checked, from board tolerance and thickness to the consistency of the solder paste. Z.COM controls the manufacturing process from the moment the ICs arrive at their facility, through the manufacturing process, up to the final packaging.

**FREE BOOK & DISKETTE!**

What is memory and why do you want more of it? Order now and get "The Macintosh Memory Guide", from Connectics absolutely free. A simple explanation of memory and how to get the most out of your Macintosh. Packed with tips on making your Mac faster; best explanation of 32-bit addressing mysteries. Includes HyperCard stack on diskette for easy reference. A complete memory guide — FREE! Pick it up where your Apple Users Guide left off.

For example: Did you know that RAM is actually a place to temporarily store your data and applications? When you turn off the power — they’re gone. Your hard drive or diskette is where you permanently store your files. That’s what happens when you “save” your file. The file is transferred to RAM to the hard drive or diskette.

You are confused with Apple’s explanation of 32-bit addressing and virtual memory? This entry-level guide to high-tech secrets gives you all the facts — in a way that makes sense! It’s easy and, best of all, FREE! Call Tiger today and let one of our friendly reps help you pack your Mac with lighting fast power.

---

**PLI DRIVES & CARTRIDGES**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC2408A</td>
<td>44mb Infinity Removable</td>
<td>$99.00</td>
</tr>
<tr>
<td>BCC2409A</td>
<td>44mb Removable</td>
<td>$99.00</td>
</tr>
<tr>
<td>BCC245A</td>
<td>88mb Uniform Cartridge</td>
<td>$139.00</td>
</tr>
<tr>
<td>BCC248A</td>
<td>88mb Uniform Cartridge</td>
<td>$99.00</td>
</tr>
<tr>
<td>BCC245D</td>
<td>44mb Format Cartridge</td>
<td>$99.00</td>
</tr>
<tr>
<td>BCC245D</td>
<td>44mb Format Cartridge</td>
<td>$159.00</td>
</tr>
<tr>
<td>BCC2507</td>
<td>Infinity Floptical 21mb Ext.</td>
<td>$479.00</td>
</tr>
<tr>
<td>BCC2507</td>
<td>Infinity Floptical 21mb Main</td>
<td>$49.00</td>
</tr>
</tbody>
</table>

---

**Z-COM**

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>BCC2835</td>
<td>1MB for SE/30, II, Ix, Icx, Ilsi</td>
<td>$59.00</td>
</tr>
<tr>
<td>BCC2836</td>
<td>2MB for Plus, SE, LC</td>
<td>$95.00</td>
</tr>
<tr>
<td>BCC2837</td>
<td>4MB for Ici, Ilsi</td>
<td>$185.00</td>
</tr>
<tr>
<td>BCC2838</td>
<td>16MB for Ici, Ix, Icx, Ilsi</td>
<td>$655.00</td>
</tr>
<tr>
<td>BCC2839</td>
<td>4MB for LC</td>
<td>$100.00</td>
</tr>
<tr>
<td>BCC2840</td>
<td>10MB for LC</td>
<td>$180.00</td>
</tr>
<tr>
<td>BCC2841</td>
<td>2MB for LC</td>
<td>$339.00</td>
</tr>
<tr>
<td>BCC2842</td>
<td>2MB for PowerBook 100, 140, 170</td>
<td>$135.00</td>
</tr>
<tr>
<td>BCC2843</td>
<td>4MB for PowerBook 140, 170</td>
<td>$295.00</td>
</tr>
<tr>
<td>BCC2844</td>
<td>6MB for PowerBook 140, 170</td>
<td>$339.00</td>
</tr>
<tr>
<td>BCC2846</td>
<td>1MBx8 SIMM Modules 80ns</td>
<td>$39.00</td>
</tr>
<tr>
<td>BCC2847</td>
<td>2MBx8 SIMM Modules 80ns</td>
<td>$75.00</td>
</tr>
<tr>
<td>BCC2848</td>
<td>4MBx8 SIMM Modules 80ns</td>
<td>$129.00</td>
</tr>
</tbody>
</table>

---

**Call Us: 1-800-666-2562**

**Fax:** 305-529-2990

**Circle 139 on Reader Service Card.**

**WE SHIP FEDERAL EXPRESS.**

---

**Printers Need Memory Too... LaserWriters use mem-ory to store fonts and prepare graphics for imaging.** Imaging is a place to temporarily store your data and applications. When you turn off the power — they’re gone. Your hard drive or diskette is where you permanently store your files. That’s what happens when you “save” your file. The file is transferred to RAM to the hard drive or diskette.

You are confused with Apple’s explanation of 32-bit addressing and virtual memory? This entry-level guide to high-tech secrets gives you all the facts — in a way that makes sense! It’s easy and, best of all, FREE! Call Tiger today and let one of our friendly reps help you pack your Mac with lighting fast power.

---

**DIAGRAMS**

---

**Call Us: 1-800-666-2562**

**Fax:** 305-529-2990

**Circle 139 on Reader Service Card.**
The 400 DPI, PostScript Level 2, Risc-Based Laser Printer That You Can Afford!

REVIEWER'S NOTEBOOK: If we had room for a larger headline, we would have told you that the Generation Systems 415 Laser Printer has 416MB of memory, 35 resident fonts and can print 6.25" x 11" and 11" x 17" pages — up to 15 of them per minute! The reproduction quality is amazing; crisp images, consistent blacks and reliable performance for any job.

The fact is, this is a great laser printer that is priced to absolutely fit! Compare the Generation Systems 415 vs. lasers from AT&T, DEC, LaserMaster, QMS and Fujitsu. The Generation Systems is the lowest cost performer in the category! The Generation Systems 415 has a SCSI port, so you can easily plug in any standard SCSI hard disk to download fonts, images, logos, your letterhead and more, making it a great network printer. By the way, there's also parallel, serial and AppleTalk ports so you can plug in PCs, Macs and other types of computers and have them all running jobs to the printer at the same time.

Sure, we were skeptical when the crate arrived. Inside, we were told, was a fire-breathing laser printer that could turn the industry on its ear. With RISC (Reduced Instructional Set Computing) and PostScript Level 2, you'll see unparalleled speed. PostScript Level 2 offers enhanced capabilities and great output.

And as PostScript Level 2 continues to develop, you'll see innovations like file compression/decompression, advanced caching, memory management technology and more.

With ultra-fine 400 dpi resolution, the Generation Systems 415 breaks the 300 dpi barrier offering sharper, richer grayscale images. Compare a 300 dpi printer down 90,000 dots per square inch — 400 dpi delivers shatter­realism with 160,000 dots per square inch! It is the ideal machine for word processing, desktop publishing, large spreadsheets — and just about any printing task. Even small type prints with incredible clarity.

Two "Must Have" Mac Utilities.

REVIEWER'S NOTEBOOK: Here's two additions to any Mac you'll use everyday: a file browser that quickly lets you view any file, even when you don't have the original application, and a super calculator that's a must for every desktop publisher.

CanOpener

MacUser Magazine called it "A Must-Have Utility", its the ultimate file browser and text searcher we've ever seen. You can search an entire folder for any occurrence of text. You can view the contents of any file, including application files. You can even extract pictures of icons and tools from application files! Who needs the original application files! You can quickly look at the contents of virtually any file — text, pictures, sounds, whatever — and copy them to the Clipboard or to a new file.

Calc+

Quick: What's 6 picas 9 points + 10 picas 9.25 points? With the fantastic Calc+ you instantly know it's 17 picas 6.25 points. And then with one click you'd know that's 2.92 inches, or 7.417 centimeters, or you could convert to the European standard of ciphers. Instantly and always available at your fingertips. Scroll up and down the paper tape, zoom full-size, copy just one line or all lines to the Clipboard. All this and more from this ingenious easy to use calculator. Calc+ is a must for anyone doing page layout, graphics or desktop publishing.

When Your List Of Things To-Do Gets Too Big To Keep In Your Head.

REVIEWER'S NOTEBOOK: The remarkable thing about In Control is its uncanny ability to do things the way you want. To organize its functionality the way you work and get going right out of the box.

In Control combines the flexibility of outline with the power of a row-and-column format to handle even the most eventful business lives. It's like having a spreadsheet and outline in one, both ready to perform. That's the secret, the ability to present information as a table or as an outline, depending on the task, or the way you work — and the way you think.

Indent, collapse, or expand your view of events, people and possibilities and categorize your information by person, project or due date. Click and drag to create to-do lists. Extremely efficient.

So the big advantage for you is the ability to track the details of a project without losing sight of the big picture. Set priorities, sort your to-do's in any order, and focus on what's more important and more profitable. Keep track of deadlines, assignments, progress and print reports, agendas and action items. Manage client and customer relationships and more. Another great feature: customizable data entry. Also ideally suited for mobile computing: In Control keeps your information handy on the road, and has low memory requirements.

The 32-Bit, 16.8 Million-Color Paint Program That Costs Just $29.95!

REVIEWER'S NOTEBOOK: It's hard to imagine that a paint program with true 32-bit color and a palette of 16.8 million colors, plus an extensive toolbox of creative features can sell for just $27.95. But a few minutes with Expert Color Paint and you'll know that it's true. Expert Color Paint brings professional-quality paint and photo preparation down to earth with one of the most feature-rich, easy-to-use products we've ever seen. This one is fast, fun and loaded with all the extras — including System 7 support.

Frankly, the high-priced paint programs are a little embarrassed. They've been telling customers that a paint system has to be expensive to be good. And while that may have been true in the past, the wall has come down. Expert Color Paint is a powerful, yet simple-to-use product that produces great looking images, just like the pricey packages add a studio-full of advanced toolbox features, such as lasso and magic wand, gradient tools, drop, air brush, paint can, patterns and more. For image editing, there's blur and sharpen, distortion, text, brightness filters, contrast control, image scaling, paint dithering, anti-aliasing (smoothing), rotate, flip, stretch and slant.

EXPERT COLOR PAINT

BCC2505 Expert Color Paint. . . . $29.95

Includes Macintosh SE/30, LC, Macintosh II, IIx, IIci, Classic II, LaserWriter II, Plus, PowerBook 14a, PowerBook 30, and Color emulation of BCC2500 or better with 2.3MB RAM and a hard disk. System 6 or later and 128K (or less) recommended.

When Your List Of Things To-Do Gets Too Big To Keep In Your Head.

A better way to perform a familiar function.

WHATEVER YOU DO...

In Control is perfect for managers in any situation. Production managers, project managers, sales and marketing managers. It's great for making lists, outlining your writing and of course, managing your personal information.

Production managers are able to keep track of the every detail involved in a project and keep them coordinated within the larger plan. Complete status reporting means every report is upon the minute. In Control is the only tool that can do it.

People managers can keep track of deadlines, assignments, progress and resources. Focus workers on the tasks suited to their talents to produce efficient work flow. Sales and marketing managers can easily manage their relationships with customers and keep all of their important customer information in one place.
RUN DOS-PC SOFTWARE ON YOUR MAC!

**REVIEWER’S NOTEBOOK:** At last! The great barrier between Mac and DOS compatibility has been removed — for good. As a user of both Mac and DOS computers, I know the pros and cons. Macs are friendly and advanced, but the DOS world has more people creating more software. Specialized software that might fill your particular needs. Plus today’s office environment uses a mix of DOS and Mac computers, I know the pros and cons. Macs are software only! No expensive hardware to buy or install. People creating more software. Specialized software... One answer from Insignia Solutions, a dedicated company who has had a five-year mission: To bridge the compatibility problem between different worlds of software. They’re the best. They have a solution to fit every need and every Mac. Best of all — it’s software only! No expensive hardware to try or install.

**Here’s a suite of solutions that solves forever the problem of Mac & DOS Incompatibility.** Need to use a co-worker’s DOS floppy with their DOS 1.2-3 file on your Mac? No problem. Simply slip it in and watch as that DOS floppy appears just like any Mac floppy — complete with icons and folders. Amazing! But that’s not all. Double-click on that DOS 1.2-3 file and stare in amazement as 1-2-3 Mac or Excel starts up automatically and loads your files. You can make changes, save it, give it back to your DOS-using co-worker, and then chuckle as he loads the file with your changes — like nothing unusual happened. But that’s only the beginning of these incredible solutions...

Turn any Mac into a DOS PC. Run actual DOS applications: 1-2-3, ProComm Plus, dBase — virtually any DOS application — from inside a Mac window. Use your Mac keyboard, mouse, and the best DOS software on any Mac.

**SoftPC.** Slip a DOS floppy into your Mac and it runs just like it was running on any DOS 286 PC. You can have the best of both worlds: the fast, easy Mac interface you’ve come to know, and a huge world of specialized DOS software that fits every need you know.

**AccessPC.** Slip a DOS floppy into your Mac and it looks just like a Mac floppy! An icon appears, you double-click it and DOS files and sub-directories appear just like the were Mac files and folders. Double-click on the DOS files and immediately run Mac applications like Word, 1-2-3 Mac and Excel. AccessPC is still the fastest — fully 4 to 10 times faster than the competition!

**Now with Cartridge and Mageto-Optical Drive Support!**

AccessPC is instantly compatible with your external cartridge and magneto-optical drives. No other utility software is needed! (Unlike the others that make you call your drive manufacturer for software they haven’t even finished yet.) Your DOS files are ready, willing and able with the finest DOS file access application made — AccessPC.

Adding bonus intelligent disk cache for your cartridge and magneto-optical drives can increase performance by 50% or more — and it’s free!

**SoftPC Family.** Turn any Mac into an advanced DOS computer. Run virtually any DOS application from within a Mac window, complete with all the extras. SoftPC will turn any Mac into a 286 AT computer, complete with a full 640 K of memory and DOS 3.3.

Run a DOS program and print directly to any Mac printer — just like it was an industry-standard Epson LO2500 (which virtually all DOS programs support). Or if the DOS program supports Postscript printers, you can print directly to any LaserWriter or other Mac PostScript printer. TrueType fonts are even included for the Epson LO2500 so you get crisp, clean printouts every time.

**Getting data between DOS and Mac has never been easier.** Cut & Paste with the Mac Clipboard between all DOS and Mac windows.

Put DOS files and applications on any Mac drive — any folder or volume that appears on your desktop can be used, even remote hard disks on networked Macs.

**What I love best about AccessPC is that all the extras have been thought of and included.** Like turning your Mac mouse into a Microsoft DOS Mouse so you have complete mouse support in your DOS programs. The one mouse in the palm of your hand works in both DOS and Mac windows. Easy DOS communication software works on a Mac. The Mac Printer and Modem ports are used. DOS COM ports. Every DOS program I’ve ever heard of works perfectly on a Mac. From CD readers to Novell networked applications — it’s all here — and it’s very easy to use.

There are three members of the SoftPC family, each designed to take advantage of the wide range of different Macs:

**Entry Level SoftPC.** This member of the SoftPC family was designed for low-cost Macs including the Mac Plus, SE, LC, Classic and Portable. You get everything mentioned above including IBM AT 286 emulation, DOS 3.3 and CGA graphics.

**Universal SoftPC.** Step up to Universal SoftPC and you’ll see new capabilities to the Entry Level SoftPC package. CD-ROM support lets your Mac CD reader play DOS CDs. And if you purchase the optional SoftNode add-on, you can access Novell Netware network solutions. It’s the perfect solution for offices with specialized Novell software.

**SoftAT.** Fasten your seatbelt and hang on as SoftAT takes DOS software to new levels of high performance. You need a Mac LC, SE30, Mac II, Quadra or PowerBook 140 or 170 to run it, but it’s all speed. You get lightning fast benefits like a Math Co-processor, EGA graphics for more demanding graphics applications, and Expanded memory for big, hungry applications. SoftPC is the ultimate answer to Mac and DOS compatibility.

**SoftNode.** Another Insignia Solutions breakthrough is SoftNode — the perfect solution for running Novell PC client software on any Mac. With the addition of the SoftNode add-on, both Universal SoftPC and SoftAT can run off-the-shelf and customized MS-DOS programs on any Mac. Now you can build on your existing PC LAN hardware and software investment and fully integrate Macs into PC workgroups. Call for your Free PC Catalog.

**Universal SoftPC.** Step up to Universal SoftPC and you’ll see new capabilities to the Entry Level SoftPC package. CD-ROM support lets your Mac CD reader play DOS CDs. And if you purchase the optional SoftNode add-on, you can access Novell network solutions. It’s the perfect solution for offices with specialized Novell software.

**SoftAT.** Fasten your seatbelt and hang on as SoftAT takes DOS software to new levels of high performance. You need a Mac LC, SE30, Mac II, Quadra or PowerBook 140 or 170 to run it, but it’s all speed. You get lightning fast benefits like a Math Co-processor, EGA graphics for more demanding graphics applications, and Expanded memory for big, hungry applications. SoftPC is the ultimate answer to Mac and DOS compatibility.

**SoftNode.** Another Insignia Solutions breakthrough is SoftNode — the perfect solution for running Novell PC client software on any Mac. With the addition of the SoftNode add-on, both Universal SoftPC and SoftAT can run off-the-shelf and customized MS-DOS programs on any Mac. Now you can build on your existing PC LAN hardware and software investment and fully integrate Macs into PC workgroups. Call for your Free PC Catalog.

**Your Choice of Insignia Product And FREE FormTool, Personal Lawyer, Lotus Agenda**

**INSIGNIA**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccessPC Bundle</td>
<td>$79.90</td>
</tr>
<tr>
<td>Entry Level SoftPC Bundle</td>
<td>$159.90</td>
</tr>
<tr>
<td>Universal SoftPC Bundle</td>
<td>$219.90</td>
</tr>
<tr>
<td>Universal SoftAT Bundle</td>
<td>$335.90</td>
</tr>
<tr>
<td>SoftAT Bundle</td>
<td>$335.90</td>
</tr>
<tr>
<td>SoftNode Bundle</td>
<td>$125.90</td>
</tr>
<tr>
<td>SoftNode Bundle 10 Pack</td>
<td>$740.90</td>
</tr>
</tbody>
</table>

**TIGER EXCLUSIVE BUNDLE**

- **Your Choice of Insignia Product:** AccessPC Bundle
- **And FREE FormTool, Personal Lawyer, Lotus Agenda**

**Call Us:** 1-800-666-2562

**Int'l Orders:** 305-443-8212

**CIRCLE 139 ON READER SERVICE CARD.**

**WE SHIP FEDERAL EXPRESS**
Create Your Own Multimedia Production!

REVIEWER'S NOTEBOOK: turns your Mac into a complete audio workshop! Fast, and easy — not to mention a carload of fun! Record, edit and play back live or recorded sound to add important impact to multimedia presentations, training materials and documents with voices, music and sound effects. Nothing smacks an audience like great sound — it keeps them right there!

The MacRecorder Sound System Pro digitizer features a built-in microphone, external microphone jack, line input jack and input level control for simple, centralized recording. Just plug the digitizer into your Mac's printer or modem port, open the mic and start recording! The software included, called Sound Edit Pro, acts as your mixing board to create soundtracks, voice-over narrations and great sound effects. Record directly to disk — then play back right from the disk. The sound appears on your screen as a waveform for easy editing. Cut and paste sound clips, just like cutting and pasting text, and modify sounds with creative tools to create interesting effects. Run sounds backwards, add echo, reverb, reverse, remove, and more.

MacRecorder Sound System Pro does not require technical knowledge of sound engineering. The fact is, you can achieve professional results the first time out. Just click to record, edit and mix. Record voices with the built-in microphone and put that voice anywhere by just moving it like you move text or graphics.

You can use MacRecorder Sound System Pro with a variety of software, including MicroMind Director, MacroMind MediaMaker, MacroMind Paracomp Magic, QuickPICS, HyperCard, QuickMail, Microsoft Mail or any program that supports Macintosh Sound Input Manager. It also supports SuperMac's VideoSpigot and Showplace. MacRecorder Sound System Pro gives sound put capabilities.

MacRecorder images, or choose from the library of Pixar ClipObjects, including furniture, lamps, a sleek racing bicycle, billboard, shopping bag, a theater spotlight, and more. You can add your own voice, music, and sound effects, and manipulate characteristics such as shininess, size, roughness and reflectivity.

ALSO AVAILABLE IN CD-ROM VERSION

MacRecorder and Showplace applications, complete online documentation for both produces, a gallery of images created with Pixar products and a sample of Pixar animation all on one CD-ROM!

INCLUDES FREE CLIP PROP KIT

M Ac R E N D E R M A N & S W O L P L A C E

BCC2410 SoundTrack & MacRenderMan Bundle .................................. $199.00

BCC2411 SoundTrack & MacRenderMan CD .................................. $349.00

Showplace: runs on any Macintosh II family computer with a Jobsite computer, 128K QuickDraw, MultiFinder and at least 5 megabytes of internal RAM (memory of 1MB recommended; MacRenderMan, Macintosh II, IIc, IIci, Plus or SE, 256K RAM, system boot 6.0.4 or higher, MacRecorder 2.0 or higher, no memory needed). MacRecorder and MacRenderMan: 5 MB of free disk space; 8- or 16-bit color display systems; 3 MB of memory of MB recommended; RenderMan compatible design package.

CALL 1-800-666-2562 TIGERSOFTWARE
GUARANTEED LOWEST PRICES ON ANY MACINTOSH PRODUCT

Create Full 3-D, Photorealistic Images!

REVIEWER’S NOTEBOOK: MacRenderMan represents the finest software available for 3-D image creation. It is perfect for those who are new to 3-D and for those with experience in modeling software. Showplace MacRenderMan gives you an easy way to improve images created with RenderMan compatible modeling applications or to create a dazzling 3-D image using the pre-designed shapes that come with Showplace. With Showplace you can assign your scene, select realistic appearances for your objects, set the lights and watch the powerful MacRenderMan software transform your image. Pixar's RenderMan technology was used in the academy award winning film Tin Toy and to create special effects in films such as The Abyss and Terminator 2. Showplace-MacRenderMan gives you access to this amazing technology and you can see images created with MacRenderMan images, or choose from the library of Pixar ClipObjects, including furniture, lamps, a sleek racing bicycle, billboard, shopping bag, a theater spotlight, and more. Then turn your camera loose and move around your scene to create spectacular effects and perceive a multiplicity of angles.

MacRecorderMan, Fascinating photorealistic design made easy (and fun). Three distinct dimensions in full color, with a variety of surface textures and designs. In our first session, we created several billboard concepts with a variety of whacked-out designs and colors in under an hour. That hour passed quickly; the real work was handled by MacRenderMan transparently.

We began the modeling process by describing the objects (geometry and appearance), the characteristics of the lighting (the light sources) and the view we wanted of the object (the camera, if you will). We then had a scene! We could change the texture of the surface (and how the light reflects off of it) and easily control the various shading techniques. The more work you do on your images, exploring the powerful capabilities of MacRenderMan, the more detailed your images become. This is a great tool for professional product designers, product design, animation, merchandise, architecture and presentation graphics. Nothing else can compare to the images you create with MacRenderMan, the most visually accurate picture making tool available for the Mac today.

MacRenderMan is used with 3-D design applications that produce RenderMan Interface Bytestream files (RIB) files. Use your favorite 3-D design system to create objects. The design software will record these geometric descriptions into a RIB file and spool the file. MacRenderMan reads the spooled RIB file and produces a color rendition, computing it in the background under MultiFinder.

Showplace. Showplace is the forum for your objects created with MacRenderMan technology. Build a dazzling 3-D scene by quickly importing and arranging MacRenderMan images, or choose from the library of Pixar ClipObjects, including furniture, lamps, a sleek racing bicycle, billboard, shopping bag, a theater spotlight, and more. Then turn your camera loose and move around your scene to create spectacular effects and perceive a multiplicity of angles.

Change the "look" of an object by changing its surface: you could have an oak grain table and a stucco-painted wall, or a stucco-painted table and an oak grain wall, or an oak grain shopping bag and brushed chrome wall! With Showplace, you can decide the appearance of an object independently of its shape. Showplace's ability to combine any object with any appearance (including those you create) is one of its most powerful features.

These "Looks" include: bricks, brushed chrome, gold and copper, concrete, gray and rose granite, veined marble, natural oak, plastic and sky patterns, among others. Manipulate characteristics such as shininess, size, roughness and reflectivity.

We have several MacRenderMan images to choose from, including furniture, lamps, a sleek racing bicycle, billboard, shopping bag, a theater spotlight, and more. Then turn your camera loose and move around your scene to create spectacular effects and perceive a multiplicity of angles.

Change the "look" of an object by changing its surface: you could have an oak grain table and a stucco-painted wall, or a stucco-painted table and an oak grain wall, or an oak grain shopping bag and brushed chrome wall! With Showplace, you can decide the appearance of an object independently of its shape. Showplace's ability to combine any object with any appearance (including those you create) is one of its most powerful features.

These "Looks" include: bricks, brushed chrome, gold and copper, concrete, gray and rose granite, veined marble, natural oak, plastic and sky patterns, among others. Manipulate characteristics such as shininess, size, roughness and reflectivity.

ALSO AVAILABLE IN CD-ROM VERSION

MacRecorder and Showplace applications, complete online documentation for both produces, a gallery of images created with Pixar products and a sample of Pixar animation all on one CD-ROM!

INCLUDES FREE CLIP PROP KIT

MACRENDERMAN & SHOWPLACE

BCC2410 Showplace & MacRenderMan Bundle .................................. $199.00

BCC2411 Showplace & MacRenderMan CD .................................. $349.00

Showplace: runs on any Macintosh II family computer with a Jobsite computer, 128K QuickDraw, MultiFinder and at least 5 megabytes of internal RAM (memory of 1MB recommended; MacRenderMan, Macintosh II, IIci, Plus or SE, 256K RAM, system boot 6.0.4 or higher, MacRecorder 2.0 or higher, no memory needed). MacRecorder and MacRenderMan: 5 MB of free disk space; 8- or 16-bit color display systems; 3 MB of memory of MB recommended; RenderMan compatible design package.

WE SHIP FEDERAL EXPRESS

MacUser September 1992 301
REVIEWER'S NOTEBOOK: When the UMAX scanners arrived here at Tiger, their reputation had preceded them. We knew that top designers, architects, artists, pre-press production houses and commercial printers had UMAX flatbeds. A few of us had even seen a UMAX in action.

What surprised us was the prices. This low?! After plugging in the awesome UMAX UC1200S, and scanning a couple of magazine covers, glossy posters, a snapshot of someone’s baby, a 35mm slide of my trip to The Bahamas and our color matching chart — we knew why so many pros use the UMAX. They deliver one pass, reproduction quality scans at 1200 dpi! Drenched colors, razor-sharp detail. But the price... how can a product with such a reputation carry such a modest pricetag?

UMAX scanners come in a variety of flavors, from a compact, 600 dpi speedster to the top of the line, 1200 dpi scanner that delivers blistering color quality. It recognizes a billion colors! Rivals the legendary drum scanning technology — at hundreds of thousands per second!

Color black & white, grayscale, halftone — do it all with five amazing UMAX flatbed scanners. For office use, the UMAX black & white scanners pump out 600 dpi images. Feature for feature, nothing outclasses or outperforms UMAX's advanced technology. Great for OCR, handsomely designed.

Pro-Quantity At A Great Price. Scan your brains out with two high powered grayscale scanners! Scanned images look just like the originals. Great for business use, libraries, medical and government applications. Built to stand up the the punishment of constant use. The UG630 is the perfect first scanner for Mac users. For office use from a graphical on-screen diagram — the UG80 and UG630 are crafted for advanced feature built in.

Whether you need the best - don’t pay more - ask for UMAX.

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 and a total of eleven! The LED lights on the MultiPort unit indicate the port selected and your Mac installs drivers. 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, or normal use, and a trackball-type mouse for graphics and publishing work.

A must for the Mac user performing multiple tasks and working with assorted equipment. Every time 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.

So add six serial ports — instantly! Connect and Control Modems, Printers, Networks, Peripherals And Other Serial Devices. Hardware And Software Included.

**BCC2546 600 DPI Grey Scale Full Page** ........ $999.00
**BCC2547 1200 DPI Colour Full Page** ........ $3999.00
**BCC2130 Multiport MP-91** ............... $229.00

**Warranty:** 7 Year’s On Everything.

CALL 1-800-666-2562
TIGERSOFTWARE
GUARANTEED LOWEST PRICES ON ANY MACINTOSH PRODUCT
September 1992 MacUser CIRCLE 139 ON READER SERVICE CARD.

**BCC2785 Multiport MP-91** ............... $229.00
Dimensions: 1.25W x 9.2 L x .36 H in., 2.25W x 8.8 L x .55 H in.
Weight: 5 lbs.
Warranty: Two Years On Everything.

WE SHIP FEDERAL EXPRESS
The Small Business Office Assistant.

In this day and age of over-complicated software and highly technical jargon, it's a welcome relief to see something you can really use! And that's what I love best about Office Manager - it does exactly what needs to be done in any small office.

Right out of the box in just a few hours, everyone in your office will be using Office Manager - getting more done in less time. Business letters that used to take 30 minutes are done in a flash! A few mouse clicks is all it takes to print standard business correspondence - and that includes the envelope.

Office Manager is the perfect complement to any accounting application. Together they do 99% of what even the most sophisticated business software can do. Office Manager is the best way to handle these everyday tasks:

- Maintain Addresses
- Keep To-Do Lists
- Write Letters
- Track Client Jobs
- Print Labels & Envelopes
- Track In-house Projects
- Phone/Fax Dialing (with Call History and Redial)

Address Cards. The heart of Office Manager lies in the Address File. From this central hub of vital information, all the various parts of your office fall into place. More than just name, address and phone number - Office Manager is a fully automatic organizer.

LETTERS.

Business Letters. With Office manager's built-in word processor, you'll whip out business correspondence in record time. Office Manager pays for itself in saved time within the first month. Start with any Address Card, then one quick-click starts a letter - complete with name, address, heading, date and greeting.

Merge Letters. We fell in love with this feature the moment we saw it - easy, instant, customized form letters. What a time saver! If you spend time writing repetitive letters you'll love this feature as much as we do.

Predefined letters like "Thanks for Your Business", "Special of the Month", "Welcome New Customer", or anything you can think of will be instantly printed with just a few mouse clicks.

Fax & Phone Dialer. How much time do you spend each day, first finding the right phone number, dialing the phone or fax machine, then possibly re-dialing because of busy or wrong numbers? I added it up one day - I spent an average of 45 seconds for each phone call, and over 75 seconds for each fax.

Job Tracking. This potent Job Tracking feature for your clients could be a separate application all by itself. This one's a real powerhouse, and it's flat easy to use and part of a job. Every time one of your clients calls, you instantly start tracking a new job, jot down quick notes for reference. Run the automatic Timer in the background to track your valuable time. Print a Job Report including total time, and a report for each phase of the project.

In-House Projects. There's always a project running around the office that needs your attention. Whether it's what's due, or need to be ordered, new topics that need to be covered in the weekly meeting, or ideas for the upcoming company newsletter, you need something to keep track of it all.

Mail Manager. This optional addition to Office Manager is a must for anyone doing bulk mailing. You get advanced sorting power, elaborate search filters and powerful mail merge options.

Office Manager Remote. Without investing in an expensive network, Office Manager Remote allows you to enter names and addresses on any remote Mac and later merge the information into Office Manager's main file.

The Total Organizer Solution for $99.

Buy The Amazing Dynodex And Get DynoPage FREE!

Dynodex is a true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information - and allows you to print perfect double-sided address book pages that fit virtually any personal organizer.

You'll now have instant access to your personal contacts both on and off the computer. At your computer, instantly look up and dial any number you need from the powerful Dynodex application - or the convenient desk accessory. On the road, all of your contacts are available in your personal organizer. Now your contact information is personal and portable.

The powerful Dynodex database delivers ultra high speed searches; instantly select subsets based on multilevel queries with a set of eight logical and arithmetic operators; for example, "all clients in California contacted within the last 6 months." On sorting you get: key, ascending or descending on any field, along with Dynodex's speedy find, change and global delete. You can delete duplicate records for good. Fast-Find and display any record instantly by simply clicking on it in the list window.

If your information resides elsewhere, Dynodex allows you to quickly import it for immediate use. Any text file, tab-delimited or comma-delimited file is ready to use, and Dynodex includes a free copy of MS-disk, for importing HyperCard, Pictorial Point and Quick-Dex address files.

On to Dynodex's powerful (and very smart) printing capabilities: You can print any size address page, even double-sided pages. Print in any font, size and style on a field-by-field basis for great pages.

FREE DynoPage. This amazing printing utility allows you to print documents at reduced sizes and on both sides of the paper. Double-sided pages are much easier to print using DynoPage, and can be printed to any size from full-size letter, legal or tabloid, to "photo-retouched" sizes for personal organizers such as Day-Timer, Day Runner, Filofax, Franklin or any custom size you want. Just drop-and-drop to print from the Finder! They couldn't have made it any easier. DynoPage comes complete with over 100 built-in layouts, and prints text in any font, size or style that's used in the original document.

Anything you can get on your Mac screen can be printed in any size or layout using DynoPage. In addition to 1-2-3 spreadsheets and charts, you can print word processing files, presentation pages, database files and more - to any size you like.

You can even print your spreadsheets to create little "fold and staple" booklets, or print reduced versions of your spreadsheets on larger sheets to use as handouts during presentations.

DynoPage prints in a variety of useful configurations, and comes complete with 40 sheets of Dynodex Instant Address Book Paper (six-ring along with half-page), dozens of pre-designed layouts, a comprehensive manual brimming with tips and techniques and a valuable coupon for big discounts on personal organizer products. Here's a look at what you'll be able to create with DynoPage:

Dynodex 2.0 Wins MacWEEK Target Award

Editors Call It "Best Overall Choice" in choosing Dynodex 2.0 as an award recipient, MacWEEK's editors wrote: "Dynodex significantly edges out the competition in performance, especially with larger address lists. The program's strong points include a streamlined interface, complex phonedialing capabilities, versatile import and export features, and a thorough and well-written manual. Unparalleled printing versatility, including address books, labels, envelopes and rotary-file cards.

TIGER EXCLUSIVE!

Dynodex w/Free DynoPage and a package of DynoPaper of your choice. 90 day limited offer (expires August 31st).

PORTFOLIO SYSTEMS

BC2542 Dynodex Macintosh w/Free DynoPage $99.00
BC2602 Dynodex Macintosh Competitive Upgrade $49.00
BC2442 DynoPaper (white, cream, gray, orange) $14.00
Macintosh Plus, II, IIgs, IIcx, or Portabook Systems 6.0 or later.
I remember being forced into taking piano lessons as a kid. My piano teacher, Mrs. Reymer, was sort of a prissy woman who'd smack my hands with a ruler when I missed a note. During my lessons, fun was the furthest thing from her mind. The repetition, the drills — I eventually quit and I've regretted it ever since. If she had injected a little fun into those lessons, I'd be on tour with The Rolling Stones today.

Now it's my turn to decide on piano lessons for my own kids. I introduced my nine-year-old, a self-proclaimed Nintendo master and junior Mac hacker to The Piano and Teaching System about four months ago. His first question was “How do I fire the weapon?” Wise guy.

I left him alone with the Miracle and waited to hear something. Ten minutes later I heard Mario Had A Little Tune. Then he took his turn and then the theme song from The Jetsons. I rushed back to his room and found him with that look on his face — the same look he gets when he reaches a new level in Zelda.

I saw that this thing really works. Today, he's writing his own tunes and getting better each day. He's enjoying music, he doesn't get hit with a ruler and all I have to do is encourage him.

The Only Self-Teaching Piano. The Piano and Teaching System can teach anyone — child or adult — to play the piano with a series of progressive, customized exercises. The Miracle music console connects to a Macintosh or PC and includes software cartridge that combines an advanced MIDI keyboard with full stereo sound and brilliant on-screen graphics. In no time at all, students of all ages will learn and perform left and right handed melodies while having a lot of fun!

There are exercises, musical pieces and drills (cleverly disguised as games), that teach hand positions, notes, fingerings, rhythm, scales and more. The Miracle can be quickly set up for any age or expertise and customizes itself to the right handed melodies — while having a lot of fun!

The Piano eliminates boring, repetitive routines. The super creative, artificially intelligent software quickly teaches the basics and builds on them in very entertaining ways. And that makes all the difference.

The Keyboard. Dazzling music! Spectacular effects! Booming orchestrations — all created by you — the Miracle keyboard — and a NES. As a stand alone instrument, The Miracle rivals the music industry's most sophisticated MIDI consoles. The 49 full size keys are velocity sensitive, so you can learn to play utilizing true piano expression. You also get a foot pedal, which controls the length of time each note is sustained and stereo earphones.

The Miracle can produce sounds from its library of over 100 instruments, sounds and effects by using a variety of motion picture sound design. To produce its superior acoustics, The Miracle uses sampled sounds, it can be connected to a home stereo system for rich, full sound.

It's Not Just For Kids! The Miracle is a lot of fun and kids all over the world are entering the world of music because of it. But it's not just for kids. The fact is, The Miracle is a breakthrough step in piano self-teaching. If you're an adult and would love to play piano (but think you're too old to do so), The Miracle can teach you with as little effort as it teaches the youngsters. And you'll enjoy it just as much!

It's Not Too Late To Learn... The Miracle is not a toy (but don't tell your kids). It's so ingenious, it can teach anyone — at any age — how to play piano. The Macintosh and PC software contain exercises specifically designed for adults, too. You don't have to know anything about the piano, you don't have to read music, and you can have a lot of fun! Normally, adults have a tough time learning something like the piano, but with the Miracle, it's easier because it moves at whatever pace you're comfortable with. If you want to start out learning just one song or melody, you can. But just work on that, and The Miracle follows you. As you become more comfortable, The Miracle can adjust to whatever method and speed you like.

Endorsed By Educators, Kids And Parents. Everyone loves the new Miracle system. Musical educators love the way it encourages children to practice, making a fascinating game of the piano. And, of course, kids love it because it's not like learning; it's a challenge. Parents love it because... well, what parent doesn't enjoy the sounds of their children enjoying a musical instrument?

The Miracle provides the ability to create over 100 instrumental sounds. Classical: Clarinet, Oboe, Strings, Sfz Brass 1, Xylophone, Rock: Fuzz Guitar, Stop Guitar, Puck Synth, Stick Bass, Percussion 1; Jazz: Saxophone, Vibraphone, Jazz Guitar, Fretless Bass, Percussion 3; Blues: Harmonica, Organ, Steel Guitar, Electric Bass, Percussion 1; Rap: Kalimba, Mod Synth, Clean Guitar, Moog, Latin, Funk Flute, Marimba, Guitar, Upright Bass, Percussion 2; Country: Banjo, Violin, 12 String Guitar, Detuned Piano, Percussion 1.

Here’s What You Get Free With The Miracle — Only From TigerSoftware. When you buy a Miracle from TigerSoftware, we’ll throw in everything you need to create your own recording studio. We’ll start with the Miracle Song Collections, Volumes 1 and 2 containing dozens of popular songs from the Beatles, to Michael Jackson. Play along with your favorite songs, or break out into your own solo. These song collections are a great value and are yours free only from Tiger. Then we add a copy of TRAX, the MIDI recording software that allows you to create your own smash hits. Change the tempo, mix different instruments, add your own vocals, sound effects and more — controlling it all from your keyboard. The TRAX interface is simple and fast, enabling you to lay down tracks using your Miracle to create your own arrangements.

FREE WITH THE MIRACLE
Everything you see below: Miracle Song Collection Volume 1, TRAX MIDI Recording Studio and Miracle Stand pictured on the top of this page.

But That’s Not All! You also get the Miracle keyboard stand you see pictured at the top of this page. With all this, you’ll be ready to create your own live performance or cut your own record.

With The Miracle, you or your child can learn to play without the boring drills and monotonous practice that music usually requires. Now There Are 40 More Ways Of Playing To Learn instead of Learning To Play! With The Miracle Song Collections, you can add dozens of popular titles to The Miracle Piano Teaching System. All the features that are making the Miracle the most popular keyboard learning method available are fully functional when you use the songs in this collection.

Custom exercises. Video game action. Full monitoring and learning curve analysis. All of it! And best of all, each song is arranged for two levels of playing difficulty: Novice and Expert.

Each volume contains 40 great songs chosen to represent a wide variety of popular musical styles. Rock & Roll, Country, Pop, Rhythm & Blues. Just pick the tune, and in no time at all you’re playing it like a pro! All songs are fully arranged so you can hear a complete accompaniment along with your performance. It’s like turning a piano lesson into a jam session!

An Instrument That Grows With You. The Miracle is not only an ideal tool for learning, it delivers lasting value as a high-quality, sophisticated musical instrument. With over 100 other instruments available, and a built-in stereo sound system, you can make an entire orchestra come to life whenever you play. As you grow as a musician, The Miracle is compatible with the entire world of modern synthesizers through built-in MIDI connections. (That’s Musical Instrument Digital Interface, the worldwide standard for computerized music.) The most amazing educational tool to come along in years.

FREE WITH THE MIRACLE
Everything you see below: Miracle Song Collection Volume 1, TRAX MIDI Recording Studio and Miracle Stand pictured on the top of this page.

FIRST TIME ANYWHERE! MIRACLE FOR THE MAC TIGER’S GOT IT IN STOCK, READY TO SHIP! NEW PC AND MAC VERSION! BOTH INCLUDE FREE HEADPHONES!
ORGANIZE TIME!

REVIEWER’S NOTEBOOK: Taking care of business just got a lot easier. 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, check your schedule, or to set up a Reminder. Just double-click on it, or use the program’s built-in key, and you are managing your time without wasting any of it.

Extremely fast, Non-obtrusive, with 30 action/task categories. There’s even a built-in demo program for you to copy freely and share with other Mac users. We can’t really manage time — it flows on relentlessly — but we can do something about our priorities!

Perfect timing. It’s either the result of incredible luck or determined effort. In business, however, you can’t always depend on luck. Even the most organized people have trouble keeping track of all the things they have to do and want to accomplish. Now there’s an easy way to make sure they are done in the order they are deleted.

Extremely fast, Non-obtrusive, with 30 action/task categories. There’s even a built-in demo program for you to copy freely and share with other Mac users. We can’t really manage time — it flows on relentlessly — but we can do something about our priorities!

**REVIEWER’S NOTEBOOK:** Tiger is proud to present Guaranteed Undelete, one of the most useful products you’ll ever own — it is the only utility that guarantees that your deleted files WILL NOT be overwritten. Deleted files are recovered in the order they are deleted. We’ll take a look at TrashMaster and Incinerator, the most sophisticated Trash utility ever devised, culling U.S. Department of Defense specifications.

Two of the most ingenious products we’ve seen in years, they can save your life in those dark moments when the power of First Things First comes in.

Time-demand 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’s of little use. First Things First is extremely easy to use, offering instant access to your list of tasks and details. It allows you to organize your efforts by category, project or group, 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 pop up your current top priority items with the click of the mouse. First Things First is always instantly available and twice as fast as any desk accessory. No application to launch, no menu items to fumble over. And you’ll have almost instant capabilities for customizing First Things First to fit your personal style. That’s important.

The floating clock icon 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 your clock (or use the built-in hot key of your choice) any time you want to access your time management utility. Nothing could make more sense or be more intuitively usable! Organization becomes an easy habit. Creating new Reminders or ToDo list items is simple — just click on the New button and enter the text for your Reminder or Things To Do. You can choose any category you want and set a time and date, or simply create a list of unscheduled things. You can also assign your Things To Do a priority level from 1 to 4, in order to more easily track what’s most important, as well as to an importance. Whenever you want to see your top priority items for today, all you have to do is Option-click on your clock.

You can customize your listing of Things To Do and schedule events in the future by signing your Things To Do a priority level from 1 to 4, in order to more easily track what’s most important, as well as to an importance. Whenever you want to see your top priority items for today, all you have to do is Option-click on your clock.

Guaranteed Undelete. The act of Undeleting a file can be a tricky process. Often, recovering a file is an error, time, range, and priority level. Best of all, since First Things First uses pop-up menus to let you make your viewing selections, you can always see exactly what your current view selection choices are without having to click on a menu or open a dialog box.

**CUSTOMIZABLE TIME RANGE:** Version 2.0 offers you the ability to customize the time range of the tasks and reminders to be viewed. Simply call up a dialog box to input the start and stop date.

Import/Export — Great for Mac Portables. Version 2.0 offers flexible options for converting personal information from other programs into First Things First and exporting to text formats or to update First Things First with other programs. This makes it ideal for Mac Portables users who want to be sure they have the most recent task and scheduling information on both their portable and desktop Macs.

**FREE FROM TIGER**

**Visionary Software**

BCC2409 First Things First 2.0 . . . . . . . . . . . . . $69.95

Any Macintosh with at least 1mb of RAM and System 6.0 or later.

**Dynode**

A $120 VALUE

A true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information. It allows you to print perfect double-sided address book pages that fit virtually any personal organizer. So you now have instant access to your personal contact information — both on and off the computer.

**Free from Tiger**

**Visionary Software**

BCC2409 First Things First 2.0 . . . . . . . . . . . . . $69.95

Any Macintosh with at least 1mb of RAM and System 6.0 or later.

**Dynode**

A $120 VALUE

A true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information. It allows you to print perfect double-sided address book pages that fit virtually any personal organizer. So you now have instant access to your personal contact information — both on and off the computer.

**Free from Tiger**

**Visionary Software**

BCC2409 First Things First 2.0 . . . . . . . . . . . . . $69.95

Any Macintosh with at least 1mb of RAM and System 6.0 or later.

**Dynode**

A $120 VALUE

A true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information. It allows you to print perfect double-sided address book pages that fit virtually any personal organizer. So you now have instant access to your personal contact information — both on and off the computer.

**Free from Tiger**

**Visionary Software**

BCC2409 First Things First 2.0 . . . . . . . . . . . . . $69.95

Any Macintosh with at least 1mb of RAM and System 6.0 or later.

**Dynode**

A $120 VALUE

A true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information. It allows you to print perfect double-sided address book pages that fit virtually any personal organizer. So you now have instant access to your personal contact information — both on and off the computer.

**Free from Tiger**

**Visionary Software**

BCC2409 First Things First 2.0 . . . . . . . . . . . . . $69.95

Any Macintosh with at least 1mb of RAM and System 6.0 or later.

**Dynode**

A $120 VALUE

A true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information. It allows you to print perfect double-sided address book pages that fit virtually any personal organizer. So you now have instant access to your personal contact information — both on and off the computer.

**Free from Tiger**

**Visionary Software**

BCC2409 First Things First 2.0 . . . . . . . . . . . . . $69.95

Any Macintosh with at least 1mb of RAM and System 6.0 or later.

**Dynode**

A $120 VALUE

A true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information. It allows you to print perfect double-sided address book pages that fit virtually any personal organizer. So you now have instant access to your personal contact information — both on and off the computer.
Automatically Remove Jagged Edges!
New JAG Is The Ultimate Anti-Aliasing Tool For The Mac...

REVIEWER'S NOTEBOOK: The "jaggies" are gone! Improve your PICT and PIC2 files to pixel-perfect sharpness and clarity in seconds. This is a product worth its weight in gold for Mac painters, animators, 3-D modelers, and photo retouchers/enhancers. Powerful anti-aliasing and edge-detection technology polishes your images for smooth curves, razor-sharp edges and deep, rich detail. Supports 8 and 24 bit still images and animations.

For 3-D rendering applications, JAG cuts your production time by up to 75%, eliminating the need for oversampling: Jag's are handled AFTER the rendering is complete.

Works with all the top programs: Pixel Paint, Studio 6, Oasis, UltraPaint, PhotoShop, ColorStudio, Studio 32 (and other software with built-in anti-aliasing), MacroMind Director, Gold Disk Animation Works, Swivel 3D, Swivel 3D Pro, Professional, Ray Dream Designer and more.

Nothing looks like JAG enhanced images. If you want pro-quality work, nothing we've seen anywhere is better. This product has exploded in popularity as the Mac has become the perfect graphics front end. Try it once and you'll be spoiled...

Stop Tolerating The Jagglies! JAG is compatible with virtually all leading Mac color graphics and animation software, with full support for PICT and PIC2 file formats. It's advanced anti-aliasing technology cleans 8-bit paint images with unbelievable results, and its sophisticated anti-aliasing techniques for 24-bit images allow greater freedom when working with 24-bit paint and retouching programs. For Mac animators, JAG delivers spectacular 8-bit multimedia presentations. For 24-bit animations, JAG can handle studio quality frame by frame, full color output to tape.

For smaller text and single-point images, JAG puts meticulous controls at your fingertips to protect the sharpness and color. The edge tracking mechanism is fast — unbelievably fast! You'll see crisper, cleaner images in record time.

And high res is handled up to 4K, for seamless integration into professional graphic production environments. JAG works quietly in the background, so you can continue to work on your Mac while it performs its magic on your images and animations. There's batch processing and format conversion.

Build huge collections of mixed "stuff" that can be sorted, gathered and retrieved at amazing speeds. Search through one hundred megabytes of 3,000 items faster than you can say, "Searching Mariah Collections is bullet fast!"

You can routinely work with 90 to 100 megs worth of images at a time. Just dump it in and let Mariah do the rest. The Boolean search (using AND, OR and NOT functions) screens through hundreds of megabytes and infinite items in seconds.

If you're still using a word processor to gather and organize your thoughts — think again. This is the breakthrough of the '90s, Outliners are ideal for capturing quick, fleeting brainstorm ideas. With built-in hierarchy of levels and sub-levels, it's easy to rearrange various parts to really fit. The important items bubble to the surface while subordinate ones fall into perfect place. We find using an outliner a time-saving tool for all our writing. It's simply better-suited for the task than any word processor, but that's only the beginning.

Also Available From Symmetry:

REVIEWER'S NOTEBOOK: Another superior product from the makers of Acta 7 is Mariah — the world's first multimedia organization and retrieval utility. Desktop graphics and multimedia are exploding at a phenomenal rate. You do things on your Mac unheard of just a few years ago. Think of Acta 7 as the easiest-to-use thought processor for the Mac.

If you're still using a word processor to gather and organize your thoughts — think again. This is the breakthrough of the '90s, Outliners are ideal for capturing quick, fleeting brainstorm ideas. With built-in hierarchy of levels and sub-levels, it's easy to rearrange various parts to really fit. The important items bubble to the surface while subordinate ones fall into perfect place. We find using an outliner a time-saving tool for all our writing. It's simply better-suited for the task than any word processor, but that's only the beginning.

Also Available From Symmetry:

REVIEWER'S NOTEBOOK: Another superior product from the makers of Acta 7 is Mariah — the world's first multimedia organization and retrieval utility. Desktop graphics and multimedia are exploding at a phenomenal rate. You do things on your Mac unheard of just a few years ago. Think of Acta 7 as the easiest-to-use thought processor for the Mac.

If you're still using a word processor to gather and organize your thoughts — think again. This is the breakthrough of the '90s, Outliners are ideal for capturing quick, fleeting brainstorm ideas. With built-in hierarchy of levels and sub-levels, it's easy to rearrange various parts to really fit. The important items bubble to the surface while subordinate ones fall into perfect place. We find using an outliner a time-saving tool for all our writing. It's simply better-suited for the task than any word processor, but that's only the beginning.

Also Available From Symmetry:

REVIEWER'S NOTEBOOK: Another superior product from the makers of Acta 7 is Mariah — the world's first multimedia organization and retrieval utility. Desktop graphics and multimedia are exploding at a phenomenal rate. You do things on your Mac unheard of just a few years ago. Think of Acta 7 as the easiest-to-use thought processor for the Mac.
Create powerfully VISUAL Desktop Presentations!

NOTHING GRABS AN AUDIENCE LIKE CA-CRICKET PRESENTS....

REVIEWER’S NOTEBOOK: CA-Cricket Presents and CA-Cricket Graph are two of the easiest graphics packages in the industry today. CA-Cricket Presents combines all the necessary tools you’ll ever need to develop, organize and deliver a professional presentation. CA-Cricket Graph, our professional grade tool for serious graphing tasks, is the perfect tool for formal presentations. Professional power and simplicity make CA-Cricket Graph a great presentation management or the financial community.

CA-Cricket Graph gives you professional quality black and white and color output from a wide range of film recorders, image setters, ink jet, thermal and laser printers. CA-Cricket Graph is the standard in Macintosh charting. You won’t find the depth or sleek operation of CA-Cricket Graph anywhere else. Just enter your data into the program itself or import it directly from your word processor, database or spreadsheet and select one of 12 chart types. Includes Scatter, Quality Control, Stacked Bar, Pie, Double Y, Polar, Column, Line, Area, Stacked Column, Bar and Text charts. Great for businesses, engineering, statistical and scientific users.

CA-Cricket Graph is the standard in Macintosh charting. You won’t find the depth or sleek operation of CA-Cricket Graph anywhere else. Just enter your data into the program itself or import it directly from your word processor, database or spreadsheet and select one of 12 chart types. Includes Scatter, Quality Control, Stacked Bar, Pie, Double Y, Polar, Column, Line, Area, Stacked Column, Bar and Text charts. Great for businesses, engineering, statistical and scientific users.

CA-Cricket Presents also includes a driver for the Autographix Overnight Slide Service. Or you can use Video Presents to run your presentation on-screen with special effects, transitions and variable timed automatic frame advance. CA-Cricket Presents runs on The Mac Plus, Mac SE and the entire family of Mac IIs with speed and grace.

CA-CRICKET PRESENTS

(A hush falls over the crowd.)

Whether you've been asked to prepare a killer presentation with an impossible deadline, or you've got the luxury of a little time, CA-Cricket Present is the package you should reach for. It's extremely visual, very easy to use and simple to design process. Because pictures are better than words, great pictures are best — providing maximum impact and clear communication. Create 35mm slides, dazzling overheads, speaker's notes and pro-quality handout materials. The graphic design is unique in a collection of magnificent templates that are ready to use, or can be altered to meet your specific needs.... in seconds. CA-Cricket Present also knows how successful presentations should be assembled, providing great outlining tools for facilitating efforts. The Acta Outliner, mentioned earlier, is an innovation in presentation software, helping you formulate and organize your ideas. Along with the Templates and Palette tools, there’s a feature that AUTOMATICALLY assembles your presentation for you! It's called Auto Present. Just enter your text in the Outliner, select a theme and your ideas instantly become a full-blown presentation!

Advanced users will love the comprehensive set of tools available to them. Unmatched text manipulation tools, drawing features, sophisticated graphing and table capabilities. The CA-Cricket Present file integra-

CA-Cricket Presents gives you pro-quality text, lines, text, arrows, rectangles, ovals and other elements anywhere you want. Position your graphs wherever you like and even stretch or shrink them to fit any layout. Overlay multiple sets of data and add colors to your backgrounds and objects with just a mouse click. You’ll quickly display and change your background colors, fonts, type styles and sizes. Place

CA-Cricket Graph is an excellent tool for use with desktop publishing and desktop presentation applications. Graphs can also be printed on your LaserWriter, ImageWriter II or any choose selectable device.

CALL 1-800-666-2562

Reviewed by: Paulur Stack

Call Us: 1-800-666-2562

WE SHIP FEDERAL EXPRESS

Int'l Orders: 305-443-8212

Fax: 305-529-2990

Call Us: 1-800-666-2562

CA-CRICKET PRESENTS

BCC2806 CA-Cricket Presents ....... $139.00

BCC2807 CA-Cricket Graph ......... $89.00

Call Us: 1-800-666-2562

September 1992

MacUser

September 1992

307
Dr Mac is your best mail order source because we guarantee the lowest prices, overnight delivery, and money back guarantees. If you find any of the products listed here or in our catalog advertised for less in this magazine, we'll meet or beat that price!

We guarantee overnight delivery to every address in the continental U.S.A. If you don't get your in-stock order the next day, we pay the shipping! If you are not 100% satisfied with the products you purchased, return within 30 days for a full refund.

Please note that the item you wish to purchase carries a money back guarantee when you order (see policies for details). Let Dr Mac take care of all your Macintosh needs — 100% guaranteed!
FREE PRODUCT INFORMATION

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 433 RIVERTON, NJ
POSTAGE WILL BE PAID BY ADDRESSEE

MacUser
P.O. BOX 1688
RIVERTON, NJ 08077-9688

IT'S AS EASY AS 1, 2, 3

1. Check off your answers to the six research questions.
2. Circle the numbers on the card that correspond to the ads or articles you'd like more information about.
3. The literature will be mailed to you from the advertiser free of charge.

PLEASE PRINT CLEARLY

Name

Title

Company Name

Address

City State Zip

□ Please send me a one-year (12 issue) subscription to MacUser for $19.97. Offer valid in U.S. only.

MU 9/92-6
It's Two Displays for the Price of One!

E-Machines ColorPage T16 II
- 16" Color Display
- Sony Trinitron
- Multi-Resolution
  - 640 x 480 • 832 x 624
  - 1024 x 768 • 1152 x 870
- Reduced Magnetic Emissions

E-Machines ColorPage E16 Promo
- 16" Multi-Resolution Color Display
  - 640 x 480 • 832 x 624 • 1024 x 768

Color Displays

New Color Cards

E-Machines Interface cards work with virtually any display from 12" to 21" including:
- Apple
- Radius
- RasterOps
- Sony
- & More

And E-Machines Cards gives you more performance and a lower price. CALL US!

Available features include:
- 8 or 24-bit Color
- Acceleration
- Built-in Ethernet Connectivity
- Pan & Zoom
- Virtual Screens
- Video Output Capabilities

#1 Worldwide Retailer
Nobody sells more E-Machines than Express Direct. So nobody can give you better advice, better support or a better price.

Mac Systems
We specialize in building Complete Systems. Let us tailor a System perfect for you.

Mac II 400 • $1,945
Mac II 50 • Call
Mac Quadra 700, 90 • $3,395
Mac Quadra 950 • NEW!

For PowerBook-Prices, See Next Page

The Express Advantage
With Express Direct, you always get:
- Low Prices & Fast Delivery
- Toll-Free Technical Support
- Prompt Customer Service
- Expert Advice & More!

Express Hours (central time)
M-F: 8am-7pm, Sat 8am-2pm
24hr Fax, 7 days/week

800-535-3252
International Orders Shipped Daily
FAX 312.549.6447
Hi-Resolution, Hi-Speed Solution!

From 300 dpi to 800 dpi

NewGen Turbo PS/300p Laser Printer
- Durable Canon 4 page per minute LX engine
- 300 x 300 dpi • 16 MHz RISC based PostScript processing • Serial, Parallel and AppleTalk autoswitching • 35 Fonts • 3MB RAM • Upgradable to 16MB RAM

NewGen Turbo PS/400p
- 4 ppm Canon LX engine • 400 x 400 dpi
- Image Enhancement Technology • 4MB RAM • 35 Fonts • 16 MHz RISC based PostScript processing

NewGen Turbo PS/660
- 8 ppm Canon SX engine • 600 x 600 dpi
- Image Enhancement Technology level II • 6MB RAM • 35 Fonts • 25 MHz RISC based PostScript processing • Serial, Parallel and AppleTalk autoswitching • Ethernet expandable

NewGen Turbo PS/880
- 8 ppm Canon SX engine • 800 x 800 dpi
- 12 MB RAM • 35 Font • 25 MHz RISC based PostScript processing • Serial, Parallel and AppleTalk autoswitching • Ethernet port

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

PLI Infinity Optical 3.5"
- 128MB on one 3.5" cartridge

PLI Infinity 44 Removable
- Comes with cartridge

PLI Infinity 88 Removable
- $779

$569

NEWGEN PRINTERS

NewGen Printers
- 400 x 400 DPI
- 35 Fonts

NewGen Turbo PS/300p
- RISC SPEED
- CANON ENGINE
- 35 Fonts

NewGen Turbo PS/400p
- $1,795

NewGen Turbo PS/660
- 600 x 600 DPI
- 35 Fonts

NewGen Turbo PS/880
- 800 x 800 DPI
- 35 Fonts

$1,345

$469

$1,595

AUTHORISED DIRECT NEWGEN RESELLER

Easy Payment Options & Leasing Terms
- We accept money orders, cashier's 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.

Apple Mac are trademarks of Apple Computer. Prices subject to change without notice. All returned orders will be subject to a minimum 15% restocking fee plus return shipping. Call for RMA before returning. All warranties on Macintosh or Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agents only. All other manufacturer's warranties still apply.
Turn Your Mac into a Quadra!

Rocket Gives Your Mac II '040 Speed and Performance!

PowerView

Finally You Can Connect PowerBook to a Color Display

Mac PowerBooks

Macintosh PowerBook 140 $2,495
4/40, 16 MHz 68030 microprocessor

Macintosh PowerBook 170 $3,595
4/40, 25 MHz 68030 microprocessor

We Carry a full line of PowerBook Accessories. Ask about our Starter Packages and Super Packages.

PowerBook Color System

Color PowerBook System $3,395
• PowerBook 140 4/40
• Sony Color Trinitron 14" display
• Radius PowerView External Interface

It's like having a Color Mac IIi system — only better because it's portable!

Authorized Direct Radius Reseller

1801 W. Larchmont Ave.
Chicago, IL 60613 USA
312.549.0030

"The Mac Systems Company"
Circle 128 on Reader Service Card.
If you're looking for great Mac peri
great direct source, call USA★FLEX

FREE NEC CD ROM!

Buy NEC's MultiSync®
4FG, 5FG or 6FG
monitor together with a
MacFG™ 8X or 24X
Interface Card receive
NEC's InterSect™
CDR-37 portable
CD-ROM reader and
SCSI Interface Kit
FREE!

FREE $449 VALUE!

NEC
Silentwriter®
Model 95

FREE TONER CARTRIDGE!

$1399

B1-NEC95
LIST PRICE $1749

- Free toner cartridge with purchase
- 5 PPM PostScript Level 2 and PCL 5
- AppleTalk/Parallel/Serial
- Automatic interface monitoring
- Automatic Emulation Switching
- Sharp Edge Technology
- 250 Sheets and built-in 15 envelope feeder
- Perfect for simultaneous shared use with
Macintosh and IBM compatibles.

NEC
Colormate
PS Model 40

$4299

B1-Cmps/40
LIST PRICE $4799

- Free color ribbon with purchase
- Color thermal transfer printer
- Prints on paper and transparencies
- Adobe PostScript interpreter
- 300 DPI
- AppleTalk interface standard

NEC
MultiSync® 4FG™
15" Monitor

$759

D1-NEC4FG
LIST PRICE $949

- 1024 x 768 Non-interlaced @ 60 Hz
- .28mm Trio dot pitch and tilt/swivel base
- 75 MHz max. video bandwidth
- FullScan™ capability for edge-to-edge images
- Exclusive AccuColor™ Control System for
adjustment of on-screen color to suit individual
preferences
- High-contrast, polished screen improves focus
& enhances color vibrancy
- Reduced Magnetic Field™ technology
- Mac LC® II, Quadra compatible
- Supports expanded, WYSIWYG and condensed
viewing modes from 58 DPI to 93 DPI

NEC
MultiSync® 5FG™
17" Monitor

$1399

D1-NEC5FG
LIST PRICE $1699

- 1280 x 1024 Non-interlaced @ 60 Hz
- .28mm Trio dot pitch and tilt/swivel base
- 150 MHz max. video bandwidth
- FullScan™ capability for edge-to-edge images
- Exclusive AccuColor™ Control System
- High-contrast, polished screen surface
- Dual dynamic beam focus & Invar shadow mask
- Supports Apple 1152 X 870 dual page mode
- MPRll compliant
- Mac LC® II, Quadra compatible
- Supports expanded, WYSIWYG and condensed
viewing modes from 58 DPI to 93 DPI

NEC
MultiSync® 6FGx™
21" Monitor

$2799

D1-NEC6FGx
LIST PRICE $3499

- 1280 x 1024 Non-interlaced @ 60 Hz
- .28mm Trio dot pitch and tilt/swivel base
- 135 MHz max. video bandwidth
- FullScan™ capability for edge-to-edge images
- Exclusive AccuColor™ Control System
- High-contrast, polished screen surface
- Dual dynamic beam focus & Invar shadow mask
- Meets strict Swedish MPRll guidelines
- Mac LC® II, Quadra compatible
- Supports expanded, WYSIWYG and condensed
viewing modes from 42 DPI to 72 DPI

NEC
MultiSync® 3FGx™
15" Monitor

$639

D1-NEC3FGx
LIST PRICE $799

- 1024 x 768 Non-interlaced @ 60 Hz
- .28mm Trio dot pitch and tilt/swivel base
- 63 MHz max. video bandwidth
- FullScan™ capability for edge-to-edge images
- Polished, high-contrast screen improves
focus & displays colors more vibrantly
- Invar shadow mask for increased brightness
- Reduced Magnetic Field™ technology
- Mac LC® II, Quadra compatible
- Supports expanded, WYSIWYG and condensed
viewing modes from 58 DPI to 93 DPI

NEC
Mac FG™ 8X/24X
Color Display Interface Card

Combine the Mac FG 8X or 24X with a Multi­
Sync® FG™ monitor for the ultimate graphics
subsystem for your Macintosh computer.

NEC
MacFG™ 8X

$799

FG8X
LIST PRICE $899

- Multiple display modes customize
desktop size for different applications
- Switch display modes on the fly
without restarting
- On-board QuickDraw acceleration
- Compatible with Mac® II family and
Quadra series

MacFG 24X

$1599

FG24X
LIST PRICE $1899

SPECIAL BUNDLE PRICING IS
AVAILABLE ON THESE COMBOS:

NEC
MultiSync® 4FG +
MacFG™ 8X

$1,499

NEC
MultiSync® 4FG +
MacFG™ 24X

$2,299

NEC
MultiSync® 5FG +
MacFG™ 8X

$2,899

NEC
MultiSync® 5FG +
MacFG™ 24X

$4,299

NEC
MultiSync® 6FG +
MacFG™ 8X

$1,499

NEC
MultiSync® 6FG +
MacFG™ 24X

$2,299
phetals from a at 1-800-398-3539!

NEC
Intersect™
CD/ROM CDR-37

$394
D1-CDR-37
LIST PRICE $495

- Low-cost entry to multimedia CD-ROM
- Fast data access: 450 million seconds average access time, 150 KB/second data transfer rate, 64 KB cache memory
- Optional battery pack for portable operation
- 2 year manufacturer's warranty
- Includes MAC interface kit
- CD-ROM XA-ready for multimedia support

IBM® LaserPrinter 6A & 10A

True 600 x 600 dpi output... for under $4000!

$1899
4029021
LIST PRICE $2695

- PostScript® software from Adobe® built in
- Enhanced print quality — 300 x 300 dpi with Print Quality Enhancement Technology, 600 x 600 dpi with optional memory added
- Plug-and-play compatibility with Apple® Macintosh® computers
- 39 Adobe® Type 1 scalable fonts
- Versatile paper-handling capabilities
- Twice the output capacity and 2.5 times the input capacity, with automatic paper-size sensing trays, as compared to Apple® Personal LaserWriter™
- Up to 6 pages per minute in 300 dpi

Optional Accessories
200-Sheet Letter Cassette 1183260 $49
200-Sheet Legal Cassette 1183276 $55
500-Sheet 2nd Drawer Letter 1183366 $319
500-Sheet 2nd Drawer Legal 1183366 $325
1 MB Memory 1183332 $139
2 MB Memory 1183334 $259
4 MB Memory 1183355 $699
Scalable Font Card for additional 22 fonts 1183336 $279
PCL5 Emulation 1183339 $139

MAC Interface Kit Required
- SCSI interface board & cable
- Adobe® Photoshop® Limited Edition
- Scurtastic ps (plug-in module for Photoshop)
- Acquire DA (scanning desk accessory)
- Epson's apple scanner driver

IBM® Personal Printers for Macintosh® by LEXMARK™

IBM® LaserPrinter 6A

- 600 x 600 dpi — up to 4 times the resolution, saving 50-70% in printing costs
- PostScript® software from Adobe® built in
- Plug-and-play compatibility with Apple® Macintosh® computer
- 2.5 times the input and output capacity, and 5 times the envelope capacity, with wrinkle-free envelope conditioning, as compared to the Apple® LaserWriter II If and IIG
- Versatile paper-handling capabilities, including three input sources
- Up to 10 pages per minute in 300 dpi

USA FLEX

TO ORDER:
800-398-3539

FAX # (708) 351-7204
Government & Education Sales 1-800-497-3539
Habla Español - 1-800-872-4691
M-F 24 HOURS A DAY & Sat. & Sun. 9A.M. to 4P.M. - CT
Code # MU0902

USA FLEX 471 Brighton Drive, Bloomingdale, IL 60108
CIRCLE 245 ON READER SERVICE CARD.
We Get a Good Return on Our Investment.

The Nature Conservancy takes a business approach to protecting our natural world. Each day in the United States we invest in over 1,000 additional acres of critical habitat so that rare animals and plants—like this lemon lily—will return next year. Join us, and make an investment in our natural heritage. Future return: isn’t that what investment is all about?

Conservation Through Private Action

For more information, call toll-free 1-800-628-6860.

(Circle 158 on reader service card.)
This is where teachers buy their technology. Shouldn't you?

SAVINGS UP TO 60% ON SOFTWARE, HARDWARE, MULTIMEDIA AND MORE!!

Whether you are an educator or a parent, Educational Resources offers a single source solution for all your computing needs. Call today for our Full Line Catalog, Macintosh Catalog and our new Multimedia Catalog. Whatever your needs, we have the solution!

NEW! $29.25
(Retail $59.95)
School Version $44.25
Lab Pack (5) $119.25

NEW! $34.25
(Retail $59.95)
Lab Pack (5) $104.25

NEW! $47.25
(Retail $89.00)
AppleTalk Network Version $194.25

NEW! $39.25
(Retail $89.95)
School Version $64.25
Lab Pack $119.25

NEW! $26.25
(Retail $39.95)
QuickTime compatible!
Requires Kid Pix $32.25

NEW! $94.25
(Retail $129.95)
Home Version $54.25
Lab Pack $29.25
Network Edition $599.25
Site License $1299.25

NEW! $44.25
(Retail $69.95)
English/Spanish
CD-ROM

EXTRAS

VideoSpigot LC $419.95
VideoSpigot Nu.Bus 499.95
100x-140x External Modem 89.95
Texas Instruments MicroLaser Plus PS/17 1249.95
Odino External Hard Drive 399.95
In Focus 1600LC Color PC Viewer 1795.00
Logitech ScanMaker 600GS 849.95

CD-ROM

NEC CDR-36M CD-ROM Drive $455.95
NEC CDR-73M CD-ROM Drive 699.95
Just Grandma & Me 34.95
A Silly Noisy House 45.95
Discs 10-Pack Library 424.95
Grolier Electronic Encyclopedia 239.75

800-624-2926
USA/Canada

708-888-8300
In Illinois

Your #1 Source for Educational Software & Technology

Educational Resources • FAX 708-888-8499
1550 Executive Drive, Elgin, IL 60123

• Checks & School P.O.'s welcome • $25 min. on charge cards • Free shipping over $300 in U.S. • Under $300 add 5% shipping with $4 min. • Canada under $200 add 10% with $5 min. over $200, add 5% - also add 7% GST • Prices effective through October 31, 1992

Call today for your free Educational Macintosh catalog.

CIRCLE 112 ON READER SERVICE CARD.
Why Buy a
POWERDrive
from
GOOD REASON
#1
More Megabytes
for Your Buck
HDI ships thousands of storage products every month. Our volume buying results in big discounts for you!

GOOD REASON #2
Mac Toll-Free Hot Line
Have a question about setup and operation of your new POWERDrive? We have the answer – seven days a week!

GOOD REASON #3
Choices
Plenty of brand name hard drives, CD-ROM, tape backup, removable and memory to choose from.

GOOD REASON #4
Solid Quality
- Pre-tested / pre-formatted
- Low-heat steel cases
- 50-pin daisy chain connector
- Everything you need to get up and running fast!

GOOD REASON #5
Satisfaction Guaranteed
Each product includes a 30-Day "Worry-Free" Guarantee PLUS a 1-Year Replacement Policy.

---

<table>
<thead>
<tr>
<th>MB's</th>
<th>Mechanism</th>
<th>ms/Access</th>
<th>Internal</th>
<th>External</th>
<th>MB's</th>
<th>Mechanism</th>
<th>ms/Access</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>42</td>
<td>Seagate</td>
<td>28</td>
<td>$219</td>
<td>$249</td>
<td>320+H</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>$1199</td>
</tr>
<tr>
<td>52ps</td>
<td>Quantum</td>
<td>17</td>
<td>$229</td>
<td>$299</td>
<td>330</td>
<td>Fujitsu</td>
<td>12</td>
<td>$999</td>
<td>$1049</td>
</tr>
<tr>
<td>80</td>
<td>Maxtor</td>
<td>19</td>
<td>$279</td>
<td>$339</td>
<td>425</td>
<td>Fujitsu</td>
<td>12</td>
<td>$1069</td>
<td>$1119</td>
</tr>
<tr>
<td>105ps</td>
<td>Quantum</td>
<td>16</td>
<td>$339</td>
<td>$399</td>
<td>520</td>
<td>Fujitsu</td>
<td>12</td>
<td>$1149</td>
<td>$1199</td>
</tr>
<tr>
<td>130</td>
<td>Maxtor</td>
<td>15</td>
<td>$349</td>
<td>$399</td>
<td>660+H</td>
<td>Micropolis</td>
<td>16</td>
<td>NA</td>
<td>$1549</td>
</tr>
<tr>
<td>210</td>
<td>Maxtor</td>
<td>15</td>
<td>$599</td>
<td>$679</td>
<td>1050+H</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>$1979</td>
</tr>
<tr>
<td>210</td>
<td>Quantum</td>
<td>16</td>
<td>$629</td>
<td>$689</td>
<td>1050+H</td>
<td>Seagate</td>
<td>14</td>
<td>NA</td>
<td>$2149</td>
</tr>
<tr>
<td>320+H</td>
<td>Maxtor</td>
<td>14</td>
<td>$999</td>
<td>$1049</td>
<td>1346+H</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>$2249</td>
</tr>
</tbody>
</table>

*Manufacturer 2 Year Warranty. All POWERDrive Kits include: Ontrack Disk Manager, cable and installation guide.

---

REMOVABLE
SyQuest 44MB
20ns w/44MB cartridge $449
SyQuest 88MB
20ns w/88MB cartridge $599

CD-ROM
Chinon
External 360ms $577
NEC
External 360ms $679

TAPE BACK-UP
DAT 20GIG
4mm w/Retrospect $1495
Includes 1 cartridge & cables
Sanjoyo 250MB
External $549
Includes tape & back-up software
Extra Tape $49

MEMORY
1MB (1x8·80ns) $39
4MB (4x8·80ns) $159
Highest Quality SIMMs Fast & Easy to Install!

---

HARD DRIVES International
800-927-3182
800-927-3182
Hard Drives International: 602-350-1126
FAX: 602-350-1150 • 1912 W. 4th St., Tempe, AZ 85281

---


---

"...some of the lowest prices advertised for the Macintosh." - Mac Week 3/20/90
THE MAC SOLUTIONS HOUSE

1 (800) 7-ADVANCE

SUPPORT

- All purchases backed by a 30-day satisfaction money-back guarantee (see details at bottom)
- TWO-YEAR CarePlus Plan Available: 72-Hour Express Regular 1st year / ± a 2nd Year Extended Warranty
- Buy with confidence, as AIC is a strong, rapidly growing company with both Mac & PC Experience

LEASING

WE ARE THE MAC LEASING EXPERTS. FOR PERSONAL OR BUSINESS USE, CALL US DIRECT.

THREE GREAT REASONS TO LEASE FROM AIC:
1. LEASING IS TAX DEDUCTIBLE
2. LEASING PROTECTS FROM OBsolescence
3. 24-HOUR APPROVALS IN MOST CASES

Monitors

E-MACHINES 17" II w/True SI SYSTEM
$790 at 165" (up to 10% on lease)

SEIKO 16" COLOR MONITOR & 24-BIT CARD
$1,730 / 163" Quality 16" TriMonit Monitor w/RouterOspa 24-Bit Color Card

SUPERMAC DUAL 18" TRI MonITOR... $2,995 / 199" Outstanding 19" Dual Ristr Tri Monitor from Industry Leader

Software

ADOBE ILLUSTRATOR ............. $229

ALDUS PAGEMAKER 4.2 ......... $495

CLARIS WORKS 8.0 ............... $195

QUARK EXPRESS 3.1 .............. $545

Printers

NEWGEN PS 400P
400 dpi Laser Printer
$1,665 / 450 mo.*

NEWGEN PS 880 (600 DPI)
$3,495 / 140 mo.*

SEIKO PERSONAL COLORPOINT PS 32665 / 123 mo.
Quality Color PostScript-Compatible Printer at Breakthrough Price

HP COLOR DESKWRITER C
$655

HP DESKWRITER ................. $399

SEIKOSHA MAC PRINTER ......... $195

ImageWriter Compatible

Mac Systems

APPLE QUADRA 700 SUPERSTATION
Mac Quadra 700 w/ 256MB RAM, Quanta 44MB Hard Drive, 1-Machine CPU, Color Monitor & 74-Bit Color VRAM, Apple Extended Keyboard & ABC’s EXPRESS 2-YEAR WARRANTY

$322 mo. on lease at 165 mo. lease

APPLE MAC INTIO SUPERSTATION
Mac Intio w/2560 RAM, Quantum 240MB Hard Drive, E-Macintosh 17" 1.5" 1X Macintosh Color Monitor, E-Machines Return MX 24-Bit Color Accelerated Video Board, Extended Keyboard, & ABC’S EXPRESS 2-YEAR WARRANTY

$319 mo. on lease at 58 mo. lease

APPLE MAC INTIO SYSTEM
$36/01 / 131 mo. on lease

SMC RAM/33MB HD, 14" Panasonic Color Monitor, Ext. Keyboard

APPLE MAC INTIO SYSTEM
$295 / 101 mo. on lease

SMC RAM/88MB HD, 14" Panasonic Color Monitor, Ext. Keyboard

MAC Mini COMPLETE STARTER SYSTEM
Mac LCII w/ 44MB SYQUEST Removable Drive, 80MB HD, 14" Panasonic Color Monitor, Ext. Keyboard

$2890 / $1848 on lease

MacPowerBook 140
4/90

$2095 / 332 mo. on lease

MacPowerBook 170
8/120 w/Memot
$1855 / 1314 mo.

POWERBOOK DREAM DEAL
MacPowerBook 170/80 w/4x5 Scrol/Receive Fax Module, 8-Bit Color Adapter, Apple's 12" Sandbox Color Monitor & Targus Case

$5925 / $176 mo. on lease

Printers

POWERBOOK DREAM DEAL
MacPowerBook 170/80 w/4x5 Scrol/Receive Fax Module, 8-Bit Color Adapter, Apple's 12" Sandbox Color Monitor & Targus Case

$5925 / $176 mo. on lease

MacPowerBook 140
4/90

$2095 / 332 mo. on lease

MacPowerBook 170
8/120 w/Memot
$1855 / 1314 mo.

PERIPHERALS

TAMARACK ARTISTIC MODELS
$150

LEOBRON 510
24-BIT COLOR SCANNER
$1410

MAX 16-30 24-BIT COLOR SCANNER
$123

INC: ADOBE PHOTOSHOP 2.5 & WORKSPACE II SOFTWARE

DAYSTAR UNIVERSAL POWERCACHE 40MHZ ACCELERATOR
$865

Turbo Charge Your Mac to 40MHz! (Requires adoption on some Macs)

LIND MAC POWERBOOK FULL CYCLE BATTERY RECHARGER
$189

Full Cycle Battery Charger & Conditioner for Mac PowerBooks

MAC LEASING AUXILIARY BATTERY PACK
$198

External Battery Pack lasts 4 times longer & recharges from your Mac

MICROTER 6005 24-BIT COLOR SCANNER
$1295 / $52 mo.

Full-True Color Refurbished Scanner w/Adams PimpShop

PLI 4MHz SYDNEY REMOVABLE DRIVE
$995

Hight Quality 4MHz Industry Standard Removable Cartridge Drive

SUPERMAC VIDEO SPEED
$195

Capture QuickTime Movies from your Mac

TARGUS MAC POWERBOOK UNIVERSAL CASE
$174

MAC POWERBOOK ULTIMATE LEATHER CASE
$135

WACOM INTUS PRESSURE SENSITIVE GRAPHICS TABLET
$799

Highest Quality Pressure-Sensitive Graphics Tablet with Cardless Pen

CIRCLE 176 ON READER SERVICE CARD.

Product of the Month

FOR INTERNATIONAL SALES CALL: (310) 325-2687

(800) 733-8262 / (800) 272-7477
(310) 325-1422 / FAX: (310) 328-4973
23810 Tello Ave., #5, Torrance, CA 90505

0% Down Leasing!

Prime Options ColorRight 16.7 Million Color Dye Sub Printer
$399 per month

Photographic Quality

300 Dpi Dye Sublimation Quality

Paper/Transparencies

Ultra-Fast Processor

0% Down Leasing!

QMS PS 410 LASER PRINTER
$495

True PostScript, 45 Ports, Compact Package. While Supplies Last!

LAPIS 10" MONO MONITOR & CARD
$50

Complete High Quality Monochrome System. While Supplies Last!

FOR INTERNATIONAL SALES CALL: (310) 325-2687

(800) 733-8262 / (800) 272-7477
(310) 325-1422 / FAX: (310) 328-4973
23810 Tello Ave., #5, Torrance, CA 90505

C.O.D. ORDERS: Add $5.00 on Federal Express. No Sales Tax & Credit Cards are accepted, no personal checks please.

ORDERING: Call for shipping methods and rates. All major credit cards accepted (with 5% for sales tax)

ORDERING: Please send money orders or certified check to our main office. All credit cards are accepted. Please allow 10 business days to process orders. All items subject to availability. Please allow up to 2 weeks for delivery. All products must be in original condition and packaging and must be sent back within 30 days of purchase date. No refunds on freight & handling. 15% Restocking Fee on opened and used Products.

FOR INTERNATIONAL SALES CALL: (310) 325-2687

(800) 733-8262 / (800) 272-7477
(310) 325-1422 / FAX: (310) 328-4973
23810 Tello Ave., #5, Torrance, CA 90505

C.O.D. ORDERS: Add $5.00 on Federal Express. No Sales Tax & Credit Cards are accepted, no personal checks please.

ORDERING: Call for shipping methods and rates. All major credit cards accepted (with 5% for sales tax)

ORDERING: Please send money orders or certified check to our main office. All credit cards are accepted. Please allow 10 business days to process orders. All items subject to availability. Please allow up to 2 weeks for delivery. All products must be in original condition and packaging and must be sent back within 30 days of purchase date. No refunds on freight & handling. 15% Restocking Fee on opened and used Products.

FOR INTERNATIONAL SALES CALL: (310) 325-2687

(800) 733-8262 / (800) 272-7477
(310) 325-1422 / FAX: (310) 328-4973
23810 Tello Ave., #5, Torrance, CA 90505

C.O.D. ORDERS: Add $5.00 on Federal Express. No Sales Tax & Credit Cards are accepted, no personal checks please.

ORDERING: Call for shipping methods and rates. All major credit cards accepted (with 5% for sales tax)

ORDERING: Please send money orders or certified check to our main office. All credit cards are accepted. Please allow 10 business days to process orders. All items subject to availability. Please allow up to 2 weeks for delivery. All products must be in original condition and packaging and must be sent back within 30 days of purchase date. No refunds on freight & handling. 15% Restocking Fee on opened and used Products.
2 Meg NEC
Silentwriter 2 Model 95 $1379
Second Paper Drawer $299
Fax Upgrade Call

QMS
PS 410 Call
PS 815MR $3895
PS 825MR $4695

GCC TECHNOLOGIES
PLPI, PLPIS
BLPII, BLPII, BLP Elite
Writelmpact
WideWriter

We Stock All Accessories & Supplies for Our Printers

Removable Drives

Eagle
Eagle 44 $399
Eagle 88 $499

SYQuest
Infinity 44 $579
Infinity 88 $699

Syquest Cartridges
44 Megabyte $65
88 Megabyte $109

Bernoulli
90 Meg Transportable $799
90 Meg Cartridge $145
90 Meg Cartridge 3 Pak $425

Optical & Floptical
PLI
3.5" Sony 128 Meg Optical $159
21 Meg Floptical $469

SPECIALS
Adobe
Photoshop 2.0 $399

Articulate Systems
Voice Navigator II $499

CoStar
LabelWriter Plus $279
AddressWriter $429

Emac
Silhouette Trackball $76

Scanners

UMAX
UC 630 600 DPI $1199
UC 1200 1200 DPI $3069

Sharp
JX 320 MacUser $1409

Microtek
600ZS $1239
1850ScanMaker $1499

MCINTOSH SYSTEMS

We Stock
PowerBook
Batteries, Battery
Chargers, Carrying
Case, Modems and
Display Adapters.

PowerBook 140 4.40 $2495
PowerBook 170 4.40 $3795
PowerBook 170 8.80 $Call!

While They Last!
Macintosh IIx $3799
We also stock Ileci, Ilsi, and all
Quadras.

CD-ROM

NEC
Intersect CDR 37 w/ MultiSpin $379
Intersect CDR 74 w/ MultiSpin $569

PLI
Sony CD-ROM $649

CTC Technology
Porta Drive $599

MODEMS

SuperFax Modem V.32bis w/dsl $399
SuperFax Modem V.32 w/dsl $329
SuperFax 2400 Plus w/dsl $199

US Robotics
US Robotics Courier HST $559
US Robotics Courier V.32bis $599
US Robotics Dual Standard $799

Global Village
Teleport $169
Teleport FullFax 2.0 $215
PowerPort/Gold $Call!
PowerPort/Silver $Call!

Hayes
Ultra 9600 $599
Ultra 144 $Call!

Hard Drives

Five-Year Warranty!

385 MB 4.4 ms $1099
760 MB 4.6 ms $1399
1.2 G1 4.1 ms $1999
1.5 G1 4.1 ms $2599
1.6 G1 11.5 ms $2999
2 G1 3.9 ms $3399

Thirty-Day Money Back Guarantee!

Prices valid 7/28/92 - 8/28/92
SALE!

"...this is one Mac purchase you’ll never regret."

MacWEEK 9/17/91

**PowerCards**
40 MHz PowerCard 030 (IIXx only) $599
50 MHz PowerCard 030 (II, IIx, IIXx) $899

**PowerCaches** (Non-Universal & Universal)
40 MHz PowerCache 030 $599/$799
50 MHz PowerCache 030 $899/$1099

Monitors

**NEC**
MultiSync 3FGx $399
MultiSync 4FG $759
MacFG 8X Color Card $799
MacFC 2X4 Collar Card $1599

**Lapes**
CT20® Sony Trinitron w/24 bit accelerated Color Card $2899

**SuperMatch 20x** $1699

**SONY.**
3404 17" $1099
3404 14" $659
3402 For LC $399

**NETWORKING**

**Asante**
16k Cards (Nubus) $169
64k Cards (Nubus) $219
Mini Hub $269
EN/SC PowerBook $388

**Dayna**
EtherPrint $339
DaynaPORT E/I-T $149
DaynaPORT SCSI $269
DaynaSTAR MiniHub $269

**OPTICAL Cartridges**

600 Meg $105
128 Meg $49

**3M**
6 Meg $299

SIMMs

4 Meg 80ns $92
1 Meg 80ns $30
2 Meg 80ns $58
6 Meg PowerBook Memory $299

**MacWEEK 9/17/91**

© MacCenter 1992

Rooke 25
Rooke 2Si
Rooke 33

**IMPULSE TECHNOLOGY**

Animals
Performance/40/iop 25 MHz $1629
Performance/40/iop 33MHz $1395

**NewLife Classic Accelerator**

Maxier $47
SE 16 MHz 68030 $699
SE 25MHz $679

**MONITORS**

**SuperMAC**
20" Platinum Monitor (Grey Scale) $899
In Stock!

**SONY.**
1604 17" $1099
1304 14" $649
1320 For LC $399

**Dynamics**

**Reg Card:**

- Your credit card is not charged until your order is shipped.
- Personal checks, company checks, money orders and cashier's checks are accepted; money orders and cashier's checks clear immediately, please allow two days for personal and company checks to clear.
- APO and FPO orders are accepted with no minimum or surcharge.
- Purchaser: Qubed Software Incorporated. Government and institutional purchase orders are accepted with thirty (30) day terms. Corporate PO's accepted with 30 day terms upon receipt of approval. No minimum or surcharge for purchase orders.
- International Orders: No minimum orders or surcharge for international orders, whether placed by mail, fax or telephone.
- Money Back Guarantee: If product carries a manufacturer's 90 or 60-day money back guarantee, please ask for details when ordering.
- All prices, promotions and product availability is subject to change without notice. We regret we cannot be responsible for typographical errors and cannot guarantee compatibility of all products.
- All returns must have an authorization number. Please call 912-456-7466.
- Full returns or refunds shipments are subject to a restocking fee.

**HOURS:**

- 8:00 am - 6:00 pm CST W-F
- 10:00 am - 4:00 pm CST Saturday
- Sunday: Call, we may get lucky.

MacCenter™

812 San Antonio Street; Suite 406 • Austin, Texas 78701-2224

© MacCenter 1992

United Kingdom 0800-89-5074
Germany 0130-81-4748
Mexico 95-800-292-7029
NEW! Quark XPress 3.1 $499
Ask about our wide selection of Quark XTensions.

MacUser’s Price Performance Leader
July 1992 Optical Drive Review

NEW! Xerox AccuText 3.0 OCR Software $465
Only $999 with purchase of any flatbed scanner!

DoveFax 24/96 $185
DoveFax Plus 24/96 $249

HP DeskWriter $385
HP DeskWriterC $675

NEW! Apple CD-150
CD-ROM Drive $475

MacAcademy VHS Training Tapes $39 each

Seiko CM-1445 1h” Trinitron $539

Jetinc Inkjet Refill Twin Pack $15.99
For HP DeskWriter & Apple StyleWriter

Silentwriter Model 95 $1385
300 DPI Postscript Level 2 Auto PC-Mac Switching
6 pages per minute • 35 Resident Fonts

BOTTOM LINE 24-HOUR INTERNATIONAL SALES FAX (512) 476-6399

MacRecorder Digitizer Only

1219 West Sixth, Austin, Texas, USA 78703

Japaneseでの国際販売も扱っております。
**Sl.PERMAC. Applied Engineering Plus Drive DRIVES & TAPES Ad00e P11oloShop 2.0 499**

- **Bernoulli OOMB w/ lnlertare**
- **PU Super Floppy**
- **CD ROM**
- **Chinon CD-ROM**
- **Conner 40MB Ltd. Up**
- **Quantum 105MB FPS**
- **Quantum ProDrive 240MB**
- **Fujitsu 425MB**
- **Fujitsu 605MB 1.2GB**
- **Scott External Drive Kit 52/99**

- **NEC CD-R 8/12 w/Type Galaxy 469**
- **NEC CD-R 7**
- **PLU CD ROM**
- **Toshiba CD-ROM XM 3001A**
- **Microline - CD-ROM**
- **Type Galaxy PS**
- **NEC City 34/1D 0**

**SOFTWARE**

- **PhotoImpact 3.0 w/TypeGallery 355/455**
- **Adobe Illustrator 3.2 w/ATM 395/499**
- **Adobe Photoshop 2.0**
- **CSUSB 3.x with Windows**
- **Adobe Type Manager 2.02 54**
- **Adobe Type Reunion/Streamline 2.0 36/115**
- **Adobe After Dark & More Alive Dark Bundle 37**
- **Adobe FreeHand 3**
- **Adobe PageMaker 4.2 374**
- **Adobe SuperParent 3.0** 120
- **Adobe Reader**
- **AI Direct 1.2**
- **AutoCount**
- **Commerce 3.0**
- **Cotton City 2 Pack**
- **DataWorks**
- **Disk Fit Pro**
- **Disk Defender 3.7**
- **Disk Defend**
- **FastTrack Media Tracks**
- **FrontPage FastPro 2.6**
- **FileMaker Pro**
- **FireWorks**
- **Fontographer 3.5**
- **Fontographer**
- **Fotolino**
- **Lithographer**

**PLI Drives**

- **PLI Infinity 55 4x Quest**
- **PLI Infinity 4x 3.5**
- **PLI 3.5" 120MB w/IBM**
- **PLI 3.5" 52X Total Drive**
- **PLI 3.5" 120MB IBM-L**
- **PLI 3.5" 21MB IBM-L**

**CD ROM**

- **Chinon CD-ROM 525**

**SPECIAL**

- **Spectrum / 8 - 24 PDQ**
- **Spectrum / Series III B-2**
- **Spectrum / 8 Bis & LC**
- **Thunder II/4 Video Cards**
- **NEW! 17" Color Display**
- **19"/21" Platinum Display**
- **SuperMatch 20" Dual Mode Trinitron**
- **SuperMatch 20" Color**

**ON SALE**

- **Video Spigot starting at $399**
- **Thunder Cards - Call!**

**SCANNERS**

- **HP ScanJet L1 1299**
- **Mutoh 6000c w/Photoshop LE**
- **Mutoh 6002d w/Photoshop**
- **Mutoh 1600 Scanner**
- **Sharp JX650 w/Interface 1325**
- **Sharp JX650 w/Interface 415/9999**
- **Umax 630 w/Photoshop**
- **Umax 1200 w/Photoshop**

**DRIVES & TAPES**

- **Applied Engineering 1.44 Drive 209**
- **Applied Engineering Plus Drive 209**
- **Bambooli 9MB w/Interface**
- **PLI Super Floppy/ Turbo Floppy 395/287**
- **PLI Quick SES w/ Cable 319**
- **Compaq 4MB Limited Up**
- **Quantum 105MB FPS**
- **Quantum ProDrive 240MB**
- **Fujitsu 425MB**
- **Fujitsu 605MB 1-2GB**
- **Internal or External Drive Kit 52/99**

**CD ROM**

- **Chinon CD-ROM 525**

**Touch Sensitive Tablets**

- **6x9 Standard**
- **12x18 Standard**
- **12x12 Standard**
- **12x12 Electrostatic**

**Painters**

- **Painter $199**

**UMAX**

- **NEW! RasterOps Rainforest Li $775**
- **Acer UMAX 630 Scan$1 1129**

**MICROTEK**

- **MICROTEK 6002S $1219**

**DTRGOM**

- **Turbo microMaser PS/35 $1925**

**DAYSTAR**

- **Daystar 50FM PowerCache with 6882 FPU $1485**

**Applied Software**

- **MacAcademy Video Training Tapes**
- **MacGlobe**
- **MacToy**
- **MacProject 1.2**
- **Maximind Director 3.1**
- **Macromind MediaMaker**
- **Managing Your Money 4.0**
- **MediaTracker 3.0 w/IBM**
- **MicroPhone 1.04**
- **Microsoft Excel 4.0**

**UPGRADING**

- **All UMAX Scanners include AdoBe Photoshop Image Editing Software:**
  - **UMAX 650-6000F 24-bit color $1129**
  - **UMAX 1200 w/IBM 24-bit color $3099**
  - **UMAX 1200 w/IBM 24-bit color $3099**

**DEALERS**

- **Acceptors for LC, SE/30, II, Bsi, Bsx, Bicx.$129**

**SPECIALS**

- **All Cards Include Free CPU Slot Adapter**

**TURBO MIRROR**

- **3MHz PowerCache $619**

**WARRANTIES**

- **4MHz PowerCache $899**

**POWERSUPPLIES**

- **5MHz PowerCache with 6882 FPU $999**

**TERMS**

- **$5,000 minimum**

**Returns**

- **$5,000 minimum**

**Shipping**

- **$5,000 minimum**

**RISC Processors • Postscript Level 2 • Appletalk Interface**

**Phone:**

- **1-900-420-3737**

**Fax:**

- **1-900-420-8770**

- **1219 West Sixth • Austin, Texas 78703**

**HOW TO ORDER:** Post Office, Moneygram. Discover (no surcharge), check, and COD's. $6.00 minimum on CODS. Texas residents add 5% 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.SUS Ground, Back, Fed. Federal Express. Returns: items must be in original condition and package and return on RPM. 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.
NEW YORK'S LARGEST COMPUTER SUPERSTORE AT YOUR FINGERTIPS... 1-800-221-8180

SEE WHY THE
COMPETITION
IS SHAKING THEIR FISTS,
AND CUSTOMERS ARE
APPLAUDING OUR
PRICING AND
SELECTION ON
NEC PRODUCTS
FOR THE MAC!

THUMBS UP PRICING!

NEC CD Gallery 37
• Adds worlds of exciting new capabilities to your Macintosh computer • Includes lightweight portable CDR-37 ROM Drive which performs at 450ms access time, plus software, cables & 7 CD-ROM titles including World Atlas, Beethoven's Symphony #9, Grolier's Electronic Encyclopedia and a pair of Koss speakers
$399.95 (NEC CDGALLERY37)
ALSO AVAILABLE NEC CD GALLERY 74

NEC SilentWriter Model 95
Postscript Laser Printer
• 6 ppm • Includes Sharp Edge Technology / 300 dpi output • Adobe PostScript Level 2 • 2MB RAM • 35 resident fonts • Automatic emulation switching between AppleTalk, parallel, RS-232 or RS-422 interfaces built-in • HP III & HP PCL5 compatible • 250 sheets and built-in 15 envelope feeder
$1399.95 (NEC MODEL-95)

NEC Multisync 4FG 15" Monitor
• 15" flat square, digitally-controlled multiple frequency monitor with NEC's exclusive AccuColor Control System. The new Multisync 4FG monitor extends technology to a new dimension of video standards, including 28mm Trinitron dot pitch and tilt and swivel base • NEC exclusive AccuColor control allows you to adjust color to suit your needs • Matches Pantone and Trumatch color systems • Supports most video standards including Macintosh, VGA, Super VGA, and others. Reduced Magnetic Field Technology for low ELF emissions • Please order with NEC-MAC-KIT for $19.95
$699.95 (NEC 4FG) (NEC 3FG)
ALSO IN STOCK NEC 3FGx $629.95

NEW YORK'S LARGEST
APPLE DEALER!
Come visit our 20,000 square foot superstore at 15 Park Row in NYC, across the street from City Hall. We carry over 5000 products for Apple and DOS in stock at discount prices! We're authorized for everything we sell. Sorry Apple branded computers and peripherals can only be sold through our retail outlet. ASK FOR OUR LATEST CATALOG!

Open 24 Hours
1-800-221-8180
Order By Fax • 24 Hours A Day
1-718-497-1791

Circle 115 on reader service card.
“Order by 10pm (PST), have it tomorrow for just $3”

Retrieve It!
MVP Software 7 Introducing Retrieve It!, the friendliest Mac text retriever ever. It quickly finds and displays any text anywhere on any of your hard drives, floppy disks, CD ROMs, or fileservers. Retrieve It! can search file names (extremely fast) and it can search inside of files as well. Special introductory price $38.

IntelliDraw
Aldus 7 IntelliDraw is an extraordinary new drawing program with intelligent features that give you an easy new way to visually experiment, refine, and draw your ideas. Visual "what-if," — innovative smart tools link graphics in your drawing so they respond to changes automatically.

Capitalist Pig
Pluma Software 7 New! Animated business simulation game challenges you to build and run your own business under authentic economic conditions. Experience terrorists, fires, scandals and more, as you battle for billions—or bankruptcy. Thought-provoking, educational and fun!

DupLocator
Midnight Software 6 New! The first software available for locating duplicated files. Organizes, catalogs and even builds disks from files scattered across multiple volumes, networks or even your entire floppy library! Features include 3D buttons, floating palettes, Balloon Help, universal file coloring, disk serialization, SCSI mounting, file compression, plus a whole lot more.

SoftPC Windows 3.0
Insignia Solutions 6 New optimized version of SoftPC, includes special screen and mouse software drivers to accelerate Windows programs within SoftPC. Run any Windows program that requires VGA graphics, protected mode, or extended-memory to 16 MB. Comes with a copy of MS-DOS 5.0 and Microsoft Windows 3.1 installed.

Lottery Tracker & Wheeler 4.0
Triad Publishing, Ltd. 7 The most comprehensive lottery software package for pick-5, pick-6, and pick-7 lotto games. Choose up to 80 numbers, analyze/select numbers from past drawings, create tickets, record bets to check for winners later, and print charts. Comes with a FREE audio cassette: Lottery Winning Strategies.

QuicKeys 2.1.2
CE Software 7 The ultimate desktop automation tool, designed to improve your desktop environment. Easily create and use hundreds of time-saving shortcuts. Any repetitive task you perform on your Macintosh can be done more easily and more consistently with QuicKeys.

BeagleWorks
Beagle Brothers 7 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. Features irregular-text wrap, multiple columns, automatic sum tool, in-cell editing, 256 custom colors, and In-Context Editing™, a revolutionary technology exclusive to BeagleWorks which allows access to, or creation of, items from one file without having to leave the module in which you are currently working.

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090
System 7 Compatible • System 7 Savvy • 30-60 Day Money Back Guarantee

THE ONLY PLACE
Wizards are working at Mac's Place.

How else can you explain the wise answers you get to your questions? The software information the Mac's Place people always have at their fingertips? The calm, reassuring voices on the other end of the phone? It's really no surprise some people feel that way. But the real reason is that we're the only major mail order company that's *Mac compatible*. That means we know more about Mac products—including System 7 compatible products—than anyone else. So we can answer your questions better than anyone else and make sure you get the products that are right for you. Try us. It isn't wizardry that sets us apart. It's knowledge.

Our Hours: Monday through Friday 6 AM–10 PM PST and Sat/Sun 6 AM–6 PM PST  
Call 1-800-367-4222 US & Canada

*Macintosh Compatible means we run our company completely on Macs. Everyone has at least one Mac box on their desk, equipped with 8 megs RAM, 40-MEG Hard Drive, 14" color monitor, connected via our Ethernet network to our custom-programmed database. The database literally runs all phases of our operation — product information, order taking, order processing, inventory control, accounting, purchasing, customer service, technical support. All of us also have complete desktop communications, connecting to online services and other corporate sites around the world via E-mail, networked modems and FAX modems.

So you see, we don't just sell 600-MEG hard drives, high speed networked modems, and System 7 applications—they're all an integral part of our day to day operation.
**Snooper**

MAXA Corporation

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.

**Double Helix 3.5**

Helix Technologies

Client/Server Software included in every box! Fastest multiuser relational database for the Macintosh. Its client/server architecture keeps network traffic down and productivity up. Provides real-time updating, giving each user immediate on-screen updated information. Its object-oriented, non-procedural programming environment allows modifications on the fly!

**QuadraCache**

DayStar Digital

Increase your Quadra 700, 900 or 950 performance 10 - 40% with QuadraCache. This inexpensive, PDS cache card gives Quadra 700 and 900 users 950 level speeds -- all for a fraction of the price Apple is charging 900 users for their 950 upgrade. And, QuadraCache inexpensively turbocharges the 950s—making them the absolute fastest Macs alive. Upgradable through DayStar's Swap-Up program. 100% compatibility guaranteed.

**FolderBolt/NightWatch II**

Kent Marsh Ltd.

If you share a Mac with others, ensure privacy by using FolderBolt to lock folders on your hard disk or floppy. A simple click of the mouse locks and unlocks folders. NightWatch II gives you the most ironclad hard disk protection in the industry. It offers three levels of protection: diskless, key disk and classic token disk. Impenetrable.

**Classic Accelerator! w/FPU**

NewLife Computer Corp.

NewLife Accelerators are designed for performance without sky high costs. With an Accelerator! installed in your Mac Classic, even the most demanding software won't slow you down. Imagine...the performance of a iMac in the footprint of your compact Mac! Call for complete pricing on all NewLife Accelerators.

**JMP Version 2**

SAS Institute

Visualize your data to discover meaningful patterns and outliers. JMP to conclusions faster using statistics including ANOVA, regression, MANOVA, 2D and 3D Spin, control charts and more. With new JMP Design, $258, create classical and D-Optimal experimental designs and screen for significant effects and interactions.

**Painter 1.2/76 x 9 Tablet**

Fractal/Wacom

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.

**JetInk Refill Twin Pack**

DGR Technologies


Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

System 7 Compatible  System 7 Savvy  30-60 Day Money Back Guarantee
"You can get great prices and great service." —Mac

**THINK C 5.0/THINK Reference**
Symantec - THINK C features an extremely fast 100% ANSI compiler, an even faster linker, an optional global optimizer, a powerful source-level debugger and more. Take full advantage of object-oriented programming and new System 7 capabilities. THINK Reference, $69 provides instant on-line access to the critical system information you need to program the Macintosh.

**Microcom Virex**
- Virex is a comprehensive solution to Macintosh computer viruses. The Virex application detects and repairs files infected by all known Macintosh viruses. The Virex INIT continuously monitors the computer to prevent infection, and performs repairs instantly.

**PersonToPerson (2-user)**
Asante - Mac communication software system that mirrors "traditional" office interactions. Instead of shouting across the workplace, PersonToPerson allows users to send voice messages across the network. Includes an In/Out Board and a Post-It Note Window. No file server or net-administration required!

**Disk•Go**
SoftWriters, Inc. - Speed, Speed, Speed. Just drop Disk•Go into your System Folder and accelerate your hard disk. On average, Disk•Go increases hard disk speed by 40%. Advanced technology provides immediate acceleration without having to reformat your hard disk. Get Disk•Go now...you've been waiting long enough!

**FAXstf Net**
STF Technologies - Provide every Mac on your AppleTalk network with the ability to send/receive faxes using almost any fax/data modem. Background send/receive operation up to 14,400 bps, broadcast capability and much more. FAXstf Universal (single user) $56, and LC (basic) $26 also available.

**VersionTerritory 2.0 (10-user)**
SoftWriters, Inc. - Imagine updating all of your Macintoshes with the touch of a button. With VersionTerritory, updates that took hours in the past now take just a few minutes. Examine Macintoshes, distribute documents, update software and utilize the power of your network with VersionTerritory.

**PGA Tour Golf**
Electronic Arts - Experience all the excitement and pressures of a PGA tour pro, with the only software licensed by the PGA. Features actual PGA course blueprints, 3-D topographic grids, instant replay, competition against 60 real pros, announced scores. PGA Tour Golf Master Program includes four courses. Play three more tough PGA courses on the Tournament Course Disk.

**Full Metal Mac**
Soft Wars - Conflict simulation game that places each opponent in the role of a combat infantry officer in command of modern infantry elements. Gets down to the nitty-gritty of modern, small arms infantry combat—the sweat, fear, chaos, pressure and unpredictability. One or two players.
"It's not wizardry that sets us apart, it's Knowledge"

Access RD/Aria
Optical Access Intl. 128 MB in your shirt pocket. This 3.5" optical drive is the cutting edge of technology, enhanced with SuperCache software for lightning fast operation. The ultimate data security and affordability. Includes: cable, and removable 3.5" media cartridge (ANSI compatible).

$1598

Access MF/Gigabyte
Optical Access Intl. The fastest, highest capacity, and easiest-to-use optical drive. Handles mass storage and retrieval tasks effortlessly. In rewritable mode, it functions like a 1000-MB removable hard drive. In WORM (Write-One, Read-Many) mode, all file versions remain intact and easily accessible.

$2995

PROclaim!
Compact Designs QuickTime CD-ROM. Most complete source of quality multimedia images. Over 600 MB of images includes 250 video clips saved as 24-bit QuickTime movies. Subjects include: Business, Technology, Cities, People, Environment, Military, Space, and much more. Includes features such as presentation animations and video- Animate phrases, as well as a user-friendly HyperCard visual directory.

$258

Red Baron/MouseStick
Sierra On-Line/Advanced Gravis Red Baron—a monumental step forward in flight simulation on the Mac! Go head to head with more than 20 aces. Take command with the Gravis Mousestick, fully designed to transform you into an ace of the European skies, with programmable buttons to command potent firepower.

$44/58

Miracle Piano Teaching System
Software Toolworks The first keyboard that teaches you how to play it! Makes learning even the basics a pleasure. Professional keyboard with 49 standard-sized velocity-sensitive keys, 128 digitized instruments and sounds, with full MIDI compatibility. Includes hundreds of songs and lessons and full orchestral accompaniment.

$188

CAUSE 3.1

$17

Dual Page Display (Mono)
Lapis Technology Perfect for multitasking or any job that's easier with more screen space — spreadsheets, desktop publishing, text and graphics. This 19" two-page display provides 1024 x 828 screen resolution at 72 dpi, a 75 Hz refresh rate, and "Apple-standard" P104 phosphor.

$738

Mac Shareware 500 Book
Ventana Press Required reading for shareware users. An all-in-one collection of information on the world of Mac shareware. The four companion disks include the authors' top-rated programs from the various shareware categories, plus an America Online membership diskette and 5 hours of free sign on time.

$28

Mac's Place Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090 
System 7 Compatible System 7 Savvy 30-60 Day Money Back Guarantee

“Our service will
"Order by 10pm (PST), have it tomorrow for just $3"

PROmotion
Motion Works 1 Easily create full-color animations with multiple audio tracks, even if you can't draw. Interface follows traditional animation techniques such as cel-based actors, onion skinning and path-based motion. Other features include cel tweening and Print to Video. Export your animations to QuickTime™ or Berkeley Systems After Dark™.

$248

Infini-D 2.0
Specular International 1 Easy-to-use Infini-D now in an awesome second generation! Combines a friendly interface with sizzling 3D power: instant conversion of EPS files into 3D objects, blist- tering rendering speeds (up to 500% faster!), incredible PICT mapping control, and extensive QuickTime support make Infini-D 2.0 the 3D package for you!

$648

DiVA VideoShop
DiVA VideoShop is a fun, easy and powerful application for creating and editing QuickTime movies. Used with any QuickTime digitizing board, DiVA VideoShop's recording module lets you record video and audio clips directly onto your hard disk. For ease of editing, DiVA VideoShop uses icons (moving icons) to represent each clip. You can incorporate clip media from the Image Bank CD Collection of 300 movies, 70 music scores, and a sound effects library, all included. Special Bundles: VideoShop & RasterOps 24STV.....$1172.

$398

Vision Software 1 New! Make a full-color movie of whatever's happening on your Mac screen with CameraMan! Captures all screen activity in real-time to a QuickTime or PICS movie. Use your screen movies in multimedia, presentation, and QuickTime packages. Free movie player included!

$98

Cinemation
Vividus 1 Automatically animate your PowerPoint® or Persua- sion™ presentations, or create new presentations using text, paint, and animation tools, with Cinemation. Add interactive buttons, QuickTime video and sound. MacWorld Editor's Choice, MacUser Four-Mice: "No other multimedia presentation program comes close to this level of ease of use."

$378

Bernoulli Transportable 90-MB PRO
IOMEGA 1 The best removable solution for your state-of-the-art needs! System 7 and QuickTime require even greater storage demands, but now you simply insert another affordable 90-MB disk—180 with included compression—and you'll never fall short of disk space again.

$1362

ColorPage T16 II Trinitron
E-Machines 1 The best 16-inch display provides sharp, clear Trinitron performance with multiple resolution capabilities. Plug-play with the built-in video of the Mac LC, IIci, IIgs or Quadra. Or add a ColorLink SX/T interface card and get accelerated 24-bit color, video-out and integrated Ethernet networking all on one card for $658.

$698

DP+ Hard Drives
DataPlace 1 Available only at Mac's Place! These quality Quantum hard drives and Syquest Removable Cartridge drives come with Alysys Software’s More Disk Space, Central Point’s MacTools Deluxe and Nova’s Kaboom! Special Edition. Each drive features a selectable SCSI ID switch, two 50-pin SCSI connectors, an external fuse and two AC-plug-ins.

See listings under Hard Drives

$248

make you smile.”

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090

System 7 Compatible  System 7 Savvy  30-60 Day Money Back Guarantee
“Ask the other direct mail places why you can’t sell Mac stuff”
CPU's and More...

- Apple 12" Monochrome Monitor $229.00
- Apple 12" RGB Monitor $429.00
- Apple 17" RGB Monitor $899.00
- Apple 15" Portrait Monitor $369.00
- Apple 16" RGB Monitor $1345.00
- Apple 21" Color Monitor $499.00
- Sony 14" Trinitron RGB $659.00
- Macintosh Display Board $245.00
- Macintosh Cardboard $498.00
- 25K VRAM Upgrade for Mac LC $96.00
- 25K VRAM Upgrade 68000 $69.00

High-end Video and More...

- **E-Machines**
  - All new prices, to Hot list!
  - RasterOps
    - 18" Color Trinitron Signature System with RasterOps XLK $299.00
    - 19" Hitachi Color Systems with RasterOps XLK $254.00
    - 21" Hitachi Color Systems with RasterOps XLK $299.00
  - New 16" Color Systems
    - Mac - Display Boards
      - RasterOps 24XU Display Board $1885.00
      - RasterOps Paint Board $154.00
      - RasterOps XU Display Board $395.00
      - RasterOps 24X Display Board $450.00
      - RasterOps 24XK Display Board $950.00
    - Multimedia Boards
      - Mac - Display Boards
      - RasterOps 24XU Display Board $1885.00
      - RasterOps Paint Board $154.00
      - RasterOps XU Display Board $395.00
      - RasterOps 24X Display Board $450.00
      - RasterOps 24XK Display Board $950.00
  - SuperMac
    - 24-bit Color
      - Spectrum 24 Series III $1425.00
      - Spectrum 24 Series II $1015.00
      - Spectrum 24 Accelerator $429.00
      - ColorCard $495.00
    - 8-bit Color
      - Spectrum 240-PB $235.00
      - Spectrum 8 Bit $495.00
      - Spectrum 8 Series III $330.00
    - E-Machines
      - SuperTronic 20 Dual-Mode Trinitron $1695.00
      - SuperTronic 20 Color $1395.00
      - SuperTronic 20 Multi-Mode Color $1990.00
      - 21" Platinum $2119.00

Want more details? Call!

Terms and Conditions: Payment: Mac and Micro Exchange House, New Canaan, CT, 06840, EFT, and Purchase Orders. EFTs are dropped Off at Check Cashed with $25.00 charge. EFTs and Purchase Orders are not available for orders over $2000, and are subject to credit approval. Macs are EXCHANGE only, Mac and Micro Equipment, Inc. reserves the right to refuse any order. Macs and Micros are not leased to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo. Macs and Micros are not shipped to foreign banks or in any other country or any nation that does not guarantee timely fulfillment of all orders or that is subject to embargo.
Your Mail Order Super Store

Mac and MORE INC.

Presents ... ETC Peripherals Inc.

and their Family of Products!

ETC 10BaseT Hub
The ETC 10BaseT provides twelve UTP ports, via RJ-45 modular jacks for connection to network interface cards. On-board transceiver provides diagnostic LED for each UTP port. Two sets of switchable BNC/AUI port, five status LEDs indicate repeater link and performs full multi-port repeater functions specified in IEEE 802.3 standard. It also has 110/220v automatic detection and switching.

ETC Repeater
The ETC Repeater is an economic and easy solution to expand your ethernet network. The ETC Repeater provides two BNC ports for connection to two thin-ethernet segments, IEEE 802.3 10 Base2 Thinnet standard, full multi-port functions, four LEDs indicate both segments' reception and transmission status and supports a maximum of five segments with a network length of 3035 feet, via four repeaters.

ETC DATApress
The first 'smart' SCSI data compression interface designed to work external of the Macintosh.
Features:
- 'Real-time' data compression
- Allows seven additional SCSI devices to be added to your Mac.
- Won't interfere with virtual memory
- Can be added as an internal option to the ETC DataPort Family of removable cartridge drives.

ETC PowerGlide 105 Keyboard!
Features:
- 105-key extended keyboard layout with full cursor control, 15 function keys, and numeric keypad
- Apple Desktop Bus (ADB) Interface
- Foreign Language keyboards are also available

ETC Tools 2.3
ETC Tools 2.3 is a completely new version of the formatting utility that ETC now ships with their DataPort drives— and there has never been anything like it before. Its worry-free graphic interface makes formatting and initializing cartridges and drives a snap. You'll never have to fear whether you are erasing the right drive again. You can even combine separate drives into what appears to be one giant hard disk on your desktop with ETC Tools' SuperVolume feature.

ETC Hard Drives!
The ETC drives are fast, reliable, and economical. Better all around value can not be found. Let your Mac and MORE sales representative know what kind of Macintosh you have. That's the only way we can be sure that your new drive will 'fit' your Mac.

ETC Removable Drives
ETC Removable Drives feature a SyQuest 45 or 88 MB drive in a 2nd footprint half-height drive enclosure. Included with the drive is one removable cartridge, SCSI interface cable, ext. terminator block, power cord, manual, and ETC Tools 2.2

ETC DataPort
Each cartridge houses a 3.5 hard drive with drives ranging from 105 to 539 MB that can easily be removed and transported to another location.
- ETC DataPort (one bay)
- ETC DataPort Twin (two bays)
- ETC DataPort Tower (four bays)

Now you can have PCs on your Macintosh network or share peripherals with a little help from ETC...

ETC LAN Adapter
The ETC LAN Adapter is an external connection that allows IBM and IBM compatibles access to Macintosh Ethernet Thin or 10BaseT networks.

Magic Converter
ETC Magic Converter II - parallel to SCSI interface to connect most SCSI hard disks, tape, CD-ROM, and removable drives to your IBM & compatibles.

All products from ETC Peripherals include a 30-day return privilege. If for any reason you are not completely satisfied with any ETC product you may return it for credit, exchange or a refund ... your choice. All products must be returned freight prepaid with their original packing material cartons and be in 'like new' condition including all original packaging material, manuals and registration cards. Call our Customer Service department for complete details and an RTS # prior to its return.

CIRCLE 41 ON READER SERVICE CARD.
World's First Dual Capacity —
256MB/128MB Rewritable
3.5" Magneto-Optical Drive
Introductory Offer — only $1,748

**VISTA V256**

- Full compatibility — Vista V256 reads & writes to ISO Standard 128 MB format cartridges, and a true, non-compressed 256 MB to GZ format cartridges
- Reliable — features the acclaimed M.O.S.T. mechanism as used in the award-winning Vista V128 3.5" MO drive
- Fast — transfer rate up to 1.2 MB per second
- Economical — additional 256 MB cartridges only $89
- Versatile — Mac and IBM compatibility

Order Direct 800.944.6232

OCEAN Microsystems, Inc.
246 Hacienda Avenue
Campbell CA 95008 USA

---

Macintosh SOFTWARE PROTECTION

Don't lose software profits — use SecuriKey® — a unique hardware device that prevents unauthorized use and duplication of software.

- DESIGNED FOR THE MACINTOSH
- Allows unlimited backup copies
- Does not permit duplication
- Can record software usage
- Available with custom logos
- Variety of programmable options

CALL US TODAY!
1 (800) 456-2587

Serial device now available

[Details about SecuriKey®]

---

Incandescent parrots.
Pink dolphins.
And half the medicine known to man.
This is the rain forest.

Every second another acre of rain forest is destroyed forever. The World Wildlife Fund needs your help. 1-800-CALL-WWF

World Wildlife Fund Rain Forest Rescue Campaign

---

338 September 1992 MacUser
Wacom Graphics Tablets

MacUser Magazine

All Wacom tablets include Wacom input pen. Tablets are available in a choice of sizes and surface types—plain, electrostatic, or transparent menu panel.

Wacom 6 x 9 Standard Surface $449
Wacom 12 x 12 Standard Surface $649
Wacom 12 x 12 Electrostatic Surface $699
Wacom 12 x 18 Standard Surface $999
Wacom 12 x 18 Electrostatic Surface $1010
Wacom 18 x 25 Standard Surface $2525

Graphics Software

Fractal Design Painter $199
With Purchase of Wacom Tablet:
The MacUser Eddy Award Wacom Designed to work perfectly with Wacom Digitizing Tablets!

Quark XPress 3.1 $499
Quark XPress Available
Adobe Photoshop...
Adobe Illustrator 3.2
Aldus PageMaker 4.2
Aldus FreeHand 3.1
MacAcademy Video Training Tapes $39 each
Available for Quark, PhotoShop, Illustrator, Aldus, & More

NewGen Printers

NewGen Turbo PS/300P $1225
300x300DPI, 2MB RAM, 4ppm, RISC-based

NewGen Turbo PS/400P $1725
400x400DPI, 2MB RAM, 5ppm, RISC-based

NewGen Turbo PS/630P $2399
600x600DPI, 4MB RAM, 5ppm, RISC-based

NewGen Turbo PS/840P $3025
800x800DPI, 2MB RAM, 8ppm, RISC-based

NewGen Turbo PS/400T & 1200T $3350
800x400DPI, 6MB RAM, 8ppm, RISC-based

Wacom 6 x 9 Standard Sunace $449
Adobe Photoshop $499

Wacom 12 x 12 Standard Sunace $699
Adobe Illustrator 3.2 $335
Aldus PageMaker 4.2 $475
Aldus FreeHand 3.1 $369

Wacom 400, 400DPI, 4MB RAM, 8PPM, RISC-based

Wacom 400, 400DPI, 4MB RAM, 8ppm, RISC-based

Tablets are available in a choice of sizes and surface types.

Quark XPress 3.1 ........................................... $499
Quark XPress Available
Adobe Photoshop...
Adobe Illustrator 3.2
Aldus PageMaker 4.2
Aldus FreeHand 3.1
MacAcademy Video Training Tapes $39 each
Available for Quark, PhotoShop, Illustrator, Aldus, & More

NewGen Printers

NewGen Turbo PS/300P $1225
300x300DPI, 2MB RAM, 4ppm, RISC-based

NewGen Turbo PS/400P $1725
400x400DPI, 2MB RAM, 5ppm, RISC-based

NewGen Turbo PS/630P $2399
600x600DPI, 4MB RAM, 5ppm, RISC-based

NewGen Turbo PS/840P $3025
800x800DPI, 2MB RAM, 8ppm, RISC-based

NewGen Turbo PS/400T & 1200T $3350
800x400DPI, 6MB RAM, 8ppm, RISC-based

Wacom 6 x 9 Standard Sunace $449
Adobe Photoshop $499

Wacom 12 x 12 Standard Sunace $699
Adobe Illustrator 3.2 $335
Aldus PageMaker 4.2 $475
Aldus FreeHand 3.1 $369

Wacom 400, 400DPI, 4MB RAM, 8PPM, RISC-based

Wacom 400, 400DPI, 4MB RAM, 8ppm, RISC-based

Tablets are available in a choice of sizes and surface types.
WE'LL MATCH ANY ADVERTISED PRICE!

BIG, FAST DRIVES!

The MICRODISK from Micropolis...
Large Capacity, High-Performance External Drives

According to Byte magazine's extensive tests, the Microdisk is the fastest MAC drive available. With record-setting effective access times as low as 3.9 milliseconds and data transfer rates as high as 10.0 megabytes/second, the Microdisk is the drive you need for high performance applications.

And, the Microdisk tops the list for reliability with a 150,000 hour mean-time-between-failure rating. Combine all this with a five-year disk drive warranty and you have the best drive for your money.

MICROPOLIS

If You Need High-Capacity, Speed and Reliability... Call Us Today!

DIRECT/TECH
800-279-5520

CIRCLE 33 ON READER SERVICE CARD.

CIRCLE 48 ON READER SERVICE CARD.
Display Systems

- Radius Display 19"/21"... $915/$1169
- Two-Page Mono Display with tilt 
  & swivel base
- Radius Precision Color Display 19"/20"... $2089/ $2745
- Two-Page Color Display with tilt 
  & swivel base
- Radius Color Pivot ........................................... $1265
- Landscape & portrait mode with tilt 
  & swivel base
- Radius Monochrome Pivot . . . ..........................$699
- Landscape & portrait mode with tilt 
  & swivel base
- Radius Full Page 15" Display ........$565

Video Interfaces

- Radius Two Page Display Interface...........$389
- Monochrome interface for Radius Two-Page display
- Radius Color Pivot Interface SE/30, IIB, LC...$499
- 64n870 8-bit interface for Color Pivot
- Radius Mono Pivot Interface SE/30, II, IIB, LC...$259
- 64n870 Interface for Monochrome Pivot
- Radius Precision Color 8X-8X IBI Interface.... $755
- 8-bit NuBus interface for Radius Color Displays
- Radius Precision Color 2N-2N IBI Interface.... $1699
- 24-bit NuBus interface for Radius Color Displays
- Radius PowerView for PowerBook ...............$519
- 640 x 480 interface connects to PowerBook SCI

Accelarators

- Radius Rocket 25i ........................................... $1254
- 25MHz 68010 accelerator for Macintosh II, IIe, Be;
  68020, Boosts system performance up to 6 times.
- Includes QuickDraw and display list acceleration routines.
- Also includes 8MB SDRAM for up to 128MB 
  of RAM and an 8040 processor direct slot.
- Radius Rocket 25 ........................................... $1625
- Same as Rocket 25i with the addition of a Motorola 
  Math CoProcessor to further increase performance
- Radius Rocket 33 -Quadra 950 Performance! ....$2109
- 33MHz 68010 accelerator for Macintosh II, IIe, Be;
  68020, Boosts system performance up to 8 times.

1219 West Sixth • Austin, Texas 78705
Intl Fax (512) 476-6399 1-900-420-3525
$2 PER MINUTE

51/2
HM1.2/15
$1998

Mayors Special

Internal Quantum
240MB/10ms $625

- 30 Day 100% Guarantee
- Two year warranty on Maxtor 
  and Quantum
- One year warranty on Syquest, 
  Conner and Seagate
- Lifetime toll-free tech support
- Government and University 
  POS accepted
- No credit card surcharge on 
  Visa-MC-Amex
- All drives include software, 
  hardware, cables.
- All prices and availability subject 
  to change without notice.
- Shipping charges nonrefundable.

Gigabyte King!

$1998

"The superior driver software of the HM
1.2/15 speeds it past the other Wren
7 based drives."

"Despite its bar-
gain price, it ranked
near the top in all
performance tests."
MacUser July 1991

SyQuest

External

44MB w/Cart $ 439
Add’l Cartridges $ 66
88MB w/Cart $ 559
Add’l Cartridges $ 99

Exabyte

External Tape Backup
8200 2.2GB and Tape $1999
8500 5.0GB and Tape $3199

Quantum

52MB/12ms $229 $299
105MB/10ms $344 $414
120MB/10ms $409 $479
240MB/10ms $625 $724
425MB/13ms $1139 $1209

Maxtor

80MB/17ms $294 $364
120MB/15ms $344 $434
213MB/15ms $584 $654
340MB/13ms $899 $929
535MB/12ms $1099 $1179
675MB/17ms $1354 $1544
1020MB/13ms $1749 $1899
1500MB/13ms $2474 $2644

CD ROM

Toshiba External Kit 
Includes "Nautilus' CD 
$559

Seagate

External Tape Backup
49MB/28ms $234 $304
426MB/14ms $1129 $1199
676MB/12ms $1519 $1699
1020MB/15ms $1895 $1998
1420MB/15ms $2295 $2395
1352MB/12ms $2699 $2799
We can help you design your entire system. Just give one of our sales consultants a call.

Cache cards, accelerators, and coprocessors

THIRD WAVE SELLS ALL MODELS OF MACS!

Call for pricing on all models of Macintosh CPUs

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. Prices start at only $1299 and the 128 MB cartridges are only $49. Ask about our special offer for qualified service bureaus!

Asante Ethernet from $169

5 Year Warranty Rated Number One by MacUser

-Radius Rocket-
-Daystar PowerCache-
- Macworld Editors Choice 1992-

Cache cards from Logica speed up your Ilsi or Ili by 40 percent! The LogiCache Ilsi plugs into the Ilsi slot or into the Logica Dual Slot Adapter for use with SE30 or Ilsi expansion cards. Logica math coprocessors for LC, LC II, Classic II, and Ilsi 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.

Display systems

SuperMatch color displays 17 - 21 inches.
Spectrum PDQ 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) 832-9282 FAX (512) 832-1533 We accept Visa, Mastercard, American Express, and Discover. Corporate, educational, and government purchase orders accepted. Most deliveries via Federal Express.
### Compare Our Dat Drives to Theirs.

<table>
<thead>
<tr>
<th></th>
<th>Third Wave Datadrive</th>
<th>The Other Guys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warranty</td>
<td>5 years</td>
<td>2 years</td>
</tr>
<tr>
<td>Price: 2GB</td>
<td>$1395.00</td>
<td>$1595.00</td>
</tr>
<tr>
<td>Compression (8GB)</td>
<td>$1595.00</td>
<td></td>
</tr>
<tr>
<td>Firmware Updates</td>
<td>From tape</td>
<td></td>
</tr>
<tr>
<td>Upgrade Method</td>
<td>User Install</td>
<td></td>
</tr>
<tr>
<td>OEM</td>
<td>Hewlett Packard</td>
<td></td>
</tr>
<tr>
<td>Form factor</td>
<td>3.5&quot;</td>
<td></td>
</tr>
<tr>
<td>MTBF</td>
<td>50,000 hours</td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>Retrospect</td>
<td></td>
</tr>
</tbody>
</table>

**Media**

- 68 MB Tapes for Teac: $17.00
- 150 MB Tapes for Teac: $24.00
- SyQuest 45 or 90 MB cartridge: $68.00 or $115.00
- DAT cassette 60 or 90 minute: $17.00 or $20.00
- Optical cartridge 512 MB: $25.00
- Optical cartridge 1024 MB: $25.00
- Optical cartridge for Teac: $268.00
- Optical cartridge 128 MB: $40.00

**Memory Upgrades**

Third Wave manufactures a complete line of memory products for all Macs — 1, 2, 4, and 16MB SIMMs, including low profile 18MB SIMMs for the Quadra 700.

- 120 MB: Internal $49.00, External $59.00
- 240 MB: Internal $71.00, External $89.00
- 520 MB: Internal $129.00, External $139.00
- 850 MB: Internal $139.00, External $149.00
- 1000 MB: Internal $189.00, External $199.00
- 1300 MB: Internal $259.00, External $269.00
- 1700 MB: Internal CALL, External CALL

**Storage Systems**

**Removable Media**

<table>
<thead>
<tr>
<th>OptiDisk 128</th>
<th>1299.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>OptiDisk 128 (SONY)</td>
<td>1595.00</td>
</tr>
<tr>
<td>OptiDisk 800</td>
<td>2895.00</td>
</tr>
<tr>
<td>OptiDisk 1000</td>
<td>3695.00</td>
</tr>
<tr>
<td>45 SR (SyQuest) w/cartridge</td>
<td>475.00</td>
</tr>
<tr>
<td>88 SR (SyQuest) w/cartridge</td>
<td>669.00</td>
</tr>
<tr>
<td>DATadrive 2GB</td>
<td>1395.00</td>
</tr>
<tr>
<td>DATadrive 8GB (One year warranty)</td>
<td>1595.00</td>
</tr>
</tbody>
</table>

**Dat Drives**

- A MacWorld Favorite!
- "Quietest" — March '91
- "One of the best manuals" — "Highest SCSI Eval. Read/Write" — September '91

**One, Four, and Sixteen MB SIMMs**

- Quantum 60-80 2.5 inch
- 16ms internal drive with Third Wave's 6 megabyte PowerRAM memory module — only $649.00!
- A total of 80MB storage and 8MB pseudo-static RAM! Send us your PowerBook and we'll install it free!

**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.

**A Special Offer For PowerBook Owners!**

8/80 In Your PowerBook For Only $649!
Business day money back guarantee • Prices do not include freight • All specs are from the manufacturer.

All brands and product names are trademarks or registered trademarks of their respective companies and/or owners.
VideO Graphic Solutions

Color Pivot/LE Bundle $1489

NEC

Silentwriter Model 95 $1398

- 300 dpi • 6 ppm • 35 fonts • 2 MB RAM, up to 5 MB
- AppleTalk, Serial, Parallel Interface
- Automatic Interface Monitoring

NEC Silentwriter2 Model 990 $2449

- RISC Based Processor • 300 dpi • 8 ppm • 35 fonts
- Automatic Language Switching • Adobe PostScript
- 2 MB RAM, up to 4 MB
- AppleTalk, Parallel, Serial Interface, PLUS Built-in SCSI Port

Epson EPL-7500 Laser Printer $1995

- True Adobe PostScript
- High-speed RISC processor
- 6 ppm • 300 dpi • 35 fonts • 2 MB RAM, up to 6 MB
- Parallel, Serial, AppleTalk Interface
- 250-sheet paper tray standard

QMS -PS 410 Laser Printer $1495

- Emulation Sensors Processor
- 4ppm • 300 dpi • 45 fonts • 2 MB RAM, up to 6MB
- AppleTalk, Serial, Parallel Interface

ACCELERATION

PowerCache

(Mac LC, SE/30, II, ltx, Iicx, Iisx, SE/30)
33 MHz PowerCache $639
33 MHz PowerCache with 68882 chip $639
40 MHz PowerCache $833
40 MHz PowerCache with 68882 chip $1069
50 MHz PowerCache $1299
50 MHz PowerCache with 68882 chip $1679

Expansion Boards for the Mac LC and Mac IIsi
PowerMath LC $109
Equalizer LC (virtual memory upgrade) $195
Equalizer LC (includes 68882 chip) $259

Network

Mac LC Series Ethernet Cards
Thin/10BaseT $195

Mac II Series Ethernet Cards
Thick/Thin, 16K or Thick/10BaseT, 16K $159
Thin/Thin, 64K or Thick/10BaseT, 64K $209
Mac II Series, E II Ethernet Cards
Thin/Thin/10BaseT, 64K $249

Other Mac Models Available!
Call 10BaseT Hub with 12 Ports
10BaseT Hub with 8 Ports $499
Friendly Net Adapters
Quadra & LaserWriter IIg (Thin or 10BaseT) $79

MISCELLANEOUS

3C 2400/9600 Baud Fax Board $189
3C 2400 Baud Modem (includes software & cable) $97

VIAASANTE

Mac LC Series Ethernet Cards
Thin/10BaseT $195

Mac II Series Ethernet Cards
Thick/Thin, 16K or Thick/10BaseT, 16K $159
Thin/Thin, 64K or Thick/10BaseT, 64K $209
Mac II Series, E II Ethernet Cards
Thin/Thin/10BaseT, 64K $249

Other Mac Models Available!
Call 10BaseT Hub with 12 Ports
10BaseT Hub with 8 Ports $499
Friendly Net Adapters
Quadra & LaserWriter IIg (Thin or 10BaseT) $79

Circle 46 on Reader Service Card.
MAGIC MODEMS

MAGIC FaxMODEMS

MAGIC AFX Fax MODEM
2400bps modem. 9600 send & 4800bps receive
class 1 & Group 1 & 3, fax, software..............$89

MAGIC FX Fax MODEM
2400bps modem. 9600bps send & receive
class 2 & Group 2 & 3, fax, software...............$139

MAGIC VFX Fax MODEM
9600bps modem. 9600bps class 1,2, Group 2 &
3 fax, V.42bis & MNP5, software..............$189

MAGIC VFX V.32bis Fax MODEM
14400bps modem. 14400bps class 1 & 2, Group 2,
3, & 4 fax, V.42bis/V.32bis & MNP5...........$289

MAGIC MODEMS

MagicAMX MODEM
2400bps modem. 100% Hayes compatible......$69

MAGIC VX MODEM
2400bps modem with compression to 9600bps.
Hardware V.42bis & MNP5..........................$139

MAGIC VX V.32 MODEM
9600bps modem with compression to 38400bps.
Hardware V.32/V.42bis & MNP5..................$199

MAGIC VX V.32bis MODEM
14400bps modem with compression to 57600bps.
Hardware V.32bis/V.42bis & MNP5..............$299

MAGIC MODEMS & IRONPAK

MAGIC HARD DRIVES

Magic 40MB Hard Drive*..........................$199
Magic 52MB Quantum LP**.....................$239
Magic 100MB Hard Drive*......................$299
Magic 105MB Quantum LP**...................$369
Magic 240MB Quantum LP**....................$699
Magic 425MB Quantum*.........................$1099
Magic 600MB Wren Runner*....................$1599
Magic 1.2GB Seagate*...........................$1999
Magic 1.5GB - 5 Year Warranty!..............$2099

MAGIC 45R & 88R

Magic 45R SyQuest Drive**.....................$49
Magic 88R SyQuest Drive**....................$49
SyQuest 45 & 88 Cartridges....................$69/$119

MAGIC TAPE

Magic 150MB Tape Backup*......................$69
Magic 525MB Tape Backup*.....................$99
Magic 600MB Tape Backup*.....................$99
Magic 2.0GB DAT Backup*.....................$1695
Magic 5.0-8.0GB DAT Backup*..................$1999
Magic 2.3GB 8mm Backup*.....................$2895
Magic 5.0GB 8mm Backup*.....................$3799

MAGIC 128 Optical

Magic 128MB REM Optical*.....................$1299
Magic 128MB 3.5" Cartridges...................$59

MAGIC CD-ROM

Magic Toshiba CD-ROM Drive....................$549

MAGIC TAPE BACKUPS

Magic 150MB Tape Backup*......................$69
Magic 525MB Tape Backup*.....................$99
Magic 600MB Tape Backup*.....................$99
Magic 2.0GB DAT Backup*.....................$1695
Magic 5.0-8.0GB DAT Backup*..................$1999
Magic 2.3GB 8mm Backup*.....................$2895
Magic 5.0GB 8mm Backup*.....................$3799

MAGIC CD-ROM BACKUPS

Magic Toshiba CD-ROM Drive....................$549
Magic RailGun 030
Accelerators for
Mac SE, Plus &
Classic,

Accelerators available
with built-in large
screen video output

Magic performance
upgrades for the
Mac LC, Ilsi, Ilii,
Classic II, SCSI

RAILGUN 030 PRO*

030 Accelerators with Built-in Video Output,
68882 Math CoProcessor, PMMU, &
Panasonic 19" Two Page Display for your
Macintosh SE, Plus, or Classic

16MHz RailGun FRO & 19"...........$899
25MHz RailGun FRO & 19"..........$999
33MHz RailGun FRO & 19"**.........$1299

*Add $99 for Classic or Plus Version
** 33MHz version includes Virtual 3.0

RAILGUN 030

030 Accelerators for your Macintosh SE, Plus,
or Classic. Optional 68881/2 Math FPU

Magic RailGun 16MHz.................$399
Magic RailGun 25MHz...................$499
Magic RailGun 33MHz..................$699
Math CoProcessor Upgrade...........$49
RailGun SCSI Accelerator.............$49

Magic Accelerators

The Magic Math 030 adds System 7 Virtual
memory capabilities and built-in math coprocessor
to your Macintosh LC & Classic II.

Magic LCD30 with CoProcessor.........$199
Magic Math LC CoProcessor...........$59
Magic Math Classic II CoProcessor......$59
Magic Ilsi Dual Slot Card with FPU......$99
Magic Cache Ili / Ilii 64k............$169

SCSI Accelerator

Magic SCSI II & Mirror Card..........$299

Magic Memory Upgrades

Magic Memory

Each Magic Memory Upgrade is backed by the
Magic Lifetime Guarantee. Magic SIMMs are
made of the highest quality components and
designed specifically for your hardware.

4MB SIMMs $99

Macintosh RAM

1MB SIMMs .......... Starting at $29
2MB SIMMs ............... $59
4MB SIMMs ............... $99
16MB SIMMs ............. $549
2MB PowerBook RAM ...... $149
4MB PowerBook RAM ...... $249
6MB PowerBook RAM ...... $299
4MB Classic Upgrade ..... $99
LC VRAM ..................... $69
Quadra VRAM .............. $35

1MB TI RAM $49

Print RAM

GCC LP/L 1MB .................. $49
LZ960/RealTech/Quicksor 8MB Kit .... $499
NEC Silentwriter 2 M90 2MB Upgrade .... $249
NEC Silentwriter Model 95 2MB ........ $159
QMS PS-410 4MB Upgrade .......... $239
QMS PS-815 4MB Upgrade .......... $349
TI 1MB RAM Upgrade ........... $49
TI Turbo RAM Upgrades ......... Call

Incredible Performance from your
Mac SE, Plus, & Classic

Hard Working Tools For Your Macintosh

MAGIC ACCELERATORS

The Magic Math 030 adds System 7 Virtual
memory capabilities and built-in math coprocessor
to your Macintosh LC & Classic II.

Magic LCD30 with CoProcessor........ $199
Magic Math LC CoProcessor.......... $59
Magic Math Classic II CoProcessor.... $59
Magic Ilsi Dual Slot Card with FPU.... $99
Magic Cache Ili / Ilii 64k............ $169

SCSI Accelerator

Magic SCSI II & Mirror Card......... $299

A Complete Line of
Memory Upgrades
for Macintosh
Computers
Printers
& Accelerators

All Magic Memory
Upgrades Include
A Full Lifetime
Warranty

MAC Products USA

1 800 622 3475

TEL 512-472-8881
FAX 512-499-0888
SINGAPORE 65-287-5181
MALAYSIA TEL 603-734-7330
CUSTOMER SERVICE
TECHNICAL SUPPORT
RETURNS SUBJECT TO
PRICES SUBJECT TO
RESTOCKING FEE
CHANGE & AVAILABILITY

Call PRICES
CIRCLE 137 ON READER SERVICE CARD.

Hard Working Tools For Your Macintosh

B09
**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 two-year warranty. Internal hard drives also include bracket kits to fit your particular Mac.

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>52MB</td>
<td>$239</td>
</tr>
<tr>
<td>105MB</td>
<td>$349</td>
</tr>
<tr>
<td>120MB</td>
<td>$429</td>
</tr>
<tr>
<td>240MB</td>
<td>$699</td>
</tr>
<tr>
<td>425MB</td>
<td>$1,099</td>
</tr>
</tbody>
</table>

**SyQuest**

All MacLand Removable Hard Drives come with our own installation and reference manual, DiskMaster Plus™ formatting utility software, cables, and a one-year warranty. Cartridge not included.

<table>
<thead>
<tr>
<th>44 Megabyte Hard Drives</th>
<th>88 Megabyte Hard Drives</th>
</tr>
</thead>
<tbody>
<tr>
<td>$399</td>
<td>$499</td>
</tr>
</tbody>
</table>

Cartridges:
- 10 Pak-ea. $62
- 5 Pak-ea. $63
- Singles $64

| 52MB | $299 |
| 105MB| $399 |
| 120MB| $499 |
| 240MB| $779 |
| 425MB| $1,149|

**Testing, Testing 1-2-3...**

That’s right, when you purchase a MacLand hard disk drive or removable hard disk drive, you can be assured that your drive has passed our rigorous 10 point quality testing program. We have one of the lowest failure rates in the industry. If, in the unlikely event you do encounter a problem, we take care of you with our 24 hour Rapid Repair program, because we know how important it is for you to keep your system running. Nobody does it quicker or better than MacLand.

**MEMORY**

| 1MB 80ns | $35 |
| 2MB 80ns | $73 |
| 4MB 80ns | $125 |

**RISK-FREE BUYING FROM MACLAND!**

Don't Take Chances On Your Hardware Purchases.
Here's Why Buying From MacLand Makes So Much Sense...

- MacLand is a NASDAQ Publicly Traded Company With Over $3 Million In Assets.
- MacLand has been distributing Mac and peripheral products for over 5 years.
- We offer Toll-Free Ordering and Technical Support.
- 3-Minute Order Processing. If you're in a hurry, we can take your order in an instant with our Macintosh networked computer system. If you're not, we will take all the time you need to make your purchase.

**To Order Call 1-800-333-3353**

MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217

Product names are trademarks or registered trademarks of their respective holders.
The Qume CrystalPrint Express is a lightning-fast laser printer with the muscle to handle the most demanding printing jobs.

Unbelievable Quality...Unbeatable Price

**Qume CrystalPrint Express**

The Qume CrystalPrint Express is a lightning-fast laser printer with the muscle to handle the most demanding printing jobs.

"For impressive speed at an affordable price, nothing beats the CrystalPrint Express" - MacUser Magazine, June 1991

The Express is backed by a full one-year manufacturer's warranty and MacLand's exclusive 30 day money back guarantee.

- Fast 12 Pages Per Minute
- Legal, Letter, Envelopes and Transparencies
- 3 Megabytes of Ram
- Dual Paper Trays
- 600 x 300 DPI
- 39 Resident Fonts

Only $1,999

---

**MacLand® 14" Color Monitor**

- Monitor $449
- Monitor & 256 Color Card $729
- Monitor & Million Plus Color Card $879

**Magnavox 14" Color Monitor**

- Monitor $489
- Monitor & 256 Color Card $749
- Monitor & Million Plus Color Card $899

---

**ORION TECHNOLOGIES**

**MacScan ULTRA**

- 14" Color Monitor $369
- Monitor & 256 Color Card $669
- Monitor & Million Plus Color Card $799

---

**ORION TECHNOLOGIES Complete Page Display**

- Crystal Clear Resolution!
- Front-Mounted Controls!
- Tilt-Swivel Base!
- 30-Day Money Back Guarantee!

**ORION TECHNOLOGIES Dual Page Display**

- See Two Full Pages At Once!
- Sharp Screen Resolution!
- Tilt-Swivel Base!
- 30-Day Money Back Guarantee!

**ORION TECHNOLOGIES Complete Page Display**

- Fast 12 Pages Per Minute
- Legal, Letter, Envelopes and Transparencies
- 3 Megabytes of Ram

**ORION TECHNOLOGIES Dual Page Display**

- See Two Full Pages At Once!
- Sharp Screen Resolution!
- Tilt-Swivel Base!
- 30-Day Money Back Guarantee!

---

**Unbelievable Quality...Unbeatable Price**

**Qume CrystalPrint Express**

The Qume CrystalPrint Express is a lightning-fast laser printer with the muscle to handle the most demanding printing jobs.

"For impressive speed at an affordable price, nothing beats the CrystalPrint Express" - MacUser Magazine, June 1991

The Express is backed by a full one-year manufacturer's warranty and MacLand's exclusive 30 day money back guarantee.

- Fast 12 Pages Per Minute
- Legal, Letter, Envelopes and Transparencies
- 3 Megabytes of Ram

Only $1,999

---

**To Order Call 1-800-333-3353**

MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802 24 Hr. Fax: (602) 345-2217

Circle 150 on Reader Service Card.

---

**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!
**Video Cord Required**

**Generation Systems**

New Color Pivot LE
Dual Orientation
624x832 pixels, 62 dpi
8-Bit Color
$799.00

**Video Spigot**

NuBus Version

with Adobe Premiere
$439.00

**Micron**

Color Boards
8-Bit SE/30 ... $299.00
24-Bit SE/30 ... $399.00

**SHARP JX-100**

18-Bit Portable color scanner with interface
$399.00

**Mac Depot Hard Drives**

PostScript Level 2 Printers

GS 309 ........ $1799.00
300dpi, 8.5 x 11", 9ppm

GS 415 ........ $4495.00
400dpi, 11 x 17", 15ppm

**Mass Micro**

DataPak45 ........ 24599
DataPak88 ........ 49999
DataPak mo/128 .. 15999

**System 7**

Personal Upgrade ...... $899

- AppleShare 3.0 ........ 9999
- AppleTalk, Remote Access ........ 16999
- QuickTime Starter Kit ........ 15599
- PC Exchange ........ 6599

Lower Prices  Great Service  Overnight Delivery  30-Day MBG
HARDWARE

SOFTWARE

DEPOT™

MAC PROJECT II
339.00
RESOLVE
169.00
MICROSOFT - 30 Day MBG
EXCEL 4.0
295.00
WORD 5.0
295.00
SWORKS
99.00
MAC BUSINESS BUNDLE
99.00
ACCU TEXT V3.0
599.00
DTP & GRAPHICS
ADOBE - 30 Day MBG (except fonts)
58.00
MICRO TYPE MANAGER
63.00
ILLUSTRATOR w/ATM
329.00
PHOTOSHOP 2.0
545.00
PREMIERE
299.00

Salamander

PowerBook Accessories

See the newest items!

Targus Premier/Case.............125
Universal Case............ 75
2mb memory module.............125
8mb memory module.............75
Notebook Keypad.............. 35
Quantum 120MB.............99

ALDUS - 30 Day MBG
FREEHAND 3.1
389.00
PAINTMASTER 4.2
489.00

CLARIS - 30 Day MBG
MACDIAOW PRO
249.00
QUAX - 30 Day MBG
QUAX PROJECT 3.0
579.00

UTILITY

AFTER HOURS SOFTWARE - 30 Day MBG
DATABOOK
75.00
AMAZE - 30 Day MBG
FABRICE CALENDAR
45.00
CLAYTON DAILY PULMER
45.00
BERKELEY - 30 Day MBG
28.00
MORE AFTER DARK
23.00
FIB - 30 Day MBG
128.00
HARD DISK TOOL KIT
124.00
MACA - 30 Day MBG
SNOWFLAKE KIT
149.00

SALIENT SOFTWARE - 30 Day MBG
AUTODRAW DISKDOUBLER
49.00
SYMANTEC - 30 Day MBG
NOTES PRO
95.00
SAM
65.00

Government purchase orders accepted.

Circle 53 on Reader Service Card.
128 megabytes of removable, erasable optical storage on fast, ultra-reliable 3.5" disks. 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. The 128REM™ is built for the future, conforming to both ANSI and ISO standards, ensuring upward compatibility.

DGR Price. DGR Performance. DGR Reliability. The DGR Technologies 128REM™

Includes One Year Warranty & 30 Day Money Back Guarantee

The Price/Performance Leader

—MacUser 3.5" Optical Drive Review, July 1992

$1,399

Order Direct 800-235-9748
In the 1992 hard-drive triple-crown, La Cie™ finished First, First, First. Never before has a single company swept all three Macworld World Class Award fixed-drive categories. And that’s not all! La Cie’s Silverscanner is also a 1992 Macworld champ. Thanks to all those Macworld readers who named La Cie the best bet in mass storage solutions. You’re the reason we work so hard to win!

The 1992 Macworld World Class Awards

Best Hard Drive!
(under 80MB)

Best Hard Drive!
(80-200MB)

Best Hard Drive!
(over 200MB)

Best Color Scanner!
La Cie Silverscanner

“...I’m now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie...”

MacWeek, February 1991
We’re the odds-on

Smart people know how to pick a winner! That’s why Macintosh users voted La Cie their favorite in all three 1992 Macworld World Class Award fixed-drive categories. For across-the-board quality, innovation, service and value, La Cie hard drives are the smart-money bet!

NEW! 120MB Powerbook Quantum Internal Drive

FREE! Powerbook openers $19.95 value

La Cie ZFP Drive

La Cie Cirrus

La Cie Tsunami Portable and fast, starting at under 2.75 lbs.

FREE! SilverliningTM $149 value

*Call for details on terms, conditions, limited money back guarantee and free offers. Price does not include shipping. Add sales tax where applicable. ZFP, ZFP Plus, Cirrus, Tsunami, PocketDock, PocketDock, ExpressDrive, Silverscanner, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992 La Cie Ltd. 8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.
favorite.

**Tsunami and Cirrus Drives**
Winner of Industrial Design's famous ID award, these beautiful quiet drives pack power beneath sinuous lines.

**Internal & ZFP™ Drives**
Economical, reliable and well-built.

<table>
<thead>
<tr>
<th>Drive Size</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>50MB Quantum LPS</td>
<td>$229</td>
<td>$299</td>
</tr>
<tr>
<td>80MB Qntm 2½&quot; for Powerbook</td>
<td>$449</td>
<td>PocketDrive</td>
</tr>
<tr>
<td>100MB Quantum LPS</td>
<td>$369</td>
<td>$469</td>
</tr>
<tr>
<td>120MB Quantum LPS</td>
<td>$419</td>
<td>$519</td>
</tr>
<tr>
<td>120MB Qntm 2½&quot; for Powerbook</td>
<td>$699</td>
<td>PocketDrive</td>
</tr>
<tr>
<td>240MB Quantum LPS</td>
<td>$679</td>
<td>$779</td>
</tr>
<tr>
<td>425MB Quantum Maui</td>
<td>$1019</td>
<td>$1119</td>
</tr>
<tr>
<td>650MB Seagate</td>
<td>$1649</td>
<td>$1749</td>
</tr>
<tr>
<td>1.2GB Seagate</td>
<td>$1899</td>
<td>$1999</td>
</tr>
<tr>
<td>1.6GB Seagate</td>
<td>$2799</td>
<td>$2949</td>
</tr>
</tbody>
</table>

**The La Cie Advantage**

With every La Cie hard drive you get:
- FREE Silverlining ($149 value)
- FREE switchable termination ($50 value)
- Universal power supply
- Approved by FCC, UL, TUV, VDE and CSA for legal safe operation and industrial grade quality

New! 30 Day Money Back Guarantee*

"I like the La Cie Drives Best"
David Ashbaugh

---

The 1992 Macworld World Class Awards

Best Hard Drive! (under 80MB)

Best Hard Drive! (80-200MB)

Best Color Scanner!
La Cie Silverscanner

"I like the La Cie Drives Best"

---

800-999-0143
6 a.m.-6 p.m. PST Mon.-Fri.
International 503-520-9000 Fax 503-520-9100

VISA, Mastercard, C.O.D. and approved purchase orders accepted*

---

$439 120MB ZFP Quantum Magnum®
We love to run! For you and with you! When it comes to fast-moving mass storage, La Cie's stable of portable, removable and removable media drives has our competition beat by a mile. Pack a palm-sized PocketDrive™ or pick our lightweight Cirrus Optical. Only the quality and service is heavyweight. We've got the Macworld World Class Awards to prove it! As a Quantum company, we'll run to your assistance for years to come!

See us at Macworld Expo! Bayside Expo Center Booth #1306

*Call for details on terms, conditions, limited money back guarantee and free offers. Price does not include shipping. Add sales tax where applicable. ZFP, ZFP Plus, Cirrus, Tsunami, PocketDrive, PocketDock, ExpressDrive, SilverScanner, SilverScan, Silverlining, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. © Copyright 1992 La Cie, Ltd.

8700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.
La Cie PocketDrives
Quantum power “to go.”
40MB PocketDrive incl. T-connector $249
80MB PocketDrive incl. T-connector $349
120MB PocketDrive incl. T-connector $499
Optional PocketDock Cable $99
Extra T-Connector $59

La Cie Optical Drives
Reliable, fast and economical.
128MB 3 1/2" Optical $1599

La Cie ExpressDrive
The ultimate in data security. Drives are both upward and downward compatible.
ExpressDrive Chassis $399
50MB Quantum LPS Drive $399
100MB Quantum LPS Drive $549
120MB Quantum LPS Drive $799
240MB Quantum LPS Drive $949

La Cie Tape Drives
155MB Tape Drive $649
1.3-2.0GB DAT Drive $1399

The 1992 Macworld World Class Awards
Best Hard Drive! (under 80MB)
Best Hard Drive! (80-200MB)
Best Hard Drive! (over 200MB)
Best Color Scanner!
La Cie Silverscanner
“Superb service and product.”
Mike Basham

For portability to go the distance, sprint to a phone and call toll free.
800-999-0143
6 a.m.-6 p.m. PST Mon.-Fri.
International 503-520-9000 Fax 503-520-9100
VISA, Mastercard, C.O.D. and approved purchase orders accepted*
You made Silverscanner™ number one. And, we're still riding hard for you! In the high-stakes race of color scanning, La Cie remains way out in front! Our Silverscanner is more versatile, more capable, more colorful than ever before. And when it comes to service, La Cie always finishes first. Why gamble on anything less.

*Call for details on terms, conditions, limited money back guarantee and free offers. Price does not include shipping. Add sales tax where applicable. ZFP, ZFP Plus, Cliris, Tsunami, PocketDrive, PocketDock, ExpressDrive, Silverscanner, Silverscan, Silvershine, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. Bundles in U.S.A. only. Ad design and production on Macintosh by Graphic Witness. © Copyright 1992 La Cie, Ltd. 6700 SW Creekside Place, Beaverton, OR 97005. Phone: (503) 520-9000, Fax: (503) 520-9100. All rights reserved. Printed in U.S.A.
La Cie Silverscanner
Our Silverscanner is so good, we used it to produce this ad.
Clean your glasses and take a look.
Gorgeous color. Fine image detail.
Excellent tonal range. Very high resolution. It's all there. The proof is right in front of you!
Bet on the Silverscanner.

- 24 bits, one pass, up to 1200 dpi
- Wide dynamic range
- Lightning fast scanning
- Color dynamic previews
- FREE Silverscan™ software plug-ins

La Cie Silverscanner
La Cie Silverscanner with Color It! and Read-It O.C.R. Pro! $1399
La Cie Silverscanner with Photoshop, ColorStudio and Read-It O.C.R. Pro! $1899
When it comes to world-class speed and performance, nothing eclipses the form and function of a true thoroughbred. At La Cie, our goal is to make each and every product a thoroughbred. From the sleek lines and dainty footprints of our award-winning cases to the power of our technological muscle, La Cie builds champions that leave the competition in the dust. And as a Quantum company, we have the financial strength and staying power to bring you future generations of winners. For unbeatable technology and support, La Cie's the winning pick. You can bet on it.
# Monitors to the Macs!

## RasterOps Color Systems

- **20" RasterOps Color Display with 8XL card**
  - $2395
- **20" RasterOps Color Display with Accelerated 24-bit card**
  - $2795
- **20" RasterOps Color Trinitron with Accelerated 24-bit Card**
  - $3195

## RasterOps Color Displays

- **16" Sweet 16 Color w/ MX purchase**
  - $995
- **20" Trinitron MultiScan Color**
  - $2745
- **21" Color Hitachi Quadra-Ready**
  - $2795

## Mac Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC II Color System</td>
<td>$1,195</td>
</tr>
<tr>
<td>Mac LC II 4MB RAM/66HD, Sony 1320 14&quot; Color Display, Apple Keyboard, Mouse, System 7 &amp; Hypercard</td>
<td>$3,595</td>
</tr>
<tr>
<td>IIIi Productivity System</td>
<td>$2,595</td>
</tr>
<tr>
<td>Mac IIIi 3MB/40HD, Lapis 15&quot; Full-Page Display, Apple Keyboard, Mouse, System 7 &amp; Hypercard</td>
<td>$1,145</td>
</tr>
</tbody>
</table>

## Scanners

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Umax UC630 w/Photoshop</td>
<td>$1,265</td>
</tr>
<tr>
<td>Microtek 600ZS w/Photoshop</td>
<td>$1,295</td>
</tr>
<tr>
<td>Microtek 1590 SlideScanner w/P</td>
<td>$1,595</td>
</tr>
<tr>
<td>Apple One Scanner</td>
<td>CALL</td>
</tr>
<tr>
<td>HP ScanJet Bg</td>
<td>CALL</td>
</tr>
</tbody>
</table>

## Drives & Storage

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLI Removable 44/88</td>
<td>$599/779</td>
</tr>
<tr>
<td>PLI Hiploctal</td>
<td>$469</td>
</tr>
<tr>
<td>Microtek CD-ROM</td>
<td>$725</td>
</tr>
<tr>
<td>Microtek 190T Tape Backup</td>
<td>$799</td>
</tr>
<tr>
<td>Microtek 3.5 Optical</td>
<td>$1,625</td>
</tr>
<tr>
<td>RoadRunner 80 Int. for PwbBook</td>
<td>$449</td>
</tr>
<tr>
<td>RoadRunner 80 Int. for PwbBook</td>
<td>$699</td>
</tr>
<tr>
<td>Athena A50 Transportable Drive</td>
<td>$450</td>
</tr>
<tr>
<td>Athena A100 Transportable Drive</td>
<td>$650</td>
</tr>
</tbody>
</table>

## Networking

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGSNB Mac II</td>
<td>$229</td>
</tr>
<tr>
<td>10T Hub 8 Port/12 Port</td>
<td>$295/499</td>
</tr>
<tr>
<td>FriendlyNet Adapters</td>
<td>$89</td>
</tr>
<tr>
<td>EN/SC Ethernet for PowerBook</td>
<td>$339</td>
</tr>
<tr>
<td>LCMC Ethernet for LC</td>
<td>$229</td>
</tr>
</tbody>
</table>

## Displays

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displays</td>
<td></td>
</tr>
<tr>
<td>Sony 132/1340</td>
<td>$379/CALL</td>
</tr>
<tr>
<td>E-Machines E-16/T-16DI</td>
<td>$895/125</td>
</tr>
<tr>
<td>Lapis Full-Page Gray Scale</td>
<td>$499</td>
</tr>
<tr>
<td>Lapis 19&quot; Dual-Page</td>
<td>$995</td>
</tr>
<tr>
<td>Apple 12/13</td>
<td>$499/999</td>
</tr>
<tr>
<td>VIDEO CARDS</td>
<td></td>
</tr>
<tr>
<td>E-Machines Dogro Color &amp; Futura CALL</td>
<td>$429</td>
</tr>
<tr>
<td>Lapis ColorServer Nu Bus</td>
<td>$429</td>
</tr>
<tr>
<td>Lapis ColorServer PDS/17</td>
<td>$525</td>
</tr>
</tbody>
</table>

## Modems

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FastCache ci (64K)</td>
<td>$299</td>
</tr>
<tr>
<td>ComboCache si</td>
<td>$335</td>
</tr>
<tr>
<td>PowerCache 32M Hz/w FPU</td>
<td>$645/845</td>
</tr>
<tr>
<td>PowerCache 40 Mhz/w FPU</td>
<td>$845/1025</td>
</tr>
<tr>
<td>PowerCache 50M Hz/w FPU</td>
<td>$1295/1545</td>
</tr>
</tbody>
</table>

## Printers

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>New RasterOps CorrectPrint 300</td>
<td>$779</td>
</tr>
<tr>
<td>Color Qty. Subs.</td>
<td></td>
</tr>
<tr>
<td>Picked/Perf. compatible</td>
<td></td>
</tr>
<tr>
<td>QMS PS-410W/35</td>
<td>$1,495/3895</td>
</tr>
<tr>
<td>Apple LaserWriter IIF/IIG</td>
<td>$285/3395</td>
</tr>
<tr>
<td>Apple LaserWriter NTR</td>
<td>CALL</td>
</tr>
</tbody>
</table>

## DayStar Accelerators

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>FastCache ci (64K)</td>
<td>$299</td>
</tr>
<tr>
<td>ComboCache si</td>
<td>$335</td>
</tr>
<tr>
<td>PowerCache 32M Hz/w FPU</td>
<td>$645/845</td>
</tr>
<tr>
<td>PowerCache 40 Mhz/w FPU</td>
<td>$845/1025</td>
</tr>
<tr>
<td>PowerCache 50M Hz/w FPU</td>
<td>$1295/1545</td>
</tr>
</tbody>
</table>

## Mac News

**Mac News Hours:** M-F 8am-7pm (CT) Sat 10am-2pm

**1-800-243-9383**
24 HR FAX 312-871-4556

Apple/ Mac are trademarks of Apple Computer. Prices subject to change without notice. All returned orders will be subject to a minimum 15% restocking fee plus return shipping. Call for BMA before returning. All warranties on Macintosh or Apple branded products sold by MacNews will be honored by MacNews or its authorized agents only. All other manufacturers’ warranties still apply.
Fujitsu 520 MB $1249
5-Year Warranty!

Fujitsu Performance and Reliability

- Increased performance levels in high-end Macs. Fujitsu drives have become the standard in reliable performance.
- Reliability demanded for data-intensive work in CAD/CAM, graphics, multimedia and network applications.
- An industry leading mean time between failure ~200,000 hours.
- Fujitsu’s incredible five-year disk-for-disk warranty.

WREN

MB  INTL  EXTL
630  1649  1749
1.2G 1899 1999
1.6G 2799 2949

Just ask away...When you phone, you have a right to expect courtesy, logic and a helpful attitude. Many people ask us questions about hard drives, SCSI addresses, termination, etc. We may not know all the answers, but we'll try to find any we don't have. If you decide to place an order, that's nice too.

Quantum

MB  INTL  EXTL
52  $229  $299
Go•80  439  N/A
Go•120699  N/A
105  349  429
120  399  479
240  659  729
425  1099  1169

Toshiba

MB  INTL  EXTL
830  $1499  $1599

800 MBs in your SE, SE/30, CI, Q-700

Fujitsu

MB  INTL  EXTL
330  $1099  $1199
520  1249  1349

Maxtor

MB  INTL  EXTL
120  $359  $439
213  499  569
340  949  1049
535  1249  1349
760  1399  1549
1.2G 1899  1999

Great Prices. Priceless Support!

- Helpful, knowledgeable sales associates.
- Toll-free technical support—call as often or for as long as you need. See why APS has won 2 MACWORLD Service Hero awards!

APS Technologies

- Disk-for-Disk Replacement Warranty—you'll probably never need it, but if you do, 90% of our warranty service is performed within 48 hours (most within 24 hours). Return shipping via FEDEX Standard Overnight Service—no charge.
- 24-hour BBS with the latest version of our software.
Toshiba CD-ROM $699

Get a Bundle

7-Disc APS Reference and Entertainment Library

- Toshiba’s exclusive contamination-proof mechanism
- Toshiba’s high performance—325 ms ave. access time
- Illustrated Encyclopedia
- World Atlas
- The Orient: InterOptica’s Multimedia Travel Encyclopedia
- Time Table of History: Science & Innovation
- Macintosh Animation Showcase
- Nautilus: Intro
- Sherlock Holmes: Consulting Detective

Monitors

Model
TriAm Full Page $399

Includes APS Reference and Entertainment Library

16 grays w/Macintosh si, ci and Quadra built-in video

256 grays w/Lapis card for SE/30, LC, Mac IIi..............$799

Sampo Dual Page Mono $699

Sampo Dual Page Grayscale

256 grays w/Lapis card......$849

DAT

Model INTL EXTL

APSDAT $1599 $1699

2.6–5 GB Compression DAT

APS_DAT 1299 1399

Desktop and Portable Units
Archive-based Mechanisms

TEAC 155 $499

Tape Drives Include Retrospect by Dantz Development

Toshiba

CD ROM $699

Includes APS Reference and Entertainment Library

SyQuest

Model EXTL

SQ-555 $459

SQ-5110 559

Dual 44 859

Dual 88 999

For a limited time—With any drive purchase, you can buy Redux or INITPicker by Microseeds Publishing, and CalendarMaker (any one, $20; any two, $33.95; any three, $44.95) or DiskTop by CE Software ($29.95).

1-800 235-2750
Your window to hot new products in the Macintosh industry. A unique section displaying new advertisers and their products. The place to turn first for this month's latest.

Machines you can write off. People you can't.

The National Cristina Foundation needs the old computers you're going to put out to pasture. Because computers you're planning to write off as useless, can prevent millions of people from being written off.

Your old computers can enjoy a fruitful second life — by giving new life. Everyday, all over the country, we're putting computers like yours to work helping train people with disabilities, the disadvantaged and students at risk. In time, they become people who hum with the skills society needs. Sparkle with the sense of self-fulfillment that comes from being wanted, productive members of the community.

By sending us computers you plan to discard we can help develop this precious human resource — the more than 43 million Americans with differing abilities.

In the process you might just help us discover another Beethoven, Albert Einstein, Franklin D. Roosevelt, or Helen Keller.

Machines you can write off. People you can't.

National Cristina Foundation
A not-for-profit foundation.

To donate computers call:
1-800 CRISTINA
(1-800-274-7846)

Helping people with differing abilities lead more productive lives.

Donated computers and office equipment are tax deductible.
INCLUDING YOUR ACCOUNTANT!

$4995

The Brother HT-500PS - the full color printer that lets you have & do it all - for only $4995!

That's right, $4995 gets you everything you ever wanted in a full-color printer - and then some.

16.7 million vivid, high density colors on both paper and transparencies, auto interface switching between parallel, serial & AppleTalk,™* auto emulation support of virtually any system or platform including HP-PCL and HP-GL®.® In short, it's all here.

Combine that with our 35 resident fonts, 5 MB of memory (expandable to 21 MB), our flexibility to work with anything from Harvard Graphics.®* to PageMaker.®* Excel™*, Illustrator.®* and our exclusive black and white bypass mode which lets you generate fully rasterized proof quality output on most laser printers with a video port, and you can see why this is one printer that will have the competition seeing red.

If you want to hear more about an affordable, high quality, full color printer, call us today at 908-356-8880 (extension 4300), for information on the Brother HT-500PS color printer.

The printer everyone is talking about.

## HARDWARE
<table>
<thead>
<tr>
<th>Category</th>
<th>Premier</th>
<th>Classified</th>
<th>Business Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerator Boards</td>
<td>367</td>
<td>373</td>
<td>391</td>
</tr>
<tr>
<td>Bar Coding</td>
<td>367</td>
<td>373</td>
<td>389</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>367</td>
<td>373</td>
<td>391</td>
</tr>
<tr>
<td>Communications</td>
<td>367</td>
<td>373</td>
<td>389</td>
</tr>
<tr>
<td>Computer Systems</td>
<td></td>
<td>373</td>
<td>389</td>
</tr>
<tr>
<td>Data Acquisition</td>
<td>367</td>
<td>373</td>
<td>391</td>
</tr>
<tr>
<td>Data Recovery Services</td>
<td>378</td>
<td></td>
<td>390</td>
</tr>
<tr>
<td>Disk Drives</td>
<td>367</td>
<td>373</td>
<td>391</td>
</tr>
<tr>
<td>Diskettes</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>General Input Devices</td>
<td>369</td>
<td></td>
<td>390</td>
</tr>
<tr>
<td>Insurance</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Memory Upgrades</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Networking</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Peripherals</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Power Supplies</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Printers</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Scanners</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Security</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Used Equipment</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
</tbody>
</table>

## SOFTWARE
<table>
<thead>
<tr>
<th>Category</th>
<th>Premier</th>
<th>Classified</th>
<th>Business Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Bar Coding</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Business</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Business Time Management</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>CAD/CAM</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>CD-ROM</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Communications/Networking</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Educational</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Emulation</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Engineering</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Entertainment/Games</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Financial</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Fonts</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Genealogy</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>General</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Government</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Graphics</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Health</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Language Tools</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Legal</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Lottery</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Medical/Dental</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Networking</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Personal Management</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Programming Tools</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Public Domain</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Real Estate</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Recreation</td>
<td>369</td>
<td>370</td>
<td>391</td>
</tr>
</tbody>
</table>

## MISCELLANEOUS
<table>
<thead>
<tr>
<th>Category</th>
<th>Premier</th>
<th>Classified</th>
<th>Business Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessories</td>
<td>366</td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Books/Catalogues</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Business Opportunities</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Consulting/Programming</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Data Conversion Services</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Desktop Publishing Services</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Diskette Copy Services</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Furniture</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Novelties</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Services/Repair</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Slide Imaging Services</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Supplies</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
<tr>
<td>Training</td>
<td></td>
<td>370</td>
<td>391</td>
</tr>
</tbody>
</table>

## AD SALES INFORMATION
One Park Avenue, New York, NY 10016
(212) 503-5115 or (800) 825-4ADS

## ACCOUNT REPRESENTATIVES
- **Sherrie M. Graddic**
  Business Card Representative
  [212] 503-5152
- **Larry Grella**
  [212] 503-5138
  AL, AR, IA, IL, IN, KS, KY, LA, MI, MO, MS, NE, OH, OK, TX, WI, CANADA, OVERSEAS
- **Thomas P. Koletas**
  [212] 503-5136
  CT, DC, DE, FL, GA, MA, MD, ME, NC, NH, NJ, NY, PA, RI, SC, VA, VT, WV
- **Dennis M. Leavey**
  [212] 503-5111
  AK, CA, CO (202, 408, 415), 510, 707, 800, 803, 916, HI, ID, MN, MT, ND, NV, OR, SD, WA, WY
- **Laura A. Salerno**
  [212] 503-5140
  AZ, CA (213, 310, 619, 714), CO, NM, UT

## CENTRAL ADVERTISING STAFF
- **Paul Stafford**
  Vice President, Central Advertising
- **Anne R. Brockinton**
  Production Director
- **Chris Meyer**
  Production Coordinator
HARDWARE/ACCELERATOR BOARDS–DISK DRIVES

PUSH YOUR MAC TO THE EXTREME

The competition claims nobody's faster - We'll guarantee it!!

VANDAL™ combines an incredible performance increase for your SE with on-board support for a variety of third party single page and dual page monochrome monitors. You get the power of a fully functional MC68030 running at 33-50 MHz and 4 or 16MB of 32bit high speed memory to accelerate all your applications. The VANDAL offers the ability to change monitors on the fly from the Control panel.

IMPACT™ increases the speed performance of your LC/LCII by 200-300%!! The MC68030 CPU operating at 32MHz allows full use of System 7's Virtual Memory without additional software. Also included is a 32K direct mapped external cache with write thru for increased overall performance. With IMPACT installed, the LC or LCII exceeds the performance of a Mac IIC!!

EXTENDER™ A low cost way to extend the power of your LC past the LCII! Run System 7's virtual memory. Features a 16MHz 68030. Buy today, and you can upgrade to the faster IMPACT accelerators.

For more EXTREME speed & power, all boards are available with optional 68882 math chip. Easy installation, no adapters required.

FOR MORE INFORMATION CALL 1-800-995-2334

EXTREME SYSTEMS
1-800-752-1333
International: 612-937-1107 • Fax: 612-937-5815
6321 Bury Drive, Eden Prairie, MN 55344

Stop leaning on your elbows during screen refreshes! If you're looking for blow-your-hair-back-speed, the ImagePro™ combination accelerator-video board delivers a sizzling 400-1400% blast! Works with most large monitors, including Radius™. Buying your little Mac was a good investment, now you can make it a better one with our ImagePro™ board. Motorola 68030 processor & math co-processor • SIMM sockets for extra memory • Speeds of 16, 25, & 33MHz • 15" & 19" Monitors 30 day-money-back guarantee • Formatted and loaded with System 6.07 or 7.01

Call 1-800-638-4784 for The One Board Solution
ImagePro
System Technology Corporation • 1860 Fern Palm Dr. • Edgewater, FL 32141
Tech Support 904-428-0411 • Fax 904-428-0765

CIRCLE 250 ON READER SERVICE CARD

IF YOU HATE TO WAIT...

Install Your Large Hard Drive with a Click of Your Mouse.

Installation of virtually any SCSI drive is easy and only minutes away with Ontrack's DiskManager Mac hard disk installation utility for Macintosh.

• Create customized partitions.
• Complete with utilities to manage and secure your data.
• Available with or without a hardware installation kit.

Completely System 7 Compliant

1-800-752-1333

CIRCLE 251 ON READER SERVICE CARD

QUICKOR IS BETTER

40 OR 105MB FAST DRIVES
• One year warranty
• All cables
• Anti-virus software
• Formatted and loaded

40MB ONLY $248
105MB ONLY $448

40 OR SOME SUPER SMALL DRIVES
• Formatted and ready to go
• Just a little larger than your mouse
• Cable not included

40MB ONLY $399
105MB ONLY $699

Call 1-800-638-4784 for The One Board Solution
QuickKit
System Technology Corporation • 1860 Fern Palm Dr. • Edgewater, FL 32141
Tech Support 904-428-0411 • Fax 904-428-0765

CIRCLE 252 ON READER SERVICE CARD

MacUser September 1992 367
Current TMS Hard Drive owners call today about the $99 TMS "Shadow To Go" upgrade policy!

Shadow 52 LPS 11ms $329
Shadow 105 LPS 11ms $462
Shadow 120 LPS 10ms $539
Shadow 240 LPS 10ms $839
Shadow 425 10ms $1399

"This is one case where less means more."

TMS PRO SERIES DRIVES
Two Year Full Warranty
Activated Quantum Buffer
Int. Ext.
Pro 52 LPS 10ms $239 $319
Pro 105 LPS 10ms $372 $452
Pro 120 LPS 10ms $449 $529
Pro 240 LPS 10ms $749 $829
Pro 425 10ms $1319 $1399

Extended Service Program Available
Call Today

TMS REMOVABLE SUBSYSTEMS
SyQuest Two Year Full Warranty
TMS Pro R45 20ms $429
Includes 1 cartridge, cartridges $67.95

TMS TAPE BACKUP SYSTEM
TEAC One Year Full Warranty
TMS Pro T155 & 1 tape $499
Extra tapes $19.95

RETROSPECT by Dantz—$100 Program Available with the purchase of tape drive

PRO SERIES FEATURES:
- Easy Access front window
- International Auto-switching PS
- Selectable Pushbutton SCSI ID Switch
- Thermostatically Controlled Fan
- Shielded Power Supply
- Full Hardware & Documentation
- IDEL • FREE TECHNICAL SUPPORT

Our Pro Series 210 Mb Drive was awarded 4 Mice in the April 1992 MacUser—"The 1992 Product of the Year!"

Call Today For A Quote On Your Ideal System!
The Perfect Couple-Together at Last!

Use one hand for your mouse, the other to enter data on the BAT, your 7" x 7", seven key Chord KeyPad™. Chord technology combines ergonomics principles to emulate a complete Macintosh extended keyboard. Wrist supported, fingers rest on five home keys while thumb controls two shift keys. Data is entered by "chording" or striking combinations of keys. No more looking from screen to keyboard. Learn in 45 min. Comfortable. Efficient. PC compatible.

Explore the rapport of BAT and Mouse.
Single Chord KeyPad™ $295.
Dual Chord KeyPad™ $495.

ArtiScan gives you—state-of-the-art resolution and impeccable image quality. When it comes to professional flatbed scanners, MacUser Magazine had this to say about the Tamarack ArtiScan:
"Produced the best image"; "Its hardware is impressive"; "The fastest"; "Exhibited excellent color accuracy"; "At the top of the heap" (December 1991).
ArtiScan gives you hardware up to 800 DPI and 24 bit per pixel (16.7 million colors and 256 gray levels). SCSI interface for fast operation. Hardware Gamma correction for accurate image enhancement.

• Photoshop Full 2.01 included.
• 6000C: $1245 • 8000C: $1545
• Transparency option (to scan 8.5" x 11.7" x-rays, slides, etc. . .): $645

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.

Introduction to the BookEndz PowerBook Docking Station

Introductory Pricing:
Model 100 $149 Model 140/170 $179

• Requires No Power
• Model 160, 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!

Pilot Technologies, Inc.

Give yourself the Premier Advantage!
The prominence and dominance of full-color display advertising at low, cost-effective rates is one of the smartest marketing enhancements you can give your products in front of 382,000 Macintosh business buyers.

MacUser Premier 800-825-4237
MacBARCODA
for Bar Codes that don't fail

LABEL DESIGNER
The ultimate in label printing
Two great time and cost savers. Both technically outstanding and easy to use

MacBARCODA
- Eliminates film masters
- More precise adjustment than fonts.
- Producing bar codes in EPSF.
- Supports UPC, Code 39, ITF, ISBN and EAN.
- Compatible with popular page design packages.
- Also available with color.
- A suite of D.A.'s.
- Prices from $349.

LABEL DESIGNER
- Used daily to produce all types of labels on a PostScript® printer.
- For $245 look what you get

T-Script
PostScript® Language Interpreter and Utilities
- Outputs PostScript® documents to Apple (incl. StyleWriter, Laser LS), HP, GCC, Canon, Epson, Mitsubishi and others.
- PostScript® to TIFF converter, variable resolution up to 2000 dpi color.
- Supports all PostScript® fonts.
- Previews PostScript® files.
- Chooser level & AppleTalk compatible.
- System 7.0 and TrueType compatible.

BodyCello
ORDER NOW! 1-800-922-3556
- 24-bit color with picture viewer.
- CD-ROMs are 24-bit color with picture viewer.
- Disk sets are 8-bit color with picture viewer.

Kids write their own "animated" stories when they play...

Test Your Surgical Skills On This Patient's Brain - When You Play . . . SURGEON 3 THE BRAIN

This unique program allows children to express their creativity while making animated storybooks. They learn important language skills but also have lots of fun! After writing a story, they can play it like a movie!

FEATURES
- Paint Tools Palette - Create your own Background
- Objects - Place them in the background
- Characters - Choose from a girl, a boy, a dog, a cat or a bird. Watch them move!
- Sounds - Add your own voice or any sound.

For FREE Demo Disk Call • 408-737-9454

For MORE INFORMATION Call ISM at (410) 560-0973 • Fax: (410) 560-1306

Kids write their own "animated" stories when they play...

For MORE INFORMATION
Call ISM at (410) 560-0973
FAX: (410) 560-1306
High Yield CD

More than a mind full.

The Macademic™ CD-ROM is the world's largest library of Macintosh educational software. Designed for educators and students of all ages with more than 7,500 educational programs and related files ranging from art and music to math and science, foreign languages, religion, reading and spelling, health, programming and more...

Quantum Leap
CD SOFTWARE
We deliver great value.
1-800-762-2877
(305) 885-9985 • Fax (305) 885-9986

Ciao!, ¡Hola!, Привет!, Guten Tag!
From the HyperGlot Software Co., the Leader in Foreign Language Software for the Macintosh in Spanish, French, German, English, Russian, Italian, Japanese, and Chinese featuring extensive digitized sound or CD audio!

Call or write HyperGlot for your free catalog today!
800-726-5087 P.O. Box 10746, Knoxville, TN 37939-0746

Ciao!

Easy4D™
Simply the best
4th DIMENSION® development environment available.

"If you're looking for a shell that teams outstanding features with a well-designed interface, choose Easy4D."
—MacUser, Feb. '92, p. 60

Using 4th DIMENSION?
Start with Easy4D. It gives you everything you need to create polished, professional databases in the shortest time. Features include:

- Fully functional layout templates
- Built-in mail merge
- On-line customizable help
- Codeless Custom Reports
- 30-day money-back guarantee
- Extensive documentation

Natural Intelligence, Inc.
297 Massachusetts Ave., Cambridge, MA 02140
800-999-5649 • 617-376-1878 • Fax 617-992-7425

Call or write HyperGlot for your free catalog today!
800-726-5087 P.O. Box 10746, Knoxville, TN 37939-0746

Ciao!

Ciao!

PRACTICA MUSICAM™
Your personal music tutor

—MacUser, August 1990

- Intervals, chords, melody, rhythm
- Interactive staff notation
- Scales
- Uses built-in sound or MIDI manager
- Historical & computer-generated melodies
- Custom ear training melodies
- Scorekeeping
- Includes textbook
- Beginning to advanced

ARNOVA • 800-415-4666 • Box 637, Kirkland WA 98033

VERSIO 2.3 • $125

MacUser Premier
800-825-4237

MacUser September 1992 371
We’ve seen slide service bureaus come and we’ve seen slide service bureaus go. Find out why, year after year, business professionals that demand high quality output and top notch service rely on Accent Presentations.

- 4K Solitaire imaging
- PostScript imaging
- Ilford overheads and prints
- Virtually all PC and Mac programs supported
- 24 hour turnaround
- Toll-free customer support
- Free Fed-Ex shipping
- First five slides free

We help you project your best image. Call us, toll-free, and say “I’d like to try you free.”

ACCENT PRESENTATIONS
San Diego, CA • Minneapolis/St. Paul, MN

Overnight
$495

Postscript Imaging from Mac/PC Files

- 35mm Color Slides (4000 line)
- Canon CLC 500 Fiery Color Lasers
- Ilford Color Overheads and Prints
- Tektronix Thermal Prints and Overheads
- BBS Information Service (404)874-4804

Just send us your native files. Files received by 10 am or Priority Federal Express are back to you the following morning. We make imaging easy...CALL TODAY!

The BEST PRODUCTS, TECHNICAL SUPPORT, & PRICES Available!

(800)232-5411 or (404)874-6740

CIRCLE 271 ON READER SERVICE CARD

NOW, YOU CAN AFFORD TO LOOK AS GOOD AS YOU ARE!

MacUser’s brilliant, four-color Premier section—packed with sales power and panache—is the ideal way to show 382,000 Macintosh business buyers that your cutting-edge company has truly arrived. Make your promotional launch to the “big time” with a Premier ad that’s not only a beautiful showcase for your capabilities, but a truly affordable marketing enhancement. Call today for details!

MacUser Premier
800-825-4237

Cost-effective full color arrives!

MacUser Marketplace Premier makes the power and panache of 4-color display advertising truly affordable. Let Premier launch your company to the “big time” - 382,000 Macintosh business buyers!

MacUser Premier
800-825-4237
CIRC LE 306 ON READER SERVICE CARD

BAR CODING

WORTHINGTON BAR CODE READERS

• Top rated by Independent review!
• Optional Magstripe Input
• 1 or 2 scanners per reader
• Complete with Laser Scanner - $1389
• Complete with SteelWand - $399

PORTABLE BAR CODE READERS

• Battery Operated Reader
• 64K or 256K Memory
• 2x16 LCD, 32 Key Keyboard
• Complete 64K Unit with Laser - $1734
• Complete 64K Unit with Wand - $799

For all Macintosh models. European Keyboards Supported
• Attaches through ADB as Second Keyboard
• Wand, CCD or Laser input
• 2of5, UPC/EAN, 128, MSI, Code39
• 2 year warranty
• Same day shipping, Free UPS Blue

"The WOP Reader is highly reliable and easy to use."
Brett Fifield, Bitstream Inc.

Call Toll Free in the USA or Canada
800-345-4220

European Office: Rotterdamse 6
9501 Appencorn, Switzerland
71 87 51 15
71 87 51 17 Fax

USA Headquarters:
417 Imallas Street
Santa Cruz, CA 95060
408-456-7938
408-456-9944 Fax

CIRC LE 304 ON READER SERVICE CARD

BAR CODE & 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 in 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

MacUser September 1992 373
SPECTACULAR DEMO SALE!

APPLE

PowerBook 170
4/40 w/fax modem - $3,175.00
8/40 w/fax modem - $3,535.00

PowerBook 140
4/40 - $2,139.00
8/40 - $2,499.00

PowerBook 100
2/20 w/ext. floppy - $949.00
4/20 w/ext. floppy - $1,099.00

* Accessories for PowerBooks Available

ALL CONFIGURATIONS AVAILABLE

Mac Plus - $450.00
Mac SE -
1/20 (800K) - $650.00
1/20 (FDHD) - $795.00
Mac II
1/40 - $1,495.00
4/80 - $1,795.00
Mac IIx
1/40 - $1,849.00
4/80 - $2,149.00

Mac II ci
5/0 - $2,350.00
5/80 - $2,575.00
5/160 - $2,725.00

Mac Classic
4/40 - $899.00

Mac Classic II
4/40 - $1,079.00

Mac SE/30
2/40 - $1,699.00
4/80 - $1,999.00

Mac LC
NEW 2/40 - $1,099.00
Demo 2/40 - $999.00

SPECIALS + Apple Parts & Upgrades

8 Bit Video Cards - $129.00

Power Supplies
PLUS, SE, Mac II, IIx
Quatra, LC, II si, etc.

Printer Parts
Laserwriters, Imagewriters, etc.

Apple Keyboards

Mac Monitors
12" Mono - $175.00
12" RGB - $325.00
13" Hi-Res RGB - $499.00
Two Page Mono - $799.00
21" Color - $1,999.00
Apple Univ. Mon. Stands - $35.00

Apple Peripherals
CD SC Drive - $275.00
CD Plus - $349.00
Apple Scanner - $450.00
Apple Scanner One - $825.00

Logic Boards
128K to Quadra 900

Upgrades
SE/30, IIci, Quadra700, etc.

Monitors
Parts and video cards - all available
HP Deskwriters - $275.00

QMS
ColorScript 100 Model 10 - Demo - $3,199.00
New - $4,499.00
PS 810 Postscript Printer - Demo - $1,399.00
New - $1,699.00
Turbo (NEW) - $2,399.00
PS 815 MR Printer - Demo - $2,749.00
New - $2,999.00
PS 820 Printer - Demo - $1,599.00
New - $1,699.00
Turbo (Demo) - $2,599.00
PS 410 Laser Printer - Demo - $899.00
New - $1,199.00
PS 2220 - Demo - $5,500.00
New - $6,995.00
QMS Accessories, Paper, Paper Trays, Memory, etc.
Call for Super Deals!!! (BELOW DEALER COST)

1-800-729-7031

Compare Our Prices, Quality & Service.

RADIUS, RasterOps, SuperMac
Super deals on new and demo monitors, video cards, etc. Call for Super Prices !!!!
Used Mac Truckload Sale!

Mac Plus Upgrades
Upgrade your 128K/512 for
Mac Plus CPU Only $399
Upgrade 512k enhanced Only $199

Regular Laserwriter $799
3804 Karen Ln.
Bossier City, La. 71112
Tech line 318-742-0546

Shreve Systems 800-227-3971

Mac Parts!

Blowout Parts & Stuff!

Upgrade  $1999
Iic to Quadra 700
Iicx to Quadra 700
Apple 40-meg tape backup
8-bit video board

Apple 12" mono mon. & bd
Price: $549
Fujitsu 800K external floppy
Price: $79

SE 1/20 $649
(keyboard extra)

Mac Plus Upgrades

Mac In Stock®
800-944-6227
Fax: 305/321-0905 • Reseller Fax: 305/321-9818 • Int'l: 305/321-0904

INTERNATIONAL COMPUTER & NETWORKING

Mac BYTE
22775 Pacific Coast Hwy, Malibu, CA 90265

Cash For Your Mac or Peripheral
Low & High End Custom Setups
Preowned Macs with Warranty

800-432-BYTE
OPEN MON. - SAT.
### COMPUTER SYSTEMS

#### Computer Design & Graphic Systems

<table>
<thead>
<tr>
<th>MONITORS</th>
<th>PRINTERS</th>
<th>STORAGE/MISC.</th>
<th>CPU'S</th>
<th>DISPLAY CARDS</th>
<th>SCANNERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerBook</td>
<td>Mac IIci</td>
<td>SuperMac</td>
<td>40</td>
<td>4140</td>
<td>2325</td>
</tr>
<tr>
<td>8MB/120HD..</td>
<td>53180</td>
<td>9.24</td>
<td>6465</td>
<td>20MB/256HD 15195</td>
<td>16455</td>
</tr>
<tr>
<td>Classic II</td>
<td>8MB/40HD..</td>
<td>11299</td>
<td>8MB/120HD..</td>
<td>53180</td>
<td>9.24</td>
</tr>
<tr>
<td>Mac LCII</td>
<td>8MB/40HD..</td>
<td>11299</td>
<td>8MB/120HD..</td>
<td>53180</td>
<td>9.24</td>
</tr>
<tr>
<td>Mac Illi</td>
<td>8MB/40HD..</td>
<td>11299</td>
<td>8MB/120HD..</td>
<td>53180</td>
<td>9.24</td>
</tr>
<tr>
<td>Apple Monitor</td>
<td>12 Color ......</td>
<td>409</td>
<td>13 Color ......</td>
<td>649</td>
<td>16 Color ......</td>
</tr>
<tr>
<td>SuperMac</td>
<td>StyleWriter ......</td>
<td>1345</td>
<td>Personal NT ......</td>
<td>1125</td>
<td>Laser NTR ......</td>
</tr>
<tr>
<td>Radius</td>
<td>Precision Be ......</td>
<td>1729</td>
<td>Precision 24x ......</td>
<td>1655</td>
<td>Printer Mono ......</td>
</tr>
<tr>
<td>Microtek</td>
<td>TrueLaser ......</td>
<td>1729</td>
<td>Precision Be ......</td>
<td>1729</td>
<td>Print Color ......</td>
</tr>
<tr>
<td>E-Machine</td>
<td>SXMMX ......</td>
<td>489709</td>
<td>E 16 Monitor ......</td>
<td>989</td>
<td>Optical 12MB/1149</td>
</tr>
<tr>
<td>Apple Printers</td>
<td>StyleWriter ......</td>
<td>1345</td>
<td>Personal NT ......</td>
<td>1125</td>
<td>Laser NTR ......</td>
</tr>
<tr>
<td>HP Printers</td>
<td>DeskWriter ......</td>
<td>335</td>
<td>DeskWriter C ......</td>
<td>915</td>
<td>Laser IIF ......</td>
</tr>
<tr>
<td>Texas Instrument</td>
<td>PS17, 2.5MB ......</td>
<td>1149</td>
<td>PS31, 2.5MB ......</td>
<td>1149</td>
<td>Texas 24/96 ......</td>
</tr>
<tr>
<td>MAXUM</td>
<td>UC 630 ......</td>
<td>1229</td>
<td>UC 1000 ......</td>
<td>149</td>
<td>Case ......</td>
</tr>
</tbody>
</table>

#### MACMARKET

**All systems bench tested before shipping**

- Toll free technical support
- Free Shipping in California
- We only sell new systems with a full one year warranty
- Visa, MC, & Discover add 2.5%
- You are not charged until your order is shipped
- Prices are subject to change without notice

**Toll free technical support**

- 818.708.6388 (California)
- 818.708.6399
- 800-223-4-MAC

**Entire Macintosh Line**

**New and Used, Bought and Sold**

Latest models in stock!

**Compare Our Prices, Quality & Service.**

**We'll pay cash for your Macintosh Equipment.**

**Your Classified in Marketplace acts!**

In fact, this proven buying section has sold products so successfully—month after month—that 80% of our classified advertisers place their ads here on a consistent basis. The one outstanding reason for this tremendous selling success is that 90% of buyers read MacUser Marketplace! And more than 2 in 3 of them took action in the past 12 months as a result of reading Marketplace.

**MacUser Classified**

**800-825-4237**

**You are not charged until your order is shipped.**

**We only sell new systems with a full one year warranty.**

**Entire Macintosh Line**

**New and Used, Bought and Sold**

Latest models in stock!

**Compare Our Prices, Quality & Service.**

**We'll pay cash for your Macintosh Equipment.**

**Your Classified in Marketplace acts!**

In fact, this proven buying section has sold products so successfully—month after month—that 80% of our classified advertisers place their ads here on a consistent basis. The one outstanding reason for this tremendous selling success is that 90% of buyers read MacUser Marketplace! And more than 2 in 3 of them took action in the past 12 months as a result of reading Marketplace.

**MacUser Classified**

**800-825-4237**

**You are not charged until your order is shipped.**

**We only sell new systems with a full one year warranty.**
INSURANCE

Insurance

SAFEWARE: provides full replacement of hardware, media and purchased software. As low as $6.99 a year, provides comprehensive coverage. Theft, fire, power surge, storms and more. No lists of equipment are needed. One call does it all! Call 8am to 10pm ET (Sat. 9 to 5). SAFEWARE, THE INSURANCE AGENCY INC., 2929 N. High Street, P.O. Box 20211 Columbus, OH 43202 (800) 848-3469 (NAT) or (614) 262-0559 (OH)

MACUser Marketplace

To place your ad call
(212) 503-5115 or
(800) 525-4ADS

INSURES YOUR COMPUTER

ComputerInsurance PLUS

Include in one easy step ComputerInsurance PLUS replaces your computer after fire, theft, power surge, natural disasters, including earthquake. Call NOW to receive comprehensive coverage and full replacement. The ComputerInsurance Agency, Inc. 6150 Old Millersport Rd. NE Pleasantville, OH 43148 (800) 722-0385 10 a.m.-6 p.m.

MEMORY UPGRADES

SIMMS

CALL FOR LOWEST PRICES ON
MAC SIMMS 256K TO 16 MEG. AS LOW AS $31.00 PER MEG
INSTALLATION INSTRUCTIONS INCLUDED
LIFETIME WARRANTY
NO SUR-CHARGE FOR MC OR VISA
1-800-662 SIMM (1988)
WE'VE BEEN IN THE SEMICONDUCTOR BUSINESS FOR 28 YEARS
DATA MEMORY SYSTEMS CO
508-683-2235 FAX 508-876-5223

CIRCLE 322 ON READER SERVICE CARD

MacUser Marketplace

Second Color Option Available

MEMORY UPGRADES

16MB TECHNOLOGY NOW!!

MAC IIfx - 16MB SIMM $ 509.00
MAC IIci, cx, si, &
QUADRA 900 - 16MB SIMM $ 499.00
MAC QUADRA 950 - 16MB SIMM $ 499.00
MAC QUADRA 700 - 16MB SIMM $ 549.00
MAC POWERBOOK 140,170 - 6MB $ 279.00

PRICES SUBJECT TO CHANGE WITHOUT NOTICE

OTHER MEMORIES AVAILABLE: 1X8, 2X8, 4X8, 6X8, 16X8, POWERBOOK, LC V-RAM, QUADRA V-RAM

CALL FOR OUR COMPLETE CATALOG

TELE: (818)855-5688 FAX (818)855-5687

TUES, WED, THU, C.O.D., CASH, VISA OR MASTERCARD. COMPANY AND UNIVERSITY P.O.'S ACCEPTED UPON CREDIT APPROVAL.

414 CLOVERLEAF DR., UNIT B, BALDWIN PARK, CA 91706

CIRCLE 333 ON READER SERVICE CARD
## Applied Engineering

- QuickSilver Ilsi: $219
- QuickSilver Ilsi with FPU: $279
- Transwarp SE: $729
- Transwarp LC 25mHz: $579
- Transwarp LC 35mHz: $919
- Transwarp LC 40mHz: $1259
- Transwarp LC 50mHz: $1389
- Transwarp Accelerator 40: $1759
- FastMath LC: $119
- FastMath Classic II: $129

## Daystar

- Universal PowerCache: $649
- 33mHz: $839
- 40mHz: $1049
- 50mHz: $1309
- 50mHz w/FPU: $1569
- Power Cache adapter: $33
- FastCache Ilsi 64K: $299
- FastCache Ilsi 64K w/FPU: $359

## Technology Works

- 4x8x80 Mac II/IIx: $135
- 64K Ilic: $145
- MacIlsi Adapter - 20MHz: $95
- LC 512K VRAM: $55

## SYquest Cartridges

- 44MB Cartridge: $64
- 88MB Cartridge: $109

## Quick30

- 25 MHz Accelerator for Mac Plus: $525
- 25 MHz Accelerator for SE: $525
- ImagePro 10MHz for SE: $175
- ImagePro 25MHz for SE: $375
- ImagePro 33MHz for SE: $725

## NewLife

- Newlife 16MHz
- Mac Classic Accelerator: $569

## Computer Care

- Mac Rescue: $219

## Siemens

- 1x8x80: $31
- 4x8x80: $109
- 2x8x80: $58

### Models

- Quick30 25 MHz Accelerator for Mac Plus: $525
- Quick30 25 MHz Accelerator for SE: $525
- ImagePro 10MHz for SE: $175
- ImagePro 25MHz for SE: $375
- ImagePro 33MHz for SE: $725

### Newlife

- 16MHz
- Mac Classic Accelerator: $569

### Siemens

- 1x8x80: $31
- 4x8x80: $109
- 2x8x80: $58

## MacPortable Siemens

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB100-2MB</td>
<td>$109</td>
</tr>
<tr>
<td>PB100-4MB</td>
<td>$299</td>
</tr>
<tr>
<td>PB100-6MB</td>
<td>$299</td>
</tr>
<tr>
<td>PB140/170-2MB</td>
<td>$109</td>
</tr>
</tbody>
</table>

## Powerbook

- PB140/170-4MB: $249
- PB140/170-6MB: $299
- Internal Powerbook Hard Drive: $689

## Bernoulli Disks

- Bernoulli 44MB Removable Disk 3-pack: $265
- Bernoulli 90MB Removable Disk 3-pack: $435

## CD ROM Drives

- Toshiba CD ROM with Kit: $695
- CD ROM Gallery NEC: $495
- CD ROM Gallery NEC: $735

## Fax Your Order 24 Hours A Day

Call Between 7AM and 6PM Pacific Time Weekdays
And 9AM-4PM Saturdays
1-800-848-8967

The LLB Company, Inc. • 300 - 120th Ave NE • Blg. 1, Suite 120 • Bellevue, WA 98005
Phone: (206) 454-7302 • Fax (206) 454-7302 FAX YOUR ORDER 24 HOURS A DAY

- Orders received before 7:30 PM Eastern Time weekdays ship same day.
- We export to most countries in the world.
- Prices subject to change.
- Quantity pricing for dealers.

### Compare Our Low Shipping Prices:

- $6 And up Overnight shipping by Airborne Express.
- $4 And up ground shipping by UPS.

- Orders received before 7:30 PM Eastern Time weekdays ship same day.
- We export to most countries in the world.
- Prices subject to change.
- Quantity pricing for dealers.
- • Bank cards accepted. Your card is not charged until the order is shipped.
- • All returns require approval and are subject to a restocking fee.
- • All government & educational PO’s accepted upon approval.
<table>
<thead>
<tr>
<th>SIMMs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Megabyte 70 ns</td>
<td>$31.00</td>
</tr>
<tr>
<td>1 Megabyte 80 ns</td>
<td>$30.00</td>
</tr>
<tr>
<td>1 Megabyte 100 ns</td>
<td>$59.00</td>
</tr>
<tr>
<td>2 Megabyte 80 ns</td>
<td>$105.00</td>
</tr>
<tr>
<td>4 Megabyte 80 ns</td>
<td>$319.00</td>
</tr>
<tr>
<td>8 Megabyte 80 ns</td>
<td>$549.00</td>
</tr>
<tr>
<td>16 Megabyte 80 ns</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Video RAM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Bit to 8 Bit Upgrade</td>
<td>$24.00</td>
</tr>
<tr>
<td>256K Quadra URAM</td>
<td>$39.00</td>
</tr>
<tr>
<td>512K Mac LC URAM</td>
<td>$59.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LifeTime Warranty On Memory Products</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>68030 25Mhz Accelerators</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>“Quick30” for Mac SE, Plus, 512Ke</td>
<td></td>
</tr>
<tr>
<td>Runs at the speed of a Mac IIC</td>
<td></td>
</tr>
<tr>
<td>System 7/Virtual compatible</td>
<td></td>
</tr>
<tr>
<td>Add up to 16 Megabytes of RAM</td>
<td></td>
</tr>
<tr>
<td>Includes 68882 Math CoProcessor</td>
<td>only $529.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FPUs (chip only)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>68082 16 Mhz</td>
<td>$59.00</td>
</tr>
<tr>
<td>68082 20 Mhz</td>
<td>$69.00</td>
</tr>
<tr>
<td>68082 25 Mhz</td>
<td>$109.00</td>
</tr>
<tr>
<td>68082 33 Mhz</td>
<td>$135.00</td>
</tr>
<tr>
<td>68082 50 Mhz</td>
<td>$175.00</td>
</tr>
<tr>
<td>68081 16 Mhz</td>
<td>$45.00</td>
</tr>
<tr>
<td>68081 20 Mhz</td>
<td>$49.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Miscellaneous</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>T.I. MicroLaser 1 MB MDF for Mac LC</td>
<td></td>
</tr>
<tr>
<td>(To run Virtual)</td>
<td></td>
</tr>
<tr>
<td>Mac Classic 1 MB Bd</td>
<td>$139.00</td>
</tr>
<tr>
<td>Mac Classic 3 MB Bd</td>
<td>$55.00</td>
</tr>
<tr>
<td>SyQuest Cartridges</td>
<td>$119.00</td>
</tr>
<tr>
<td>512Ke to Plus Upgrade</td>
<td>$65.00</td>
</tr>
<tr>
<td>68081 16 Mhz PMU</td>
<td>$255.00</td>
</tr>
<tr>
<td>Mac Portable RAM</td>
<td>$79.00</td>
</tr>
<tr>
<td>NeHT Memory</td>
<td>CALL</td>
</tr>
<tr>
<td>Mac Portable RAM</td>
<td>CALL</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PowerBook Memory</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>140/170 6 MB Upgrade</td>
<td>$289.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cache Cards, Etc.</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Mb 64K Cache Card</td>
<td>$139.00</td>
</tr>
<tr>
<td>1 Mb 64K Cache Card</td>
<td>$129.00</td>
</tr>
<tr>
<td>1 Mb 2-slot Card + 68882</td>
<td>$119.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PowerBook Memory</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Megabyte Module</td>
<td>$109.00</td>
</tr>
<tr>
<td>4 Megabyte Module</td>
<td>$199.00</td>
</tr>
<tr>
<td>6 Megabyte Module</td>
<td>$289.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>68882 FPUs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>16 Mhz for Macintosh LC</td>
<td></td>
</tr>
<tr>
<td>33 Mhz for Macintosh LC</td>
<td></td>
</tr>
<tr>
<td>50 Mhz for Macintosh LC</td>
<td></td>
</tr>
<tr>
<td>20 Mhz plus 2 slots for Macintosh IIsi</td>
<td></td>
</tr>
<tr>
<td>20 Mhz for Macintosh Classic II</td>
<td></td>
</tr>
<tr>
<td>33 Mhz for Macintosh Classic II</td>
<td></td>
</tr>
<tr>
<td>50 Mhz for Macintosh Classic II</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PowerBook Memory</th>
<th></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Accelerator/Monitor Combo</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>“ImagePro” for Classic, SE, Plus, 512Ke</td>
<td></td>
</tr>
<tr>
<td>Runs at the speed of a Mac IIC</td>
<td></td>
</tr>
<tr>
<td>System 7/Virtual compatible</td>
<td></td>
</tr>
<tr>
<td>Add up to 16 Megabytes of RAM</td>
<td></td>
</tr>
<tr>
<td>Includes 68882 Math CoProcessor</td>
<td></td>
</tr>
<tr>
<td>Optional Display - 15, 19, or 24 inch</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SAME DAY SHIPPING</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OVERNIGHT DELIVERY - 8.00</td>
<td></td>
</tr>
<tr>
<td>TOLL-FREE TECHNICAL SUPPORT</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PERIPHERAL OUTLET</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>321 East 1st, PO Box 2309</td>
<td></td>
</tr>
<tr>
<td>Oklahoma 74020</td>
<td></td>
</tr>
<tr>
<td>International 405/332-6341</td>
<td></td>
</tr>
<tr>
<td>Fax 405/332-2245</td>
<td></td>
</tr>
</tbody>
</table>

| CIRCLE 382 ON READER SERVICE CARD |          |
MEMORY UPGRADES

POWERBOOK MEMORY
SIMMS & VRAM
For All Macintoshes

CACHE CARD
Ilci & Ilsi

MAC NETWORK FAX
MAC PORTABLE RAM
For instant product info via ROBOFAX
Call 1-800-424-3299 Day or Night

ADD ON AMERICA
A DIVISION OF IRONHORSE CORPORATION

MacUser Marketplace
To place your ad call
(212) 503-5115 or (800) 825-4ADS

PERIPHERALS

Sony 501
SONY 301
128MB 2.25 Optical
$2,499
$1,459
SONY 301
600MB 2.25 Optical
600MB 2.25 Optical
$1,459
$1,799

Ricoh 9200EIT
Ricoh 9000EIT
600MB 2.25 Optical
$2,969
$1,879

SuperMac
PLI

Pinnacle Micro

MacUser Marketplace
is a special economical section for product and service listings.
<table>
<thead>
<tr>
<th><strong>E-Machines</strong></th>
<th><strong>Supra</strong> - IN STOCK!!</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerCache II, Ilci, Ilcx11si, SE/30, Ilx 50MHz...$1049</td>
<td>Supra 2400 w/MacPac Software $1299.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>SupraFax Modem Plus 2400/8600 $1899.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>SupraFax Modem 14.4 v.32 bis IN STOCK $399.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>SuperMac</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>Spectrum 24 Series III/Trinitron System $3599.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>Spectrum 8-24 PDU SuperMatch 24&quot; Sys. $2499.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>SuperMatch 17&quot; Multimode Color Monitor $1049.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>Spectrum 8-24/8-24 PDUsi $829.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>Spectrum 8LC $499.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>E-Machines</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>E-Machines NEW! T-16 II/SX-24 Trin. Sys. 16&quot; Trinitron w/24 bit accelerated video board. $1899.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>E-Machines NEW! T-16 II/SX-8 Trin. Sys. 16&quot; Trinitron w/8 bit accelerated video board. IN applicable. $1699.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>E-Machines NEW! T-16 II/DoubleColor Sys. 16&quot; Trinitron w/8 bit accelerated video board. Incredible Value! $1499.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>TechWorks</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>NuBus 10 Base T, Ethernet Card $175.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>NuBus 10 T, Thin, AUU Ethernet Card $199.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>GraceLAN Std. 50 User Version 2.0 $329.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>GraceLAN Asset Manager $559.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>Seiko</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>CM1445 24 Bit Color Bundle 14&quot; RGB monitor with RasterOps CX3 24 bit color board $1229.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>CM1445 6 Bit Color Bundle 14&quot; RGB monitor with RasterOps CX2 6 bit color board $779.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>Princeton Graphics</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>Ultra 1400 14&quot; Color Monitor-With Tilt Swivel $349.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>Truevision</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>IlaVista ITSC Graphics Overlay Card CALL FOR PRICE.</td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td><strong>Simms</strong></td>
</tr>
<tr>
<td><strong>TOLL FREE LINE FOR BOTH ORDERS AND TECHNICAL SUPPORT</strong></td>
<td>1mb, 4mb &amp; 16mb for all Mac's CALL FOR PRICE.</td>
</tr>
</tbody>
</table>
POWER SUPPLIES

POWER SUPPLIES

COMPAQ COMPATIBLE P/S FOR:
- Portable Plus
- Portable II
- Portable 286
- Portable III, 386
- Desk Pro 286/12
- Desk Pro 386, 386/20, 386/25
- Desk Pro 286E, 386S, 386/20E
- Desk Pro 386/20S, 386/25E
- Desk Pro 386/33, 486/25
- Desk Pro 386/33L, 486/33L
- Desk Pro 286N, 386N, 386S/20N
- System Pro 386/33

APPLE COMPATIBLE P/S FOR:
- Macintosh LC, LC II
- Macintosh SE, SE/30
- Macintosh SC
- AT&T 6300
- AT&T 6286 WGS
- AT&T 6386 WGS
- AT&T 6386 EL/WGS

APPLE COMPATIBLE P/S FOR:
- Macintosh CX, CI, Quadra 700
- Macintosh II, IIX
- Macintosh II FX

AT&T COMPATIBLE P/S FOR:
- XT, AT Tower, Baby AT
- Mini AT, PS 2/20/30
- Stilmate

IBM COMPATIBLE FOR:
- XT
- AT
- AT Tower
- Baby AT
- Mini AT

CALL US NOW! TOLL-FREE (800) 722-0602

CRA Systems, Inc.
600 X 600 dpl
POSTSCRIPT LIQUIDATION

$2695.00

Starting at:
- 7 Megs of RAM
- Canon 8PPM Laser Printer Engine
- Advanced MII00 2880 KIC Processor
- Up to 100 Times Faster than the BNT
- IBM-compatible PC or Mac Printing
- Autotek, KJ22, SCI Interface
- Dual Page Processing
- SEE OUR AD UNDER "SYSTEMS"

1-800-375-9000 1-817-754-2120

BUSINESS

MAIL ORDER MANAGER

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.

Business

WORTHINGTON
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 & Fonts
• 30 day money back guarantee

CIRCLE 343 ON READER SERVICE CARD

CD-ROM

Category begins on the next page.
CD-ROM Drives

Your choice of cable, FREE! All drives come with drive software and cable specify WIDE SCSI to SCSI or WIDE Mac to SCSI cable.

Other drives available!

<table>
<thead>
<tr>
<th>Drive</th>
<th>Access Time</th>
<th>Buffer</th>
<th>SCSI Settings</th>
<th>Volume Control</th>
<th>Firmware</th>
<th>Software</th>
<th>Termination</th>
<th>Termination</th>
<th>RCA Jacks</th>
<th>Maximum Voltage</th>
<th>Data Transfer</th>
<th>Reliability</th>
<th>Warranty</th>
<th>Price</th>
<th>Form Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEC-CD-37</td>
<td>45ms</td>
<td>64K</td>
<td>2x0</td>
<td>Dial</td>
<td>Music Box DA</td>
<td>1</td>
<td>Not Included</td>
<td>Internal Termination</td>
<td>No</td>
<td>125 Volts</td>
<td>15K Seconds</td>
<td>16,000</td>
<td>3 Year</td>
<td>$479</td>
<td>1695</td>
</tr>
<tr>
<td>NEC-CD-75</td>
<td>45ms</td>
<td>64K</td>
<td>2x0</td>
<td>Dial</td>
<td>Music Box DA</td>
<td>1</td>
<td>Not Terminated</td>
<td>No</td>
<td>Yes</td>
<td>25 Volts</td>
<td>15K Seconds</td>
<td>20,000</td>
<td>3 Year</td>
<td>$699</td>
<td>1593</td>
</tr>
<tr>
<td>CD Tech CD-T3801</td>
<td>57ms</td>
<td>64K</td>
<td>2x0</td>
<td>Dial</td>
<td>Remote DA</td>
<td>2</td>
<td>Not Included</td>
<td>Internal Termination</td>
<td>No</td>
<td>25 Volts</td>
<td>15K Seconds</td>
<td>20,000</td>
<td>2 Year</td>
<td>$599</td>
<td>1581</td>
</tr>
</tbody>
</table>

2-Free CDs with the purchase of CD Tech CD-T3801, MultiMedia Handisc & America Alive!

1 FREE CD
Buy a CD-ROM drive of your choice and get the EDUCORP CD Sampler free. $9.95 value.

BONUS
2 FREE CDs!
Buy 3 other CDs with any drive bundle on your 1st order and get Economic Data Disc & Environmental Data Disc FREE. A value of $300. Quantities limited. Use code #D3.

3-Free CD's with the purchase of CD Tech CD-T3801, MultiMedia Handisc & America Alive!

1 FREE CD
Buy a CD-ROM drive of your choice and get the EDUCORP CD Sampler free. $9.95 value.

BONUS
2 FREE CDs!
Buy 3 other CDs with any drive bundle on your 1st order and get Economic Data Disc & Environmental Data Disc FREE. A value of $300. Quantities limited. Use code #D3.
**CLASSIFIED**

**CAD/CAM**

**CADMOVER®**
Don't Scan it... Move it!
Move artwork/3D models via DXF, IGES, EPSSL, and more...
Into a wide variety of file formats without redrawing or sacrificing high resolution by scanning.
- 23 bi-directional formats
- Accurate & Easy to use
- Saves time & money

**EDUCATIONAL**

**GRADE MACHINE**
GRADING MADE EASY!
The best Mac gradebook just got better.
New Version 9.0 adds student graphs, narrative comments, multiple grading scales, user-defined special teams, password protection and much more. System 7 and network compatible.
Still only $79.99 (bundled with new Attendance Module). Money-back guarantee!

**ENGINEERING**

**McCAD EDS**
The leader in
Integrated Electronic Design
Schematics Simulations PCB Layout Autorouting Call or write for free demos.
VAMP Inc. 6753 Selma Los Angeles, CA 90028 213-466-5533

**ENTERTAINMENT/GAMES**

**THE BLACKJACK TUTOR & SYSTEM CHECKER**
Blackjack for everyone, this program does it all!
Game, Tutor, Evaluator, Generator, and lots more.
Now System 7.0 compatible. Reduced to $79. For a detailed description, send inquiries to: JK Blanchard Enterprises 4455 Torrance Blvd, #129 Torrance, CA 90503

**FREE旅遊 & CLIP ART**
FREE FONTS & CLIP ART
FREE fonts & clip art images. PAY ONLY $5.00 SHIPPPING PER PACKAGE
PAY ONLY $5.00 SHIPPING PER PACKAGE

**NEW! LANDVIEW**
FOR CONTOURING & TERRAIN MODELING
LANDesign FRAME mac-
C0D€S/Surveying Structural Analysis Civil, Land Survey, Roads, Marine, 3D Designs, grading, CAD, etc.

**SYSTEM 7**

**MacUser Marketplace**
Second Color Option Available

**COMMUNICATIONS/ NETWORKING**

**TeleFinder**
The leading Macintosh Bulletin Board System in business and education. First in quality we've seen...
- Support Mac and PC users.
- TelFinder is $425.95 for unlimited users.
- Use modern or Apple Talk with NetConnect.
- Factory support & support included.

**DESKTOP PUBLISHING**

**ELSEWARE CORPORATION**
CheckList 2.01
1991 Eddy award winner!
Checks your PageMaker and PostScript files for font and graphic problems.
DataShaper 1.2
Automatically formats database text files during import into PageMaker
$179.95 Each
For more info call: 206.547.9623

**ENTERTAINMENT/GAMES**

**COOL MAC SOFTWARE FOR ADULTS**

**CIVIL • STRUCTURAL • SURVEYING**

**CIVIL SOFTWARE**

**MacUser Marketplace**
To place your ad call (212) 503-5115 or (800) 825-4ADS

**ENTERTAINMENT/GAMES**

**THE BLACKJACK TUTOR & SYSTEM CHECKER**
Blackjack for everyone, this program does it all!
Game, Tutor, Evaluator, Generator, and lots more.
Now System 7.0 compatible. Reduced to $79. For a detailed description, send inquiries to: JK Blanchard Enterprises 4455 Torrance Blvd, #129 Torrance, CA 90503

**FREE FONTS & CLIP ART**
FREE FONTS & CLIP ART
FREE fonts & clip art images. PAY ONLY $5.00 SHIPPPING PER PACKAGE
PAY ONLY $5.00 SHIPPING PER PACKAGE

**NEW! LANDVIEW**
FOR CONTOURING & TERRAIN MODELING
LANDesign FRAME mac-
C0D€S/Surveying Structural Analysis Civil, Land Survey, Roads, Marine, 3D Designs, grading, CAD, etc.

**SYSTEM 7**

**MacUser Marketplace**
Second Color Option Available
Classified

Classified Never Cramps Your Style!

Classified ads give you solid marketing advice, lab-tested recommendations, aggressive frequency and multiple-ad discounts, and 382,000 Macintosh buyers. What we don’t impose are any hard rules that cramp your creativity. You’re free to choose the size, shape, and color options that are right for you and your product! So cut loose and go for your share of big business from MacUser’s 382,000 proven Mac buyers—94% of whom read MacUser Marketplace.

MacUser Classified 800-825-4237
FOUND A BARGAIN?  
Let Your Source Know You Found It in MacUser Marketplace

INTRODUCING IMPACT WITH 
Accents & Borders 2

Part two of the award winning Accents & Borders series contains frames, borders, tiles, ornaments, symbols and halftone images. Compatible with all popular DTP and Graphic design software!

FREE 6/3.5 11 DISKS FULL OF 
VIRUS-FREE SHAREWARE

• Games • Education 
• Religion • Hypercard 
• Business • and more!

Pay only $5.00 shipping/package. Foreign add $5.00 per package. Credit card only!

SATISFACTION GUARANTEED SINCE 1985

SMC SOFTWARE PUBLISHERS
(619) 931-8111 Ext. 511

MacUser Marketplace

29 Graphics, inc. 
1449 Avenida Encino, Suite 401 
Oceanside, CA 92054 
(619) 576-7979

800-456-0234 
SPECIAL INTRO OFFER!

MACART! 
Professional Quality Maps for Graphic Design!
Publications - Presentations - Envelopes - Banners - Teaching Aids 
World - Continents - Major Countries - 5 Major US Cities 
Globes - United Nations - Cities - States - Lakes - Rivers 
Gloves - US States with Countries 
With or without the DTP program
For Free catalog with sample maps:

CIRCLE 364 ON READER SERVICE CARD

LOWEST DISCOUNTS FOR MIDI 
Authorized MIDI retailer—all name brands 
sequencer/notation: Ensoniq, Finale, Vision, TurboTrack, Music Time, Music Pro, Performer 
MIDI Interfaces: 1x3, 2x6, 8x8 keyboards, modules—Mac starter pac $109-199 National/ International Sales & Price Quotes MC Visa School PO CK MO-open weekends

CIRCLE 367 ON READER SERVICE CARD

DIGITAL 
Hard Disk Recording, DAT, Macintosh, MIDI 
Instruments, Coda, Mark of the Unicorn 
Passport, Dr. T's, Opcode, Digidesign 
Roland, J.L. Cooper & more...

500-548-4907 
MacBEAT 

CIRCLE 368 ON READER SERVICE CARD

PUBLIC DOMAIN
FREE 
MAC & IBM SOFTWARE CATALOG
24 Pages! ASP Member

SOFTSHOPPE, INC. 
P.O. BOX 367 
ANN ARBOR, MI 48106 
Tel: (313) 767-7358 
FAX: (313) 767-7359

Toll-Free—24 Hrs. 
1-800-851-8089

CIRCLE 369 ON READER SERVICE CARD

MacUser Marketplace 

Stand out in a crowd! Take advantage of MacUser's new second and third color options. Call 1-800-825-4237

CIRCLE 370 ON READER SERVICE CARD

DUST COVERS 
ALL FABRIC 

• Felt backing prevents damage to the Macintosh Screen 
• Has a button for quick access to Apple menu 
• Protects your Macintosh from dust and scratches 
• Protects your Macintosh Model

MacUser Marketplace 

To place your ad call (212) 503-5115 or (800) 825-4ADS
DESKTOP PUBLISHING SERVICES

Postscript Output: Reflex or Film
Lowest Prices in USA & No Bump in $ for Graphics
• Next Day Air $5 or less • 1200/2400 Output • FREE Quality Control Kit
• High Speed Mediam Sup. 24 runday • Flexible Monthly Rates • Sp. Rates to Schools
• Full Color Service Cost Effective up to 1500 Bmin • OR Hrs 9 am to 11 pm.

ENTERGRAPHICS
RR 356A Salt Point Turnpike
Poughkeepsie, NY 12601
(800) 473-4108, modem (914) 473-5719

SLIDE OUTPUT from $3

Macintosh 3.5" DDC duplication starts at just $.88. Prices go even lower as you continue to order.
• Duplication + 100% Verification
• Custom Labels/Sticker/Mailer
• Custom Packaging & Assembly
• Multiple Media Available
• Special Rates For Demo Software & Site Licensing
• Educational Discounts Available
• 24 Hour Turn-Around
• Guaranteed Products

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

SLIDE IMAGING SERVICES

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

SLIDE IMAGING SERVICES

Rainbow

COPY SERVICES FROM $.88

HIGHEST QUALITY MEDIA

Macintosh 3.5" DS/DD duplication starts at just $.88. Prices go even lower as you continue to order.
• Duplication + 100% Verification
• Custom Labels/Sticker/Mailer
• Custom Packaging & Assembly
• Multiple Media Available
• Special Rates For Demo Software & Site Licensing
• Educational Discounts Available
• 24 Hour Turn-Around
• Guaranteed Products

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

SLIDE IMAGING SERVICES

ALL MAJOR PACKAGES

100% Adobe Postscript Chromascipt II
• Canon Prints (Fyery® RIP)
• Custom Slides
• Free Support
• Toll-Free BBS For Data Transmission
• Free Fed Ex Shipping

1-800-441-2141
50 Alden Rd., Plymouth, MA 02360
*We made it the top by repeating the process*

SLIDE IMAGING SERVICES

FIND YOURSELF A BARGAIN?

Let Your Source Know You Found it in MacUser Marketplace

PRO MAC T-SHIRTS!

Friends don't let friends
Do it on their own!

This is your brain
On an IBM

Friends don't let friends
Do it on their own!

100% Cotton, True color printing
$15.00 virus/OOD/Check

(800) 447-3081 x463

CIRCLE 380 ON READER SERVICE CARD

CIRCLE 379 ON READER SERVICE CARD

CIRCLE 381 ON READER SERVICE CARD

CIRCLE 382 ON READER SERVICE CARD

CIRCLE 383 ON READER SERVICE CARD
AD FORMAT: 
MacUser will design and type set each BusinessCard ad. Advertisers should furnish typeset copy. Ads include: 1) Headline (line, initial caps=20 characters max, all caps=25 characters max), 2) Descriptive copy (5 lines, 25 characters max), 3) Company name (same specifications as headline), and telephone number (2 lines, 40 characters per line). No logos, artwork or camera-ready ads. Publisher reserves the right to edit supplied copy to meet section specifications.

DEADLINES: 
MacUser is published 12 times a year. The BusinessCard closing is approximately two months prior to issue date. Please send copy and payment to: MacUser BusinessCard, One Park Avenue, 3rd Floor, New York, NY 10016, ATTN: Paul Fusco. For more information call Paul Fusco at 800-825-1237 or 212-503-5866, FAX: 212-503-5860.

HARDWARE/COMPUTER SYSTEMS

MacINTOSH/PC COMPUTERS

SOFTWARE/ACCOUNTING

INSURANCE

INVENTORY • POS • UPS 
Take control of your inventory! Largest Mac base in USA. A/R billing, bar code/data control, auto vendor orders, custom features, taxes (GST too), customers, invoices, reports, G/L links & more! EASY for clerks. Free demo. Also UPS/LIS & Q/Y.

BUSINESS

DEALERS call Simon Gil for Pricing. We Export.

REVOLUTION IN RUSSIA!
Can you stop the craze? Can you lead Russia into democracy? Travel the CS, ask people questions. Then lead the country, using your new knowledge of entertainment multimedia. Color & B/W versions, $99/shipment. Check/VISA/MC.

OFFICE MGMT/TIME BILLING
Ideal for lawyers, ad agencies & consultants. Designed to handle all computerized tasks for small office. Track projects and clients, schedule activities, monitor time, generate invoices & accounting reports & print checks. Demo. 

SOFTWARE/ACCOUNTING

EDUCATIONAL

Clearlight Software
We offer the best in adult-oriented graphic
ics for your Mac. If your age is 18 or older, request our free catalogue of suiting adult software. Color MACS ONLY. Visa and MasterCard accepted.

ADULT GRAPHICS

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING

SOFTWARE/ACCOUNTING
**BUSINESSCARD**

**SCIENTIFIC**

**MATRIX/MATH CALCULATOR**
Interactive, 20 functions, 16 operators. User-created functions, least squares, eigenanalysis aid, partitioning, large arrays. Useful for engineers, scientists, students. Menu Help/Examples $75. Think Pascal Source: $150.

Greer Software Products
Box 268, Annandale, Virginia 22003
Tel: (703) 978-3327

**FREE SOFTWARE**
Order 10 or more of our hot shareware titles and receive a free copy of Disinfectant and other anti-viral programs. Choose from our many utilities, games, fonts, graphics, QuickTime movies & music titles. Send SASE for FREE catalog.

**NITE OWL SOFTWARE**
PO Box 4309, Elwyn, PA 19063-7309

**SHAREWARE**

**CABLES**
- ANY MAC CABLE NEED
- SCSi/POWERBOOK CABLES
- PHOTOT Compatibility KITS
- VGA ADAPTERS
- SWITCHBOXES AND MUCH MORE. CALL TODAY!

Mac Express
Free Catalog
Call 1-800-223-1999

**MISCELLANEOUS/ACCESSORIES**

**RPN/Algebraic Calculator**

MicroMath Scientific
Box 21550 Salt Lake City, UT 84121-0550
Order 800-942-6284 Info 801-943-0290

**BusinessCard**

**MISCELLANEOUS/ACCESSORIES**

**CONSULTING/PROGRAMMING**

**Smart Solutions. Informed Advice.**
- Network design and custom applications
- Database and time/expense accounting systems
- Troubleshooting and technical support
- Documentation and training
- Specializing in 4th DIM and client-server apps.

Natural Intelligence, Inc.
2067 Mass. Ave., Cambridge, MA 02140
(617) 876-4876 Fax: (617) 492-7425

**DESKTOP PUBLISHING SERVICES**

**Graphics—Consulting & Training**
- Learn QuarkXPress, PageMaker, Photoshop, others
- Learn Layout & design
- Classes for producing professional quality: newsletters, brochures, printed materials, Presentations, catalogs, stationery.

THE DESIGN STUDIO
2425 W. Loop South, #1007, Houston, TX 77027
713-965-0100

**SERVICES/REPAIR**

800k MAC Disk Drive Repair
REPAIR OR EXCHANGE / INTERNAL OR EXTERNAL RELIABLE SERVICE / FAST TURNAROUND REASONABLE PRICES ... Dzames • Mirror Tech. • Cutting Edge • P.K.I. • Apple • Macintosh • Sony • Fujitsu • Osborne... All MAC compatible makes & models.

Huntley Repair Service
234 County Road Evanston, WY. 82930
307-789-4148

**BUSINESSCARD**

BusinessCard is Direct And Powerful
New MacUser Marketplace provides you with the most cost-effective advertising opportunity in the Mac market.

**BusinessCard**
Call Sherrie Graddic today!
1-800-825-4237

**BUSINESSCARD**

**CONSULTING/PROGRAMMING**

**Smart Solutions. Informed Advice.**
- Network design and custom applications
- Database and time/expense accounting systems
- Troubleshooting and technical support
- Documentation and training
- Specializing in 4th DIM and client-server apps.

Natural Intelligence, Inc.
2067 Mass. Ave., Cambridge, MA 02140
(617) 876-4876 Fax: (617) 492-7425

**DESKTOP PUBLISHING SERVICES**

**Graphics—Consulting & Training**
- Learn QuarkXPress, PageMaker, Photoshop, others
- Learn Layout & design
- Classes for producing professional quality: newsletters, brochures, printed materials, Presentations, catalogs, stationery.

THE DESIGN STUDIO
2425 W. Loop South, #1007, Houston, TX 77027
713-965-0100

**SERVICES/REPAIR**

800k MAC Disk Drive Repair
REPAIR OR EXCHANGE / INTERNAL OR EXTERNAL RELIABLE SERVICE / FAST TURNAROUND REASONABLE PRICES ... Dzames • Mirror Tech. • Cutting Edge • P.K.I. • Apple • Macintosh • Sony • Fujitsu • Osborne... All MAC compatible makes & models.

Huntley Repair Service
234 County Road Evanston, WY. 82930
307-789-4148

**TRAINING**

Rent MacAcademy Videos by Mail
Video’s the easy way to learn! All major Mac programs available: over 85 different titles, each 2 hours long. A two week rental including S&H, costs less than a dollar a day. Return postage is prepaid. Get a free catalog.

CareerTAPES® Enterprises
PO Box 309 Center Harbor, NH 03226
(603) 253-7470

**BUSINESSCARD**

Business Buyers Prefer MacUser
When asked which publication is most useful in making product selections, common subscribers to MacUser and MACWORLD chose MacUser by a margin of nearly 4 to 1. Tell 382,000 interested buyers about your products and services today.

BusinessCard
Call Sherrie Graddic today!
1-800-825-4237

**BUSINESSCARD**

**PLAY YOUR CARDS RIGHT...**
Our BUSINESSCARD & Your Credit Card!

**BUSINESSCARD** is already the most cost-effective way to reach tens of thousands of proven Macintosh business buyers each and every month in MacUser magazine.

And now, you can earn maximum frequency discounts with MacUser’s new Credit Card Charge Program:
- save as much as $540
- take advantage of every issue advertising

This program offers the lowest out-of-pocket expense for MacUser advertisers who use their VISA, MasterCard or American Express card for payment.
- no delay for credit card approval
- convenient billing on your monthly credit card statement

The savings is obvious...but the real value is in delivering your ad message to over 382,000 active business buyers in every issue of MacUser.

You can’t buy more for less anywhere!

**DON’T DELAY...CALL TODAY**
1•800•825•4237
I Sack Newton!

What costs too much, does too little, and breaks too easily?
That's right, Apple Computer strikes again.

I s it just me? Or is Apple acting kind of wacky gah-gah with this new line of hand-held gizmos that, according to the company, will magically produce a trillion dollars or so in sales? As this vision of the future unfolds, I'm reminded of George Bush's peculiar amazement upon sighting a bar-code reader at a grocery store. Are Sculley and crew suffering from this same Gomer Pyle mentality? Goll-lee!

Technology doesn't advance in sudden leaps and bounds. Bush was stunned by the laser-beamed bar-code reader because he hadn't been to a grocery store for a few decades. If you don't get out much, these "advancements" can catch you off guard. Technological advancements are always part of observable trends. True, it may be a fast-paced observable trend, but it's never so fast that it catches a normal person by surprise.

It's this last notion that makes me laugh about the failed Fifth Generation Project envisioned by the Japanese several years ago. The idea was to circumvent the current developments in computer technology and somehow leapfrog into a whole new concept. The computer was supposed to be catapulted overnight into some sort of who-knows-what dream world. From its inception, the idea made no sense. Developments in technology and software are closely followed by a huge contingent of scientists and engineers. Before anything important happens, everyone knows it's happening.

No important "new" technology we use today became an overnight sensation. Laser-disc technology took a long time to develop before the compact disc became a sensation. Cellular-phone systems were on the drawing boards and discussed openly for years before they found themselves in every yuppie's car. A slew of technologies are being developed, but few of them are a secret. The eventual product may be kept a mild secret, but that's as far as secrecy goes. Surely nothing could remain so secret that a Fifth Generation could suddenly emerge from a bunch of Japanese scientists shooting in the dark.

I get the feeling that Apple is suffering from the same ego-driven delusion that infected the Fifth Generation promoters.

Having said all this, I'll now complain about the Newton devices themselves. When I think of those dinky pocket contraptions, I think "junk." Sorry, but carrying around some breakable clunky little pocket computer is just asking for trouble. I know plenty of people who do it and rave. I've tried a couple of them and have even gone so far as to seriously test that crazy Wrist Mac. Maybe someday these things will make me comfortable. For now, no.

Apple is calling these gewgaws "Newtons" because, I suspect, the device can easily be dropped (and probably as easily broken), thus reconfirming certain gravitational precepts developed by Isaac Newton. The breakability of these gadgets makes me nervous. I once broke a screen on a NEC Ultra-lite and have been unnerved ever since by the delicacy of portable computers. Pen-based machines are particularly freaky. First of all, these devices are expensive. Even if a pen computer sells for less than $1,000, it's expensive.

I'm amused at how the marketers tell you that something is less than $1,000 to indicate that it's somehow inexpensive. Hey, guys, get a clue. $2.49 is inexpensive! $16 is inexpensive. $995 is expensive. Perhaps they're comparing everything with Cray-2 prices.

Whatever the case, nobody wants to drop a $995 Newton unless they're doing product testing on a loaner and Apple expects the machine to be returned in a parts bag. Know it: Eventually these things are going to be dropped. Who wants to pass out a few hundred of these $995 overblown clipboards to their fumble-fingered employees? Nobody, that's who — and that's why these things will never catch on. You can barely read the screen. They'll chew up batteries like there's no tomorrow. Handwriting recognition is years away. And, finally, there are better solutions, called notepads, that cost less.

OK, it's obvious that I'm not a big fan of these things. They're too expensive, and older technologies can do the job better (ever heard of a pencil?). Taking old technologies or anything that already works well and is already inexpensive and throwing silicon technology at it is an incredible waste of technological resources.

Technologies such as portable phones add an element of convenience and efficiency to our day-to-day life, so they are a welcome improvement. A notebook computer can do most of the work of a desktop computer and is also a welcome technology. But a computerized notepad is just plain stupid.

Sorry, but I don't see the trillion dollars in sales from them.
and Radius have designed a display system so flexible it will make you look.
We've designed our new FG series of monitors specifically for the Macintosh®. We also make many other Mac compatible peripherals, from CD-ROM readers to a full line of printers.

Feel free to stare. After all, you've never seen a display system quite like this.

Presenting the MultiSync® FG™ Display System. A unique combination of NEC's award-winning monitor technology and a display interface card designed specifically for NEC by Radius™.

Now you can use all your applications more effectively. Thanks to the flexibility provided by multiple viewing modes.

For example, Condensed modes let you increase resolution and desktop size so you can display more on-screen information. You can put two documents side-by-side for easy cutting and pasting of active cells in your spreadsheet.

The 72 DPI mode gives you a preview of your final output. All modes display standard resolution and also let you zoom in on specific areas of your document, paint and photo-modify, or simply get a closer look of your work.

And the best part? You can change to any viewing mode at any time. Right from within your application.

Without having to reboot the computer. Because the monitor automatically adjusts itself to the resolution of your application.

Our monitors come in three sizes — 15", 17", and 19".
display performance. And include features like FullScan™ capability for edge-to-edge images, and our exclusive AccuColor™ Control System, which allows you to match on-screen color to your printed output or personal preference.

There are also two MacFG™ boards, for 8-bit or 24-bit color; both include FG custom display timings in ROM.

For more information, call 1-800-NEC-INFO. (In Canada, 1-800-343-4418.) Or for information via fax, call NEC FastFacts™ 1-800-366-0476, request #62234.

One look at these display systems, and you’re sure to see things our way.
Buy A MultiSync FG Display Solution for your Mac system and get a free CD-ROM reader.

At NEC we believe one great solution deserves another. That's why from now until September 15, 1992, we're going to give you a free CD-ROM solution when you buy a MultiSync® FG™ Display Solution. NEC's MultiSync FG Display Solution is a combination of the MacFG™ 8x or 24x Color Display Interface card and one of the new MultiSync 4FG, 5FG or 6FG monitors. Together they give you a display solution with video performance that rivals all others.

And with NEC's portable Intersect™ CDR-37 CD-ROM reader and SCSI Interface Kit, you'll have everything you need to add CD-ROM capability to your Macintosh® system.

So, buy a MultiSync FG Display Solution for your Mac® system and you'll get a free CD-ROM reader. It's the ideal solution for your QuickTime® and CD-ROM based applications.

For promotion details call 1-800-NEC-INFO. (In Canada call 1-800-343-4418.) Or for details via fax, call NEC FastFacts® at 1-800-366-0476, request #2222.

Because † is the way you want to go.