New PowerBook Bonanza

- 6 Sleek 040 Models
- Unique Trackpad
- 4-Hour Power

Virus Slayers
Protect Your Mac Against 52 Strains

Make Your Point!
Presentation Tools that Deliver

Ultrarealistic Color Printers
10 Contenders Vie for Editors’ Choice
POWER MACINTOSH RUNS FAST WITHIN STOCK. JUST WAIT TILL YOU SEE IT
While it's true that the Power Macintosh® will zip right along with current programs, it'll perform even better with the next version of Microsoft Office for the Macintosh.

The programs in the Microsoft Office will not only take advantage of the power and speed of Power Macintosh, they'll also work together. Seamlessly. Effortlessly.

In other words, you'll have a suite of full-featured business programs so well integrated that they act as if they were one program.

But it doesn't stop there. These programs have built-in intelligence that senses what you want to do and helps you do it.

Isn't this something you want?

If so, you really should consider Microsoft Office. Far and away, it's the best way to get the most out of the new Power Macintosh.

But we warn you, you'd better fasten your seat belt.

Pick up Microsoft Office for Macintosh now. And we'll send you the new version for Macintosh or Power Macintosh at no charge when they ship in the near future.
The new NEC Silhouette 440 is you. And you. And you.
Our new personal Mac laser printer lets you say what you want to say, exactly the way you want to say it. That's because it's a true laser printer with 300 dpi resolution, along with our patented Sharp Edge Technology and Microline toner, for crisper characters and richer, darker blacks.

And because it comes with 17 resident Adobe Type 1 fonts, 35 professional TrueType fonts, and built-in TrueType and Type 1 rasterizers.

It's loaded in other ways, as well. It has Adobe PostScript Level 2, so it works beautifully with any application. NEC's 6 ppm print engine. 3 MB of standard RAM. And an AppleTalk interface, for quick and easy connectivity with one or several Macs.

It also gives you what no one else does: a 2-year limited warranty that will get you a replacement printer overnight, if anything goes wrong. All for about $800.

For more information, call 1-800-NEC-INFO. Or, for information via fax, 1-800-366-0476, and request document #79640. Thank you. And you. And you.
Contents

Features

96 PowerBooks: The Next Generation
BY CARY LU The new PowerBooks have more going for them than just speed—Macworld Lab uncovers a bigger display, better batteries and sound, plus PowerPC options.

106 Photo-realistic Color Printers
BY JIM HEID Macworld Lab puts ten dye-sublimation printers through their paces to show that beautiful, professional color output costs less than you might think.

116 Virus Killers
BY BRUCE SCHNEIER Will your Mac survive a viral onslaught? Macworld Lab tests the protective powers of the top four programs.

News

39 MacBulletin

40 News Software industry's merger explosion • HP's 12-ppm, 600-dpi workgroup printer • Tech support gets costlier, and more

49 Power Mac News Power Mac SCSI, NuBus slowdown reported • Native applications multiply

51 New Products

Opinion

25 State of the Mac
BY ADRIAN MELLO Apple makes the honor roll.

31 Letters

175 The Desktop Critic
BY DAVID POGUE Free (and nearly free) shareware greats.

179 The Iconoclast
BY STEVEN LEVY Warm, fuzzy . . . Internet?!

183 Conspicuous Consumer
BY DEBORAH BRANSCUM Our fifth annual guide to the best Mac resources.

274 Wise Guy
BY GUY KAWASAKI Roadblocks along the information superhighway.

The top seven presentation packages, page 144.

We test ten dye-sublimation printers, page 106.
Graphics

122 News Fonts and images 24 hours a day • Trapping made easier • Drum-quality scanning under $13,000, and more
126 Expert Graphics BY CATHY ABES Graphics professionals share their secrets.
130 Inside PostScript Level 2 BY KRISTI COALE With features like smoother halftones, faxing, and better memory allocation, Level 2 should make a big splash, but color promises remain elusive.

Networks

158 News NetWare coming to PowerPC • Streamlined ARA servers • AppleShare 4.0 on 030s, and more
160 Solving Network Mysteries BY JOEL SNYDER Our network sleuth uncovers the best protocol analyzers.
165 PowerBook Notes BY CARY LU Bargain software for your PowerBook.

Buyers' Tools

187 Editors' Choice Top picks from our comparative articles.
193 Star Ratings More than 300 product-review summaries.
205 Streetwise Shopper Hardware and software bargains: discounts, bundles, upgrades.

At Work

136 News PowerPoint 4.0 gets a face-lift • Sales and operations software in one • WordPerfect's document distributor, and more
139 Working Smart BY JIM HEID When time is money, you need time-billing software.
144 Presentation Software That Delivers BY DEKE MCCLELLAND We scrutinize the top seven presentation packages to see which will put you and your ideas in the best possible light.
151 Quick Tips BY LON POOLE Tips, tricks, and shortcuts.

Reviews

62 Collage 1.0.1 Image-compositing software
64 Apple QuickTake 100 for Macintosh Digital camera
65 QA-350 LCD LCD projection panel
67 microLaser Pro 600 Workgroup printer
69 Pablo 2.0.1 Database reporting tool
71 Ray Dream Designer 3.0.3 3-D illustration software
72 Ear Phone Streamline AV Telephone/speech-recognition earpiece
75 QMS ColorScript Laser 1000 Color laser printer
77 IX-4015 Color Image Scanner Color flatbed scanner
78 TopDown 4.0 Flowcharting program
80 WaterMark Message Central 2.0.2 Voice-mail system
83 Pointillist Stereogram software
85 MacMoney 4.01 Personal-finance software
86 DiskTop 4.5 File-management utility
87 TurboDialer Automatic telephone dialer
88 LabView for Mac 3.0.1 Data acquisition and analysis
89 Grolier Multimedia Encyclopedia CD-ROM encyclopedia
89 Helix Express 2.0.1 Relational-database software
91 VirtualDisk 1.1a Disk-cataloging software
91 Automap Road Atlas for Macintosh 2.01 Mapping software
93 Financial Competence 1.5 Accounting tutorial
93 Small Blue Planet 1.2.1 Educational CD-ROM
It's time to stop

You've reached a crossroads in computer technology. A point where choosing between a PowerPC® or a Pentium™ processor-based PC could be a difficult decision.

The PC is not what it used to be. Everything you want to do on a Macintosh®, you can just as easily do on a PC. And now, all of the most popular Mac applications are available for PCs, including those by Aldus, Microsoft, Adobe, Quark and Broderbund.

With Windows®, they're just as easy to use. And they run at incredible speeds. To put it in...
and ask directions.

perspective, Intel486™ DX2 processor-based PCs outperform the Mac Quadra™ 840av, and Pentium processor-based PCs are even faster.

Best of all, you have a choice of over 100 computer vendors who now offer Pentium processor-based PCs.

These PCs give you access to some of the world’s most innovative technologies. Like ProShare™ document and video conferencing. Video software using the Indeo™ format. Even future performance upgrades with the OverDrive™ processor technology.

So before you buy another Mac, stop and ask some questions. Find out where Apple is going, especially with the PowerPC. Then ask Intel about the Pentium processor. What you find out might put you on a whole new path.

To learn more about the Pentium processor and other innovative technologies, call 1-800-395-7009, Ext. 111.
As far as Apple is concerned, only one table can support the family.

Apple® calls it "The perfect place to put your computer to work." It's sturdy, ergonomic and carefully designed around Apple's modular footprint to fit the Mac family plus peripherals.

Call today for a free catalog of our complete line.

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

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

“The Best Mac Desk Ever.”

New!

• Ergonomic
• Fully Adjustable
• Strong
• Guaranteed
• VAR Inquiries
• Welcome

Free Catalog! 800.688.2446

| Phone 503.690.1400 | FAX 503.690.1423 | Europe 011.41.62.631026 | Japan 011.81.3.3583.0436 | JPN |
You'd like this photo more if you were in it.

You can tell stories to your great-greats about the afternoons you spent skiing at the ski. Or you can tell them about the time you were dropped from a helicopter at the top of Mt. Snow. A bottomless, bottomless adventure. It takes a true dream experience to bring you to life. Based in Winter Park, Colorado, we've been making dreams real for 15 years. All our publications, SSA column, and have a minimum of five years of experience. Call us in 303/320-0744. Wish you were here.

Adventures, Inc.

One of these is a color proof and one is output from our new printer. We forgot which is which.

We paid $70 and waited three days for one of these. The other popped out of our new Tektronix Phaser 480 in minutes. Pull out your loupe and start guessing. And while you're down there staring, note our output's phenomenal color. PANTONE-approved, it's perfect for matching those tricky product colors, logos and skin tones. You might also notice the full 11" x 17" print area. Yes, Virginia, there are tabloid-sized full bleeds. And it shares easily: the Phaser 480 is a work group printer for Macs, PCs or workstations. Plus, it boasts a powerful RISC processor and true Adobe PostScript Level 2. Spread-sized bleeds? Reprint quality comps? Pre-film proofing right at your desk? Welcome to preproduction heaven.

So head down to your nearest Tektronix dealer to see for yourself. And by the way, our guess is that the one on the bottom is our print. Well, then again...

For a free print sample or dealer location call 800/835-6100, Dept. 32C.

Tektronix

Circle 143 on reader service card
Engineered Software,
Generating isometrics with PowerDraw is easy and very quick thanks to the many dedicated isometric tools. The results look sharp—as if created using time-honored technical illustration techniques!

PowerDraw does for CAD what the Mac did for computers.

Sincerely,
Fred Goodman

CALL 910-299-4843 OR FAX 910-852-2067 • IN CANADA 204-453-8111

Circle 12 on reader service card
If they're out there drawing, you're not drawing them in. But our new Polaview™ 3000 LCD panel can help you make a few important improvements — graphically speaking.

16.7 million colors are hard to ignore
The Polaview 3000 LCD panel offers the latest in LCD projection panel technology with features certain to make people sit up and notice. Its 16.7 million colors make any chart or diagram come alive. Active matrix technology provides crisp, detailed images.

This much control can be riveting
The remote mouse is more than just point and click. It lets you enlarge images, zoom in, mask data, invert type, and time sequences. Even in different languages. Keep your audience focused with new looks all the time.

Are audiences creating their own graphics for your presentations?

Wake up to full multimedia presentations
With integrated stereo sound and video, virtually anything goes. The sound is so sophisticated it can even do the talking for you. The Polaview 3000 LCD Panel is totally compatible with PC, Macintosh and video sources. And with the Polaview 1800 and 1500 LCD panels, Polaroid has a solution for every need — and budget.

From the inventors of instant imaging
Now you can change your presentation anywhere — even minutes before you present — and still make it perfect. Polaroid has always understood how valuable your time is. Whether your image is on film or on screen, we're committed to making it shine.

Get a free Polaview 3000 demo disk!
Call 1-800-662-8337 ext. 951 today!

Polaroid

Circle 119 on reader service card
We talked to the pros when we designed the EPSON ES-800C Pro/Mac to make it the most advanced professional color scanning system in its class. The 1600 dpi ES-800C comes with the full version of Adobe Photoshop, Kai’s Power Tools, one and three pass scanning, dual cpu connectivity, plus built-in color and gamma controls. It’s the best equipped, best value professional scanner you can buy.

How do you improve on a scanner this great? By adding more free software and a $50 rebate. Now, for a limited time, buy an EPSON ES-800C Pro/Mac and you’ll get a free copy of Astound, the Eddy Award-winning multi-media presentation package, a $399 value, plus a $50 scanner rebate*. That’s one advanced scanner deal.

For more information about the ES-800C Pro/Mac, our other scanners for Macintosh or PCs, or our complete line of lasers, ink jets, and other technologically advanced computer products, visit your local EPSON dealer or call the EPSON Connection (1-800-BUY-EPSON).

* HOW TO GET YOUR REBATE/SOFTWARE: 1) Buy an EPSON ES-800C Pro/Mac between 5/1/94 and 7/31/94. 2) For rebate/software details and form, call the EPSON Connection, 1-800-BUY-EPSON, or see your local EPSON dealer. Note: software value is manufacturer’s suggested retail price.
More FREE SOFTWARE AND A $50 REBATE!
Attach any 4 serial devices including fax modems, MIDI, printers, even AppleTalk printers all to one Mac port and let Port Juggler deal with switching between them automatically.
Point, shoot, plug it into your computer. That's it—you've mastered Apple digital photography. It's the fastest way to make an important memo stand out. Or an important new vice president, for that matter.

The Apple QuickTake 100 digital camera takes brilliant 24-bit color photos. It comes with everything you need. And at $749, it costs less than other digital cameras (and even some surfboards). For an authorized Apple reseller, call us at 800-732-3131, ext. 550. After all, this could make a radical difference in your work.

The New Apple QuickTake 100 Digital Camera
- ORG CHARTS, BAR CHARTS, FLOW CHARTS AND PIES.
- CALENDARS, TABLES AND TIMELINES.
- PREFORMATTED CHARTING TEMPLATES PLUS FREE-FORM DRAWING.
- PRESENTATIONS WITH IN-PLACE EDITS OF CHARTS AND DRAWINGS.
- WORD PROCESSING WITH COLUMNS AND OUTLINING.
- ONE SEAMLESSLY INTEGRATED PACKAGE FOR THE POWER MACINTOSH.
Think of it as a whole new way of looking at your business.

Some people look at business and see an endless progression of boring, unproductive meetings.
Others look at it and see an endless progression of opportunities. Opportunities to build consensus between colleagues. To sell new ideas. And advance their careers.

Which way do you see it?
That could depend on the tools you use to prepare for those meetings. Which is a good reason to look at ClarisImpact software from Claris. And at the new Power Macintosh computers from Apple.

It's eight packages in one.
As you've probably heard, the Power Macintosh paves the way for a new generation of powerful business applications.

It's eight packages in one. As you've probably heard, the Power Macintosh paves the way for a new generation of powerful business applications.

No other business package gives you so much. For that matter, no package of its kind is optimized for the Power Macintosh, either.
So you can get everything done faster.
And easier. The Power Macintosh way.

It's Power Macintosh fast.
As you'd expect from any computer named Macintosh, the Power Macintosh runs thousands of powerful, off-the-shelf business programs.
But that's just the beginning.
At the heart of every Power Macintosh is a PowerPC 601 microprocessor, the first of a new family of ultra-high-performance RISC chips developed in a unique collaboration between Apple, IBM and Motorola.
Which means software rewritten to take advantage of this chip runs blazingly fast — faster than the same software would run on a Pentium-based PC.

Which also means ClarisImpact running on a Power Macintosh is, quite simply, one of the fastest business graphics packages you can find.
To try ClarisImpact, call Claris at 800-544-8554, ext. 322, for a free demo disk.
For the name of your nearest authorized Apple reseller, call 800-732-3131, ext. 600. And discover the power in the new Power Macintosh. The power to be your best.

Introducing ClarisImpact for Power Macintosh.

*Based on Intel 486 performance study by Agilis Laboratories. Also available for delivery: 80386 computers. All rights reserved. IBM, the IBM logo, Macintosh and "The power to be your best" are registered trademarks of Apple Computer, Inc., Power Macintosh is a trademark of Apple Computer, Inc. PowerPC is a trademark of International Business Machines Corporation, used under license. Claris is a registered trademark of Claris Corporation. Simply powerful software and the ClarisImpact logo are trademarks of the Claris Corporation.
## Keep the Flame Alive

The lamp of freedom and the light of learning can take many forms.

Your company's used computers, laser printers, modems, and other surplus equipment can help empower young minds in America, and advance the development of emerging democracies around the world.

The East West Foundation takes your surplus or used equipment and distributes it to American schools and charities, and to democratic and educational institutions in Eastern Europe, Africa, Asia, the Commonwealth of Independent States, and Latin America—wherever it can make a difference. And it does make a difference.

Donating used or overstock computer equipment to the East West Foundation can make a difference to you, too—at the bottom line. Because all donations are tax-deductible. And all types of computer equipment are welcome.

To arrange for a donation or for more information, please call:

**EastWestFoundation**

48 Temple Place

Boston, MA 02111

(617) 542-1234

Fax (617) 542-3333

**EAST WEST EDUCATIONAL DEVELOPMENT FOUNDATION**

A Not-For-Profit Corporation

---

**HALF MAN, HALF RAT. SOMEBODY CALL THE ENQUIRER. WE'RE SHOWING YOU THIS LITTLE VISUAL PUZZLE TO MAKE A POINT. YOUR EYES CAN BE TRICKED. OUR MONITORS, THOUGH, DO NOTHING OF THE SORT. THEY'VE GOT SHARP PICTURE IMAGERY SO YOU'LL ALWAYS KNOW WHAT YOU'RE LOOKING AT.**

---

**BACK ISSUES OF MACWORLD**


**MACWORLD IN MICROFORM**

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

**SUBSCRIPTION QUESTIONS**

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

**MACWORLD IN MICROFORM**

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

**BACK ISSUES OF MACWORLD**


**MAIL OR COURIER MACWORLD Communications, Editorial Dept., 9th floor, 501 Second St., San Francisco, CA 94107; 415/723-0505.**

**LETTERS TO THE EDITOR**

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

**QUESTIONS AND QUICK TIPS**

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

**CONSUMER ADVOCATE**

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

**NEW PRODUCTS AND UPDATES**

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

**REPRINTS AND PHOTOCOPY PERMISSION**

Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use only—for the flat fee of $1.50 per copy of the article or any part thereof. Specify ISSN 0745-8337 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970.

Address requests for reprint orders and for permission to copy editorial for other purposes to Reprints and Permissions, Editorial Dept.

**WRITING FOR MACWORLD**

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

---

**MACWORLD COMMUNICATIONS, INC.**

100 11th Street, Suite 500

San Francisco, CA 94103

(415) 243-0505

**MACWORLD**

A monthly journal of computer-related communications, software, hardware, and related information. Macworld is available on America Online. The area features reviews, news, new-product announcements, version information, a database of products, and Macworld-sponsored message boards and conferences. Several of our editors log on regularly. To obtain a free America Online software kit, call 800/227-6364, extension 5254.

**MACWORLD IN MICROFORM**

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

**BACK ISSUES OF MACWORLD**


**MAIL OR COURIER MACWORLD Communications, Editorial Dept., 9th floor, 501 Second St., San Francisco, CA 94107; 415/723-0505.**

**LETTERS TO THE EDITOR**

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

**QUESTIONS AND QUICK TIPS**

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

**CONSUMER ADVOCATE**

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

**NEW PRODUCTS AND UPDATES**

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

**REPRINTS AND PHOTOCOPY PERMISSION**

Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use only—for the flat fee of $1.50 per copy of the article or any part thereof. Specify ISSN 0745-8337 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970.

Address requests for reprint orders and for permission to copy editorial for other purposes to Reprints and Permissions, Editorial Dept.

**WRITING FOR MACWORLD**

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

---

**MACWORLD COMMUNICATIONS, INC.**

100 11th Street, Suite 500

San Francisco, CA 94103

(415) 243-0505

**MACWORLD**

A monthly journal of computer-related communications, software, hardware, and related information. Macworld is available on America Online. The area features reviews, news, new-product announcements, version information, a database of products, and Macworld-sponsored message boards and conferences. Several of our editors log on regularly. To obtain a free America Online software kit, call 800/227-6364, extension 5254.

**MACWORLD IN MICROFORM**

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

**BACK ISSUES OF MACWORLD**


**MAIL OR COURIER MACWORLD Communications, Editorial Dept., 9th floor, 501 Second St., San Francisco, CA 94107; 415/723-0505.**

**LETTERS TO THE EDITOR**

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

**QUESTIONS AND QUICK TIPS**

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

**CONSUMER ADVOCATE**

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

**NEW PRODUCTS AND UPDATES**

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

**REPRINTS AND PHOTOCOPY PERMISSION**

Permission will be granted by the copyright owner for those registered with the Copyright Clearance Center (CCC) to photocopy any article herein—for personal or internal reference use only—for the flat fee of $1.50 per copy of the article or any part thereof. Specify ISSN 0745-8337 and send payment directly to the CCC at 27 Congress St., Salem, MA 01970.

Address requests for reprint orders and for permission to copy editorial for other purposes to Reprints and Permissions, Editorial Dept.

**WRITING FOR MACWORLD**

Do not send unsolicited manuscripts. If you're interested in writing for Macworld, send a stamped, self-addressed envelope along with a request for our writer's guidelines. Direct (by mail) to Writer's Guidelines, Editorial Dept.
Introducing Joule™
a modular system
so innovative
it redefines
mass storage.

LACIE
LIMITED
A QUANTUM COMPANY

The Joule™ Modular Storage System
only from La Cie, a Quantum Company
Like building blocks, Joule tops one great drive with another—No tools required.

There's a reason Joule (pronounced "Jewel") doesn't look like other mass storage systems. It isn't. Joule is modular. Uniquely versatile. Unconventionally easy-to-use. And unexpectedly elegant.

Joule is a revolutionary concept that transcends the boundaries of conventional drive engineering. It allows you to combine a variety of hard disk drive and removable media drive options into a single vertically interlocked system.

Joule's modular concept eliminates cumbersome redundancies in cables, power supplies and circuitry. It's unique tower design makes installation child's play and expanding or changing your system effortless and fast. It also allows you to move drive modules in and out of the system—at will—without affecting the SCSI chain.

Joule reinvents the "ins and outs" of portable mass storage.

Everyone knows the hardest part of moving portable hard drives from one computer to another is wrestling with the cables. Joule's drive modules are cable free. They mount and dismount from the system with single-handed ease. And, because removing modules doesn't affect the SCSI chain, there's no easier way to move mass storage—from computer to computer, across the office, across town or across the country.

Joule Base with 1080MB Hard Disk Installed, plus 105MB SyQuest Module and 270MB Hard Disk Module

The Joule system and switchable active termination are patent pending.
advantages are simply towering.

The ultimate in plug n' play
gerjvility. Here's how it works.

The Joule Base combines a
hard drive or removable drive
mechanism with a universal 100
watt power supply and standard
SCSI circuitry plus a unique list of
performance and convenience
features. It can operate alone or
support up to seven mounts and
drive modules. Each features
La Cie's exclusive LaCieTerm™
digital active termination switch
(patent pending), a SCSI port and
ID switch, and two auxiliary power
outlets for attaching other SCSI
peripherals. The power switch,
activity LED and termination status
LED are conveniently located in
the front.

Joule Mounts pass power and
SCSI signals from the base through
each interlocking mount (patent
pending). Mounts also allow
modules to be inserted or removed,
leaving the SCSI chain intact.

Joule Drive Modules offer even
greater selection. Hard disks from
170MB to 2050MB, plus a full range
of SyQuest, optical, tape and DAT
modules are available to complete
your system.

The Joule Top Cap contains
the SCSI cable to the Mac giving
the system a clean single-cable
design, regardless of the number
of modules.

Building on a firm foundation.

With Silverlining disk
management software, Quantum
quality, a great warranty and
toll-free technical support, Joule
offers every La Cie advantage.
As a Quantum Company, La Cie
is backed with a Fortune 500®
commitment to quality and service.

The Joule System Rear View

Top Cap
Cable Plugs
Into SCSI Port

Quiet fan on Full-
Height modules

Rotary SCSI
ID Switch on
Each Mount

50 Pin SCSI Port
for Chaining

LaCieTerm™ Digital Active
Termination Switch

Rotary SCSI ID
Switch on Base

Surge-protected
Auxiliary
Power Outlets

Universal Power

Joule Base with 1080MB
Hard Disk Installed, plus
2050MB Hard Disk Module,
2050MB Hard Disk Module (detached),
2050MB Hard Disk Module and
1080MB Hard Disk Module
OVER 8000MB TOTAL!

To order or for more Information, call toll-free
800-999-1488
Mon.-Fri. 5 a.m.-7 p.m. & Sat. 8 a.m.-noon PST
International 503-520-9000 Fax 503-520-9100 (24 hrs.)
UK 0800-81-3013 Australia 0014-800-113-007
VISA, MasterCard, C.O.D. and approved purchase orders accepted.
Joule System Components

The Joule Modular Storage System is the most versatile and convenient mass storage solution available (patent pending). Select from a full range of hard disk and removable media options in base and module units.

Quantum 3.5" Drives

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Base w/ TopCap</th>
<th>Module w/ Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>170MB</td>
<td>$259</td>
<td></td>
</tr>
<tr>
<td>270MB</td>
<td>$329</td>
<td></td>
</tr>
<tr>
<td>340MB</td>
<td>$389</td>
<td>$359</td>
</tr>
<tr>
<td>540MB</td>
<td>$639</td>
<td>$609</td>
</tr>
<tr>
<td>1080MB</td>
<td>$949</td>
<td>$919</td>
</tr>
<tr>
<td>1440MB</td>
<td>$1189</td>
<td>$1159</td>
</tr>
<tr>
<td>1800MB</td>
<td>$1259</td>
<td></td>
</tr>
</tbody>
</table>

Quantum 2.5" Drives

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Module w/ Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>855MB</td>
<td>$299</td>
</tr>
<tr>
<td>170MB</td>
<td>$359</td>
</tr>
<tr>
<td>256MB</td>
<td>$449</td>
</tr>
</tbody>
</table>

Seagate Drives

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Module w/ Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>1650MB</td>
<td>$2039</td>
</tr>
<tr>
<td>2050MB</td>
<td>$2329</td>
</tr>
</tbody>
</table>

Removable Drives

<table>
<thead>
<tr>
<th>Drive</th>
<th>Base w/ TopCap</th>
<th>Module w/ Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest</td>
<td></td>
<td></td>
</tr>
<tr>
<td>105MB</td>
<td>$539</td>
<td>$509</td>
</tr>
<tr>
<td>270MB</td>
<td>$689</td>
<td>$659</td>
</tr>
<tr>
<td>DAT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.0GB DAT</td>
<td>$919</td>
<td></td>
</tr>
<tr>
<td>TurboDAT</td>
<td>$1159</td>
<td></td>
</tr>
<tr>
<td>8.0GB DAT</td>
<td>$1359</td>
<td></td>
</tr>
<tr>
<td>Tape</td>
<td>$1729</td>
<td></td>
</tr>
<tr>
<td>155MB</td>
<td>$569</td>
<td></td>
</tr>
<tr>
<td>600MB</td>
<td>$789</td>
<td></td>
</tr>
</tbody>
</table>

Optical

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Base w/ Mount</th>
</tr>
</thead>
<tbody>
<tr>
<td>230MB Cartridge</td>
<td>$1069</td>
</tr>
</tbody>
</table>

Additional Accessories

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Cap</td>
<td>$49</td>
</tr>
<tr>
<td>Mount</td>
<td>$69</td>
</tr>
<tr>
<td>Joule Base (no drive)</td>
<td>$199</td>
</tr>
</tbody>
</table>

The La Cie Advantage

- Silverlining Disk Management Software
- Unlimited TOLL-FREE Technical Support
- 30 Day Money Back Guarantee
- All Drives Burned In and Tested
- Ready to Plug and Play
- Valuable Warranties

LaCieTerm Digital Active Termination
- Double Shielded SCSI Cables
- FCC, UL, TUV, VDE & CSA Approved
- Termination Status LED
- Surge Protection
- Front Power Switch

*Call for details on terms, conditions, limited money back guarantee (shipping not included), warranty and free offers. Comparisons may not apply to all vendor products, check specifications. Prices do not include shipping and only apply to products shipped within the continental United States. International customers must pay for all shipping charges. Add sales tax where applicable. Joule, ZFP, Tsunami, PocketDrive, PocketJet, SilverStreak, SilverStreak, La Cie and the La Cie logo are trademarks of La Cie, Ltd., a Quantum Company. FORTUNE 500 is a registered trademark of the Time Inc. Magazine Company. All other trademarks are the property of their respective companies. All prices, specifications, terms, warranties, descriptions, products and services herein are subject to change without notice or retraction. © Copyright 1994 La Cie, Ltd. 8720 SW Creekside Place, Beaverton, OR 97005. Phone (503) 520-9000 Fax (503) 520-9100. All rights reserved. Printed in U.S.A.
La Cie Storage Solutions

**Tsunami™**: Sleek, transportable.
Our award-winning Tsunami drives offer superb performance and design.

**Quantum 3.5” Drives**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>Tsunami</th>
</tr>
</thead>
<tbody>
<tr>
<td>170MB</td>
<td>$199</td>
<td>$259</td>
</tr>
<tr>
<td>270MB</td>
<td>$269</td>
<td>$329</td>
</tr>
<tr>
<td>340MB</td>
<td>$299</td>
<td>$359</td>
</tr>
<tr>
<td>540MB</td>
<td>$549</td>
<td>$609</td>
</tr>
<tr>
<td>1080MB</td>
<td>$859</td>
<td>$919</td>
</tr>
<tr>
<td>1080MB+</td>
<td>$859</td>
<td>$919</td>
</tr>
<tr>
<td>1440MB</td>
<td>$1099</td>
<td>$1159</td>
</tr>
<tr>
<td>1650MB+</td>
<td>$1979</td>
<td>$2039</td>
</tr>
<tr>
<td>1800MB+</td>
<td>$1199</td>
<td>$1259</td>
</tr>
<tr>
<td>2000MB+</td>
<td>$1919</td>
<td>$1979</td>
</tr>
<tr>
<td>2050MB+</td>
<td>$2269</td>
<td>$2329</td>
</tr>
</tbody>
</table>

S=Seagate mechanism

**PocketDrive™**: Palm-sized portability.

Weighing just under 10 ounces, it’s the only pocket portable to offer the PocketDock™ docking option.

**Quantum 2.5” Drives**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>PowerBook</th>
<th>PocketDrive</th>
</tr>
</thead>
<tbody>
<tr>
<td>40MB</td>
<td>$239</td>
<td></td>
</tr>
<tr>
<td>85MB</td>
<td>$199</td>
<td>$299</td>
</tr>
<tr>
<td>170MB</td>
<td>$259</td>
<td>$359</td>
</tr>
<tr>
<td>256MB</td>
<td>$349</td>
<td>$449</td>
</tr>
</tbody>
</table>

*Laserscribe 630 installation kit available

Removable media: Limitless storage options.

For the finest in removable media mass storage solutions, La Cie offers an outstanding selection of drive technologies in our zero-footprint case. Silverlining (or Retrospect® with tape and DAT drives) plus one free media cartridge included.

**ZFP Removable Drives**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SyQuest</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44MB 5.25”</td>
<td>$369</td>
<td>$429</td>
</tr>
<tr>
<td>88C MB 5.25”</td>
<td>$399</td>
<td>$459</td>
</tr>
<tr>
<td>105MB 3.5”</td>
<td>$449</td>
<td></td>
</tr>
<tr>
<td>270MB 3.5”</td>
<td>$599</td>
<td></td>
</tr>
<tr>
<td>200MB 5.25”</td>
<td>$559</td>
<td>$599</td>
</tr>
<tr>
<td>Cartridges</td>
<td>$69</td>
<td>$79</td>
</tr>
</tbody>
</table>

Each drive comes with Silverlining™ and one free SyQuest cartridge.

**CD-ROM**

Toshiba Dual Speed: $639

**Optical Drives**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>$1099</th>
<th>$59</th>
</tr>
</thead>
<tbody>
<tr>
<td>230MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>230MB Cartridge</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each drive comes with Silverlining™ and one free 3.5” optical cartridge.

**DAT**

5.0GB DAT: $1099 | $1159

Tape

<table>
<thead>
<tr>
<th>Capacity</th>
<th>$569</th>
<th>$789</th>
</tr>
</thead>
<tbody>
<tr>
<td>155MB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600MB</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Each drive comes with Retrospect™ and one free DAT or TEAC tape cartridge.

Color Scanning Solutions

**As low as**

**$1599**

Silverscan II makes scanning as quick, painless and productive as possible. With features like dynamic color preview (16 sec.), magnify in preview, proof in preview, savable scan settings, up to 400% scaling in 1% steps and up to 1600 dpi in 1 dpi steps—all in one pass. It's easy for the beginner and powerful for the advanced user. And it's Macworld's Editor's Choice.

"...Fast and a pleasure to use...Produced high-quality printed images with good resolution, and its documentation was tops..."

**Macworld, November 1993**

**Silverscanner II**

All Silverscanners come with our powerful Silverscan software, Color Image editing software and Read-It OCR Pro.

<table>
<thead>
<tr>
<th>Basic Bundle</th>
<th>$1599</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Bundle Plus Cache</td>
<td>$1899</td>
</tr>
<tr>
<td>Bundle Plus Cache &amp; ColorStudio</td>
<td>$1999</td>
</tr>
<tr>
<td>Bundle Plus Photoshop</td>
<td>$1999</td>
</tr>
<tr>
<td>Optional Transparency Attachment</td>
<td>$799</td>
</tr>
<tr>
<td>Optional Sheet Feeder Attachment</td>
<td>$499</td>
</tr>
</tbody>
</table>

To order or for more information, call toll-free 800-999-1488
Mon.-Fri. 5 a.m.-7 p.m. & Sat. 8 a.m.-noon PST

International 503-520-9000 Fax 503-520-9100 (24 hrs.)

VISA, MasterCard, C.C.A. and approved purchase orders accepted

Circle 52 on reader service card
If you're not using Canvas... You're missing out.

When the rubber hits the road, you can't afford to spin your wheels using under-powered graphics software. You need drawing tools designed for today's high-tech tasks. Tools that deliver unrivaled speed and accuracy without inhibitions. You also need them now, not years from now.

We deliver.

Canvas has just the right combination of tools to help you enjoy your work and become more productive. Without sacrificing quality or compromising your creativity. Just ask our biggest fans — our competitors. They've been busy copying innovations Canvas users have enjoyed for years. Like unlimited layers, integrated drawing and painting, preview editing and object path combinations*, to name just a few. Imagine what will happen when they find out what we're working on today. The choice is clear... you can use Canvas now or spend a lifetime waiting for the competition.

Don't listen to us.

Our competitors can't use only fans. Just listen to the 400,000+ high-tech professionals who power up Canvas every day in seven languages to produce today's top technical illustrations. Or the expert analysts from leading multinational corporations, government agencies and top educational institutions who have chosen Canvas as their graphics standard. Or the computer experts at leading industry publications. They'll all tell you Canvas is the most advanced, cost-effective multi-platform graphics solution. Period.

We won't bore you with the details.

Needless to say, Canvas has all the drawing tools and features you'll probably ever need. From freehand Bezier curves to 1/65,000th-inch precision and fifteen flavors of autodimensioning.

From slide presentations with QuickTime® support to built-in color separations. From precision type handling to over a dozen industry-standard import/export tools, including EPS, PDF and CVS (Canvas for Windows). And thanks to our unique Open Architecture Technology (OAT®), there's plenty of new power available and even more when you need it. As proof, let us point out that every detail of this ad was created and color separaged within Canvas.

Don't miss out any longer.

Stop grinding your gears with old technology. Quit wasting valuable time and energy with the wrong graphics tools. Bust off your leather jacket, put on your badass shades and make tracks to your favorite Canvas Reseller today. Or call 1-800-733-6522 to order, and hop on for the ride of your life. Helmet not included.

$149.95 COMPETITIVE UPGRADE

Still using some other graphics program? Now we've made switching to Canvas even easier! Keep your dipper, but trade in that sewer for some real precision drawing power. Simply show us proof of ownership of any Macintosh graphics program and shop deeply S50 off Canvas' already low $399 price!

Circle 57 on reader service card
Grading the Latest Macs

**Power Macs and PowerBooks**

Once again, in mere months Apple has remodeled almost the entire Macintosh lineup. For longtime Macintosh users it’s now a dreamlike world in which Apple is the value or performance leader in many niches. This means it’s hard to go wrong buying a Mac, and we no longer have to put up with the snickers of PC users. This month I grade the new Power Macs and the new PowerBooks. I also update the grade of one Quadra for good measure. Overall, this is the best report card I’ve ever given to Apple’s lineup, and these high marks testify to how far Apple has come in meeting its customers’ needs.

I grade each of the models, but as usual, these grades are preliminary and should not be mistaken for full reviews.

**Blackbird Flies**

Let’s start with the latest development, the new PowerBooks. The 500 series, code-named Blackbird, is the first big change in the all-in-one PowerBook lineup. These 68040-based models are faster and offer better screen options, longer battery life, greater expandability, and a better keyboard and pointing device. Finally, now that Apple offers the Global Village modem as an option, you can buy a decent modem.

More and more users have been getting rid of their desktop systems and operating solely on their PowerBooks. Building video into the 160 and 180 series models was Apple’s acknowledgment of this working style. Several new features of the 500-series models make them even stronger candidates to replace desktop systems. These features include the higher RAM ceiling of 36MB, a full-size keyboard, built-in Ethernet, support for larger monitors, and PowerPC upgradeability—all of which make the 500 series more than adequate for most users who want to attach their Mac to a color monitor or a network. With the improved keyboard and pointing device, most users probably won’t need to buy a separate keyboard and mouse for use at their desks (see “PowerBooks: The Next Generation,” in this issue).

If you configure your PowerBook 500 with a large-screen monitor, a big hard disk, and a generous amount of RAM, you should even be able to create reasonably demanding page layouts and presentations without much compromise, comparable to using a Quadra 610 or perhaps even a 650. Don’t expect a 500-series PowerBook to perform like a Power Macintosh, but many users won’t need that much power. On the downside, there’s no FPU, and Apple should have equipped the 500 models with at least 8MB of RAM—4MB is no longer comfortable.

**The 500s’ Fortunes**

Looking at the individual models, the 520 and 520c are good replacements for the 510 and 510c. The 145B and 165 and 165c. The 280c are not completely new; they simply update (and replace) the 250 and 270c. The 520c’s dual-scan passive matrix color is better than the color of earlier passive matrix displays, but in my estimation, active matrix screens are simply superior. Having used PowerBooks with both screen types, I’ve found that working with a lower-quality screen is like peering through frosted glass. For laptops I still prefer the appearance and longer battery life of black-and-white screens, but because of the 540c’s combination of four hours of battery power and an active matrix screen, it’s the first color PowerBook I would seriously consider. With all this in mind, I give the 520 and 540c an A—. I would have given them a solid A except that they cost a little too much and don’t include an FPU.

The Duo 280 and Duo 280c are not completely new; they simply update (and replace) the 250 and 270c. The new models do benefit from a boost in speed, so they are an appealing alternative to the all-in-one design of the 500 models. For this reason the Duo 280 receives an A—, while the color Duo 280c receives a B because the 580c is a better solution for color users. If you really need a color portable, you probably will need to attach to an external monitor at times. The 580c has built-in support for an external monitor.

BY ADRIAN MELLO

STATE OF THE MAC

MACWORLD | July 1994 25
external monitor. The Duos require a MiniDock (with its extra weight) to attach to a monitor. I've used all of the PowerBooks, and I'm happiest with my Duo 250, which I use with the Duo Dock, an elegant solution to the dilemma of desktop versus portable.

Power to the Macintosh

The Power Macintosh was the biggest step forward in Apple's desktop line since the color Mac in 1987. We previewed the Power Mac in depth in our May issue. Surprisingly, the most compelling Power Mac is the low-end 6100/60. If you are in the market for a desktop machine and you don't need to add a lot of boards, this is the way to go. I have routinely seen prices under $1600 for a configuration with 8MB of RAM and a 160MB hard drive (not including monitor or keyboard). The additional cost for this model over the Quadra 610 is often less than $300. The Power Mac 6100/60 deserves an A-.

The Power Mac 7100/66 and 8100/80 are good machines, but their appeal is limited for now because of the scarceness of native Power Mac software. The 7100/66 gets an A, and the 8100/80 gets a B based on price/performance. If you rely on applications that are not yet available in native mode, then you should subtract a grade from any Power Mac until the necessary software ships.

For the time being, I recommend the Quadra 650 for those who want to have their cake and eat it too. I've seen this model priced at $2300, and it's still the best price/performance value among the 680X0-based Macintoshes. When the native Power Mac applications you need are ready, you should be able to purchase Apple's PowerPC upgrade card and get 66MHz PowerPC performance. At $700 this card is very reasonably priced; even after you add this cost to the price of the Quadra 650 you still come out ahead. For the next few months, the Quadra 650 is the best option for users whose work depends on software that's not yet offered in native Power Mac versions. Because of its overall value and the upgrade-card strategy, the Quadra 650 earns an A- and ties for top honors.

Macworld and the Power Macs

Speaking of honors, I'm pleased to say that the Computer Press Association recently selected Macworld as Best Computer Magazine for 1993 (in the highest-circulation category). It's especially gratifying that the computer-journalism professionals who make up the CPA have honored Macworld with this award for the fourth year in a row. But we didn't get to this point by standing still—as part of our constant efforts to make Macworld more useful and to improve our in-depth coverage of the Power Mac transition, we added the PowerPC News section (now called Power Mac News) even before the new machines began shipping. Because our Power Mac coverage now extends across the entire magazine, this month we are adding a logo that identifies any coverage pertinent to the Power Macintosh. Power Macs will eventually affect all users, and we intend to ensure that you can easily find Power Mac information in our pages.

So far, the Power Mac transition seems to be going very well. Apple recently announced that it sold 175,000 Power Macs in the first few weeks after their introduction. No insoluble problems have surfaced, and all our gauges show that interest in Power Macs is intense. Macworld is committed to being the best source of information on the Power Macintosh during this exciting time.
OUR 25 GB TAPE DRIVE JUST HIT A NEW HEIGHT.

It's smaller; yet our new CY-8505 backs up the largest Macintosh computer systems and networks, unattended.

How? Optional data compression boosts the 5 GB capacity to up to 25 GB. And it's fast – able to write data at speeds of up to 90 MB per minute. Such high performance means huge savings in manhours and media costs. Best of all, the MTBF rate of 80,000 hours gives you data reliability you can depend on.

The CY-8505 features software that lets you schedule full or incremental backups to run any time, day or night. A directory of files is stored on the disk, making it fast and easy to restore. A backlit status display gives you command under execution, compres-

sion ratio, transfer rate, tape remaining and more in a clear, easy to read format.

In short, you won't find a more advanced, more reliable solution on the market.

What's more, we back this turnkey solution with a two year warranty that includes responsive service and support from our in-house staff.

For more information, call today at (804) 873-9000.

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

Circle 188 on reader service card
The new AS/400.
Black goes with everything.

If your business plan includes client/server computing, rest assured that the new AS/400® Advanced Series will coordinate impeccably. Everything about it is designed with a new openness and interoperability, to thrive in client/server environments. There’s open client access, to serve OS/2®, Windows®, DOS, Macintosh or UNIX® systems with equal ease and security. Powerful features that provide open database access and protocol-independent networking are built in. There’s a wide choice of AS/400 Advanced Servers—high performance processors fine-tuned for client/server duty. And thousands of AS/400 client/server applications are ready today. In short, the new AS/400 is so easy to implement and manage, it represents a new generation in client/server computing: a system designed to stand out, even as it blends in. For additional information, call 1 800 IBM-6676, ext. 641.

©1994 IBM Corp.
The new AS/400 Advanced Series from IBM

Circle 179 on reader service card
If there's a needle in here, AppleSearch will find it.

Searching for information on a computer network can be a lot like looking for the proverbial needle in a haystack. Enter a pitchfork with a serious attitude: AppleSearch. Powerful new information-retrieval software designed to dig easily into the wealth of data residing across your office network. AppleSearch turns a typical file server into a rather untypical knowledge server. It quickly explores your entire AppleTalk network in search of information on any topic you may select. And more important, homes in on precisely the pieces you need. It's incredibly easy to use. Even first-time users can start searches by creating "Reporters" with simple English queries like "Find all references to volcanic activity in the South Pacific." The Reporters do the rest. They scan through a range of selected data, documents and information sources—such as servers, on-line services, news feeds, even CD-ROMs—in search of whatever subject you're interested in.

A personal, electronic update is then delivered to you with a list of all the information you requested, ranking each entry based on how well it matched what you were looking for. Reporters can also deliver updated information to you on a scheduled basis—whether you're in the office or not. They can even be shared with other users. Or accessed remotely using Apple Remote Access. So, for example, a marketing manager can easily track market announcements from on-line news feeds. Attorneys can access references to legal cases. And teachers and students can quickly research subjects and identify resources they might otherwise miss.

So how do you find AppleSearch? Call us at 800-538-9696, extension 160, for more information as well as the name and location of the authorized Apple reseller in your neighborhood. AppleSearch. It's just what you've been looking for.
Letters

Here Comes Trouble

G E N E STERNBERG'S GENERALLY COM-
plete article about troubleshooting
system-level problems ("Troubleshooting
Tips and Tools," April 1994) does not
emphasize enough Apple's own Disk
Tools disk, still included free with all
Macintoshes (except Performas). I am
a frontline technical-support specialist
working for a major software publisher,
and I would speculate that less than 20
percent of my callers know the value of
the Disk Tools disk. Except for this omis-
sion, the article was well written, and a
great description of what options are
available when problems arise.

Max Penden
Hayward, California

Disk Tools can be a good first line of defense in case
of disk trouble, but readers should be aware that the
Apple HD SC Setup component of the Disk Tools disk
works only with hard drives purchased from Apple,
as Apple adds an ID code to the ROM of drives that
it sells. The other component of the Disk Tools disk
is the Disk First Aid utility, which works with non-
Apple drives, if they follow Apple's partition struc-
ture. But that means that drives formatted with La
Cie Silverlining, for example, can't be checked. It
doesn't make much difference, though, since Disk
First Aid has limited recovery options.—Ed.

O N E EXTENSION MANAGER YOU
overlooked is the shareware utility
Symbionts, which goes several steps
beyond Extensions Manager. Symbionts
works like Extensions Manager (moving
stuff from one folder to another) but it
has a much nicer interface (System 6 con-
trol-panel-style). You can also throw
away extensions and save frequently used
sets of extensions.

Greg Scarich
via the Internet

When installing a new system
Folder on your Mac, don't over-
look the Scrapbook file, especially if you
keep important artwork or other clips
there. Too many times, I have replaced all
my other INITs and preference files and
forgotten about my Scrapbook.

Mark Foster
Azuza, California

Barbarians at the Gate

STEVEN LEVY, I ENJOYED YOUR
article about Apple and the Internet
(The Lowdown, March 1994). We seem to
be in similar situations. After an extreme-
ly trying period that spanned about two
weeks, I'm finally up and running with a
TCP/PPP account. What a nightmare!

Your idea of Apple supplying a built-
in interface to the Net sounds great. The
only problem I see with the proliferation
of recent Internet activity is that logjams
have resulted. I often have Archie requests
turned down because of overburdened
systems at host FTP sites. If every Joe
with a Mac has easy access to the Net,
won't the system become overloaded? A
lot of these sites have "real" work to do.
I'm surprised I haven't seen more people
addressing this issue.

If Apple opens the floodgates to the
Net as you suggest, it may be saddled with

the demise of the Net as a useful research
and academic tool, rather than hailed as a
champion of the common weal. I don't
believe the system can handle the load.

Bruce MacLeod
via America Online

Heart Attack

I READ WITH INTEREST IN THE APRIL
1994 issue of Macworld a review of
Caduceus Science Review Macintosh
Project 1.0. The review shows a Caduceus
diagram of a heart that grossly and erro-
neously misidentifies the left ventricle as
the left atrium. The reviewer points out
that there are a "few incorrect explana-
tions." Such an obvious and simplistic
error does not bode well for premed stu-
dents using the program to bone up on
their skills for the MCAT test.

Timothy Dickinson
Henderson, Nevada

Actually, I meant to showcase the misspelling deoxy-
genated in the diagram's text, and the atrium/ventri-
cle problem was just a bonus. Caduceus Project actu-
ally goes through a rigorous proofreading cycle (the
mistakes in this figure were corrected within a few
weeks of release), but Macworld got one of the first
100 disks in the production run for review. Version
1.05 is currently shipping, and the vendor has cleared
up nearly all the problems I found in the earlier ver-
sion.—Charles Seiler

April What?

A M I THE ONLY ONE WHO, AFTER
reading Lon Poole's April Quick
Tips, immediately powered up their Mac
and performed the four-corners-plus-
option-P-R-O routine?

Imagine my shock when my Mac icon
darkened and the coveted word Pro
appeared after the model name, just like
Lon said it might! My Mac seems to run
only three times as fast, not the four times
continues
After Dark

THE ULTIMATE SCREEN SAVER
Over 30 incredible displays to prevent phosphor burn-in. Includes Flying Toasters, screen munchin' worms, and dazzling tropical fish. Plus Screen-locking password protection, company logo and message display, and System 7 activity monitor.

more After Dark

An all-new collection of more than 25 add-on displays. Features contest winners Movin' Man, Tunnel and GraphStat. There's also Lunatic Fringe the shoot 'em up space game, Boris the Cat, and many more! (Requires After Dark)

CORRECTIONS

Since "The Power Macintosh Arrives" was written, Apple has changed some information that we ran in that feature's "Making AV Technology Mainstream" sidebar (May 1994). To get the Express Modem software, you need to buy a GeoPort telecom adapter. Also, to get the PlainTalk software, you must either purchase an AV model or buy the software separately.

Contrary to the May 1994 New Products report, Sonnet Technologies’ BudgetBooster does not support the Color Classic, and the LC version of the card has a 25MHz 68020 chip.

Graphisoft’s PowerPC upgrade offer for ArchiCAD has some caveats not reported in our April 1994 “PowerPC Apps” item in PowerPC News. The plan is limited to customers who bought the software between October 1, 1993, and January 31, 1994, and also paid $95 for the upgrade plan.

The May 1994 review of Connectix’s RAM Doubler 1.0.1 should have mentioned that the software is compatible with System 6.0.5.

In the April 1994 review of the LaserWriter Select 360, two printer names were transposed. We should have said that the LaserWriter Select 360’s output doesn’t look as crisp as that of the LaserJet 4M with Resolution Enhancement technology. The change does not affect our evaluation or rating.

Also in April Reviews, Passport Producer Pro’s Cons should not have included the word expensive. This would not have changed the rating.

The correct number for ordering TouchBase and DateBook is 800/888-6293 (At Work news, May 1994).

In the May feature “Smart Thinking,” Inspiration was incorrectly criticized as being unable to import files created with other applications. In fact it can import text files and More files.

Microtek’s phone number is 310/297-5000 (Graphics news, June).

Lon promised, but that’s all right. What else would one expect from a 1-in-10,000 shot at perfection?

My only problem is deciding whether to keep my Mac Pro, offer it for sale to Lon at a high premium, or read his entire column next time before rushing off to try his tips and tricks. Do you have any suggestions? Oh, and by the way, where can I buy that ADB booster?

Mike Morris
Trabuco Canyon, California

Off-Price Monitors Might Work

In your January 1994 article on monitors ("Small Wonders"), you reviewed only the plug-and-play VGA monitors. While this avoids the possibility of buying an incompatible monitor, it also makes for expensive purchases. It’s possible to buy a monitor with .28mm dot pitch, noninterlaced 60Hz refresh, and good color convergence for about $270 including an adapter. My monitor works with my Quadra 610’s internal video, providing 16-bit color at SVGA resolution. It also offers on-the-fly hardware zooming and color filters, which I don’t believe any of the reviewed monitors can do.

I realize that your lab doesn’t have the time to test every monitor, and your magazine doesn’t have the space to list the results of all of those tests. But a recommendation to visit the computer swap meets and trade shows (especially the PC ones)—where monitors range from $200 to $300—could save your readers hundreds of dollars.

Gabriel Rossman
via America Online

Speedy LaserWriter Plus

February’s MacWorld reviewed “high-speed” workgroup printers, most costing several thousand dollars ("Workgroup Printers"). One of the speed tests used a 20-page Word 5.0 document composed in 12-point Courier with three type styles. Apple’s latest PostScript Level 2 driver (LaserWriter 8.1.1) prints such a document on a seven-year-old LaserWriter Plus in 175 seconds.
Pinnacle introduces a new storage system designed especially for digital video.

The Pinnacle Orray™ is the world's first optical drive system to utilize multiple heads and multiple disks—similar to hard disk technology. The Orray™ can perform as fast as most hard disk drives, with the added benefit of removable, reliable, inexpensive optical media.

The Pinnacle Orray™ with its Patent Pending multi-disk/multi-channel architecture offers sustained transfer rates up to 8MB per second.

Each color-coded media set holds up to 5.2GB of data—perfect for most video production needs.

The versatility of the Pinnacle Orray™, with its intelligent RISC processor controller, allows for operation in multiple environments. In streaming mode the Orray™ can be used for digital video or audio. In transaction mode the Orray™ can be used as a file server or database storage system. All settings including operational modes, SCSI addresses, and status indicators are controlled and viewed from a front panel LED for easy access and identification.

The Pinnacle Orray™ is the most advanced storage system available today. It's the ultimate in unlimited storage. For more information call: 800.553.7070.
THE nVIEW Z SERIES.

They won't forget your message. You won't forget the applause. Project your next presentation directly from your computer in big, bold color images with nVIEW’s new line of LCD projection panels.

Sleek, feather-light panels that are so easy to use, yet so durable, you can deliver presentations anywhere, anytime. With impact.

nVIEW
VISIONARY DISPLAY TECHNOLOGIES

All-in-one projection panels are easy to setup with built-in audio, unique Presentation Control and the versatility to connect up to four sources simultaneously.

See it. Hear it. Feel it. Unforgettable presentations everytime.

Enjoy the applause! For more information call 1-800-736-8439 or 804-873-1354.

Put Our List On Your List

Our list is the Consumer Information Catalog. It’s free and lists more than 200 helpful government booklets. So send for the free Catalog. It’s the thing to do.

Consumer Information Center, Dept. LL, Pueblo, CO 81009

A public service of this publication and the Consumer Information Center of the U.S. General Services Administration

34 July 1994 MACWORLD

LETTERS

This is comparable to 6 of the 12 printers tested by Macworld, when printing at 300 dpi. Before you buy a new printer, make sure you have given your old printer a fair chance with the newest software.

Gerald Wright
Portola Valley, California

It’s true that the LaserWriter Plus uses an 8-page-per-minute engine, and it has the same speed as most of the printers on the raw-engine-speed test. But when you print anything other than single-font documents, all printers reviewed in the article out-run the LaserWriter Plus.—Ed.

The Right Tools for the Job

AMY ROTHEISEN OF WALTHAM, Massachusetts, writes in March’s Letters that she uses search-and-replace techniques in Microsoft Word to massage files obtained from online services. Maybe she is not aware that Microsoft Word 5.X already comes with a text-with-layout converter that does exactly what she describes. Text with layout is defined as text with a hard break at the end of each line, and paragraphs separated by double line-breaks (carriage returns, in the case of the Macintosh Operating System). Unfortunately, you cannot install this text-with-layout converter using any of the configuration sets offered by Microsoft Word’s installation script. You need to install it using the custom install features of the script. After you install the converter, a dialog box asking you to choose between plain text and text with layout appears every time you open a text file with Microsoft Word.

If you want a user-friendly utility for more-sophisticated text processing, I would recommend the shareware Add/Strip 3.0.3; or you can choose among at least eight or ten other freeware and shareware programs that give you better results, more speed, and less frustration than using search-and-replace in your word processor to preprocess your downloaded text files.

Pedro A. Lopez-Valencia
Washington, D.C.
STATISTICA/Mac™ is a complete statistical data analysis system with hundreds of presentation-quality graphs integrated with all procedures. It is designed for business, education, and research environments. The system is used in a variety of fields, including social sciences, engineering, medicine, and business. It is a comprehensive tool for statistical analysis, enabling users to perform a wide range of statistical procedures and generate high-quality graphs.

Key Features:
- Comprehensive statistical analysis procedures
- Presentation-quality graphs
- User-friendly interface
- Support for Macintosh computers

The system offers a wide range of statistical procedures, including descriptive statistics, regression analysis, ANOVA, MANOVA, MANCOVA, GLM, and many others. It also provides extensive graphing capabilities, allowing users to create a variety of graphs, including scatter plots, histograms, box plots, and more.

Quick Start:
- Installation guide
- User manual
- Sample data sets
- Technical support

System Requirements:
- Macintosh computer
- Minimum of 64MB RAM
- OS X 10.3 or later

Pricing:
- For business and educational use
- Free trial available

Contact:
- StatSoft
- Circle 99 on reader service card
- For more information, visit the StatSoft website.
There are three types of computer users: those who have lost data due to a power problem, those who are going to, and those who have protected themselves against the inevitable surge, blackout or brownout with the most reliable UPS they can buy: Back-UPS by APC. In fact, editors and users alike agree that if your system demands absolute reliability, you can depend on APC Back-UPS.

According to a study by Bell Labs, undervoltages represent the overwhelming majority of power problems likely to hit your computer. The question is not if failure will occur, but when. Whether due to construction, wiring, weather, other office equipment, or accidents, power problems are as inevitable as death and taxes. That’s why you need instantaneous battery backup power from the Back-UPS to prevent data loss, hard disk crashes, and hardware damage.

If you’re concerned about lightning, rest assured that when measured using the ANSI/IEEE 587 Category A test wave, Back-UPS are superior to

© 1994, APC, Back-UPS, PowerChute are trademarks of APC. Other trademarks are the property of their owners. Specs subject to change without notice.
"All other brands of UPS die regularly in this lightning prone environment. My APC won’t die!" said Paul Sisilli, Systems Analyst, City of Port St. Lucie. "With other brands, users don’t find out until it is too late. The power interruptions here are very hard to live with. The other brands are dying off. Typically they last just beyond their warranty period. My Back-UPS is going on three years...no other brand is as reliable."

virtually all separate surge suppressors. Surge performance is even backed by a $25,000 Lifetime Equipment Protection Guarantee.

If you’re protecting a network server, a communications interface port (on models Back-UPS 400 and higher) provides the security of an automatic shutdown to all major OS including NetWare, Windows, Windows NT, LAN Server, LAN Manager, LANtastic, SCO Unix, OS/2, Banyan Vines, AppleShare/System 7 and more, so your data is safe whether the system is attended or not. (PowerChute software and interface kits sold separately.)

And since data processed on networked clients needs protection too, the $139 Back-UPS 250 provides an economical solution for all your LAN workstations.

Discovering how essential Back-UPS protection is can be hard...if you wait for the next storm to roll through. But discovering how affordable it has become is easy...

Call today and find out (the easy way) why more than 1,000,000 satisfied users bank on Back-UPS from APC. With more awards than all other brands combined, field-proven reliability, and a two year warranty, Back-UPS are power protection you can purchase with confidence.

AWARD-WINNING FEATURES

Instantaneous backup power beats blackouts and brownouts

Unmatched lightning (tested to UL1449) and surge protection for maximum hardware safety

Network-grade line conditioning and EMI/RFI filters prevent glitches

LAN Interface (on Back-UPS 400 and up) provides automatic shutdown to all major OS: Windows, NT, NetWare, LAN Server, LAN Manager, LANtastic, Unix, OS/2, Vines, AppleShare/System7 and more.

Site diagnostics automatically spot missing ground and reversed polarity, two common miswirings which usually require an electrician’s visit to diagnose.

Option switches allow you to customize transfer voltage and alarm settings.

Test Switch for ongoing peace of mind

2 year warranty and full safety approvals

$25,000 Lifetime Equipment Protection

Circle 72 on reader service card
We've built our reputation on professional publishers from around the world.

When it comes to plain-paper typesetting, LaserMaster's® users really pile up! Every professional knows the physical appearance of their work is a direct reflection of their personal performance. That's why professionals who want to look their best choose LaserMaster.

Oversized Typesetting
The Unity™ 1200xL-O offers all the features you'll need to get the job done right. Its 12"x19" paper support lets you print 11"x17" documents with full bleeds, crop marks, and registration marks.

1200-dpi Camera-Ready Output
Unity products use LaserMaster's patented TurboRes® resolution-enhancement technology to give you precise, 1200-dpi, camera-ready output—the highest resolution possible on plain paper.

The Cost-Effective Choice
With LaserMaster's Unity line, you get quality output that's economical too. You'll find that Unity typesetters quickly pay for themselves. Unity's camera-ready pages only cost about 5 cents each. Compare that to the cost of imagesetter output that can cost as much as $9 a page.

For More Information
Your work speaks for itself. Call now for more information and some actual output. LaserMaster is "The Professional's Choice™" for quality plain-paper typesetting.

Unity 1200xL-T
Plain-Paper Typesetter
- Multi-platform, plug-and-play plain-paper typesetter for your Macintosh® or PC and most other computers
- 1200-dpi, camera-ready output
- 11"x17" paper handling (user upgradable to oversized 12"x19"
- 40-MB hard drive
- 135 premium Type 1 typefaces pre-installed

$6,995

Unity 1200xL-0
Plain-Paper Typesetter
- Multi-platform, plug-and-play plain-paper typesetter for your Macintosh® or PC and most other computers
- 1200-dpi, camera-ready output
- 11"x17" paper handling (user upgradable to oversized 12"x19"
- 40-MB hard drive
- 135 premium Type 1 typefaces

$4,995

Includes Rebate

LaserMaster 1200xl
Personal Typesetter
- The incredibly affordable bus-based personal typesetter for your Macintosh® or PC
- 1200-dpi, camera-ready output
- 11"x17" paper handling
- 135 premium Type 1 typefaces

CALL 800-950-6868 or 612-944-9330 Fax: 612-944-0522

Circle 43 on reader service card
Aldus Ships PageMaker for Power Macs

The eagerly awaited PageMaker 5.0 for Power Macintosh is now shipping from Aldus. The $895 Power Mac native version runs two to four times as fast as the existing PageMaker 5.0 does on the fastest 68040-based Macintosh, according to Aldus. Current owners of PageMaker 5.0 can upgrade for $179; owners of older versions can upgrade for $299. Aldus, 206/622-5500, 800/685-3543.

Quadra 605 Cheaper

Apple has reduced its suggested price for the 8/160 version of the Quadra 605 (without monitor or keyboard) by $200, to $1069. The 25MHz 68LC040-powered computer also now comes in two Business Productivity Solution configurations: a 4/160 model priced at $1019, and an 8/250 version priced at $1329. Both business setups ship with eight productivity software packages, including Claris's ClarisWorks, Intuit's Quicken, Gold Disk's Astound, and Full Contact from FIT Software. Apple Computer, 408/996-1010, 800/776-2333.

Apple Hard Drives

La Cie and Apple announced that La Cie will make and sell external hard drives under Apple's name. Apple is expected to bundle the external drives with some of its computers. Designed by Apple, the Apple External Hard Drive comes in capacities of 160MB, 230MB, 500MB, and 1GB and lists for $389, $479, $829, and $1299, respectively. Available now, the drives will be supported by both Apple and La Cie. La Cie, 503/520-9000, 800/999-0499.

Motorola Ships PowerPC 603

Motorola has begun shipping small quantities of the PowerPC 603 chip, which Apple is expected to use as the brains of low-end desktop and portable Power Macs.

Apple's Competitive Trade-in Program

A trade-in program recently established by Apple allows end users to trade in name-brand personal computers and equipment for credit toward the purchase of new Apple equipment. Set up in conjunction with Micro Exchange, which deals in used systems, the program accepts systems, printers, or monitors bearing brand names including IBM, Compaq, Hewlett-Packard, Macintosh, and others. To locate the nearest participating Apple reseller, call 800/538-9696.

Altsys Sues Aldus

Altsys, developer of FreeHand for Aldus, has filed suit against Aldus, claiming the proposed Aldus-Adobe merger violates an agreement between Altsys and Aldus that gives Aldus exclusive worldwide marketing rights to FreeHand. Meanwhile, Aldus and Adobe confirm that the Federal Trade Commission is continuing its investigation to ensure that the proposed merger does not create a monopoly.

Broderbund and EA Merger Off

Saying that their stock prices had changed and that they had reassessed the transaction, Broderbund Software and Electronic Arts called off their previously announced merger. Broderbund said it agreed to pay $10 million to EA as a result of the decision not to merge.

Reversals of Fortune

Radius, SuperMac, and RasterOps have all announced their first quarterly results of the 1994 calendar year. On quarterly revenues of $43.2 million (up 40 percent from the same quarter last year), Radius's net income was $1.2 million, while SuperMac recorded a net loss of $1.3 million on quarterly revenues of $39.9 million (down 9 percent), and RasterOps posted a loss of $1.1 million on $19.4 million in quarterly revenues (down 23 percent). Last year at this time, Radius was facing a loss of $5.3 million, SuperMac was enjoying a $2.1 million operating profit, and RasterOps had just taken a net loss of $6 million, including restructuring costs of $6.7 million.
Besieged Software Giants Join Forces

Cutthroat marketing competition, unrelenting pressure from Microsoft, and worries about companies' financial strength are causing an unprecedented wave of mergers in the software industry. In March, Adobe, home of PostScript and other publishing products, bought Aldus, the originator of PageMaker, for $525 million. Then Novell, the most successful networking company, acquired WordPerfect for $1.4 billion. Finally, on a smaller scale—for a mere $60 million—the software conglomerate Symantec acquired utility vendor Central Point in April, giving it a near-monopoly on commercial antivirus software. Officially, no one's actually buying anyone else; for tax purposes these are exchanges of stock for "pooling of interests." A casual observer, however, might be forgiven for calling up a mental picture of bigger fish eating smaller fish.

Is there a viable strategy behind these mergers, or is it simply a case of companies huddling together for warmth in the long, cold shadow of Microsoft? According to the companies involved, there are product-line reasons and financial reasons underlying these alliances. For example, Symantec, by merging with Central Point, has effectively swallowed its main utilities competitor. Aldus and Adobe emerge with a product line that covers almost everything that could be considered publishing, from electronic pre-press to digital multimedia. The merger covers this field so thoroughly that some products of the new entity (Adobe Illustrator and Aldus FreeHand, Adobe Photoshop and Aldus PhotoStyler) will probably be seen as redundant, and some observers expect Photoshop and FreeHand to eventually disappear.

Novell has for years been the dominant force in networking but has been forced to watch program suites such as Microsoft Office and Lotus SmartSuite gobble up increasing shares of the corporate software market. This has left Novell watching from the sidelines as a major software profit center developed, while
also raising software-compatibility issues between NetWare and applications Novell can't control. The Novell-WordsPerfect merger, which included licensing of Borland's QuattroPro spreadsheet and Paradox database to fill out Novell's office suite, is the tightest together developed by any of these companies from a product-development standpoint. Although Novell now has networking, E-mail, and a leading word processor that works on a large assortment of platforms, it's not clear that the Borland-derived products will give the suite the tight integration that is Microsoft Office's strong point.

The financial arguments for the mergers can be illustrated from the numbers for Adobe and Aldus. In 1993 Aldus had $206 million in sales and 1,100 employees, and Adobe had $313 million in sales and 1,000 employees. The merger's aim is probably a firm with at least $500 million in sales and about 1,600 employees, a broader product line, and better net income per employee. To survive the price-cutting battles that have become a standard Microsoft tactic, and to please the financial analysts who influence stock prices, the newer set of numbers will be an absolute necessity. Look, in the short term anyway, for higher profits and fewer employees at the firms involved in all three mergers. Symantec's merger announcement, for example, contains a promise to downsize Central Point's operations from 280 to 100 employees, and similar cuts can be expected to follow at the other acquired firms. This round of mergers is likely to mean short-term reorganization of tech support, with free tech support starting to vanish in the face of diminished staffing, and an end to the last few years' price cuts, as bigger vendors buy out their competitors.—CHARLES SEITER

**In Brief**

**Brainstorm to Support AE Customers**
With Applied Engineering saying it is out of business, Brainstorm Products announced several assistance programs for AE customers. Brainstorm is offering those users free technical support on AOL and AppleLink. The company said it is also giving users $50 off the list price of a Brainstorm accelerator in trade-in for an AE accelerator card. Brainstorm is also offering a related program for AE dealers. 415/964-2131.

**Multimedia Patent Ruled Invalid**
The multimedia industry heaved a sigh of relief recently when the U.S. Patent Office overturned a patent on multimedia previously awarded to Compton's NewMedia. However, the Patent Office said it is possible that the patent could be reinstated at a later time.

**DayStar Pares Processor Prices**
DayStar has announced price cuts on most of its 040 processor upgrade boards. The 40MHz versions of both the Turbo and Value 040 now cost $1149, with 33MHz versions available for $949. All the Turbo and Value 040 upgrades now also ship with a 128K RAM cache. The price for the FastCache Quadra board for the Quadra 700 and 900 was also cut: it is now retaining for $199. 404/967-2077, 800/962-2077.

**MultiSync Monitors Get Cheaper**
NEC has cut the retail prices of its entire MultiSync monitor line by as much as 19 percent. You can now pick up a 15-inch 3V display for $495 (previously $550). The 21-inch MultiSync 6Gp monitor now sells for $2125, a drop of $410. 708/860-9500, 800/632-4636.
incidence for workgroup software. State of the Art, an accounting software company, recently announced that it would provide customers with free tech support for 60 days after registering; the company simultaneously announced a $20-per-10-minutes rate for support after the 60-day period expires. Microsoft continues to offer unlimited live, toll-charge tech support, but many customers can now get faster access to techs by paying $39 a year for the Microsoft Plus program, although toll charges still apply. The program includes Microsoft Plus, the company's bimonthly customer-support magazine.

Macworld has previously reported on Claris Corporation's policy of unlimited calls for 90 days after the first call. Quark's policy of unlimited calls for 90 days after purchase, and Adobe's system of support credits (see Conspicuous Consumer, March 1994). WordPerfect, 801/255-5000, 800/451-5151; State of the Art, 714/753-1222, 800/690-5575; Microsoft, 206/882-8080, 800/426-9400; Claris, 408/727-8227, 800/544-8554; Quark, 303/894-8888, 800/676-4575; Adobe, 415/961-4400, 800/933-6687. —Cameron Crotty

**TREND**

**Faster, Cheaper Optical Jukeboxes**

**ENORMOUS STORAGE**

The optical-jukebox market may ignite if the on-demand video systems announced by Oracle and Microsoft are successful. Ultimately, jukeboxes will provide much of the permanent storage for vast video libraries. Right now, optical-disk libraries have found a niche among companies that need to archive graphics, sound, and financial data.

MaxOptix now offers four jukeboxes using its high-speed T3-1304 optical drive. The MaxLyb 6.5, at $6850, puts 6.5GB of storage in a desktop model for individuals and small workgroups. The $9950 MaxLyb 13 minitower and the floor-standing, $10,350 MaxLyb 26 are for small companies or departments. At $28,560, a 52GB model includes two optical drives. The drives support any 5.25-inch standard media up to 1.3GB. DOS/NetWare SCSI kits are available for each model.

The drives compete with Hewlett-Packard's optical jukeboxes. HP uses its own new 1.3GB optical drive, but the MaxLyb products yield better data-transfer rates at lower prices, according to MaxOptix. Both firms offer disk-management software from MacPeak and Software Architects. But HP's line focuses mostly on larger systems; it has 10GB and 20GB models, and then jumps to devices over 40GB. MaxOptix, 408/954-9700; HP, 800/826-4111. —Tim Warner

### THE AMCOEX INDEX OF USED MAC PRICES

<table>
<thead>
<tr>
<th>Machine/RAM/Hard Drive</th>
<th>Average Sale Price</th>
<th>Monthly Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>PowerBook 140/4MB/40MB</td>
<td>$1100</td>
<td>+$50</td>
</tr>
<tr>
<td>PowerBook Duo 230/4MB/80MB</td>
<td>$1100</td>
<td>$0</td>
</tr>
<tr>
<td>Mac Classic/2MB/40MB</td>
<td>$425</td>
<td>$0</td>
</tr>
<tr>
<td>Mac SE/30/2MB/40MB</td>
<td>$600</td>
<td>+$25</td>
</tr>
<tr>
<td>Mac LC II/4MB/40MB</td>
<td>$500</td>
<td>-$25</td>
</tr>
<tr>
<td>Mac Ilii/3MB/40MB</td>
<td>$600</td>
<td>+$25</td>
</tr>
<tr>
<td>Mac Ilii/4MB/80MB</td>
<td>$900</td>
<td>+$25</td>
</tr>
<tr>
<td>Mac llfx/4MB/80MB</td>
<td>$1100</td>
<td>+$50</td>
</tr>
<tr>
<td>Centris 650/8MB/230MB</td>
<td>$1200</td>
<td>-$100</td>
</tr>
<tr>
<td>Quadra 900/8MB/160MB</td>
<td>$2300</td>
<td>-$100</td>
</tr>
</tbody>
</table>

Index provided by the American Computer Exchange of Atlanta, Ga 30323 (800/262-0717). It reflects sales during the week of April 20. Configuration include keyboard and monitor, and display board for noncompact models.

---

### AOL's Easy Internet

**UNIX BE GONE**

The Internet is, as has been widely reported, the world's greatest distributed E-mail system and a rich source of all sorts of information. Since general public interest in the Internet is only a year or so old, most people don't realize that the "native mode" of Internet operations is a fairly cryptic set of Unix commands.

Simply trying to read an elek...
The next step is the implementation of national online services, and America Online has taken an early lead in smoothing Internet access for Macintosh users. E-mail is now respectfully simple, with plenty of online help—you too can now voice your opinions to president@whitehouse.gov. E-mail, however, is just part of the picture (it’s what old-timers call limited access). The next step is the implementation of news filtering, in which a user files a set of keywords and the system forwards the selected news items to the user’s file. Finally, AOL proposes to have a real point-and-click interface with full Internet access by summer, enabling users to search remote databases, perform intransitory file transfers, and log in to remote sites. America Online, 703/448-8700.—CHARLES SEITER

Quantum Spins Up 4GB

FAST 3.5-INC GRAND PRIX HARD DRIVE

Prominent hard drive manufacturer Quantum Corporation has announced two fast, high-capacity 3.5-inch drives: the Grand Prix 2140 and Grand Prix 4280, which store 2GB and 4GB, respectively. Designed for data-hungry applications, such as multimedia, the Grand Prix drives have average seek times of 8.6ms and transfer data at 9.7MB per second, but when the Grand Prix uses a Fast Wide SCSI adapter (not included) the data-transfer rate can reach a blazing 20MBps, according to Quantum. Production quantities of the drives are slated to ship to hard drive vendors in the third quarter. List prices will be set by those vendors, who will integrate the drives into final products ranging from stand-alone devices to RAIDs.—T.M.

Light Utilities

SINGLE-MINDED SOFTWARE

Light Software has announced five utility software products that each do one thing and one thing only. Light Capture ($49) captures screens and saves them in various graphics formats. Light Paint ($79) offers basic and advanced painting tools, including support for Photoshop filters. Light Compress ($49) compresses files and decompresses DiskDoubler, AutoDoubler, and StuffIt files. Light Protect ($49) encrypts and password-protects files and folders. Finally, Light Shredder ($29) permanently erases data for increased security. These utilities require System 7, and many take advantage of recent Apple system enhancements such as QuickDraw GX, Easy Open, and the Drag Manager. All the utilities ship as double-click to get to a particular resource. GNN is made by O'Reilly & Associates, and it's available via FTP by sending E-mail toinfo@gnn.com. Also included with the software is an online version of The Whole Internet User’s Guide and Catalog. NovX, 206/447-0300.

In Brief

More Monitor Price Cuts

Mitsubishi has announced price reductions of up to 27 percent on its flat-square line of monitors. The DiamondScan 15FS now retails for $469 (formerly $645), the 17FS for $1069 (formerly $1299), and the 21FS for $2335 (formerly $2999). Mitsubishi has also announced its Corporate Sares program, which promises to provide a replacement monitor at a qualified customer’s location within 48 hours of a reported failure. To qualify, you must purchase 50 or more Mitsubishi monitors during a three-month period. 714/220-2500, 800/828-6372.

Internet in a Box...

Spry Inc.’s Internet in a Box, a software-and-book combination expected to ship later this year and cost $100, has TCP/IP applications, including tools for FTP (file-transfer protocol), the Gopher file-transfer protocol, Telnet remote log-in software, mail, news, WAIS (Wide Area Information Server), and the Mosaic interface to multiple internet services. The software will act as a client to Internet service providers. The start-up and monthly fees are both $24.95, and the hourly rate is $10.95 at 14.4 Kbps. The package includes The Whole Internet User’s Guide and Catalog.

...And Yet More Internet

Another product for simplifying Internet access is Global Network Navigator (GNN). The software sits on top of Mosaic and organizes a variety of Internet resources by category so the user can browse and double-click to get to a particular resource. GNN is made by O'Reilly & Associates, and it's available via FTP by sending E-mail toinfo@gnn.com. Also included with the software is an online version of The Whole Internet User’s Guide and Catalog. NovX, 206/447-0800.
The 1994 CD-ROM Expo: Profiting From Digital Publishing
October 5-7, 1994 • World Trade Center • Boston, MA

With The Endless Opportunities That CD-ROM Provides...

CORPORATIONS ARE SLASHING COSTS AND multiplying their profits with CD-ROM for advertising and sales presentations (from catalogs to kiosks), records management, technical product support, documentation, and training.

GOVERNMENT IS DRASTICALLY REDUCING the cost of printing, storage and distribution of databases via CD-ROM.

EDUCATORS — IN SCHOOLS, LIBRARIES, AND museums — are turning their analog assets into digital dollars.

THE PRINT-PUBLISHING INDUSTRY — including books, magazines, and newspapers — is expanding to profitable new horizons with CD-ROM’s ability to capture and disseminate information at a fraction of historical print costs.

ENTERTAINMENT INDUSTRIES ARE PROFITING from an expanded ability to reach untapped audiences in the consumer market, thanks to CD-ROM technology.

The CD-ROM Expo Conference will feature first-hand success (and horror!) stories from all these communities, including valuable lessons learned in the production and marketing/distribution of CDs.

If You Would Like to Publish a CD...
Don’t begin before you’ve learned how to enjoy the benefits while avoiding the pitfalls!

If You Are Publishing a CD...
Are you sure you’re taking fullest advantage of the CD-ROM tools and techniques that can help you accomplish more in less time, with fewer complications, smaller margin for error, and greater opportunity for profit?

At the CD-ROM Expo Conference, You Can Learn About...
Successfully publishing and marketing a CD
* Maximizing multimedia in CD-ROM production
* Coping with multiple platforms and formats
* Copyright and licensing issues
* Authoring and development tools
* Emerging new production techniques
* Interactive application design
* Networking multimedia applications
* Text retrieval and development
* Content asset management and exploitation
* Strategies for defining markets
* Industry trends and developments, including portable and wireless communications
* Pricing/promotion/advertising in new markets
* Financing CD-ROM titles
* New distribution channels
* Creating/converting data to digital form
* Transitioning from print and on-line to CD-ROM
* Legislative initiatives
* Where to find digital talent
* In-house CD-ROM production and distribution vs. outside services
* Using standard digital formats for different kinds of data... and more.

If You’re Interested in CD-ROM Titles For Home, School, or Business Use...
The exhibit floor at CD-ROM Expo will dazzle you with a fabulous array of titles, bringing a universe of information, entertainment, and education to your desktop!

Yes, I’d like more information about the 8th annual CD-ROM Expo October 5-7, 1994. I’m interested in: □ exhibiting □ attending

NAME ___________________________ TITLE ___________________________
COMPANY __________________________________________________________
ADDRESS __________________________________________________________
CITY ___________________ STATE ______ ZIP _________________________
TELEPHONE ________ FAX ________

Send to: CD-ROM Expo ’94, 260 Milton St., Dedham, MA 02026 or fax to: 617-361-3389
The State of the Art.
Here's what's going on in our head. Pencils sketched scanned into Adobe Illustrator. Rainbow color effect is created with Linear Gradient. Eye is colored in Photoshop to simulate a sunglasses effect. Grid of green & black in the other lens is altered in Adobe Illustrator.

Adobe Illustrator 5.5

Adobe is pleased to announce a mind blowing upgrade. The leading illustration and page design program for Macintosh now becomes a more powerful, all-encompassing creative resource. Adobe Illustrator 5.5 for Macintosh runs native on the new Power Macintosh, and it's loaded with features that add power and automate tasks once difficult or impossible in other drawing programs. New features include trapping and text handling tools like tabs, smart punctuation and any document from any application using the Acrobat Portable Document Format (PDF). You also get a free CD-ROM with 220 Adobe Type 1 fonts, tips and techniques clip art and more. This upgrade has it all. Adobe Illustrator 5.5, what the mind wants and your nearest Adobe Authorized Reseller. Call 1-800-352-1176 for information.
ENOUGH CREATIVE OPTIONS
TO PUT YOU IN A
STATE of RAPTURE
Adobe Illustrator 5.5

CALL 1-800-521-1976 TODAY
AND UPGRADE TO ADOBE
ILLUSTRATOR 5.5 FOR ONLY $99.
(Or $149 if you have a version earlier than 5.0).

"Upgrade" doesn't even start to say it. New text tools, trapping, and Adobe Acrobat give you unheard of value in a single box. It's a no-brainer that'll take your mind as far as it can go.

Version 5.5 comes bundled with Acrobat Exchange and Acrobat Distiller™. These breakthrough tools give you the freedom to create PDF files from any application, retaining all of the document's original formatting, graphics and color. Import these, and you'll be able to perform touch-up editing on a page-by-page basis. Adobe Illustrator 5.5 also includes the Deluxe CD-Rom Edition which contains QuickTime™ movies of tips and techniques, clip art, documentation, tech notes, and more. This upgrade also contains 220 Adobe Type 1 fonts to further expand your graphics options.
Power Mac Software

**THE DELUGE BEGINS**

Developers have started to jump on the Power Mac bandwagon, delivering an increasing number of native PowerPC programs. Most programs released for Power Macs are straight ports of the 680X0 versions, offering better performance than on Quadras but no additional PowerPC-specific features.

- Ashlar’s $2995 Vellum 3D 2.5 drafting program. Upgrades from the 680X0 versions cost about $10. 408/746-1800.
- BAGH Technologies’ $4495 Architrition II 5.8 CAD program. Upgrades from version 5.7 $95; from previous versions $695. 514/273-0522.
- Canto Software’s C-Crystal image-database system and Cirrus’s image-manipulation software. Prices vary. 415/431-6871.
- DeltaPoint's $195 DeltaGraph Pro 3. Upgrades from the 680X0 version 3 $29.95, from previous versions $79.95. 408/648-4000.
- FWB’s $199 Hard Disk ToolKit 1.5, which supports SCSI Manager 4.3. Upgrades from any version $29. 415/474-8055.
- Trillium Research’s $590 Remus 1.2 drive-array-management software, which supports SCSI Manager 4.3. Free upgrades from version 1.1. 715/581-1900.
- Netherlands-based Trio Systems Europe’s C-Index Pro database engine. $495 for single users and $795 for the developers’ edition. Free upgrades from C-Index 4.0. 31 20 638-6507.
- userEZ Software’s $239 ultraSecure 3.0 security software. Free upgrades from version 1.5 or later. 714/756-5140.—GALEN GRUMAN

**Power Mac Slowdowns**

**OLD SOFTWARE IS CAUSE**

Early adopters of the Power Macs are reporting slower-than-expected performance in some cases.

Users of Adobe Type Manager have reported noticeable speed degradation, which Macworld Lab tests confirm. Like many system extensions, ATM replaces some native System 7 code with 680X0 code, which slows performance of even native software. (A PowerPC version is under development.)

Apple says that slowdown is often not noticeable unless you have many extensions—10 or 20—installed, or unless you use extensions that run continuously. The $79.95 Conflict Catcher 2.1 from Cassady & Greene (408/484-9228) can detect extensions that patch native code with 680X0 code.

Some Power Mac owners will see a performance slowdown when working with some high-end video cards or NuBus-based RAID drive systems. Vendors say that the amount of slowdown could be anywhere from a few percent to 20 percent.

However, most users will not notice the slower performance, since their data-transfer rate is not high enough for the 680X0 emulation to affect performance.

People displaying full-motion video or moving very large files across a high-speed disk array may notice a slowdown. Vendors expect to release new native PowerPC drivers and ROMs within the next few months to correct the slowdown.

The Power Mac 7100 also has a bus-timing problem that causes it to read data from SCSI drives more slowly than it writes—the opposite of how drives normally work. However, very few users will notice performance difference, since the 7100's write speeds are still faster than most peripherals.

—CHARLES SEITER, TIM WARNER. AND GALEN GRUMAN

**Power Mac Boosters**

**EVEN FASTER SYSTEMS**

To bolster the Power Mac’s speedy hardware, several companies now offer accelerated peripherals.

- KS Labs offers a clip-on CPU-clock booster for the Power Mac 6100/60 that makes its CPU run at 80MHz, rivaling the speed of an 8100/80. The Alacrity kit costs $165. 614/374-5665.
- Mobius Technologies plans a set of cache cards, to be available in a 256K version for $199 by May, a 512K version for $299 by June, and a 1MB version for $499 by July. 510/654-0556.
- New Video Corporation has shipped its EyeQ digital video-compression board with native Power Mac drivers, allowing 30-frames-per-second full-frame captures. The board costs $1895; the Power Mac software is free to current customers. 310/449-7000.
- RasterOps Corporation has software upgrades to make its 24-bit video-display cards and video-editing cards work in accelerated mode. Upgrades for the Horizon 24, PaintBoard Professional, and MoviePak series are free from RasterOps’ BBS (801/785-5783). Upgrades for the PaintBoard Turbo and PaintBoard XL cost $49 and will be available by July. Owners of RasterOps’ 20/20 and 20T monitors will also need a $49 cable adapter to use them with the Power Macs. 801/785-5750.—GALEN GRUMAN

**By attaching this $165 device to your 6100's motherboard, you get a faster system.**
Announcing OCR that’s so accurate, anything else is simply pointless.

Introducing OmniPage® Professional 5.0 from Caere, the leader in OCR.

We’d like to make our point perfectly clear. OmniPage Professional sets the standard in OCR. Offering more accuracy, more power, and more flexibility than ever before.

In fact, it offers the most advanced OCR technologies in the industry—technologies that Caere has pioneered.

Only Professional helps you spend more time using scanned information instead of correcting it. Its breakthrough 3D OCR feature recognizes grayscale information during document scanning to greatly improve recognition of poor quality documents.

That’s not all. Professional recognizes a broader range of documents, reading the most difficult characters and symbols with ease. A feat made possible thanks to its exclusive Language Analyst, neural network and fax recognition capabilities.

Professional also allows you to easily edit both text and graphics with its new Text Editor and 24-bit color image editor. And for maximum ease of use and flexibility, there’s a new click-and-choose interface, too.

So get OmniPage Professional 5.0 for your Mac today. See your local Caere dealer or call for more information on the complete family of OmniPage products at 1-800-535-SCAN. If you own a competitive product, ask about our “Step up to OmniPage” program.

For superior performance, it’s your best shot.
New Products
THE LATEST MACINTOSH RELEASES

by Cameron Crotty

128PB $999. ASDOR, 602/966-8200, 800/726-4622; fax 602/966-5166.

ELQ-105M and ELQ-105PB Removable Cartridge Drives
Based on a SyQuest mechanism, this removable-cartridge hard drive can store up to 105MB on one 3.5-inch cartridge. The low-profile drive (35mm-high) features a SCSI-2 interface and an average seek time of 14.5ms. The ELQ-105M is for desktop Macs, while the ELQ-105PB works with PowerBooks. ELQ-105M $599. ELQ-105PB $625. ASDOR, 602/966-8200, 800/726-4622; fax 602/966-5166.


IntelliTouch Model P284-MAC14
Integrated with a 14-inch Apple Macintosh Color Display (Trinitron, 0.26mm aperture pitch), this touch screen provides a resolution of 900 points per square inch. According to the manufacturer, the acoustic-wave technology used is drift-free, eliminating the calibration required by some other touch technologies. The touch monitor is available with an ADB port for the touch data, and the product ships with the company’s MonitorMouse mouse-emulation software. $1620. Elo TouchSystems, 615/482-4100, 800/356-8862; fax 615/482-6617.

Multigraph 447X
A multi-resolution (autosyncing) color monitor that displays up to 1600 by 1200 pixels at a 60Hz vertical refresh rate. The Trinitron-based Multigraph features a 0.25mm aperture pitch, and displays the more common 1280-by-1024-pixel resolution at 75Hz. Users can adjust the monitor with on-screen controls such as brightness, contrast, color temperature, focus, and convergence. The Multigraph 447X complies with both the MPR II and Energy Star guidelines. $1250. Nokia Display Products, 415/331-0322, 800/296-6542; fax 415/331-6211.

SiliconExpress IV
If your SCSI port feels like an eyedropper, but you need a big, fat data hose, you might consider this 16-bit SCSI-2 (Fast and Wide) adapter on a 7-inch NuBus card. The SiliconExpress IV supports sustained transfer rates of 20MBps and SCSI chains of up to 15 separate IDs. The card also supports Logical Unit Numbers and selectable SCSI IDs. This last feature means that two Macs, each equipped with one of these cards, can share a single SCSI peripheral. $1295. Atto Technology, 716/691-1999; fax 716/691-9353.

Spectra Star GTx and GLx
Two PostScript Level 2, thermal-wax color printers with true resolutions of 600 by 300 dpi. The GTx comes with 10MB of RAM (expandable to 32MB) and 52 fonts. Users can also expand the printer with plug-in cartridges; a 120MB hard drive is one example. The GLx comes with 8MB of RAM (expandable to 24MB) and 52 fonts, and cannot be expanded via cartridges. Both printers feature simultaneously active parallel, serial, and AppleTalk ports, and they can automatically switch among all three. GTx $4995; GLx $3795. General Parameters Corp., 510/524-3950, 800/223-0199; fax 510/524-9954.

MacWorld July 1994 51
Double your RAM.

Just install RAM Doubler* software in your Mac and it doubles your RAM. It’s that easy. No more hassles, just more RAM.

RAM Doubler is an extension that works by reclaiming memory not being used. MacWEEK says “RAM Doubler couldn’t be easier to use.” It’s the latest from Connectix, the Macintosh memory experts and makers of the award-winning CPU and MODE32.

RAM Doubler is affordable at $99 SRP with a 30-day money back guarantee. Get RAM Doubler wherever great software is sold.

RAM Doubler is not compatible with Mac LC, Classic, Plus, SE or PowerBook 100. RAM Doubler, CPU and MODE32 are trademarks of Connectix. All other trademarks are the property of their respective holders.

©1999 Connectix Corporation. RAM Doubler requires Mac II with MMU1 or better (640K or 680K processor) with 4 MB RAM and System 6 or 7. RAM Doubler is not compatible with Mac LC, Classic, Plus, SE or PowerBook 100. RAM Doubler, CPU and MODE32 are trademarks of Connectix. All other trademarks are the property of their respective holders.

Power Mac Version
Available Soon!

Circle 189 on reader service card

800-950-5880 ext. 37
or 415-571-5100, fax 415-571-5195

©1998 Connectix Corporation. RAM Doubler requires Mac II with MMU1 or better (640K or 680K processor) with 4 MB RAM and System 6 or 7. RAM Doubler is not compatible with Mac LC, Classic, Plus, SE or PowerBook 100. RAM Doubler, CPU and MODE32 are trademarks of Connectix. All other trademarks are the property of their respective holders.
Power Upgrades for all your Macs.

Instant speed for your Power Mac.

Boost your Power Mac’s performance by up to 48% with the Speedster 601 Cache. This 256K level 2 static cache maximizes both emulated and native performance, with 100% Compatibility. Plus, the Speedster 601 Cache can be easily installed in less than 10 minutes by just plugging it into the cache slot on the Power Macintosh 6100 or 7100.

New Lower Prices!

<table>
<thead>
<tr>
<th>Speedster</th>
<th>Price</th>
<th>DayStar Turbo</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>25i</td>
<td>$399</td>
<td>n/a</td>
<td>$749</td>
</tr>
<tr>
<td>33i w/cache</td>
<td>$499</td>
<td>$949</td>
<td></td>
</tr>
<tr>
<td>33f w/FPU &amp; cache</td>
<td>$699</td>
<td>$1,049</td>
<td></td>
</tr>
<tr>
<td>40f w/FPU &amp; cache</td>
<td>$899</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Blazing ‘040 power for your 030 Mac.

Now is the best time to accelerate your Macintosh with the Speedster 040. Starting at just $399, you can upgrade your Mac Ici, IIsi, Iicx, Iix or LC to ‘040 power and immediately get blazing, 100% compatible performance. Speedster 040 runs all your software up to 6X faster! You’ll even outperform Power Mac running 680X0 software by up to three times. Speedster’s low-cost design saves you almost 35% over the competition. Plus you get a 3-year warranty, 30-day money-back guarantee, and unlimited technical support rated “Excellent” by MacWorld Magazine.

Choice Displays for all your work.

Award winning quality and value.

Why settle for scrolling around on a tiny 14” monitor when you can view your entire document on an award-winning Mobius Display—that’s over three times more desktop! Just plug it directly into your Macintosh and view up to 256 gray-levels* on the bright, razor-sharp screen. Now available for over 50 Macs, Mobius Displays are rated over 60,000 hour MTBF—the most reliable in the industry. That’s why we back them up with an unprecedented Two Year Warranty. And starting at just $399, Mobius Displays are best value you’ll find anywhere. So choose the display that MacWorld named "Editor’s Choice."
This set of three utilities can help you manage other removable media. VirtualDisk runs in the background under System 7 and can keep a handle on those growing piles of floppy disks, as well as from Apple Disk Copy images. Requires System 7. $79. Continuum Software, 206/695-8136, 800/603-7446; fax 206/260-2804.

Microphone LT

Before, the only way to get this software package was to buy a modem, but now this stripped-down version of Software Venture's Microphone communications software is available as a stand-alone product. Microphone LT emulates a range of VT terminal protocols, plus Wyse 50 and PC ANSI, and also supports several file-transfer protocols, including Zmodem. The program also incorporates Loran, a graphical front end for several popular information services, including CompServe, Genie, and MCI Mail. A comprehensive manual guides beginners from basic hardware principles to dialing up another computer. $49.95. Software Ventures Corp., 510/644-3223; fax 510/848-0885.

Oxyd magnum

With many new game elements and 100 new landscapes, you'll have your hands full trying to finish this sequel without losing your marbles. Players roll around playing fields that are littered with one-way furnaces, sensors, trigger plates, and traps. The object is to uncover like-colored Oxyds in sequence, thus paving them up and forcing them to remain open. $59.95. Dongjeware Publishing, 617/497-1130, 800/228-6993; fax 617/497-1130.

Media Management Tools

This set of three utilities can help you keep a handle on those growing piles of network volumes, floppy disks, and other removable media. VirtualDisk runs in the background under System 7 and maintains a running catalog of volumes that you mount on your desktop. EasyLabels creates labels that show a disk's name and contents, and it can print them out in several Avery-label formats. EasyLabels can also print labels based on VirtualDisk catalog. With DiskDup+, users can make copies from Macintosh or DOS-format floppy disks, as well as from Apple Disk Copy images, Requires System 7. $79. Continuum Software, 206/695-8136, 800/603-7446; fax 206/260-2804.

MxdLibrarian

Cataloging software for both computer files and nonelectronic media. MxdLibrarian automatically logs files from both local and networked volumes. The software displays thumbnail images for QuickTime movies and PICT files; You can also preview QuickTime movies and sound resource files within the application. MxdLibrarian is also designed to track noncomputer source materials, including audiotapes and videotapes, audio CDs, records, magazines, books, and slides. Entries can be searched by multiple criteria, including name, subject, item type, and text in the comments field. 7.5MB min. memory; requires System 7. $129. MxdMedia Systems, 205/533-2637; fax 205/534-6473.

Oxyd magnum

With many new game elements and 100 new landscapes, you'll have your hands full trying to finish this sequel without losing your marbles. Players roll around playing fields that are littered with one-way furnaces, sensors, trigger plates, and traps. The object is to uncover like-colored Oxyds in sequence, thus paving them up and forcing them to remain open. $59.95. Dongjeware Publishing, 617/497-1130, 800/228-6993; fax 617/497-1130.

Second Sight 3.0

Interested in setting up your own little information-cul-de-sac? The latest version of this BBS software features true multiline support, full ANSI color and graphics, Zmodem batch downloading (an online batch-file editor is included), and improved synop tools for file and message management. Sysops can further customize their BBSs with the included scripting language. $199. FreeSoft, 412/846-2700, fax 412/847-4436.

Select

An Adobe Photoshop plug-in that lets you color-correct CMYK files by adjusting four graphs (one for each color) while you watch the effect on your image. You can add up to 100 points on each curve, move curves simultaneously, and save sets of curves for later use. You can also do what the manufacturer calls local or selective color correction. You select a color (or set of colors) from your image using the eyedropper tool. Then you choose a destination color, and Select moves the image color toward the destination color. You control how much the image color changes, as well as how other, similar colors react. Requires Adobe Photoshop 2.0. $245. Human Software, 408/741-5101; fax 408/741-5102.

Smart Automotive Manager III

Managing an automotive garage doesn't have to be a pain in the oil pan. This software tracks inventory, handles estimates and repair orders, keeps track of client vehicles and scheduled maintenance, and shows approximate cost and profit on a job while an estimate is being calculated. Mechanics can create job codes for easy entry of popular services, and they can retrieve customer records by name or license-plate number. Additionally, the software can create service reminders, thank-you notes, form letters, postcards, and other marketing tools. $1995. Integra Management Systems, 707/833-1823; fax 707/833-2596.

Smartcom II 4.0

The latest version of this telecommunications software includes an integrated continues
A simple demonstration of PhotoFlash software.

(A complicated demonstration isn't possible.)

1. Find a photo. The PhotoFlash Browser makes it easy to view and pick a photo—they're all stored here, whether you got them from a CD, scanner or digital camera.

2. Enhance it. Crop, rotate and resize a picture with easy-to-use tools. Dust and scratch removal is automated, too. You can instantly preview adjustments you've made.

3. Place it. With a point and click, PhotoFlash automatically places the picture in your work. You can also record and automate the tasks you do most often.

You used to have to spend a lot—and then learn a lot—before you could work with photos on your computer. Now there's PhotoFlash software from Apple.

PhotoFlash is easy to use. It helps you organize pictures, enhance them and drop them into your work. It's fast (screamingly fast on a Power Macintosh). It's memory efficient. And it's just $279.* Call 800-538-9696 to locate your authorized Apple reseller. You'll get the picture right away.
New Products

text editor that supports quoting, word wrap, and removal of line-breaks. SmartCom II 4.0 also automatically detects Hayes-compatible modems that support the I4 AT command, and it configures itself for optimum use with those modems. The software allows users to create buttons to perform scripts and macros, and it supports PowerTalk and Apple events. $149. Hayes Microcomputer Products, 404/441-9200; fax 404/441-1213.

StyleScript

Owners of the Apple Color StyleWriter Pro can now produce Adobe PostScript Level 2 output. With this driver, your Macintosh performs the rasterization that's normally handled by a raster image processor (RIP) in a PostScript printer. StyleScript provides color calibration and a LaserWriter-like interface. The software also supports Apple's PrintMonitor, and ships with 13 PostScript Type 1 fonts. 8MB min. memory; requires Macintosh Classic, System 7. $149. GDT Softworks, 604/291-9689.

TurboCAD for Macintosh

Creating high-precision blueprints is the mission of this computer-assisted-design package. The software features context-sensitive prompts that inform the user about what sort of input the package expects next, easing the learning curve. All features are accessible from floating palettes, and a special Snap palette offers tools for snapping to endpoints, mid-points, and tangents of objects. $149. IMSI, 415/454-7101, 800/833-8082; fax 415/454-8901.

U-Boat

All ahead, flank speed. This re-creation of a World War II submarine in the North Atlantic will have you fighting the Allies from the outbreak of the war until mid-1940. A real-time simulation, the game features digitized sounds and voices, and screens that are as realistic as possible—down to the condensation in the control room. Just watch out for depth charges. 4MB min. memory; requires SE/30 and 16 colors or gray scale. $59.95. DeadlyGames, 516/482-4000; fax 516/482-4057.

U-Beaut

Wildlife-Accents

A clip-art volume with an environmental feel, this collection of 50 color images (black-and-white versions are also included) features both animals and plants. The package also includes Wildbits, a 144-character pictographic font. In Wildbits, each image of an animal from the Wildlife-Accents volume illustrates its corresponding letter of the alphabet (for example, D for dolphin). Wildlife-Accents is available in EPS, PICT, and TIFF formats: Wildbits is available either as an Adobe PostScript Type 1 or TrueType font. $69. Aro International, 201/774-9620, 800/243-1515, ext. 485; fax 201/509-0728.

CD-ROMs

Photomoods

If your work isn't in the mood, then you might want to take the A-train to the store and pick up a copy of this disc. Photomoods contains 100 high-resolution (2048-by-3072-pixel), 32-bit photographic images suitable for use as backgrounds, fills, or art elements. The disc also includes 8-bit and 32-bit screen-resolution versions of each image in PICT format, a file-viewing utility, five PostScript Type 1 fonts, and a catalog of the images in Aldus Fetch format. $189. Shandonny AV, 213/913-1238; fax 213/913-7917.

Picture Factory

A library of over 2500 royalty-free, 24-bit, 640-by-480-pixel-resolution stock photographs. Categories include scenic views, space, leisure, business, people, backgrounds, animals, and food. The disc ships with browsing software that allows keysearches on multiple criteria. 4MB min. memory; requires 8-bit color. $49.95. Photodex, 510/449-9079; fax 510/449-3519.

IT'S A PIECE OF CAKE!

Multi-Ad Search" is an image catalog and retrieval system. Multi-Ad Creator" is a versatile display-ad layout program.

When used together,

Search supports the Creator "Place" Event, allowing you to select images and instantly place them in the Creator Files Palette.

Search and Creator—success has never been so sweet.
Introducing the on-line service
for people who have never tried one.
And for people who have.

Welcome to e•World

Elegant graphic interface makes it easy to navigate and find information.

Keep up-to-date with the latest from major news sources.

Easily communicate with users of other electronic services, including the Internet.

Your direct connection for the most in-depth Apple and third-party information and support anywhere.

Be more successful with relevant business, financial, and management insights.

Be part of a global community of eWorld users.

Enter e•World™ now with this free starter kit.

If you've ever tried another on-line service, you'll notice the difference in eWorld immediately. The brilliant graphics are the kind you'd only expect from Apple. And the familiar interface makes it easy to go wherever you choose and find whatever you need.

eWorld puts you in touch with a global community of Macintosh users and with people on other electronic mail services, including the Internet. It's also the best place to get the most in-depth Apple product and support information. And whether you want to access key business information or conduct on-line meetings from anywhere, eWorld is the right place to be.

There are hundreds of other reasons why you'll want to try eWorld. But rather than tell you about them, we'd like to show you. Just send for your free eWorld starter kit, including software and special registration information so you can sign on immediately.* And get ready to enter a world like no other.

Enter e•World™ now with this free starter kit.

I'd like to know more about the exciting, new on-line service from Apple. Please send me the eWorld starter software package—a $19.95 value—free.

Name..............................................
Company Name...............................
Home Address.................................
Apt./Suite #.................................
City.............................................
State..........................................TIP
Zip.............................................

Phone ........................................

Check one: □ 1 MB Disk □ 800 K Disk

Just return this coupon to:

eWorld Starter Kit
Apple Computer, Inc.
P.O. Box 4493
Bridgeton, MO 63044-9718

© 1994 Apple Computer, Inc. All rights reserved. Apple, the apple logo, and Macintosh are registered trademarks of Apple Computer, Inc. eWorld and the eWorld logo are trademarks of Apple Computer, Inc. The eWorld logo is copyrighted in the name of Apple Computer, Inc. Offer is subject to change without notice. Offer valid only in the US, Canada, and the District of Columbia. Offer expires 10/31/94. Coupon must be postmarked no later than 10/31/94. Offer not responsible for lost mail, late, or misdirected mail. Please allow 4-6 weeks for delivery. Offer does not include on-line credit card charges. Offer good while supplies last. "NOTE: To enter eWorld, you'll need the free eWorld software, an Apple Macintosh computer with system software version 7.0 or later and at least 4 megabytes of RAM, a phone line, and a Hayes compatible modem."
**New Products**

**ACCESSORIES**

**Flightstick Pro and Jetstick**  
Check six, sky pilot. The Flightstick Pro is a four-button ADB joystick that helps you get a handle on those electronic bogies and bandits. The buttons are all programmable (software included), and there is a programmable four-way switch. Users can load different button settings for different applications. The Jetstick is a two-button, jet-style joystick that also connects to the ADB port.  
Flightstick Pro $129.95; Jetstick $74.95. CH Products, 619/598-2518, 800/624-5804; fax 619/598-2524.

**BOOKS**

**Adobe Illustrator 5.0: The Official Handbook for Designers**  
Authors Tony Bove and Cheryl Rhodes guide readers through professional designers' artwork, using the artists' words to explain how the special effects and designs were created. Readers learn how to work with Illustrator's interactive dialog boxes, how to get the most out of plug-in filters, how to draw with multiple layers, and how to work with color type, images, and separations. 455 pages. $27. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 212/572-4997.

**The Internet Yellow Pages**  
Applying the format of the telephone yellow pages to the Internet, authors Harley Hahn and Rick Stout provide over 2400 listings in 155 categories of Internet services, features, and resources. The Internet Yellow Pages includes definitions of the topics listed, as well as hints on accessing the posted information. The book also has an annotated list of Usenet newsgroups. 447 pages. $27.95. Osborne/McGraw-Hill, 415/549-6600; 800/227-0900; fax 415/549-6603.

**Newton's Law: The Digital Nomad's Guide**  
According to authors Andrew Gore and Mitch Ratcliffe, Newton handwriting recognition is "not the Chevy Chase Show of input technologies, as some would have you believe." They then go on to explain how to improve your Newton's recognition rate. They also explain the PDA's hardware and software, describing how to create reports, memos, and letters; how to send faxes; and how to send and receive E-mail. 458 pages. $24. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 212/572-4997.

**Real World PageMaker 5.0**  
Subtitled Industrial Strength Techniques, this book covers such topics as getting the most out of PageMaker 5.0's enhanced Control Palette, creating custom color libraries, using Additions, and trapping spot colors. The authors (Bruce Fraser, Olav Martin Kvern, and Macworld contributing editor Stephen Roth) also give tips on workgroup publishing, PostScript, and database publishing with OLE. 512 pages. $28. Random House Electronic Publishing, 212/572-2600, 800/733-3000; fax 212/572-4997.

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. Macworld reserves the right to edit all product announcements.

---

Jeff Angus has regularly donated money to the Natural Resources Defense Council. Now he also supports them in a different and maybe even more valuable way. By donating his skills to modify a dBASE program that generates customized reports about toxic substances.

If you'd like to put your own special skills to good use, call 1-800-659-3579. And we'll match you with a local non-profit organization whose needs are compatible with your area of expertise. Call us now, and we'll show you a great way to make a real difference in the world. By doing what you do best.

*CompuMentor*  
People helping computers help people.  
89 Stillman Street, San Francisco, CA 94107
IT'S GONE. AND YOU DIDN'T BACK IT UP.

FACE IT. YOU NEED to back up your files. Use Retrospect, the number one Macintosh backup software — backing up over one million Macs, at last count.

Dragging important files to floppy disks is not backing up. If you crash you'll be retyping and trying to recover files for days. And then still searching for what's missing months later. And what if there's a fire, theft, flood, or equipment breakdown?

With Retrospect from Dantz you'll be backing up to the storage device of your choice in seconds — including SyQuest, Optical, Bernoulli, floppies, and file servers. And just about any Macintosh tape drive you choose.

Retrospect packs more power than all the others put together.

AUTOMATIC OPERATION. Simply point and click to create a script, then schedule it to run days, nights, or weekends.

WORLD CLASS RESTORING. Every preference file, document, application, control panel, extension and font is returned to its exact location. You won't miss a beat.

SECURITY. Retrospect has security covered, with full password protection at every entry point. Even encrypt data passed over the network to prevent snooping.

SPEED. Retrospect's customized drivers and interleaved data flow operate SCSI storage devices 20%-100% faster than any other backup software — guaranteed.

COMPRESSION. Retrospect's built-in Lessr™ compression cuts backups down to size without compromising performance.

NETWORK OPERATION. Back up a network of Macintoshes as easily as you back up one. Just install a Remote INIT (available in Remote 10- or 50-Packs) on each of your networked Macintoshes and include them in your backup scripts.

TOP INDUSTRY AWARDS. Don't just take our word for it. Listen to what experts say about Retrospect: "Retrospect has no equal." MacWeek, Diamond Award.
"For backing up and archiving, there's nothing better." Macworld. And Retrospect Remote is a MacUser 1993 Editor's Choice Award winner.

The price for peace of mind? Well under $200 — backed by a 30 day money back guarantee. Don't be caught off guard when disaster strikes, call your local dealer today.


© 1994 Dantz Development Corp. Retrospect and Lessr are trademarks of Dantz Development Corp. Macintosh is a registered trademark, and Power Macintosh is a trademark of Apple Computer, Inc. used under license.

Circle 26 on reader service card
“The Speed You See And The Color You Get With LeMansGT Is Absolutely Mind-Boggling.”

Mark Kvamme is President & CEO of CKS Partners, Inc., a full-service advertising and marketing communications company with offices in Silicon Valley, San Francisco, Portland and London.

CKS' stellar achievements include the redesign of United Airlines' corporate identity system and the merchandising system for the Apple Newton launch. Given their total commitment to Macintosh technology, it's not surprising that CKS was one of the first to get Radius' new LeMansGT graphics accelerator card.

"It's like you're moving a thousand times faster than before, finally getting the color fidelity you've always wished for."

LeMansGT is Radius' newest technological wonder for creative professionals. This all-new card delivers true 30-bit color, blazing fast redraw and on-the-fly resolution switching. It features custom Radius ASICs optimized for ultra-fast 32-bit QuickDraw acceleration in 2-page view. It increases productivity when working on high resolution photo realistic images. A perfect complement to the Radius IntelliColor Display/20, LeMansGT is less than 7" long, compatible with any NuBus Mac. And it's engineered for all-out performance in the new Power Macintosh. All for just $2,499.
"Technology like this is how we keep pace with our clients and ahead of our competitors."

LeMansGT is the industry's first 30-bit color card, and the latest in Radius' line of Macintosh graphics accelerators, which includes PrecisionColor Pro 24X at $1,799 and PrecisionColor 24X at $1,199.

Radius' boards are unequaled in reliability, backed by a Lifetime Worry-Free Warranty with overnight replacement guaranteed in North America and the United Kingdom. So there's no need to worry about downtime, ever again. No one else in the business offers such comprehensive support to its customers.

"It's obvious Radius is a company that truly understands how graphics professionals work, the tools and support they need to be more productive, creatively."

Call 1-800-227-2795 Ext. 14C for more information about our LeMansGT graphics accelerator and the name of your nearest Radius reseller. Or to receive faxed information, call 1-800-966-7360.
Collage 1.0.1

Image-Compositing Software

PROS: Precision editing controls; proxies allow you to reverse operations without image deterioration; resolution-independent rendering.

CONS: No CMYK support; no means for creating masks inside Collage; slow screen redraw with no interrupt option. COMPANY: Specular International (413/253-3100). LIST PRICE: $349.

SPECULAR INTERNATIONAL'S COL­lage allows you to combine and composite multiple RGB images stored in PICT, TIFF, and Photoshop 2.5 formats. Unlike the Mac's most popular image editor, Adobe Photoshop, Collage does not let you edit the pixels inside an image (except via filters). Instead, it treats each image as an independent object; you can position, transform, and layer images, as you can with object-oriented applications such as Adobe Illustrator and Aldus FreeHand. You can also mix images by applying overlay modes, and mask an image using its alpha channel.

Images as Objects

Collage's interface is similar to that of desktop publishing programs such as Aldus PageMaker and QuarkXPress. Much like a desktop publishing program, Collage lets you import raw materials created and edited in other programs and combine them to form a final document. For precision work, Collage offers rulers and snap-to guides, as well as functions that nudge, group, align, lock, and hide images. The program even provides a page boundary and a pasteboard, enabling you to establish bleeds and temporarily set aside extraneous images.

The crowning touch is a floating palette that displays the size of an image, the transformations applied to it, and the numerical results of various other operations. If you don't like an effect, you can remove it by simply entering a different value in the palette (see "The Privileges of Proxies").

Operations can be easily reversed because they are never applied to the original image. When you import an image, Collage creates a 72-dots-per-inch proxy file that represents the image throughout the editing cycle. Like a stuntman in a movie, the proxy takes a beating so the original image doesn't have to. In fact, Collage doesn't bother to revisit the original image until you render the finished composition.

The names of all imported images appear in a scrolling list. Strangely, before you can view an image inside the page area, you have to drag it from the list and drop it onto the page. But this extra step can be forgiven thanks to an otherwise straightforward interface. The first image in the list is the frontmost image in the file; the last is the rearmost. You can change the layers' order by dragging image names in the list or by selecting an image and choosing traditional layering commands (Bring to Front, Send to Back, for example). Much to Collage's credit, you can use it without once referring to the manual.

You can print composite images from Collage, but you can't print color separations. You have to render your image to disk and print color separations from another application, such as Photoshop. As in a three-dimensional drawing program, Collage lets you render your composition at any size and resolution you desire. For example, if you intend to send
a proof to a client by E-mail, you can render the image at a low resolution, just large enough to see important details. After implementing your client's changes, you can render the file at a high resolution, then open the rendering in Photoshop, make any last-minute color corrections, and output the composition to CMYK separations.

**Masks and Effects**

All three of the file formats that Collage supports—PICT, TIFF, and Photoshop 2.5—store at least four color channels. Since Collage can’t open CMYK images, each of your RGB files can include an additional alpha channel, which Collage interprets as a mask. In fact, masks are the only method for defining selection outlines in Collage, so there’s no reason not to include alpha-channel data with each image.

The problem with the alpha-channel approach becomes increasingly evident as you use the program. While Collage supplies a feathering option for blurring the masked area, the program offers no means for defining alpha channels. As a result, you have to create and edit your mask in the file’s original application. Collage doesn’t even offer traditional selection tools such as a lasso tool or magic wand, so there’s no means to select different areas and, say, apply one filter to the first half of an image and another filter to the second half. In fact, the only way that you can combine effects is to import two versions of the image to Collage with separate masks and overlay them. Obviously, it’s a whole lot easier to filter your images before importing them into Collage.

While filters are a bust, compositing is Collage’s strength. As in Photoshop, you can change the opacity of a floating image to make it translucent. You can also apply a wide range of overlay modes, including modes that are not currently available in Photoshop except via full-blown channel operations (see “Composite Controls”). For fans of drop shadows, Collage automatically creates shadows of a specified color, offset, and fuzziness. And as with all of Collage’s functions, if you don’t like the way a drop shadow or overlay mode looks three years from now, you can change the effect as easily as selecting a different option.

**The Slow Pace of Progress**

But while Collage is functional and indisputably easy to use, it’s unlikely to take the digital-imaging world by storm. Like many first-version products, its oversights are nearly as numerous as its benefits. For starters, it’s slow. Even taking into account version 1.0.1’s enhanced collection of display qualities, Collage frequently takes longer to apply transformations to its low-resolution proxy files than Photoshop takes to apply similar changes to the real images. This problem would be partially alleviated if Collage provided any means to interrupt the screen redraw, but you can neither cancel the redraw nor choose a command nor select a tool until the redraw has finished. So you sit around and wait a lot.

But speed isn’t the only problem. When you move an image, Collage shows only a rectangular bounding box, making it impossible to correctly line up proxies the first time and necessitating a lot of time-consuming nudging with the arrow keys. When you replace an image by reapplying the Import command, Collage forgets all settings previously applied to that image, including any transformations, filters, or overlay modes that you may have applied. As you can imagine, this makes it even more laborious to touch up images in Photoshop on the fly or make adjustments to alpha channels. You will definitely want to make sure you’re finished working on an image before you import it into Collage. Among the other deficiencies, you can’t undo the importing of an image; the Open dialog box lacks previews; you can’t change the page size after creating a new document; and there’s no grabber hand, so you must do allScrolling with the scroll bars. A little planning would have gone a long way toward eliminating those distractions.

**But Who Needs It?**

Specular International designed Collage as a companion product for Photoshop, and thus far, Adobe seems to have embraced it with open arms. In fact, I’ve talked to several members of Adobe’s technical-support staff who are nearly as familiar with the program as they are with their own. And if anyone should mention the L word (HSC’s forthcoming Live Picture), Adobe points to Collage as its short-term answer. But the question remains: What with Fractal Design’s Painter X2 having months ago introduced much of Collage’s functionality, and the threat of Live Picture looming on the horizon, might not Adobe integrate some of these same functions into a future version of Photoshop, thereby rendering Collage obsolete?

Though only Adobe knows the answer, this seems a likely scenario. So why should you purchase Collage? Despite its problems, it’s a sure thing and it’s available now. For those of you who frequently composite images from a variety of scanned sources and who are frustrated by Photoshop’s lack of flexibility, Collage is a flawed but serviceable tool that will enhance your range of options and enable you to render the final image at a variety of resolutions. If compositing is still just a hobby for you, however, I suggest that you wait to see what kind of improvements the future holds in store for both Collage and Photoshop.

—DEKE MCCLELLAND

The Privileges of Proxies When I rotate a proxy, Collage tracks the rotation in the information palette. (Here the rotation value—18.8°—appears highlighted in green.) To undo the rotation, all I have to do is enter a value of 0°. And unlike in Photoshop, rotations and reversions have no deteriorating effect on the quality of the original image, no matter how many times you apply the transformation.
Apple QuickTake 100 for Macintosh

Digital Camera

PROS: Least expensive color digital camera; lightweight; relatively fast picture processing; Flash EPROM protects images from power failure; delivers immediate results.

CONS: Heavy compression and interpolation requirements yield lots of artifacts; fixed-focus lens with no zoom option; maximum of eight pictures at full-screen resolution.

COMPANY: Apple Computer (408/996-1010); COMPANY'S SUGGESTED PRICE: $749.

Comparing the QuickTake 100 to other digital cameras, Apple's QuickTake 100 for Macintosh is a value leader. The only digital camera to offer color at a price of less than $1000, the QuickTake is lightweight and easy to use, processes pictures quickly enough to take several shots in succession, and stores images in memory so there's less chance of mechanical failure. But when compared with traditional 35mm cameras combined with, say, Photo CD film scanning, the value of the QuickTake 100 slips. Thanks to significant compression and interpolation requirements, the image detail is disappointingly coarse. The camera can take only eight pictures at a time when set to the more passable of the two image resolutions, and it doesn't even have a focus ring or zoom option. After using the camera for two weeks, I thoroughly enjoyed the immediacy of snapping pictures and viewing them on screen minutes later, but I also had plenty of time to mull over the camera's plentiful and obvious deficiencies. All things considered, it's one of the best gadgets of its kind, but it doesn't yet qualify as a practical tool.

Holding Up a Scanner to Real Life

Like desktop scanners, digital cameras use photosensitive chips called charge-coupled devices (CCDs) to convert light into digital signals. More-expensive cameras feature three CCDs—one each for red, green, and blue light. The QuickTake 100, however, relies on a single CCD to capture all colors. Each of the 307,000 pixels on the CCD—that's 640 by 480 pixels, one for every pixel in a digital image—is exclusively sensitive to either red, green, or blue light. This means the QuickTake actually captures only 8 bits (as opposed to 24 bits) of data per pixel. The camera compresses an image and stores it in RAM. When you open an image using the QuickTake software or an image editor such as Adobe Photoshop, the software interpolates the image on the fly from 8-bit to 24-bit color.

The primary advantages of the single-CCD approach are a reduced price—one CCD costs less than three—and speedy picture processing. Whereas many digital cameras take several seconds to process a single image, the QuickTake makes you wait about a second between each picture (assuming you don't need the built-in flash, which takes 7 seconds to recharge). But that's still too long to shoot more than a couple of photos of wildlife or other moving subjects.

Opening your image is another matter. Because the software has to interpolate a photo on the fly, it takes about four times as long to open and decompress a QuickTake image as one compressed with JPEG. The fact that the software has little real color information to work with also presents problems. In continuous-tone areas, the software is able to interpolate with a reasonable degree of accuracy. The inevitable artifacts are nothing beyond what you might associate with medium-quality JPEG compression. But in high-contrast areas, the interpolation is less successful. In a photo of a black letter against a white background, for example, the edges of the letter are fringed with a rainbow of differently colored pixels. This is because the software can't figure out what to do with the medium-luminosity red, green, and blue pixels that are bordered by low-luminosity colors (black) on one side and high-luminosity colors (white) on the other. This deficiency makes the camera particularly ill-suited to product photography.

Point-and-Shoot Architecture

Another reason that product shots should be left to another camera is the QuickTake's fixed-focus lens. A subject must be at least four feet from the camera to appear in focus, so close-ups are out. In fact, optically, the QuickTake 100 has more in common with a $10 disposable camera than with a basic 35mm model. According to Apple, the QuickTake's field of view is equivalent to that of a 35mm camera with a 50mm lens. However, the QuickTake sorely needs a telephoto option; even a single zoom setting would make a world of difference. With a little experience, you become painfully aware that the smaller your subject appears in the viewfinder, the fewer pixels the camera devotes to it. So you spend a lot of time positioning yourself, which can be a real problem when taking action photos.

Photographing at dusk with the Apple QuickTake 100 is another trial. The aperture adjusts automatically from f2.8 to f16, and the slowest shutter speed is 1/5 second. Once the sun starts setting, this camera needs a flash. Interestingly enough, the QuickTake includes a standard tripod socket, but with these specs, I doubt many folks will take advantage of it. The viewfinder lacks sight lines, making it difficult to ensure that your pictures will be straight. And last and least important, the QuickTake is designed for right-handers. Both the grip and the shutter release are on the right-hand side of the camera, so most left-handers (like me) will find themselves shooting with both hands.

Only Eight Pictures per Session

The QuickTake 100 includes 1MB of memory, which enables you to shoot eight full-screen (640-by-480-pixel) images, 32 quarter-screen (320-by-240-pixel) images, or a combination of the two sizes. For even the least discerning user, the quarter-screen option is prohibitively small. Even if you don't plan on using the entire full-screen photo, you'll appreciate the leeway it offers for cropping and rotating—luxuries not permitted by the quarter-screen option. Furthermore, you can downplay some of the artifacts by...
resampling a full-screen image to a smaller size using Photoshop or its equivalent. Resampling a quarter-screen image does not leave you much to work with.

If you think you can shoot eight photos, copy them quickly to a handy PowerBook or Duo, and then shoot some more, think again. It’s not that the interface is inadequate; it’s a simple task to connect the QuickTake to your Mac’s modem port using a standard serial cable. And a control panel allows you to mount the camera as if it were a disk, permitting you to drag-copy its contents. However, the task of lugging around your computer, setting it up on a level surface, connecting the cable, powering up, mounting the camera, copying the images, and then erasing the camera’s images so you can shoot again might be best described as clumsy and certainly time-consuming. This procedure takes five minutes, and that’s if you resist the temptation to view your pictures—which is, after all, the only way to get immediate feedback. Also worth noting: the QuickTake utility, which lets you view images and perform minor edits such as 90-degree rotations, requires 3MB of RAM to open an image. So you can more or less rule out using the utility on any machine equipped with less than 5MB of RAM. If you plan on shooting lots of photos off-site, you’re better off purchasing three or four cameras.

The good news is that once you press the shutter release, your photo is about as safe as rewritable media gets. The QuickTake uses Flash EPROM (erasable, programmable read-only memory), so it doesn’t require a constant power supply to store your images. Even if the batteries run out of juice or you remove them, your images are absolutely safe. Unfortunately, the version of Flash EPROM that Apple provides with the QuickTake 100 doesn’t allow you to erase images selectively. If you want to erase one image, you have to erase them all. So you should use this option only after transferring the images to disk, or if you’ve completely screwed up and want to start over again.

Incidentally, the recessed erase button on my camera broke about the fourth time I used it. When I pressed the button using a paper clip—the preferred tool for this purpose—the button gave way, never to return. I was still able to shoot photos, but I had to hook up the camera to my computer and use the QuickTake utility to erase the images.

Is the QuickTake Ready?

Though the QuickTake 100 provides too few options and too little quality to interest most photographers and image-editing professionals, it may excite the curiosity of some business types. As a real estate agent, my wife was very satisfied with the camera’s ability to capture new listings that she could immediately post in the office and fax to other brokers. It’s also adequate for shooting corporate badges, newsletter and presentation photos, and other images whose impact depends more on immediacy than quality. And lest we forget, every image taken with a conventional camera costs money—first for film and then for developing. The QuickTake’s images are free. If you’re in the market for a medium-quality, digital color camera that costs less than $1000, the QuickTake 100 is the best deal around. But if you’re not in a hurry, you may want to wait until some of its more obvious problems are ironed out.

—DEKE MCCAULANE
SEVEN NEW WAYS TO GET TOTALLY IN CONTROL™

If you’re looking for faster, better ways to get things done, take a look at the all-new IN CONTROL 3.0. It’s the complete planner and organizer for the Mac that can get you totally organized. (Honest!) You see, IN CONTROL is the only Personal Information Manager that combines the award-winning, multi-column Action Outliner™ with full-featured daily, weekly and monthly calendars. The result? You can throw away those little yellow stickies, make short work of long to-do lists and bury that dog-eared calendar.

1. **Spend your time wisely.** IN CONTROL is easy to use, so you can dig right in and start planning immediately. And with its fully integrated outline and multiple-view calendars, you can plan, organize and schedule all at the same time!

   Plus, you can instantly look up information from FileMaker® Pro, Touchbase® Pro, Now Contact® and Dynodex. IN CONTROL even dials the phone!

2. **Plan smarter and better than ever before.** IN CONTROL helps you prioritize everything—in as much detail as you need—so it’s easy to choose what’s most important to work on first.

3. **Be adaptable to change.** IN CONTROL’s flexible, intuitive interface makes changing your plans, reorganizing your day, shifting responsibilities and rescheduling your appointments a snap!

4. **Keep your sense of style.** Unlike many “get organized” products, IN CONTROL doesn’t force you to change your style. It works the way you work and provides countless tools to help you get organized faster, better and easier than ever before. You can even print pages to fit the most popular paper organizers!

5. **Don’t lose sight of the big picture—or the details.** IN CONTROL’s daily, weekly and monthly calendars allow you to view your activities up to a year at a time, ensuring that all your plans fit with your long-term goals.

   With IN CONTROL’s new daily views, you can also focus on the details. Like your schedule or to-dos for one particular day.

6. **Never let anything slip through the cracks again.** IN CONTROL automatically reminds you of your most critical tasks, guaranteeing that you won’t forget anything. Plus, auto carry-forward and recurring event features speed up scheduling.

7. **Get the all-new IN CONTROL 3.0, risk-free.** When you order, you don’t risk a penny because IN CONTROL is backed by our ironclad 60-day guarantee of total satisfaction.

For more information, or site license or volume discounts, call: 1-800-925-5615 or (617) 776-1110. To upgrade, call: 1-800-784-7388 ext. 300.

MacWEEK  MacUser  MACWORLD

ATTAIN  Attain Corporation, 48 Grove St., Somerville, MA 02144
(617) 776-1110  Fax: (617) 776-1626  Internet: Sales@Attain.com

MacConnection®  $85
1-800-800-6827 ext. 300  Suggested retail: $129.95

©1994 Attain Corporation. All products are trademarks or registered trademarks of their respective holders.
microLaser Pro 600

Workgroup Printer

**PROS:** Fast; networkable; high paper capacity.

**CONS:** Expensive. **COMPANY:** Texas Instruments (800/848-3927). **LIST PRICE:** $2148.

If you’re looking for the speedy Gonzalez of workgroup printers, consider the Texas Instruments microLaser Pro 600 PS65 with PowerStep. The Pro 600 is fast and flexible. It performs well and is a good choice for multiprocessor office environments—but there are a few other printers that offer comparable performance for a better price.

I tested the microLaser Pro 600 with PowerStep, 6MB of RAM, and 65 scalable fonts. Retailing for $2148, the microLaser Pro 600 has an 8-pages-per-minute Sharp engine with 600-dots-per-inch resolution. The printer comes standard with 6MB of RAM (expandable to 22MB) and supports both PostScript Level 2 and PCL 5. The Pro 600 is also available in a PS23 version with 23 scalable fonts ($1599 list price, $1948 with PowerStep). The PS23 can be easily upgraded to the PS65.

TI also offers the PowerStep, an easy-to-install option that upgrades the 20MHz RISC processor to a 40MHz RISC processor. The PowerStep also adds four times the cache memory of the standard Pro 600, plus a built-in floating-point processor. This option has a suggested retail price of $349. The PowerStep gives the Pro 600 its speed: without it you survive, but the printer is slower. However, the print quality should not be affected if you skip the PowerStep option.

The Pro 600 is fast—89 percent faster than the Hewlett-Packard LaserJet 4M on Macworld Lab’s Microsoft Word multi-font-document test. It also fared well in other Macworld Lab tests. It was slower than the Apple LaserWriter Select 360 in the 20-page Microsoft Word single-font document and the PageMaker 4.2 newsletter, but in each case by less than 25 seconds—an insignificant amount of time for a large or complex document.

The print quality on the microLaser Pro 600 is good. Characters are smooth and well formed, especially in larger type sizes. Print quality is not quite as good as that of the LaserWriter Select 360 or the Hewlett-Packard 4M, but differences are almost imperceptible, especially for memos and typical office documents.

The Pro 600 has a fairly small footprint and should fit easily into most office environments. Including two 250-sheet paper trays, the printer weighs 32 pounds and measures 13 by 14.4 by 12.8 inches.

The microLaser Pro 600 is compatible with DOS, Windows, and Macintosh environments. Both a high-speed parallel interface and an AppleTalk interface are included as standard features. This printer also provides automatic port-switching, which it achieves through an Intelligent Interfacing feature that allows all ports to remain active when more than one computer is connected to the Pro 600. The printer switches between computers, automatically adjusting for each environment.

**How Fast Is the microLaser Pro 600 PS65 with PowerStep?**

<table>
<thead>
<tr>
<th>Product</th>
<th>Multiple Fonts</th>
<th>Single Font</th>
<th>MacDraw Pro</th>
<th>FreeHand 3.1</th>
<th>PageMaker 4.2</th>
<th>TrueType</th>
</tr>
</thead>
<tbody>
<tr>
<td>TI microLaser Pro 600</td>
<td>101/165</td>
<td>76/163</td>
<td>92/192</td>
<td>110/166</td>
<td>110/166</td>
<td>50/110</td>
</tr>
<tr>
<td>Apple LaserWriter Select 360</td>
<td>113/141</td>
<td>89/164</td>
<td>127/164</td>
<td>93/141</td>
<td>93/141</td>
<td>54/110</td>
</tr>
</tbody>
</table>

Tests were conducted on a Mac Centris 650 running System 7.1 with 8MB of RAM, a Quantum LPS230 internal hard drive, AppleTalk on, and background printing off.—Macworld Lab testing supervised by Lauren Black

Texas Instruments has climbed on the Energy Star bandwagon (Energy Star is the Environmental Protection Agency’s standard for energy conservation); the microLaser Pro 600 is Energy Star-compliant, and Macworld considers this a plus. One missing option is the PostScript fax capability that is offered with Apple’s LaserWriter Select 360. This option could make an already good printer even more valuable.

The microLaser Pro 600 comes with an 80-page *User’s Guide* and a 22-page *Installation Guide*. The installation guide is useful, providing a good description of how to set up the printer and load paper, plus information on consumables. The user’s guide is also informative, with a detailed section on troubleshooting tips, a service checklist, and explanations of the LCD messages. It also elaborates on adjusting the contrast and cleaning the corona. However, I couldn’t find any discussion in the manual on automatic port-switching.

Overall, the Pro 600 is fast and provides good print quality. The price is steeper than that of other products in this category, but if you work in a busy office where a really fast printer makes everybody’s life easier, the higher price may be worth it.—Lauren L. Black
You know, there's an easier way to see what's going on inside your Macintosh.

If you really want to keep an eye on the health of your Macintosh, look no further than Apple's Personal Diagnostics. The most comprehensive testing and repair program ever created for the Macintosh, to help keep it running trouble free. It's incredibly easy to use, performing a multitude of tests with just a click of the mouse. From complete logic board and drive testing to in-depth system software analysis to repairing damaged disk directories, even alerting you to problems before they occur. To find out more, call 800-538-9696, ext. 250, for the Apple reseller near you. And see the power lurking beneath that mild-mannered Macintosh exterior. The power to be your best.

Introducing Apple Personal Diagnostics for Macintosh.
**Pablo 2.0.1**

**Database Reporting Tool**

**PROS:** Flexible and easy to use; great implementation of table “pivot” function; good charting and object graphics. **CONS:** Maintenance of data warehouse is a serious chore. **COMPANY:** Andyne Computing (613/548-4355). **LIST PRICE:** $695; for ten users $5495; HyperCube Utilities $99.

In a well-run data warehouse, a company’s information-services division diligently tracks down all data relevant to managing the company and organizes it in a way that lets everyone in the company get quick answers to questions. There are plenty of ways to manage this service; most of them are based on IBM’s original structured query language (SQL), but challengers to this ten-year-old technology have appeared.

One serious challenger is Pablo (PABLO in Andyne’s orthography), a new relational-database reporting tool that uses Apple’s Data Access Language (DAL) to communicate with remote databases. Much of Pablo was in fact developed at Apple, where it’s been in use as the companywide sales reporting system for more than a year. In Pablo’s design of the data warehouse, information resides in plain two-dimensional tables linked to a hierarchy of four other tables that specify a multidimensional structure for the data. Pablo is designed to report data views that “pivot,” like the views in Brio’s Prism, Lotus Improv, or the upcoming Microsoft Excel version 5. In a pivoting plan, each data element (a sales total, for example) is identified by a string of labels (month, quarter, year, geographic region, specific product, product category) arranged in a special order. This identification scheme makes it possible to call up data with categories in any order. A report can be specified as “sales for the last three years by region” or expanded to “sales for the last three years by state” or shuffled to “sales by state by product category by quarter” with a few clicks.

**Cubist Perspective**

The basic defined-table set from which Pablo draws its reports is called a data HyperCube, since the table-plus-structure specification describes a multidimensional data object. You pick the database you want to access with the Source Browser, which lets you list local (residential on your Macintosh) and remote HyperCubes. Then you formulate your table from HyperCube data in the View Builder, which lists all the dimensions of the HyperCube you’ve selected and lets you pick out individual data categories for your report (see “Swing Shift”).

The reporting facilities in Pablo, fortunately, go way beyond mere table construction, and also beyond the capabilities of its current competitors.

Pablo does charts from selected data and provides drawing tools to dress up reports (you can also import and place PICT files). The Data Navigator lets you pick different data sets to chart from within a report (see “Sailing”). Spreadsheet-like functions do subtotals, totals, and simple statistics on report data. This last facility is helpful in the overall Pablo scheme, because it means the designers at the corporate level responsible for HyperCube maintenance have many fewer data fields to include.

**A Job for Pros**

Making things easier for the information-systems department is not a small issue in Pablo. Someone has to think through a company’s information requirements in advance and, in detail, find the data to fill the primary data table and specify a HyperCube structure that’s rich enough to be useful (see “Square into Cubes”). If there’s not enough structure in the hierarchy (the details of dimensions, levels, columns, and data members), end users will be downloading huge chunks of table to their Pablo reports for simple inquiries; if the structure is too elaborate, end users will spend hours scrolling in the View Builder to make up basic reports. Someone also has to assign user profiles for all Pablo users in the system, specifying with the Pablo password structure which users have access to what HyperCube data.

Corporate data managers that I talked with (many of whom were members of the original Apple project teams and are now implementing the technology at other large companies) describe the usual Pablo situation as an end user’s dream paid for with plenty of hard work by the information-services department. It’s possible to set up some HyperCubes for experiment very quickly, but refining and updating HyperCubes in an environment in which the data currently resides on a corporate-strength database or server (Butler, Ingres, Oracle, Sybase, and most other popular choices) takes months. A successful implementation of Pablo as a data warehouse system usually has the additional repercussion that, since Pablo makes data access so straightforward, it tends to make middle-management staffing look bloated.

Pablo is one of the most effective end-user data-reporting tools yet evolved. It puts a considerable workload on the corporate information department that sets up a Pablo system, but it’s clearly appropriate to assign the heavy data-systems planning to a highly trained central corporate service rather than leave it to the end users. Pablo works with most popular mini/mainframe relational databases, sidesteps the hassles of SQL data access, and produces great reports with minimal effort. It’s most appropriate for midsize and large companies, and in the right settings will rapidly pay for itself.

—Charles Seiter
Introducing the QMS ColorScript Laser 1000.
Now your business has total freedom of expression.

For Cindy, communicating decision-critical information quickly, flawlessly and in brilliant color is now her livelihood. That's why she depends on the QMS ColorScript Laser 1000 Print System. It frees her to print entire forms and letterhead with color logos, images and high quality text without changing paper. It saves her the cost of stocking special forms, letterhead and multiple sets of supplies and uses standard paper and transparencies. It improves her message by highlighting key data with color in multipage presentations and documents. Add direct connection to a variety of networks and anyone can realize both greater productivity and a per user cost that rivals personal printers. Plus, our easy software loadable upgrades virtually eliminate obsolescence.

Save money. Save time. Free yourself from limitations. Discover the advantages of the QMS® ColorScript Laser 1000 Print System.

- Laser color and monochrome printing
- Compatibility with PostScript™ Level 2 and Level 1, HP PCL® 5C and HP-GL™
- TrueType font scaling
- Automatic collation
- Simultaneous input and automatic emulation switching
- 65 resident type fonts
- EfiColor™ and Colorimetric color dictionaries and Apple ColorSync™ device profile
- Supports DOS, Windows®, Macintosh® and Unix® applications
- Software loadable system upgrades

Expression is a serious business.
Call QMS today at 800 392-7559 or 205 633-4300 for the name of a reseller demonstrating the QMS ColorScript Laser 1000 in your area.

For service on QMS and other products, call 800 762-8894 (U.S.)
Q-Fax 800 633-7215 • E-mail: info@qms.com • Canada 800 263-5508

©1993 QMS ColorScript and the QMS logo are trademarks or registered trademarks of QMS, Inc. PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions. All other product and company names mentioned are trademarks or registered trademarks of their respective companies.

InfoFAX
Please see page 207 for instructions.
Ray Dream Designer 3.0.3


AFTER RAY DREAM LOWERED THE price of Designer 2.0 last year, the package became an instant price/performance leader in its class, even though it needed to be renovated. Designer 3.0 is a complete refurbishment of the program, still at a commendably low price, but early releases have some wrinkles that need to be ironed out.

Ray Dream Designer 3.0 implements some well-considered architectural changes. Designer 3.0's consolidated modeling environment does away with the separate LightForge and SceneBuilder modules. Also, version 3.0 incorporates extensions, similar to plug-ins for graphics programs, that allow for adding new modeling tools and facilitate future expansion.

Ray Dream also improved Designer's controls for creating, editing, and combining textures, and added the ability to brush textures onto the surface of three-dimensional objects. The program remains an excellent ray-trace renderer and can produce images with G-buffer channels for 3-D filtering and compositing.

Designer 3.0's modeling environment starts with a 3-D perspective window where you build models and assemble scenes. As you add objects, lights, and cameras to the scene, icons representing them appear in the Hierarchy window, which displays a collapsible outline of the scene's logical structure. From the scene hierarchy, you can select objects, link them, and organize them into groups without navigating the scene to select them. Modeling tools, clip objects, and textures are extensions that appear automatically in the drag-and-drop Objects and Shaders Browsers.

Modeling extensions include a selection of object primitives, a text tool, the FreeForm tool, and the Modeling Wizard. Object primitives are simple, uneditable shapes such as spheres or cubes. The text tool creates objects from TrueType and PostScript Type 1 fonts and offers controls, including kerning and leading.

The FreeForm tool is similar to Designer's old LightForge modeler but more versatile. In a modeling window separate from the scene window, you create objects by drawing a shape on a working plane and extruding the object along an axis defined by path-description lines. You achieve more-complex constructions by adding cross sections and applying scaling envelopes that let you modify the surface contours of the object. The FreeForm tool is the heart of Designer 3.0, but learning the techniques takes practice.

Novice modelers will appreciate the Modeling Wizard. The automated Wizard lets you produce lathed, extruded, pipeline, spiral, twisted, and skinned objects via pictorial dialog boxes. Its step-by-step approach teaches you how shapes interact to produce objects. To edit Wizard-built objects you must return to the FreeForm tool.

Perspective view is Designer's default, but you can create new views, including elevations, simply by adding cameras. You fine-tune views in the Camera Settings floating window using buttons and sliders for adjusting focal lengths and controlling camera movements. If you could drag a new camera into the work space instead, and position the camera close to its final location, you could avoid much needless navigation.

On a Mac IIx, performance is sluggish, even in wire-frame mode. Working in the flat-shading Preview mode is slow, and Better Preview is even slower. Previews render in the background, but if you need to see the composition before you take your next action (such as moving an object, changing camera positions, or adding a texture), be prepared to wait while everything redraws. Flat shading takes longer still.

Scenes get visually cluttered, even in the preview modes, after placing just a few objects. The many bounding boxes and projection lines quickly turn a simple scene into a rat's nest. If you turn off the reference grids, the projection lines disappear, but you lose depth perception.

Designer 3.0 comes with both surface and procedural textures that you apply by dragging. The program also lets you paint textures directly on the surface of 3-D objects using brushes and geometric shapes. This sounds like a great feature, but it's so slow on my IIx that it's frustrating to use. As you drag the brush, there is a delay that makes you wonder if the tool is working at all.

The Shader Editor's card-file metaphor provides wonderful controls for manipulating and combining textures. For example, you can combine a texture with a bump map to get a dappled surface, then mask it onto a checked pattern to produce a quilt effect.

The manual's descriptions lack depth and often deviate from the program's reality. Release notes (Read Me files on disk) chip at the problem but barely make dent. Early releases of Designer 3.0 are confounded by annoying operational foibles and instability. For example, multiple-vertex outlines in the FreeForm modeler get extraneous lines between vertices. Reference planes turn themselves off when you switch camera views. Labels on the Camera Settings floating palette, such as front or left, inexplicably get changed to custom. Worse, sometimes the camera's viewpoint is altered. The brush and polygon painting tools behave unpredictably. The list goes on.

Ray Dream rapidly introduced releases; I reviewed both 3.0.2 and 3.0.3. The program still needs maintenance, but a Ray Dream spokesperson told me that the company is committed to its customers and will work to make the program sound.

Although Designer 3.0 remains a price leader, it has faltered significantly in performance. At the core of Designer are excellent rendering tools and a competent modeler. When the program's problems are rectified, that combination should hold it in good stead again.

—CARLOS DOMINGO MARTINEZ
Macintosh Training
Pure.
Simple.
Effective.
Inexpensive.
Award Winning!

The Macworld Magazine WORLD CLASS AWARD for training sits in my office. The readers of Macworld voted for MacAcademy by a margin of 2 to 1 over audio training systems, disk based systems, and all other training companies and products. Simply, we won because our training works! It’s affordable, it’s flexible, it covers an incredible amount of programs, it’s simple to use and it’s guaranteed! We won the award because over 250,000 satisfied customers are proof that MacAcademy training programs will work for you. Below please find a current listing of the MacAcademy Video Training Library. Each video is approximately two hours in length and costs only $49. Each video carries a complete money-back guarantee if not totally satisfied and can be upgraded when software is upgraded for only $14.95.

Randy Smith.

<table>
<thead>
<tr>
<th>Video</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4th Dimension</td>
<td>6 Videos</td>
</tr>
<tr>
<td>Canvas</td>
<td>5 Videos</td>
</tr>
<tr>
<td>ClarisWorks</td>
<td>6 Videos</td>
</tr>
<tr>
<td>Design &amp; Layout</td>
<td>1 Video</td>
</tr>
<tr>
<td>Desktop/PrePress</td>
<td>2 Videos</td>
</tr>
<tr>
<td>Director</td>
<td>4 Videos</td>
</tr>
<tr>
<td>Excel</td>
<td>5 Videos</td>
</tr>
<tr>
<td>FileMaker Pro</td>
<td>4 Videos</td>
</tr>
<tr>
<td>Mac Fonts</td>
<td>1 Video</td>
</tr>
<tr>
<td>FreeHand</td>
<td>4 Videos</td>
</tr>
<tr>
<td>HyperCard</td>
<td>3 Videos</td>
</tr>
<tr>
<td>Illustrator</td>
<td>4 Videos</td>
</tr>
<tr>
<td>Infini-D</td>
<td>2 Videos</td>
</tr>
<tr>
<td>Integrate Programs</td>
<td>1 Video</td>
</tr>
<tr>
<td>Lotus 1-2-3</td>
<td>3 Videos</td>
</tr>
<tr>
<td>Macintosh 7.x</td>
<td>4 Videos</td>
</tr>
<tr>
<td>MacDraw Pro</td>
<td>2 Videos</td>
</tr>
<tr>
<td>Mac P &amp; L</td>
<td>3 Videos</td>
</tr>
<tr>
<td>MacProject Pro</td>
<td>4 Videos</td>
</tr>
<tr>
<td>MacWrite Pro</td>
<td>3 Videos</td>
</tr>
<tr>
<td>MS Works</td>
<td>4 Videos</td>
</tr>
<tr>
<td>Networking</td>
<td>1 Video</td>
</tr>
<tr>
<td>Now Contact/</td>
<td></td>
</tr>
<tr>
<td>Now Up-To-Date</td>
<td>1 Video</td>
</tr>
<tr>
<td>PageMaker</td>
<td>6 Videos</td>
</tr>
<tr>
<td>Peachtree Acctg.</td>
<td>3 Videos</td>
</tr>
<tr>
<td>Persuasion</td>
<td>2 Videos</td>
</tr>
<tr>
<td>Photoshop</td>
<td>6 Videos</td>
</tr>
<tr>
<td>PowerBooks</td>
<td>2 Videos</td>
</tr>
<tr>
<td>PowerPoint</td>
<td>2 Videos</td>
</tr>
<tr>
<td>Premiere</td>
<td>3 Videos</td>
</tr>
<tr>
<td>QuarkXPress</td>
<td>3 Videos</td>
</tr>
</tbody>
</table>

Quicken, Personal........... 2 Videos
Quicken, Business........... 2 Videos
QuickTime.................... 1 Video
SuperPaint.................... 3 Videos
Troubleshooting............. 3 Videos
Word........................... 4 Videos
WordPerfect................... 4 Videos

$49 each

Live Training Workshops Available in 32 major cities throughout the United States. Please call for complete schedule and/or on-site corporate training.

TOLL FREE ORDER LINE: 800-527-1914
ORDER FAX LINE: 904-677-6717
Checks, PO’s, Credit Cards Accepted  48 Hour Delivery
100 E. Granada Blvd., Dept. MW794, Ormond Beach, FL 32176
Ear Phone Streamline AV

**Telephone/Speech-Recognition Earpiece**

**PROS:** Better audio quality than provided by AV PlainTalk microphone; improves speech-recognition accuracy; unobtrusive design. **CONS:** User can't hear earpeeps, modem tones, or other computer audio without unplugging or wearing the earpiece; some discomfort after prolonged use. **COMPANY:** Jabra Corporation (619/622-0764). **LIST PRICE:** $169.

**HISTORY HAS RECORDED FOR ALL TIME THE FIRST WORDS THAT ALEXANDER GRAHAM BELL SAID TO HIS ASSISTANT THROUGH THE TELEPHONE: “COME HERE, WATSON, I NEED YOU.” BUT FEW PEOPLE KNOW THAT THE GREAT INVENTOR ALSO DESIGNED THE FIRST SPEAKERPHONE. UPON HEARING BELL THROUGH THE CONTRAPTION FOR THE FIRST TIME, WATSON REPORTEDLY REPLIED, “HEY BOSS, WHY ARE YOU TALKING INTO A COFFEE CAN?”**

I have yet to hear a speakerphone that didn't sound like an empty can of Folger's, and that includes the speakerphone that's essentially built into the AV Macs and Power Macs. Plug an Apple GeoPort Adaptor into one of these Macs and you have a high-speed fax/data modem and a voice telephone, too. It's what some call integrated telephony. (Telephony, by the way, rhymes with Stephanie. A telephony is someone who tells lies over the phone.)

Jabra's Ear Phone Streamline AV takes the coffee can out of integrated telephony and replaces it with some privacy. The Ear Phone looks like, well, an earphone—the kind that lets you listen to TV without waking the spouse—but it also contains a microphone sensitive enough to pick up your voice. A 6-foot cable terminates in a tiny black box, from which extend two short cables; one plugs into the Mac's microphone jack and the other, into the audio jack. You can connect an Ear Phone in less time than it took to read this paragraph. (You can also connect an Ear Phone to an Apple AudioVision 14 display, but configuring the monitor's control panel for the proper sound levels is a bit cumbersome. It's easier to use the Mac's rear-panel jacks.)

**Making Calls**

What's it like to wear this thing? It's reasonably comfortable, although it began to bother me after about an hour. A small foam cover makes the earpiece—the earbud, as Jabra calls it—more comfortable than a typical earphone. For the fashion conscious, Jabra sells replacement foam covers in various colors.

The Ear Phone also includes plastic loops in several sizes. The loop snaps onto the earbud and then hooks over the top of your ear to hold the earbud in place. The Ear Phone box also contains a coupon advertising a custom ear mold available from Westone Laboratories (719/540-9333). Replacement ear molds are available for approximately $35 each.

The Ear Phone includes a simple telephone-dialer application that stores up to 20 phone numbers and lets you assign a spoken command to each one. The dialer works together with Apple's Apple Phone application (which is included) to let you issue spoken commands such as "dial home" or "dial the office." Using voice commands to make calls would be more practical if you could dial numbers stored in contact databases and other documents. The AV version of the Ear Phone doesn't permit this, but a forthcoming Power Mac version will. The new version, which should be available by the time you read this, will use Apple's Telephone Manager—a system software extension that implements telephony-related functions—to enable you to dial a number regardless of where it's stored, and to do so with spoken commands, at that. After releasing the Power Mac version, Jabra may add this capability to the AV Mac version, but at this writing Jabra hasn't decided on a schedule.

At the other end of the line, the Ear Phone sounds like a standard telephone, with none of that coffee-can echo that speakerphones generate. (If you're interested in hearing a demo, I've created a short, sound-only QuickTime movie that compares the Ear Phone to the standard Apple PlainTalk microphone. You can download the movie from the Macworld Online forum on America Online. Once in the Macworld Online forum, click on the Software Library icon.)

**The PlainTalk Angle**

Unlike any other third-party microphone I know of, the Ear Phone Streamline AV works with the PlainTalk speech-recognition features that are standard equipment in AV and Power Macs. In my tests, conducted on a Quadra 840AV, speech recognition was indeed more accurate. One reason is that the Ear Phone's microphone is always the same distance from your mouth—this generally isn't the case with the Apple PlainTalk microphone.

Another reason is that a system extension included with the Ear Phone modifies the audio levels going into the Mac for better recognition. By fine-tuning the volume levels, Jabra engineers—some of whom worked for Articulate Systems, a pioneer of Mac voice-recognition products—have made real improvements in PlainTalk's accuracy.

There's a side benefit to using the Ear Phone for speech recognition: only you can hear the computer's spoken responses. If you're using PlainTalk's text-to-speech capabilities to, say, read your incoming electronic mail, you need not worry about coworkers overhearing your Mac—or your Mac annoying your coworkers.

**You Can't Hear Unless You Wear**

Perhaps the biggest drawback of the Ear Phone is that because it disables the Mac's speaker, you can't hear all the other Mac sounds—like when the modem makes a call and connects, or when an audio CD plays in play-through mode—unless you unplug or wear the Ear Phone. This is a side effect of having a computer that also acts as a telephone and a modem and a CD player. The fact remains, though, that the unplug-and-plug routine is tiresome, not to mention hard on the Mac's jacks.

The Ear Phone's simple appearance and straightforward operation belie the engineering efforts that went into it. As a hands-free telephony tool—and as a replacement for the Apple PlainTalk microphone—the Ear Phone AV is a winner. -Jim Heid
Everything's brighter when you plug in the award-winning Kai's Power Tools to leading image editing packages like Photoshop, Painter and Pixel Paint Pro. Thirty-three fantastic extensions and filters give you one-step solutions to complex graphics production jobs. And the power to summon dynamic gradients, infinite textures and awesome fractals for unlimited creativity. It's serious graphics made fun!

And now a great standalone value!

Every copy of Kai's Power Tools includes Micro Frontier's award-winning Color-It!, a 32-bit image processing and point program—a $149.95 value absolutely FREE!

Lee Varis
Digital Artist

"KPT is not only great for dazzling special effects, but it provides a wealth of tools for the nuts and bolts work we all do every day."

ABOUT THE IMAGE. Renowned digital artist/photographer Lee Varis of Los Angeles, Calif., filled in the world of "The Hermit," one in his series of haunting tarot card images, using Kai's Power Tools. The KPT Gradient Designer produced the glowing orb and its cascading rays; the KPT Texture Explorer created the card's border, while the KPT Sharpen Intensity filter brought out details in the rock. To build the dream-like landscape on the horizon, Varis used a beta version of the awesome KPT Bryce™, a powerful natural and supernatural 3-D landscape creation program—coming soon from HSC Software.

© 1994 HSC Software Corp. All rights reserved. KPT, a registered trademark of HSC Software Corp. All other products or services mentioned herein are trademarks of their respective companies.

Circle 5 on reader service card
THE QMS COLORSCRIPT LASER 1000 breaks new ground: it's the first color laser printer to sell for under $10,000 (even if it is just a dollar under), and it's the first color laser printer for the desktop (if your desktop can hold a large picnic cooler that weighs 106 pounds).

The ColorScript Laser 1000 uses an 8-pages-per-minute, 300-dots-per-inch print engine whose single paper tray can hold 250 sheets. (A second tray is optional.) The printer comes with 12MB of memory (expandable to 32MB), a color laser printer to sell for under $10,000 (even if it is just a dollar under), and 65 fonts. Built-in network ports include LocalTalk, Centronics parallel, and serial; Ethernet and Token Ring network interfaces are optional.

The ColorScript Laser 1000 is about four times as complex to set up as a monochrome laser: you need to install four developer cartridges, four toner cartridges (cyan, magenta, yellow, and black), a cleaning pad, a bottle of oil (it keeps the toner from sticking to the printer's heat rollers), a photosensitive belt, and a hopper that holds waste toner. These consumables need to be replaced at varying intervals: every 3000 pages for the oil, for instance, and once a year or so for the belt.

As with a monochrome laser printer, the time between toner feedings varies—pages with a lot of color or black use more toner than do pages containing very little. This contrasts with thermal-wax and dye-sublimation machines, which use the same amount of ink ribbon for each page regardless of a page's contents. This, and the ColorScript Laser 1000's ability to use conventional photocopier bond paper, makes the machine's cost-per-page significantly lower than that of thermal-wax and dye-sub technologies—roughly 5 to 10 cents per color page, compared with about 60 cents for thermal-wax, and several dollars for dye-sub.

How does the output look? Very good. The colors aren't as vivid as those produced by competing technologies, but they're perfectly adequate for business documents—bar charts, colored headlines, and transparencies. The printer's text quality is almost as sharp as that produced by a monochrome laser printer, and generally sharper than thermal-wax and dye-sub output. The print is also more durable than ink-jet or thermal-wax output: it doesn't smear if it gets wet (ink-jet output sometimes does), and it's nearly indestructible: unlike the wax applied by thermal-wax machines and the ink from solid-ink printers such as Tektronix's 300i, the ColorScript Laser 1000's color toner doesn't scratch off when you paper-clip it, or flake when you fold it.

The ColorScript Laser 1000 also fared well on Macworld Lab's test track, although its overall performance was half that of Tektronix's Phaser 220i, the fastest thermal-wax machine available. The printer was particularly slow in the Photoshop test. Further incentive to look elsewhere for prepress work is that the printer doesn't do as good a job with scanned images as do thermal-wax machines (such as Tektronix's Phaser 200 series) that provide enhanced halftoning options. Also, color laser technology doesn't allow for as much consistency in color as do the thermal-wax, solid-ink, and dye-sublimation techniques.

Macworld Lab encountered a compatibility glitch with the ColorScript Laser 1000, which uses a PostScript-clone interpreter. In its PostScript Level 2 mode, the printer choked on a Microsoft PowerPoint document with Microsoft's Wingdings TrueType font (similar to Zapf Dingbats). In Level 1 mode, the same document printed without incident. QMS was able to reproduce the problem, but at press time had not yet isolated it.
FastTrack Schedule from AEC Software is so quick, powerful and easy to use, no wonder it's a hit with Fortune 500 companies like 3M, Procter & Gamble, GE, and McDonnell Douglas. In fact, leading computer publications like Windows Magazine, MacWEEK and MacUser have awarded it the highest ratings in its class.

In just minutes, you can create project schedules that will enhance both your productivity and presentations. Plus, there's no need for cumbersome project management packages or time-consuming drawing programs. Simply click and drag—or use your keyboard—to create start and end dates. Outline multi-level tasks and link activities to show dependent steps. Further enhance your schedules with custom bars, milestones, colorful graphics, and flexible timeline scales. And because FastTrack Schedule runs on either Windows or Macintosh, files built on one platform can be opened on the other.

To order, or for more information, call AEC today. And let FastTrack Schedule put you on top of your projects.
**IX-4015 Color Image Scanner**

**Color Flatbed Scanner**

**PROS:** Good image quality; fast scans; excellent bundled software; small footprint.

**CONS:** Scan size limited to 8.5 by 11.7 inches. COMPANY: Canon Computer Systems (714/438-3000). LIST PRICE: $1169.

---

The Canon IX-4015 Color Image Scanner is a 24-bit color scanner that delivers good-quality scans and is easy to use. The IX-4015 scans at an optical resolution of 400 dots per inch by 800 lines per inch, and provides interpolated resolutions of 800 dpi for color scans and 1200 dpi for line art. Scanning software consists of IX Scan (an Adobe Photoshop-compatible plug-in) and Light Source’s Ofoto 2.0. The unit comes with all the cables you need for hookup. An optional automatic document feeder (not tested) is available if you will be doing OCR work. The IX-4015’s conveniently small footprint (16 by 11.2 by 3.2 inches) is also a bit of a limitation, because the scan area is confined to A4 size (8.5 by 11.7 inches).

Setup was easy, helped by the good documentation and quick-start guide. The scanner is rather unusual in that it has both of the common types of SCSI connectors on the back: a 50-pin plug as well as a DB-25 connector. (Most SCSI devices have two identical ports.) The two ports on the IX-4015 worked normally; I was able to daisy-chain another SCSI device from the scanner without problems.

The IX-4015 is a one-pass scanner, which accounts for its fast scan times. Using IX Scan within Photoshop, pre-scans of an 8-by-10-inch gray-scale photo at 400 dpi took about 20 seconds, and the actual scan took 55 seconds. Color photos at the same resolution had the same fast previews, but took approximately 135 seconds to scan. Using Ofoto to scan is considerably slower, doubling the IX Scan times.

IX Scan is a well-designed scanner interface for Photoshop (see “Get the Picture”). After prescanning, you can crop the scan area using the selection rectangle. IX Scan allows you to set the print and scan resolutions, and includes contrast, brightness, and threshold controls. You can also change the gamma curve and dither pattern of your scans. The only thing amiss with the plug-in is that it shows the size of the selection rectangle in pixels instead of the more useful inches or centimeters. You can also simulate gray scale from line art with the Dither and Error Diffusion settings. IX Scan produces clean black-and-white images, as well as good-quality 8-bit gray-scale and 24-bit color scans. While IX Scan is convenient for Photoshop users, using Ofoto provides superior scans. Ofoto’s automatic straightening, cropping, moiré removal, and calibration features make scanning an easy but slow process (for more on Ofoto, see Reviews, Macworld, July 1993).

Canon’s toll-free technical support was adequate but not stellar. The technician I spoke with was helpful, but wasn’t familiar with the product and needed to ask other staff members for help. I did get my questions answered correctly, but it took a while.

The IX-4015’s price is competitive with other color scanners, and its speed and excellent bundled software make it easy to use and a good choice for the small office. If you can get by without legal-size scans, this scanner should serve you well.—Tom Negriño

---

**TopDown 4.0**

**Flowcharting Program**

**PROS:** Automatically creates lower-level charts; clustering of symbols reduces chart clutter; increased speed draw; eight user-definable symbol palettes. **CONS:** Only black-and-white icons. COMPANY: Kaetron Software Corporation (713/298-1500). LIST PRICE: $345.

---

TopDown Flowcharting Program 4.0 includes the standard flowcharting features, such as multiple symbol palettes, a palette of ANSI symbols, custom symbol creation, custom line-styling, and multipage drawings. It’s what TopDown adds on top of the standard features that makes it a more productive tool.

TopDown allows you to quickly create a flowchart by doing many things automatically: drawing identically sized symbols wherever you click, joining symbols, routing connector lines, numbering symbols. If you’re brainstorming, Star-Burst mode lets you automatically link subsidiary ideas or topics in a tree or hierarchy. Creating an organization chart is a breeze with this option enabled. You can, of course, always use the manual override for any automatic option.

Although flowcharts present processes and information graphically, documentation of a flowchart can also be an issue. To solve this problem, TopDown allows you to create a Notecard of up to 32,000 characters for each symbol used on a flowchart. In addition to printing each Notecard, TopDown can generate an outline report listing all symbols and their associated text, a cross-reference report listing each symbol and any symbols attached to it, and an error report listing symbols that have data coming in (an arrow points to the symbol) but no data coming out (there is no arrow pointing away from the symbol).

Flowcharts have a tendency to become large and cluttered. TopDown provides four features to help deal with clutter and unwieldy diagrams. First, you can split any chart’s window into four panes that allow you to see four different areas of the chart. Second, you can create an anchor that acts like a bookmark; the Go To Anchor command takes you to the anchor location automatically. Third, you can create an overview chart in which each symbol represents a lower-level chart. (The number of lower-level charts is limited only by the memory available.)
to the program.) Last, with the Cluster command you can select a group of symbols and their connecting lines and automatically paste them into a lower-level chart; TopDown replaces the clustered symbols with a single symbol on the original diagram. This option is particularly convenient for reducing clutter.

TopDown provides several ways to navigate lower-level diagrams. You can select a symbol to represent a more detailed lower-level diagram; TopDown then draws this symbol with a shadow to show that a lower-level chart is linked to it. The lower-level chart automatically opens so that there are now two windows on the screen. Clicking on the chart's title takes you to a hierarchical menu listing all open drawings; you can also select a chart from the Show Hierarchy command.

Although TopDown supports a maximum of nine symbol palettes, including the ANSI palette, you probably won't want to use all of the available palettes in one flowchart—rotating through all the palettes is counterproductive.

TopDown also has tools for custom symbols. One way is to create 32-by-32-pixel black-and-white icons that become part of a symbol. In addition to using the FatBits editor (included in TopDown), you can open any paint file from within TopDown and select a portion of the drawing to be an icon, or you can create custom symbols with TopDown's drawing tools. Once you have drawn and saved these icons, you can resize and enter text in them just as with the standard symbols.

I recommend TopDown, both for its power and its ease of use. TopDown's support for custom symbols, multiple palettes, and automatic drawing aids, along with its ability to let you easily create and navigate lower-level charts, make it tops in my book.—DAVE KOJSIUR

---

**WaterMark Message Central 2.0.2**

To keep this program from ending up as just an overpriced answering machine, you have to spend up to several hours configuring and testing your settings. You set up the voice mail using the WMController application. Once configured, WaterMark works quite well. Outgoing and incoming messages reproduce clearly and distinctly at a volume level that matches that of a regular phone call. The whole network of nested messages and reminders worked flawlessly during my tests. The program puts up a flashing icon at the right of the menu bar showing the number of messages it has received. You can play back these messages (through the modem's speaker) or save them as document files for later review.

There are some downsides. The biggest one is that the program supports only one phone line. Also, when a call is received or a fax sent, the program puts up a modal (nonmovable) dialog box that prevents you from using your Mac till the action is finished. If you want to use the recommended High Tide High Quality sound capability, you have to turn off AppleTalk. The program is probably most effective on a dedicated Mac.

A no-frills communications program, Communicate Lite from Mark/Space Softworks, is included. The program works well, but lacks scripting tools and support for any file-transfer protocols beyond the basic Xmodem.

WaterMark Message Central is not going to be everyone's cup of tea. Unless your needs extend far beyond a normal answering machine's capabilities, it may not be worth the time and energy involved in the initial setup process. But if you are running a small business, or your family has complicated voice-messaging needs, and if you are willing to put in a little time and effort, you'll find it a very useful product.—GENE STEINBERG
MDS Drives

"MDS Zero Footprint Hard Drive—Add storage and performance to your Mac with a compact, reliable MDS Zero Footprint (ZFP) Hard Drive. They give you access to data storage without taking up valuable acreage on your desk! And they’re easy to install, with no jumpers or DIP switches to set. Features include a sturdy metal case, two SCSI ports (for daisy chaining), two switched AC outlets, and a 2-year warranty. Includes a SCSI cable and FREE Hard Disk Tool for Personal Edition formatting software."

 Prices may even be lower!

New Software... 30 day MBD
1733 New Up-Date 86/87, 2395 (10/4) 519.95
14057 New Up-to-Date & New Contact... 99.95
30 day MBD
16000 Palo Alto... 60 day MBD
6925 BUS Plan 75, 4600 Mac Plan Tix... 75.00
Paradigm Concepts... 30 day MBD
14058 HomeWorks MS or CreamWorks... 37.95
ProVUE... 60 day MBD
4582 Panarama 240, 11540 PowerTeam 95...
Spinelli... 60 day MBD
7036 ACT (phone manager)... 169.00
WordPerfect... 30 day MBD
4271 WordPerfect 3.0, 299.95, 481 UP, 74.95

GRAPHICS & DESIGN

Adobe
4145 Adobe Premiere 3.0
12346 Illustrator, 399.95, 12860 Photoshop 549.95
* Aldus... 30 day MBD
13771 Home Publisher 2.6... 44.95
14588 PageMaker 799.95, 16884 Upgrades 193.95
15021 Aldus Persuasion 3... 324.95
1330 Freeland 399.95, 4729 Upgrad... 145.95
1336 Aldus Point & Publish Bundle... 84.95

Apple Computer
3639 Paint Shop Pro 4.0
13085 Fontt Rap... 45.95

Broderbund Software
3163 Protect & Lock... 3572 Kid Pix 34.
* Claris... 30 day MBD
14158 Impact or 2518 MacDraw Pro... 269.
Corel
7830 Corel Cache... 34.95

Deneba Software... 30 day MBD
11055 uDRAWERS 99, 32277 Games 3.95... 259.
Fractal Design
10402 Painter 2.0... 265, 1564 PainterX2 94.95

Harvard Systems Corp... 30 day MBD
11195 Kids Power Tools for Photoshop... 119.95
ImageLine, Inc.
14438 Super Bundle EPS (484 images)... 94.95
14457 Value Pack 1 EPS (484 images)... 64.95

Light Source... 30 day MBD
1509 OFFOTO 9
Manhattan Graphics... 30 day MBD
4900 ReadySetGo! 6.0... 219.95

Quick
7612 Quark Express 3.3... 589.95

Ray Dream... 30 day MBD
12265 Ultra 99, 47611 Designer 3.0... 249.
SoftMaker, Inc.
10500 dExt Tiến Plus
* T/Maker... 30 day MBD
Clickart (bitmapmed) 34.95 (EPS) 55.95
3144 Incred. Images or 3147 CD-ROM... 89.95

PROGRAMMING/UTILITIES

Alidus
5230 CallOpener 2.0... 59.95, 9985 KillScope 25.
* Aldrin Systems... 30 day MBD
7184 Sustain SpaceSave, 34.95, 6040 Deluxe 69.

Apple Computer
1206 At Ease 45.95, 7072 QuickTime Kit 75.95
1914 System 7.1... 59.95, 10047 System 7.5... 99.95
1047 System 7.1Font Pac... 62.

AEG Software Security Trio
15864 Firewall/TrashBlock/TrashOne...
* CE Software... 60 day MBD
1727 CalendarMaker 39.95, 7827 QuickKeys 105.

Central Point... 30 day MBD
5041 MacTools 3.0 85.95, 11812 Upgrad 49.95

Connectix... 30 day MBD
14769 RAM Douler 7830 Maxima 3.0 oz. 55.

$3 Overnight Shipping
Money-back Guarantees (+) Toll-free Technical Support

And, we stock more than 3500 different products for your Mac; if you don’t see what you need here, just give us a call.
<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>10785 IX-4015 Color Scanner — The smallest footprint in its class. Delivers 400 x 800 dpi in 24-bit color and 400 x 1200 dpi grey scale. Comes with OFOTO scanning software.</td>
<td>$999.95</td>
</tr>
<tr>
<td><strong>EXCLUSIVE! FREE CARDCASE INCLUDED!</strong></td>
<td></td>
</tr>
<tr>
<td><strong>$599</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NOVEMBER</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SPECIAL</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CALL</strong> for details!</td>
<td></td>
</tr>
<tr>
<td><strong>$599</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NOVEMBER</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SPECIAL</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CALL</strong> for details!</td>
<td></td>
</tr>
<tr>
<td><strong>$599</strong></td>
<td></td>
</tr>
<tr>
<td><strong>NOVEMBER</strong></td>
<td></td>
</tr>
<tr>
<td><strong>SPECIAL</strong></td>
<td></td>
</tr>
<tr>
<td><strong>CALL</strong> for details!</td>
<td></td>
</tr>
<tr>
<td><strong>$599</strong></td>
<td></td>
</tr>
</tbody>
</table>
New Delrina Fax PRO for Macintosh is the best fax software you can buy. Details below.

Tired of fax machines and fax software sending images like the one on the left?

Well, now you can get the phenomenal image quality shown on the fax on the right (actual unretouched image) every time — with new Delrina Fax PRO™ for Macintosh. With Delrina Fax, you can now send the sharpest, best defined images of any fax software, regardless of monitor resolution. And with Delrina Fax you can even view gray-scale faxes on-screen.

Sending with Delrina Fax is as easy as printing a document from your favorite application. And since it works in the background you can send and receive faxes without leaving the application you’re in. It also lets you easily track and manage your faxes, customize your own cover sheets, and use OCR to quickly convert faxes with text into documents that are ready for editing with your word processor.

Plus, Delrina Fax supports all fax modems, even the PowerBook Express Modem and the AV GeoPort Telecom Adapter. And unlike other fax software, you gain the reliability provided by Delrina’s Communications Toolbox fax drivers. So as you update your system software or hardware, Delrina Fax keeps on working. And it’s made by Delrina, the makers of the best-selling fax software in the world, WinFax PRO™.

For even more exquisite details, or to order Delrina Fax PRO, call us today.

Delrina Fax PRO, WinFax PRO and Delrina are trademarks of Delrina (Canada) Corporation. Macintosh is a registered trademark of Apple Computer. All other product names are trademarks of their respective owners. ©1994 Delrina (Canada) Corporation. All rights reserved.
Pointillist

Stereogram Software

PROS: Inexpensive; fun to use; will amaze your friends. CONS: Enthusiastic viewing of stereograms can give you headaches.


MW

MacMoney 4.01

Personal-Finance Software

PROS: Easy to learn and use; good graphing and reporting features. CONS: Lacks investment-tracking and tax-reporting features found in competing programs. COMPANY: Survivor Software (310/410-9527). LIST PRICE: $89.95.

MW

I F YOU'VE ALWAYS LOVED OPTICAL ILLUSIONS, or snuck away to distant theaters and anonymously slipped on blue and red glasses to watch 3-D movies, Pointillist is the program for you. And even if you haven't had a lifelong yearning to fool your brain into seeing things that aren't there, Pointillist is a gleefully wacky program in these days of mergers and serious computing.

What Pointillist does is make stereograms. Stereograms are images that look, at first glance, like random dots, but as you focus on a plane beyond the focal point of the page or screen, a 3-D image emerges from the pattern and appears to hover inches in front of the background.

The Official Secret Decoder Book, known in more stodgy products simply as the manual, describes four reliable ways to learn how to see the 3-D images. All of them are ways to help you get your eyes to focus beyond the image. If you can imagine staring at the horizon while also looking at a piece of paper a few inches in front of your face, you've got the basic idea. Once you can see the images emerge from the background, you can blink or move farther away to find a comfortable viewing distance. But don't change your focus, or you'll lose the 3-D effect and simply see a dot pattern again.

Pointillist comes in four different modules. GraFX Viewer 1.0.2 lets you open and view stereograms. SuperDots 1.0.2 enables you to create your own stereograms from PICT files. GraFX Stereograms and GraFXgrams are screen savers that work with Berkeley Systems' After Dark to project stereograms and stereogram animation on your monitor.

To make your own stereogram, you first create an 8-bit PICT image in a paint program. Then you open SuperDots and choose Create Stereogram. The pattern-selection dialog box opens with four choices of dot patterns (black-and-white, gray-scale, or color-random dots, or a custom PICT pattern of your own design). You then open up the picture that you want to make into a stereogram, and the program goes to work.

SuperDots converts your PICT image into a gray-scale image (if it was originally a color image), then creates an illusion of depth based on the darkness of each area in the picture. The darker the gray, the farther away it appears; the lighter the gray, the closer the image appears. Once the stereogram is completed, you can add color overlays and borders to dress them up.

Provided you have After Dark 2.0, GraFX Stereograms and GraFXgrams work like other After Dark add-on screen savers, showing a cycling display of your stereograms or stereogram animation on your screen. The program ships with 40 stereograms and 3 animated sequences, so you have plenty to look at even before you start adding your own designs.

Pictor GraFX promises that a more elaborate product called HoloVision will be available in the near future for those budding stereogram artists who want more control over the creation and design of their 3-D work. For now, SuperDots and any paint program provide enough of the basics to whet the appetite of all but the most one-dimensional.—LIZA WEIMAN

Before The base 3-D image here is a gray-scale image created in a paint program. The colored dots at the top represent the portion that SuperDots has already converted into a stereogram image.

After If you hold this image close to your face, then move it slowly away from you without changing your focus, the image of the crane should appear to be hovering above the background.
Introducing The New SQ5200C Drive. The Biggest Reason Yet To Join Our 5.25” Family.

The SQ5200C delivers big in data-intensive applications such as desktop publishing and multimedia, with 200MB of storage, hard drive performance, and full read/write compatibility with all SyQuest 44MB and 88MB cartridges. Plus all the advantages of removability, like unlimited capacity, off-line storage, system sharing, fast backup, and unbeatable data security and transportability.

If you’re a SyQuest user, it’s the best way to migrate to the next level of storage. If you’re looking to SyQuest for the first time, it’s the biggest reason yet to join the world standard. To find out how to get more mileage out of your demanding applications, call 1-800-245-2278.

Sales of more than 6 million cartridges and 1 million drives have made SyQuest the world standard in removable storage.

Look for this logo when buying removable storage products.

The World Standard.

1-800-245-2278. SyQuest Technology, Inc., 47071 Bayside Parkway, Fremont, CA 94538. SyQuest and the SyQuest logo are registered trademarks of SyQuest Technology, Inc. © 1994 SyQuest Technology.

Circle 249 on reader service card
Money does. Survivor Software needs to adorned interface makes for easy data entry. You fill out forms that look like their paper counterparts, so work around this by using asset accounts “Like Paper, but Smarter”). By default, MYM has extensive tax-estimation abilities that enable you to assign categories to specific lines on IRS tax forms; Quicken is almost as good as MYM in this area, and it also handles loans better than MacMoney does. Survivor Software needs to add these features to MacMoney to stay competitive. I’d also like to see the prorating of some categories on a report.

The problem with MacMoney isn’t so much what the program includes; it’s the features that it lacks and that are available from the competition. Unlike Quicken or MYM, MacMoney can’t track stocks, bonds, or mutual funds. You can work around this by using asset accounts Microlytics that allows you to search for strings of text within documents. There are two disappointments, though: Gofer provides no printed manual—just a lengthy documentation file on one of the installation disks. And more important, the version of Gofer that ships with DiskTop is a valuable package that helps you copy, move, rename, delete, and find files—without using the Finder. Furthermore, when you need to organize large numbers of files on different volumes, DiskTop handles virtually all of these tasks more quickly and effectively than the Finder does.

Like Paper, but Smarter MacMoney’s unadorned interface makes for easy data entry. You fill out forms that look like their paper counterparts, so it’s hard to make a mistake.

DiskTop 4.5

DiskTop is a simple but powerful file-management utility that lets you copy, move, rename, delete, and find files—without using the Finder. Furthermore, when you need to organize large numbers of files on different volumes, DiskTop handles virtually all of these tasks more quickly and effectively than the Finder does.

Longtime DiskTop users know how handy this unassuming desk accessory can be. With the release of version 4.5, DiskTop is even more powerful, and its revamped interface design gives it a polish it lacked before.

You access DiskTop from the Apple menu or by using the built-in hot-key combination Shift-D. The lower half of the program’s main screen contains a window that displays a directory of each disk connected to your Mac (similar to a list view in the Finder). The top half of the DiskTop screen contains a set of 3-D-style buttons you click on to perform various file-management tasks.

You can now fully customize the interface with ten different custom list views, each containing only the file information you want to display. You can rearrange the order of columns by dragging them, and you can make the columns as wide or narrow as you want.

A number of improved features speed up most jobs. For example, there are keyboard shortcuts for all the major file-management tasks. When you press the Shift key, DiskTop displays the shortcuts right on the main interface buttons, so it’s easy to learn the shortcuts.

The improved interface makes navigating your folders easier, too. By adding the names of frequently accessed folders to the main Drive pop-up menu, you can jump straight to the listed folders.

DiskTop’s search functions outperform the Finder’s Find command. You can simultaneously search for files by any combination of name, creation date, modification date, type, creator, and size. (The Finder handles only one kind of search at a time.) Once you find the files you want, you can retain the results of the search and add to the current found set with subsequent searches.

DiskTop is also great for handling System 7 aliases; the program lets you create and move aliases with a single command, saving you the trouble of first creating an alias and then dragging it into the desired location.

Of course, the program also enables you to do some things you can’t do with the Finder at all—like making folders and files completely invisible, or editing the four-letter type and creator codes the Macintosh uses to identify files. (You occasionally need to do this to repair a damaged file.)

The new version also makes it easier to export file information to other applications. File lists that are displayed by DiskTop can now be exported as tab-delimited text files.

PrairieSoft is shipping DiskTop with two add-on modules. DiskLaunch is a utility that allows you to bypass the Finder to launch applications and open files. From anywhere on screen, you can access a pop-up menu listing your most frequently used applications and documents. Just select the ones you want from the menu, and DiskLaunch opens them.

The other module, Gofer, is a text-search-and-retrieval utility program from Microlytics that allows you to search for strings of text within documents. There are two disappointments, though: Gofer provides no printed manual—just a lengthy documentation file on one of the installation disks. And more important, the version of Gofer that ships with DiskTop 2.0, is incompatible with all 68040-based Macs. You have to send in a coupon to get the free 040 upgrade, which was still being beta-tested when this review was written.

But even without DiskLaunch and Gofer, DiskTop is a valuable package that makes organizing a crammed hard drive a more manageable task.—JOSEPH SCHORR
Before you consider a third party external drive, look at what we’ve brought to the party.

Introducing Apple® External Hard Drives. Now you can add reliable external storage to your Mac with all the quality you expect from Apple, at prices that will surprise you. Apple External Hard Drives are bundled with everything you need to begin safely storing your data right away, including a power cable, a SCSI cable, and a terminator. Convenient front-panel SCSI ID and power controls make it easy to power up and change your SCSI address — whether you set the drive up vertically or horizontally.

The new Apple drives are available in four convenient storage capacities, 160Mb, 230Mb, 500Mb and 1000Mb, and are manufactured exclusively by La Cie, Ltd. a Quantum Company. And right now we’re celebrating the Apple Drive debut by loading each drive with powerful hard disk management software, handy utilities and much more.

Look for the Apple Drive at your local dealer soon. For more information and the name of a participating reseller or Quantum distributor, call La Cie.

Now you can safely store your work outside your Mac without leaving the Apple family.

That’s cause for celebration.

For All The Facts Call: 800-999-0499

© 1994 La Cie, limited. All rights reserved. Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc. registered in the United States and other countries and under license thereto.
**TurboDialer**

**Automatic Telephone Dialer**

**PROS:** Dials numbers from your Mac; works with multiligne phones; cheap. **CONS:** Sounds seep into phone conversations; not compatible with some PBX systems. **COMPANY:** Advanced Software (408/733-0745). LIST PRICE: $79.95.

Because the device plays the touch-tones through your handset, the TurboDialer works only with telephone systems that accept touch-tones. Those include many multiligne phone systems, as well as some PBX systems. Certain PBX systems work with the device only after you manually dial the phone for an outside line; others don’t work with the TurboDialer at all. If you have any doubts, check whether your phone accepts analog input at the handset.

The TurboDialer ships with its own extension, DirectDial. DirectDial can dial a phone number from any application. All you do is highlight the number and hit a user-definable hot key. You can configure DirectDial to preface a phone number with 9 to get an outside line, if necessary, or to not dial the local area code. In addition to DirectDial, most database, card-file, and contact-management programs can produce dial tones.

This product is not without glitches. The TurboDialer’s speaker doesn’t sound as good as the Mac’s internal speaker. More important: in theory, only touch-tone sounds pass through the TurboDialer to the handset of your phone. Any other sounds the Mac makes merely play on the TurboDialer’s speaker. In practice, it’s a different story. If you’re on the phone when your computer makes a noise, the TurboDialer transmits the noise faintly both to you and to the person with whom you’re speaking.

A grounding problem with Centrises creates a hissing noise on the phone as long as the TurboDialer’s connected. Advanced Software says this problem is limited to the Centris models. I found the noise irritating enough that I kept the TurboDialer connected to my Mac II at work and not to my Centris at home.

Except for the occasional computer noise that seeped into my phone conversations, I found the TurboDialer to be a well-executed product. If you never dial phone numbers that are stored in your computer, I highly recommend it.—PAUL DEVINE

---

**LabView for Mac 3.0.1**

**Data Acquisition and Analysis**

**PROS:** Complete system for analyzing experimental data; access to giant virtual instrument library. **CONS:** Overkill for simple applications. **COMPANY:** National Instruments (512/338-9119). LIST PRICE: $1995.

The scientific-instrument business underwent a revolution in the 1980s. As fast, inexpensive computers became available, equipment designers realized that you could get a signal converted to digital form and get the digital data into computer memory, where all sorts of processing could be accomplished with software. Instead of real physical special-purpose instruments, “virtual instruments” could take over the instrument market.

National Instruments has become the leading exponent of this virtual instrument (VI) approach. You can string together a few LabView icons to simulate a traditional scientific measuring system, but National Instruments has anticipated practically every useful system known to modern laboratory practice, and huge libraries of third-party virtual instruments are available. A new batch of signal-analysis Measurement VIs of interest to electrical engineers (power spectrum, amplitude and phase measurement, impulse and transfer response functions) expands the already large built-in VI package, and another VI for automating repetitive testing makes the Measurement VI package more useful on the test bench.

In version 3.0.1, a uniform programming environment across Sun (Unix), PC Windows, and Mac platforms has been established, making VIs from all three groups distributable to the others. This software leverage, combined with the acquisition of HiQ, means that LabView has no real competitors at the high end of the data-acquisition and -analysis market. Several other programming constructs improve the 3.0.1 package: simple usage of global variables, local variables to control instrument-panel elements, and occurrence functions to help manage timing. As in earlier versions, there’s provision for integrating LabView code with C language code in the MPW environment, and the software still manages data acquisition for IEEE 488 and VXI bus hardware products. A native-mode PowerPC version should be available by the time you read this.

**Switched On** You could build this monitoring demo yourself in half an hour, but LabView includes it and dozens of other ready-to-go examples. Version 3.0.1 offers easier programming of front-panel controls and indicators.

LabView 3.0.1 is a different product from the original. And its Texas-based developers may have thought a little too big for some users. Full use of version 3.0.1 requires 12MB of RAM, 24MB of hard disk space, and a math coprocessor. So if your lab has older Macs, especially in some low-velocity activity such as temperature or humidity monitoring, you might find products from Remote Measurements or GW Instruments better suited for the task. But for large-scale, demanding projects in data acquisition and analysis, LabView 3.0.1 is an unchallenged standard, in a class by itself.

—CHARLES SEITER
OWN 100 EXOTIC CARS!

100 photographs of Exotic Cars on CD-ROM can be yours with Corel Professional Photos series 29000.

Other categories:
• 1000 - Sunrises and Sunsets
• 1100 - Mountains of America
• 12000 - Sunrises and Sunsets
• 13000 - Porsche Racing
• 14000 - Coasts
• 15000 - Wild Animals
• 16000 - Sailboats
• 17000 - Bridges
• 18000 - Ireland
• 19000 - Wild Animals
• 20000 - Spirit of Buddha
• 21000 - Auto Racing
• 22000 - Bridges
• 23000 - People
• 24000 - Food
• 25000 - Lakes and Rivers
• 26000 - Fields
• 27000 - History
• 28000 - Ireland
• 29000 - Western Canada
• 30000 - Egypt
• 31000 - Residential Interiors
• 32000 - Deserts
• 33000 - Alaska
• 34000 - Aviation Photography
• 35000 - Insects
• 36000 - New Zealand
• 37000 - Fighter Jets
• 38000 - Fireworks
• 39000 - Predators
• 40000 - Alaska
• 41000 - Desert Life
• 42000 - Commercial Construction
• 43000 - Waterfalls
• 44000 - Alaska
• 45000 - Desert Life
• 46000 - Hawaii
• 47000 - Turkey
• 48000 - Northern California
• 49000 - Alaskaland many more...

The World's Leading Photo CD-ROM Collections
from the makers of CorelDRAW, the world's best-selling graphics software.

OVER 160 STUNNING CATEGORIES AVAILABLE!

Great as screen savers or stock photography.
Ideal for ads, brochures, presentations and multimedia.
Use CorelDRAW to retouch or add special effects.

$29.00

100 SUPERAH IMAGES
IN EACH COLLECTION!

CALL: 1-800-395-7778
SERIOUS GRAPHICS SOFTWARE & HARDWARE

Circle 78 on reader service card
Grolier Multimedia Encyclopedia

**PROS:** Encyclopedia text is fully indexed and easy to search and meander; relatively fast access times; multimedia elements embrace a broad spectrum of topics.

**CONS:** Some of the animation and video clips are clumsy; a few hierarchy glitches.

**COMPANY:** Grolier Electronic Publishing (203/797-3530). **LIST PRICE:** $395.

---

I F Y O U B E L I E V E, L I K E I D O , T H A T E L E C T R O N I C search algorithms are second only to plumbing when ranking advances in civilization, you'll find the newest version of the Grolier Multimedia Encyclopedia to be a first-class Boolean treat. The disc indexes the entire text of the 21-volume Grolier Academic American Encyclopedia and arranges the more than 33,000 topics into easy-to-navigate, logical hierarchies. A search on the word *silicon*, for instance, yields a list of 177 topics ranging from cement to semiconductors.

Among the many still images in the Pictures database are examples of tools, animals, political and religious leaders, architecture, and astronomy. Audio selections include animal and bird sounds, highlights from historic speeches and musical scores, and samplings of musical instruments from accordance to zither. (The encyclopedia requires at least an 8-bit color system, 1.5MB of free RAM, 3MB of hard disk space, and a QuickTime-capable CD-ROM drive.)

More than 50 video clips offer short takes on topics as diverse as Venus flytraps and the first moon landing. Given the size and resolution constraints of QuickTime movies, many of the videos are murky and difficult to make out. But some, like the footage of the Hindenburg disaster, are spectacular.

The 15 Multimedia Maps and the 13 Knowledge Explorer multimedia essays offer brief glimpses of broad topics—the Civil War, women’s suffrage, the workings of the human body. The Painting and Sculpture essay, for instance, rapidly presents images ranging from cave paintings through Nam June Paik’s video sculptures.

The disc offers an intriguing window onto the kinds of interactive reference materials we can anticipate. However, I couldn’t help wishing that a few of the lesser video clips and animations had been sacrificed to make room for more fulsome text—Dr. King’s entire “I Have a Dream” speech rather than the very brief quip describing it, for example.

Timeliness is another issue. The last bibliographic reference for computer graphics is from 1987; the last for computer memory is from 1985.

Future versions will no doubt clean up some of the hierarchical snafus. When you choose to view art images, for instance, you find two of van Gogh’s paintings listed under his name; a third is found under its title, *Chair and Pipe*.

Still, the good points of the Grolier encyclopedia are worth extolling—it has excellent search capabilities, it weighs much less than a shelf full of books, and it’s fun.

—SUZANNE STEFANAC

---

Helix Express 2.0.1

**PROS:** Intrinsically multiuser, client-server design, built-in document management, updates information immediately across a network.

**CONS:** Icon programming sometimes awkward.

**COMPANY:** Helix Technologies (708/465-0242). **LIST PRICE:** $589.

---

H ELIX TECHNOLOGIES PIONEERED a unique, icon-based programming technology for relational databases on the first Macs. The program has a devoted following, mainly because a Helix database is easy to modify—and databases always seem to need modifying. Early versions were slow, but version 2.0.1 is much faster. Search speed is about four times quicker in 2.0.1 than in 1.0, and on the new faster Macs it tackles megarecord files with no problems. Although it can’t compete with Microsoft’s FoxPro/Mac in raw search speed, Helix’s performance is no longer objectionable, and multiuser operation is downright snappy.

Helix introduced binary large objects (BLOBs) as data structures a few years ago; a BLOB field in a Helix database can be text, a picture, sound, or any Mac file type. Helix used BLOBs to design a separate document-management system that was folded into Helix Express 1.0. Version 2.0.1 now supports access to externally stored documents. This means that a Helix database can manage access to huge, network-based piles of information while the database itself remains relatively compact. Helix now updates information immediately across a network as soon as a user makes a change (updating access is managed with a detailed password-administration system).

Besides the basic speed improvement, query forms no longer redraw after a query value changes; text fields can now contain keywords as indexed subfields; and a Power query mode lets you formulate record searches in something approximating English, rather than using a query form. Report generation has been improved by an automatic multicolumn, multirow feature that lets you make spreadsheet-like reports, with the equivalent of in-cell scrolling.

Helix Express 2.0.1 custom database development has been simplified in two different ways. Developers can get an unlimited number of run-time versions for $495 (clients in client-server mode can be activated with a call to Helix). And a new book,

---

**Search and Enjoy** Access to text elements via the alphabetized Title List, robust Word Search, chronological Timeline, and hierarchical Knowledge Tree is straightforward and fairly fast.

---

**Simplicity** Helix Express 2.0.1 includes examples of basic business applications that users can modify and extend. Even with no background in programming, tinkering with Helix databases is fairly simple.

**Riding The Helix Express**, by Jan Harrington (Helix Technologies, $29.95, 1994), explains how to do real Helix business applications of varying complexity. Although it’s easy to set up quick-and-dirty database models in Helix, making optimal use of the tiles and abaci (Helix’s programming elements) calls for some guidance. Nonetheless, users who want to upgrade to relational-database capabilities should look at a Helix Express demo. Helix’s claim that its database is geared to nonprogrammers is quite valid, and now the program’s improved performance makes it a serious competitor with 4D, Omnis, and FoxPro for all-Mac networks.—CHARLES SEITER
Your Best Value Guaranteed

Give Us 30 Days And You'll Be A Mirror Customer For Life.

In an industry clamoring with companies all claiming to give you the best value in displays, only one company has the confidence to prove it to you with a 30-day “Love It Or Return It” guarantee. Mirror. Long before many other display companies were even formed, Mirror was supplying customers, like you, with the finest-engineered displays at the sharpest price points around. It's this level of value that keeps thousands of satisfied customers coming back for more—time and time again. You will, too!

Award-winning technology priced within reach!

At prices like these, it would be easy to confuse these displays with the lower-end displays on the market. But don't be misled. Mirror's advanced technologies give you quality you must see to believe.

And we have a wall full of awards to prove it.

Our Full Page Monochrome Display is a Macworld Editors' Choice and has earned a Four Mice Rating from MacUser.

Our Two-Page Display also dazzled MacUser editors and earned a rating of Four-And-A-Half Mice.

Our 17" Trinitron sailed to a MacUser Four Mice Rating, also.

Compare... Mirror costs up to 30% less!

Take a look at Mirror's hot specs and sizzling low prices. Then shop around. Check out how far your money goes with RasterOps," Phillips' SuperMac" and Radius" Feature-for-feature, dollar-for-dollar, you'll find none come close to matching the value of a genuine Mirror display.

Call Now For Your 30-Day Trial!

To start enjoying the finest value in displays, simply pick up the phone and call us. If our displays doesn't meet your expectations, return it within thirty days, and we'll refund your money: No questions asked. Guaranteed.

Call Now For Information About Other Industry-Leading Mirror Values Including: Scanners, Optical Drives, DAT Drives, CD-ROM Drives, Hard Drives, Graphics Cards And More!

5198 West 76th Street, Edina, MN 55439 USA fax: 612-832-0052 tech support: 800-323-9285

5198 West 76th Street, Edina, MN 55439 USA fax: 612-832-0052 tech support: 800-323-9285

Call Now For Information About Other Industry-Leading Mirror Values Including: Scanners, Optical Drives, DAT Drives, CD-ROM Drives, Hard Drives, Graphics Cards And More!

Circle 58 on reader service card
VirtualDisk 1.1a

VirtualDisk has one basic purpose, which it fulfills extraordinarily well: it catalogs removable disks, including floppies, SyQuest cartridges, Bernoulli disks, and opticals. The process is practically automatic. As you dismount a disk, VirtualDisk goes into action (indicated by a progress bar on screen). Within a few seconds, the program records the disk's directory and stores it in the VirtualDisk folder.

Inside VirtualDisk's colorful desktop folder is the catalog itself, consisting of the icons of all the disks you've added to the catalog. When you double-click on a catalog icon, you see the original disk's directory (although creator information isn't displayed). You can search for the files you want using the Finder's Find feature. When you double-click on any file in the directory, a message asks you to insert the original disk on which the file resides. Once you mount the disk, the file opens normally.

There are a handful of options in the VirtualDisk control panel, such as whether to catalog floppies and/or removable disks, and whether the program should ask you to OK the cataloging process. An Options button lets you save icons in your catalog and choose whether the icons should be black-and-white or color.

Two additional utilities are packaged with VirtualDisk. The first, EasyLabels, allows you to print a disk's directory in any of several standard Avery label formats. You can customize labels. Also, you cannot save the label sheets you create—the program's sole, annoying shortcoming.

The second utility is the shareware favorite DiskDup+, which offers full track-by-track copying of your floppies. DiskDup+ also reads and mounts disk images created in Apple's Disk Copy format. The program, which sells for $20, is bundled with VirtualDisk at no extra cost.

By default, a VirtualDisk catalog takes 1MB on your hard drive. The catalog expands as its contents increase (up to 65MB if you ever get close to its 300,000-file limitation). VirtualDisk is almost invisible in actual use, except for the progress bar it displays when it scans a new (or changed) disk. In using VirtualDisk, I encountered none of the quirks I found when reviewing a competing program, Atticus Vista.

The brief manual clearly describes how to use VirtualDisk and EasyLabels. The VirtualDisk control panel provides online help. When trouble arises, Continuum's customer support is easy to reach (it's a toll-free call), friendly, and informative.

Judged alone, VirtualDisk is perhaps the best solution to your disk-cataloging woes. When you add EasyLabels and DiskDup+ to the mix, it's an excellent value indeed, and I highly recommend it.

—Gene Steinberg

Automap Road Atlas for Macintosh 2.01

Automap uses a database of freeways, highways, and state and county roads to calculate routes between more than 120,000 North American locations. It's a tool for finding the best routes between cities and towns. Unlike some CD-ROM atlases, Automap's database doesn't include every street on the continent. Automap won't help you find the best route between bookstores in Manhattan, for example. But the program fits on a PowerBook hard drive (using only 5MB of disk space), and unlike the CD-ROMs, Automap tells you how to get where you want to go.

After setting preferences such as driving speed and whether you like to drive on freeways or smaller roads, you tell Automap where your trip begins and ends by selecting points on a map or by entering place names in a dialog box. You can name up to four places that you want to visit (or avoid) along the way. Then you click on Calculate.

In a few seconds, Automap finds the quickest, the shortest, or the preferred route for your journey. Automap draws an easy-to-read map highlighting the route and creates written driving directions with estimated travel times. You can adjust the level of detail and amount of territory the map displays, and then print the map and a separate sheet of directions.

To test Automap, I printed maps and driving instructions for businesses (well, bike racers and rock bands trying to earn a living) making more than a dozen 3- to 12-day trips throughout the U.S. We still carried road maps, but we didn't refer to them very often. We found Automap's maps and especially its written directions easier to read and handle than the other maps. We all got to our destinations on time.

Automap finds recreational areas, reports state driving laws and populations, and lists phone numbers for local tourists and chamber of commerce information.

There is room for improvement. Automap gave a few directions like "Take the Unknown 15 miles." The program can't store more than one set of preferences. And Automap supports cut-and-paste exporting of its maps and data, but not tab-delimited data export. Also, the map window took about 30 seconds to redraw on a 40MHz 030 Mac. Although the lag is annoying, I found the result worth the wait. Still, Automap tells you how to get where you're going better than any other map, atlas, or software I've seen.—Jim Feeley
Although TextBridge™ OCR software is easier to use, less expensive, and often more accurate, OmniPage® still has its uses.

In a recent independent test on a wide variety of documents, TextBridge OCR provided more accurate recognition on average than OmniPage Professional.

Yet TextBridge is only 1/7th the price of OmniPage Professional—$99 vs. $695.

Available in both PC and Mac versions, TextBridge works with most popular word processing applications, fax modems and scanners (including TWAIN support).

So try TextBridge. Of course, if you want to spend an extra $596, you can just coast along with OmniPage Professional.

To order TextBridge, call 1-800-248-6550 ext.3

Xerox Imaging Systems
A Xerox Company

Circle 100 on reader service card
Financial Competence 1.5

**Business Economics Tutorial**

**PROS:** Easy to use; explains financial statements in easy-to-understand terms.

**CONS:** Undistinguished graphics; overpriced.

**COMPANY:** Competence Software (603/435-5099). LIST PRICE: $99.

---

If you’ve ever looked at financial statements and found them intimidating or just plain baffling, then the maker of Financial Competence wants you. Its seven-lesson system demystifies three basic types of financial statements—income statements, balance sheets, and cash-flow statements. Text, simple graphics, and basic animation make these instruments comprehensible to businesspeople, students, and the general public.

Lessons consist of several sections and a quiz. You’re encouraged to proceed in order; after scoring at least 80 percent on all quizzes, you receive an on-screen certificate. The program tracks your progress so you can quit and continue later where you left off. A browse mode lets you explore the program but without a “reward.”

At various points Financial Competence prompts you for information about your business; you can supply real or made-up data. For example, in the lesson on income statements, you learn what cost of sales consists of by entering cost figures for material, labor, and overhead. The tutorial then uses these, and other numbers you provide, to explain the connections between various financial-statement entries—the effect of sales has on gross margin, for example, or the relationship of operating expenses to operating income. You can export data from the program to a spreadsheet or word processor.

Much of the information in financial statements involves where a business’s money comes from and where it is spent. To demonstrate this, Financial Competence frequently shows an animated wad of currency moving from one graphic (such as a bank) to another (such as a factory). Unfortunately, these animations are painfully slow, even on a Mac IIfi with 5MB of RAM. While it does help convey the idea of cash flow, by the 15th journey or so, the traveling money becomes extremely annoying, and there’s no option to shut off animations.

The program comes in a canvas moneybag stuffed with packing paper printed with pictures of 20-, 50-, and 100-dollar bills. And all in all, it’s a mixed bag. You needn’t worry that the tutorial is too complicated for a nonbusinessperson (like me); Financial Competence assumes no prior knowledge of financial statements. Everything is explained in fairly basic terms, new information is introduced very slowly, and some concepts are repeated several times. Like the cash-flow animation, this approach may facilitate comprehension, but it might also make you impatient after a while.

As advertised, Financial Competence explains how financial statements are compiled and how they relate to each other. You could learn the same thing from a book, though, faster and for less money. And that might be the more financially competent thing to do.—MICHAEL ROSENTHAL

Small Blue Planet 1.2.1

**Educational CD-ROM**

**PROS:** Nicely integrated collection of beautiful Earth-from-space images; users can add custom pop-up annotations; includes world map showing pattern of day and night. **CONS:** Lacks many features of standard atlases; text is poorly edited; no search function. **COMPANY:** Now What Software (415/885-1696). LIST PRICE: $79.95.

**MW**

---

Small Blue Planet: The Real Picture Atlas is a nicely integrated compilation of Earth-from-space images from many sources, including the CIA, NASA, the U.S. Geological Survey, and the National Oceanic and Atmospheric Administration. This visually stunning CD-ROM is organized around three main images: a global relief map composed of satellite images that colorfully display both oceanic and continental contours; a mosaic relief map of the 48 contiguous United States, dramatically rendered in shades of gray; and a somewhat disappointing political map of the world showing only countries—current as of November 1993—and national capitals.

You can zoom in on any of the main maps in ever greater detail, or soar across the globe in any direction. In addition, Small Blue Planet pinpoints smaller-scale images with red markers; one click on a marker opens a thumbnail preview, and another click displays the image at full size. While pop-up location identifiers are available in many small-scale images, there is little logic to what is identified—Genoa and Venice, for example, but not Rome—and some identifiers (such as Kiluea Volcano) are positioned incorrectly. You can also add your own pop-up annotations to any image. A window containing country-specific data is available in the main political map, and you can obtain information—often either incomplete, too technical, or blatantly promotional—on every image.

A separate part of the program, the Chronosphere, dramatically (and dynamically) illustrates the pattern of day and night on the world relief map. A Gallery section displays thumbnail pictures of all the disc’s images (sorted first by type of remote sensor, then by image title), but inconveniently, no search function is available to quickly locate an image of a given location.

Small Blue Planet is not as comprehensive as a standard reference atlas, and it lacks many atlas features, such as distance scales, a master index, and information to help you interpret map colors or contours. Some small-scale images are not accessible from the most logical main map; for example, you can reach a beautiful mosaic relief image of Italy from the main political map but not from the relief map. Other problems include a manual that’s too brief, some poorly edited text in the program, and a lack of overall online help. But maps and Earth-from-space images are endlessly fascinating, and the contents of Small Blue Planet are no exception.—ROBERT C. ECKHARDT

---

**MACWORLD July 1994 93**
POWERBOOKS: The Next Generation

APPLE'S NEW NOTEBOOKS BOAST 040 POWER AND A RADICAL NEW DESIGN

By Cary Lu

When Apple introduced the PowerBook line in 1991, it changed the way Macintosh users thought about laptop computers. Previously, Apple's idea of portability was the Macintosh Portable, a 16-pound system that contradicted its name. Now, a million PowerBooks later, Apple's new 68LC040-based 500-series PowerBooks represent a notebook-computer design as radical as that of the original PowerBooks.

The four 500-series PowerBooks are the first Apple notebooks to offer 040 performance, but they boast much more than a faster processor. On the outside, a new case design, a unique trackpad that replaces the familiar PowerBook trackball, and a larger display give the 500-series PowerBooks a distinctive look. Important, but less apparent, features include a new nickel-metal-hydride (NiMH) battery, an Ethernet interface, 16-bit sound, and provision for either a second battery or PCMCIA (Personal Computer Memory Card International Association) cards.

The New Lineup

Four PowerBooks make up the 500 series and replace all 100-series PowerBooks, except for the 145B ($1599) and 165 ($1869). The PowerBook 520 and 520c have passive matrix screens and use 25MHz 68LC040 CPUs. The 520c also represents Apple's first implementation of color dual-scan LCD technology. The result is a passive matrix color screen that's superior to the 165c's, though still inferior to active matrix screens. Apple prices were not final at press time, but the 520 will cost from $2000 to $2200, and the 520c, from $2600 to $2900. These prices include 4MB of RAM and a 160MB hard drive.

The PowerBooks 540 (64 levels of gray) and 540c (up to 32,000 colors) have active matrix displays and 33MHz 040 processors. The basic 540 configuration ($3000 to $3300) will ship with 4MB of RAM and a 240MB hard drive; the basic 540c ($4000 to $4500) will ship with a 320MB hard drive. The 540 and 540c are also available in a configuration that in-
POWERBOOKS: THE NEXT GENERATION

PowerBooks: The Next Generation

eludes 12MB of RAM and a modem. All 500-series PowerBooks are expandable to 36MB of RAM. And yes, all four 040 PowerBooks can be upgraded to PowerPC 603-based Power Macs. The PowerPC upgrade will enable your PowerBook to run both native-PowerPC code and 680X0 code under emulation.

Upgrading to a PowerPC PowerBook should not be difficult because the 040 CPU resides on a daughterboard, not on the motherboard itself. Making the upgrade to PowerPC will involve only swapping CPU cards. Unlike earlier PowerBooks, the new 500 models open up easily, allowing you to add accessories. Remove two screws and the keyboard comes off, opening up space for three plug-in cards: the CPU daughterboard, the RAM card (which plugs into the daughterboard), and the modem card (see “The Pull-Apart PowerBook”). Changing the hard disk drive is only a little more difficult.

To accommodate all the new features, the new PowerBooks have a slightly larger case—a quarter-inch wider and almost a half-inch deeper than the 100-series PowerBook case; the weight remains about the same but depends on the configuration. The 500-series models look like no PowerBook you’ve seen before. The new case design shows more curves and angles than the squarish older models; for example, the palm rest at the front of the case curves downward.

A Faster PowerBook—Sometimes

The new PowerBooks are about one and a half times as fast as the current 100-series PowerBooks (see “68040 PowerBooks Speed Test,” for specific testing results). Overall, performance is about equal to that of Intel 486-based notebooks. The 500-series systems aren’t the fastest 040 PowerBooks, however. The new 040 PowerBook Duos, the 280 and 280c, outperform the 500 series because the Duos have faster video circuitry (see “The 040 Duos—The Fastest PowerBooks”).

The 68LC040 CPU processor lacks the floating-point unit (FPU) of the full 68040 CPU used in some desktop Macs. An FPU has little effect on applications such as word processors, page-layout programs, database managers, and, for most users, spreadsheets. However, in Macworld Lab’s tests on FPU-intensive tasks (mathematics software, CAD, some graphics programs, and spreadsheet calculations involving transcendental functions), 030-based PowerBooks with a coprocessor (165c, 180, 180c) outperformed the 040 PowerBooks. For such numeric processing, an Intel 486-based laptop runs faster still (see “68040 PowerBooks Speed Test”). Expect third-party upgrade specialists to take on the task of unsoldering the CPU and replacing it with a full 68040 chip. The extra power and heat load of the FPU may limit your CPU options, however. According to Apple, a full 25MHz 68040 with an FPU will meet Apple’s heat-dissipation guidelines for the PowerBook case, but a 33MHz 68040 with an FPU will not. Also, the 040 PowerBooks, have always used a clock-doubling technology similar to the clock doubling in Intel 486DX/2 CPUs. The 25MHz 040 actually operates internally at 50MHz; however, the system bus and motherboard can process data at only half that speed—25MHz. Intel has marketed the clock-doubling features of its DX/2 CPU for the last couple of years. Apple is finally responding and pointing out this inherent capability of 68040 processors.

It’s OK to Point

The most obvious change in the new PowerBooks is the trackpad, a flat rectangular patch that replaces the trackball. You operate the trackpad with your finger. Underneath the pad is a rectangular array of capacitance sensors that track your finger as you move it around. It’s a relative-motion device; that is, if you run into the edge of the pad, you simply pick up your finger and put it back anywhere on the pad, much as you would lift a mouse that you’ve run off the edge of a mouse pad. Users will have different reactions to the trackpad.

You’ll have to give it your full attention for at least five minutes to get a fair sense of how it works.

The trackpad requires the capacitance of your flesh and blood to operate, just like the buttons in many elevators. Your fingernail, a pen, or a stylus will not work; you need to use your finger, fingerprint side down. A large, single “mouse” button sits in front of the pad. You might expect tapping the trackpad to serve as a mouse-click, as it does with most drawing tablets for the Mac. It doesn’t. You must use the button, typically with your thumb while your forefinger strokes the pad. The trackpad is not pressure sensitive, although it can detect the size of your fingerprint; future versions might be able to use this information to detect how hard you are pressing down.

The trackpad has no moving parts and nothing to clean. It detects 387 points per inch, so it responds to very small finger movements by locating the center of your fingerprint (see “How the Trackpad Works”).

You use the new Trackpad control panel to set the trackpad’s characteristics, in the same manner as you use the Mouse control panel, which is still included with the 040 PowerBooks. So if you plug in a mouse, you can adjust the two pointing devices independently. This is an improvement over 100-series PowerBooks, in

Take Control

Apple’s new modular Control Strip control panel provides battery-status information and quick access to common PowerBook functions. It runs on all PowerBooks, although the twin-battery indicators and remaining-battery-life indicator work only on the 500-series models. You can add or remove modules that you need and shrink the entire display to a small tab.

Full-Size Keyboard

The new PowerBooks offer a full-size keyboard for typing. There’s also a row of function keys as well as escape and power-on keys along the top row. Missing are page up and page down keys.

Ethernet for Everyone

In addition to ADB, sound-in and -out, video-out, and SCSI ports, the new PowerBooks all feature a built-in Ethernet port. The new notebooks have only a single serial port, which supports LocalTalk.

Audio In/Out

Serial

ADB

Video

SCSI

Modem
which the Mouse control panel sets both trackball and mouse simultaneously.

Double Your Battery Life
If you've been frustrated by the battery life of the 100-series PowerBooks, you'll be happy to hear that the 500 series uses high-capacity NiMH batteries. The new PowerBooks accept either one or two batteries, using left and right battery compartments (you flip the battery over when switching sides). Apple ships the 540 and 540c with two batteries; the 520 and 520c ship with one battery.

If you use two batteries, the PowerBook drains the left battery first and then automatically switches over to the right battery. Draining power from one battery at a time simplifies battery management; you can be sure that the left battery is drained and ready for recharging when the computer switches to the right battery. However, this technique forfeits 5 to 10 percent of the potential battery life. All batteries can run for more than twice as long if the current drain is cut in half. If two batteries that drain one after the other last four hours, the same two batteries drained simultaneously at half the current will run for about 20 minutes longer.

When you store the battery, a sliding cover hides the battery's contacts, so you don't need to bother with a battery-storage case. Unlike the metal cover that protects the magnetic media in 3.5-inch floppy disks, the slider doesn't work automatically; you have to move it manually before you insert the battery.

Apple calls the new batteries intelligent because they contain a small processor that communicates to the PowerBook the specific type of battery, voltage, temperature, current, and capacity, all of which change as the battery ages. This information makes it possible to estimate more accurately the PowerBook's performance and remaining capacity. With NiCad batteries, there is no way to accurately estimate remaining battery life because the only information available is the voltage. Even the intelligent estimates can't be completely accurate, however, since the way you use the PowerBook can change dramatically from minute to minute. NiMH batteries tend to be expensive to begin with, and the new PowerBook batteries with this additional circuitry will sell for $120 each. The new PowerBook models also include a Control Strip control panel that displays power information (see the screen image "Take Control"). The Duos use the same battery technology, although neither Duo batteries nor AC adapters are compatible with the 500-series PowerBooks.

If you're using two batteries, you can

The Pull-Apart PowerBook
Unlike the 100-series PowerBooks, the new 500-series notebooks are designed to allow users to get inside easily to add RAM, plug in a PowerPC upgrade card, or install a modem card.

Hard Drive and Bracket
Four screws hold the hard drive to a bracket that in turn attaches to the chassis by two more screws (not shown). It's easy to remove the hard drive for repair or replacement.

RAM-Expansion Card
You add RAM by installing a RAM card in a slot on the CPU card.

CPU Card
The 68040 CPU resides on a daughterboard that plugs into the motherboard. To upgrade to a PowerPC processor, you simply replace the CPU card with the new PowerPC CPU card.

Modem Card
A separate slot on the motherboard accommodates a modem card.

PCMCIA Adapter
You can plug a PCMCIA or a PDS adapter into the left-side battery slot to gain access to either type of peripheral.

Full-Function Keyboard
Remove two screws (not shown) from underneath the unit, and the keyboard comes off.

NiMH Batteries
The slots on either side of the new PowerBooks also accommodate two NiMH (nickel-metal-hydride) batteries. The left-side battery compartment also accepts a PCMCIA or PDS adapter.

Trackpad
The 500-series PowerBooks feature a trackpad, rather than the familiar trackball, and a curved palm rest.
change one at any time. If you’re using one battery, the computer holds its RAM for three minutes during sleep while you change the battery. For older PowerBooks, to switch internal batteries without losing the contents of RAM, you need a small external battery source to provide power while you make the switch.

The new 40-watt AC adapter consists of two 20w adapters in a single case (the old adapters were 15w, 17w, and 24w). It can charge one battery while supplying power to the computer. A PowerBook can charge a battery in about two hours. If the PowerBook is shut down or asleep, two spent batteries can be charged in two hours.

### The Versatile Left-Side Slot

The left-side battery compartment is also a multipurpose slot that contains a PDS connector in addition to the battery connector. You can leave the left compartment empty (with a dust cover) to save weight, or install a hardware accessory such as a cellular modem, data-acquisition device, or the like.

You can also plug an adapter (about $200) into the left-side battery slot and make the 500-series PowerBooks the second Apple product to offer PCMCIA capability (the Newton, of course, was the first). The adapter will take two stacked PCMCIA 5mm-thick Type II cards or one 10.5mm-thick Type III card.

Type II PCMCIA cards typically offer flash memory (a kind of RAM that behaves somewhat like a hard drive, storing information without continuous power), network interfaces, and even mainframe interfaces. Type III cards can, for example, hold a small, 1.8-inch hard drive or a radio communication device. Some PCMCIA cards that are common for DOS/Windows notebooks—system memory enhancements and Ethernet cards, for example—aren’t necessary for a PowerBook. A modem card isn’t essential for PowerBook users either, but one could be an attractive option for a company that wants to swap modems among a fleet of PowerBooks.

Will PCMCIA cards produced for DOS/Windows notebooks work in a PowerBook? Maybe. At first, Apple says, expect only a small number of cards to work. Apple hopes to convince many card vendors to supply software drivers and possibly make card changes so a wider range of PCMCIA cards will work with the 500-series PowerBooks.

### Bigger, Better Display

All four 500-series Power Books sport 9.5-inch-diagonal, 640-by-480-pixel screens that display 84 dots per inch. If you’re familiar with the 8.4-inch color screen of the PowerBook 180c, you’ll notice a big difference in the PowerBook’s screen real estate.

The 500’s passive matrix screen shows 16 levels of gray; the 520c displays 256 colors. While Apple has always used dual-scan passive matrix LCDs in its monochrome PowerBooks, the 520c is the first color passive matrix PowerBook to use dual-scan technology. Toshiba and Sharp, among others, have used color dual-scan screens in DOS/Windows notebooks for about a year. A dual-scan screen is actually two displays with independent scanning circuits butted together. Since a dual-scan screen refreshes twice as fast as a traditional passive matrix screen, the result is a sharper image.

If you’ve seen the PowerBook 165c, you’ll notice that the 520c has distinctly better contrast and a wider viewing angle. Although it doesn’t match an active matrix screen, a dual-scan color screen produces good images that you won’t mind working with all day and showing off without apology.

The 540’s active matrix screen supports 64 shades of gray. The 540c offers 256 colors in 640-by-480-pixel mode or up to 32,000 colors in 640-by-400 mode. The capability to offer both 8-bit and 16-bit color was introduced last October with the Duo 270c. In 16-bit mode, the 640-by-400 image is centered in the middle of the screen with a black band above and below. Unlike the 270c, you can switch between the two image sizes on the fly without restarting the 540c. Note, however, that software already running when you switch resolutions will not readjust for the screen’s size change; the effect of going to a smaller, more colorful screen size is that the PowerBook cuts off the bottom 80 rows of pixels, which can eliminate an essential button or leave windows extending beyond the active screen. For most applications (those with resizable windows), restarting the PowerBook cures window-size glitches.

All 500-series PowerBook screens—including the color ones—use a single backlight, which consumes less power than the twin backlights used in 100-series PowerBooks. Apple estimates the

---

### Apple’s 040 PowerBooks at a Glance

<table>
<thead>
<tr>
<th>PowerBook Model</th>
<th>CPU</th>
<th>Configuration (RAM/hard drive)</th>
<th>Maximum RAM</th>
<th>Display Type</th>
<th>Grays and Colors</th>
<th>Screen Resolution</th>
<th>Battery Life (one battery)</th>
</tr>
</thead>
<tbody>
<tr>
<td>520</td>
<td>25MHz 68LC040</td>
<td>4MB/160MB</td>
<td>36MB</td>
<td>9.5-inch passive matrix</td>
<td>16 grays</td>
<td>640 X 480</td>
<td>2.5-4 hours</td>
</tr>
<tr>
<td>520c</td>
<td>25MHz 68LC040</td>
<td>4MB/160MB</td>
<td>36MB</td>
<td>9.5-inch color passive matrix</td>
<td>256 colors</td>
<td>640 X 480</td>
<td>2.5-4 hours</td>
</tr>
<tr>
<td>540</td>
<td>33MHz 68LC040</td>
<td>4MB/240MB</td>
<td>36MB</td>
<td>9.5-inch color active matrix</td>
<td>64 grays</td>
<td>640 X 480</td>
<td>1.5-5 hours</td>
</tr>
<tr>
<td>540c</td>
<td>33MHz 68LC040</td>
<td>4MB/240MB</td>
<td>36MB</td>
<td>9.5-inch color active matrix</td>
<td>64 grays</td>
<td>640 X 480</td>
<td>1.5-5 hours</td>
</tr>
<tr>
<td>Duo 280</td>
<td>33MHz 68LC040</td>
<td>4MB/240MB</td>
<td>40MB</td>
<td>9-inch active matrix</td>
<td>16 grays</td>
<td>640 X 480</td>
<td>2-4 hours</td>
</tr>
<tr>
<td>Duo 280c</td>
<td>33MHz 68LC040</td>
<td>4MB/240MB</td>
<td>40MB</td>
<td>9-inch active matrix</td>
<td>16 grays</td>
<td>640 X 480</td>
<td>2-4 hours</td>
</tr>
<tr>
<td>Duo 280c</td>
<td>33MHz 68LC040</td>
<td>4MB/240MB</td>
<td>40MB</td>
<td>8.4-inch color active matrix</td>
<td>32,000 colors</td>
<td>640 X 480</td>
<td>2-4 hours</td>
</tr>
</tbody>
</table>

NA = not applicable. *Weight includes two batteries. **In 8-bit mode, the PowerBook 540c and Duo 280c display 256 colors in 640 X 480 pixel resolution. In 16-bit mode, the 280c displays...
How the Trackpad Works

In Apple's new 500-series PowerBooks, a small, flat, rectangular trackpad replaces the trackball used in 100-series PowerBooks. The trackpad uses capacitance sensing, just like the touch-sensitive buttons in a modern elevator. Instead of the elevator button's single sensor, the trackpad has a grid of conductive strips. Controlling circuits put out high-frequency signals along the strips and sense changes in the electrical field for each strip. This electrical field emanates through and above the surface of the pad. Placing your finger on the trackpad surface disrupts the electrical field for several of the conductive strips. Sophisticated software and hardware calculate the center of this disturbance. By scanning the strips rapidly, the trackpad's circuitry follows the movement and speed of your finger. The trackpad can detect 387 points per inch, so it can track very small movements. Like a mouse, the trackpad is a relative-motion device; when you raise your finger and put it back anywhere on the pad, the cursor stays put.

Dashes represent the amount of disruption in each strip. Smaller dashes represent greater disruption.

Outline of finger over the grid. X marks the center of the electrical fields’ disruption as calculated by the trackpad.

same minimum battery life for color and gray-scale models. However, the gray-scale PowerBooks have distinctly brighter screens (at maximum brightness) than the color models do. Set to the same screen brightness as the color PowerBooks, the gray-scale models should run about 15 percent longer.

The new PowerBooks support the same external monitors as before, up to 16 inches in 256-color mode. VGA and SVGA monitors are still driven at a flicker 60Hz and 561-Iz, respectively.

Mega RAM

The 500-series PowerBooks accept up to 36MB of RAM, a big step up from the 8MB or 14MB limit of the 100-series PowerBooks. All models have 4MB of RAM soldered onto the CPU daughterboard. Additional RAM goes in a plug-in RAM card. Apple will offer an 8MB card (about $400); third-party memory-card vendors will supply cards in many capacities.

The memory consists of the low-power dynamic RAM used by Duos, although Duo memory cards are not compatible. Apple expects the RAM cards will be compatible with the PowerPC upgrade, but cannot confirm this until the upgrade is built.

The RAM stays alive only during power-on and sleep, so you have to create and save your RAM disk during start-up and shutdown. Apple includes persistent RAM disk software, but you cannot perform a cold start from a RAM disk; you have to start up from the hard disk, load the RAM disk (automatically), and restart.

The Sound of CD Music

The 500-series PowerBooks' sound input and output are true stereo 16-bit sound that provides CD-quality 44.1kHz sampling range, a tremendous improvement over the monaural 8-bit sound with 22kHz sampling in the earlier PowerBooks. The sound-input and output jacks are standard stereo minijacks; the sound-input jack takes line-level signals directly from a stereo system, rather than microphone-level signals as in earlier PowerBooks. The built-in microphone is, however, monaural. Stereo speakers, suitable for a modest presentation, sit in the corners of the screen lid on all 500-series models. They don't produce hi-fi sound, but they are good enough to delight or irritate an airplane seatmate. Through a stereo system, the sound quality is excellent when recorded and played back at highest quality (10MB per minute).

The Keyboard of a Desktop Mac

The 520, 520c, 540, and 540c are the first PowerBooks to offer full-size Macintosh keyboards—at least in the main typing area—with the same key spacing as on a desktop keyboard. This is possible because the new 500-series cases are slightly wider than previous PowerBook cases. (The 100-series PowerBook keyboard is 97 percent of full size; the Duo's is 88 percent.) An extra row of small keys runs along the top—an escape key, function keys F1 through F12, and a power-on key. The power-on key works like a desktop Mac's, so you no longer need to reach around to the back to power up your PowerBook. Remote-control devices can turn on the new PowerBooks from an ADB port (to turn on the computer with a phone call, for example). Moving the escape key to its normal position at top left leaves space for larger control, option, and control keys to the left of the spacebar.

Apple has also added an LED indicator to the caps lock key. Note that function keys F13 through F15 and the home, end, page up, page down, help, and delete keys are missing. The arrow keys remain in an awkward row instead of in an inverted T as on the Apple Extended Keyboard. That's a pity because Apple had the space to position the arrow keys correctly.

Ports and Modems

The new 500-series PowerBooks all include an Ethernet port with a standard Apple Attachment Unit Interface (AAUI). And they have a single serial (printer) port that supports LocalTalk; however, they have no external modem serial-port connector. Their other ports are the standard single ADB, SCSI, and video-out. A Kensington MicroSaver slot mates to a security cable.

### Battery Life

<table>
<thead>
<tr>
<th>Battery Life (two batteries)</th>
<th>Weight (standard configuration)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-7 hours</td>
<td>6.3 pounds</td>
<td>$2000-$2200</td>
</tr>
<tr>
<td>4-6 hours</td>
<td>6.4 pounds</td>
<td>$2600-$2900</td>
</tr>
<tr>
<td>3-6 hours</td>
<td>7.1 pounds*</td>
<td>$3000-$3300</td>
</tr>
<tr>
<td>3-6 hours</td>
<td>7.1 pounds*</td>
<td>$3600-$3900</td>
</tr>
<tr>
<td>3-6 hours</td>
<td>7.3 pounds*</td>
<td>$4000-$4500</td>
</tr>
<tr>
<td>3-6 hours</td>
<td>7.3 pounds*</td>
<td>$4200-$5200</td>
</tr>
<tr>
<td>NA</td>
<td>4.2 pounds</td>
<td>$2500-$2650</td>
</tr>
<tr>
<td>NA</td>
<td>4.2 pounds</td>
<td>$3000-$3150</td>
</tr>
<tr>
<td>NA</td>
<td>4.8 pounds</td>
<td>$3300-$3600</td>
</tr>
<tr>
<td>NA</td>
<td>4.8 pounds</td>
<td>$3800-$4100</td>
</tr>
</tbody>
</table>

thousands of colors in 640 x 400 pixel resolution.
Apple will offer in the United States and Canada 500-series PowerBook bundles that include a Global Village Communication modem with Global Village software. The modem will also be available separately for $399 from Global Village. This modem operates at 19.2 kilobits per second. The 19.2-Kbps terbo speed is fast today, but it will be surpassed later this year by V.34 (V.Fast) modems running at 28.8 Kbps. The terbo modems can connect to 14.4-Kbps and slower modems. In European and Pacific Rim countries, Apple will sell its own Express Modem II, which runs at 14.4 Kbps for both data and fax, with Apple software. The Express Modem has a programmable data-access arrangement (DAA) that self-configures for the System language; for example, starting up in French configures the modem for the French phone system.

New, small DAA adapters can change the country choice, and a North American DAA is available for the first time.

**Bundled Software**

With all 68040-based PowerBooks (including the new Duo 280 and 280c), Apple is bundling the following software:

- Apple Remote Access client (the server version costs $275). The client software also works with AppleTalk Remote Access server version 1.0.
- PC Exchange to read and write DOS/Windows floppy disks.
- MacLinkPlus/Easy Open Translators, from Dataviz, converts between many common file formats in the DOS/Windows world.
- PowerBook File Assistant, which includes file synchronization and a persistent RAM disk.
- Control Strip, a new control panel with power-management features (see "Take Control").
- Calendar, a basic calendar with several ways to view and track appointments.
- HyperCard 2.2 player.
- A coupon for eWorld software, Apple’s online information service, which is scheduled to debut in June.
- PowerTalk (for systems sold with 12MB of RAM in the United States), an electronic-mail management extension developed originally for System 7 Pro.

You cannot upgrade a 100-series PowerBook to one of the 500-series PowerBooks. If you buy a $20, $20c, or $40 and then decide you really wanted active matrix color after all, you can upgrade...
It seems like only yesterday that Apple introduced the PowerBook Duos 250 and 270c. Actually, it was way back in October 1993. Those Duos are gone now, discontinued and replaced by the 280 and 280c. You'll notice that the new Duos are outwardly identical to the 250 and 270c (see "New PowerBook Duos," Macworld, December 1993). However, on the inside, the new Duos have a 68LC040 CPU, the same one used in the new all-in-one 500-series PowerBooks.

As with the 500-series PowerBooks, the Duos' 33MHz 040 CPU lacks an FPU. The 280 and 280c come with 4MB of RAM soldered on the motherboard. A plug-in RAM card can hold up to 36MB, for a total of 40MB.

In Macworld Lab tests, the new Duos outperformed equivalent 500-series PowerBooks, most likely because of the Duos' faster video circuitry. While the 280 and 280c may be a little faster than their all-in-one counterparts, the Duos still offer only monaural 8-bit sound as opposed to the snazzy 16-bit stereo sound of the 500-series PowerBooks.

The 4.2-pound Duo 280 has a 9-inch active matrix gray-scale screen with 640 by 400 pixels. The 4.8-pound 280c has an 8.4-inch active matrix color screen with 256 colors in 640 by 480-pixel mode, and up to 32,000 colors in 640 by 400 mode. Like the 540c (but unlike the Duo 270c), the 280c can switch between the two color modes without restarting. However, such on-the-fly resolution switching occasionally causes software glitches, so you may want to restart your Duo after you change resolutions anyway.

All current docking stations and other Duo accessories work with the new Duo models. To transform the mobile Duo into a full-featured desktop Macintosh, Apple has introduced a new version of its desktop docking station. The new PowerBook Duo Dock II includes an Ethernet interface (AAUI connector) and supports 21-inch monitors with 256 colors and 16-inch monitors with thousands of colors. Final pricing was not determined at press time, but Apple says the Duo Dock II will cost between $700 and $900. With 1MB of VRAM, the original Duo Dock, which continues in the Duo product line, also supports thousands of colors on 16-inch monitors.

The Duo Dock II includes two features used only on 030-based Duos: a 32K RAM cache for the CPU, and an FPU. Neither cache nor FPU in any dock works with an 040 Duo. The old Duo Dock can be upgraded to the Duo Dock II for about $400. Apple will offer an upgrade to convert any Duo into a 280c by changing both the motherboard and the screen. Apple also plans to offer a PowerPC upgrade for the 280 and 280c.

Faster Duos The new PowerBook Duo 280 and 280c look the same as the Duo 250 and 270c, which they replace. However, a 68040 CPU makes the new Duos considerably faster than previous models.

Apple ships a new Type III NiMH battery with the 280c. The new battery will work with any Duo and will be available as a replacement battery along with supporting software (about $85). The Type III battery has 15 percent more capacity than a Type II battery; the Type II battery offers 50 percent more capacity than a Type I battery. All three batteries will work in any Duo, but Apple continues to ship the Duo 230 with a Type I battery, and the Duo 280 with a Type II battery; only the Duo 280c ships with a Type III. If you want to buy a replacement battery, Apple offers only the Type III.

Finally, new software gives Apple's Duo Express Modem 14.4-Kbps fax capability, up from the old 9.6-Kbps speed. If you already have a Duo Express Modem, all you need for faster faxing is a software update (which Apple plans to offer for free on online services) and a receiving fax machine or modem able to connect at 14.4 Kbps. The maximum data-transmission rate remains at 14.4 Kbps.

to a 540c (for about $2000); however, 520/520c units remain 25MHz computers even after the upgrade.

Which PowerBook?
If you're shopping for a PowerBook, which one should you buy? For sheer portability, the new 040 Duos run a little faster and are a lot lighter than the 500-series PowerBooks. But if you want to carry a completely self-contained Macintosh with all the standard ports, a 500-series PowerBook beats a Duo.

Based on Apple's preliminary pricing, the 540/540c costs $1000 to $1500 more than the 520/520c. The extra cost buys a faster processor, a larger hard drive, an active matrix screen, and a second battery. If the price gap closes to about $600, the 540s will be a much better buy; until then, it's a difficult choice. When choosing a PowerBook, consider carefully whether you need color. Not only do color models cost a lot more and consume more power than gray-scale models, but also a color display is hard to see outdoors on a sunny day.

The 500-series PowerBooks are superior to the 100 series in every way except price. If you are on a tight budget (or simply prefer the 100-series design), the 145B and 165 or a used PowerBook are your only options.

A more difficult question: If you already have an all-in-one PowerBook, should you switch to a new model? If you have a PowerBook 100, 140, 145, or 170 and need more capabilities, this is a good time to change over. If you own one of the more recent PowerBooks, you probably won't find an urgent need to switch, unless you have run into serious limits in processor speed or battery life. The PowerBook design is so strong that the 100-series notebooks will remain in use for years after competing notebook computers have been stored in closets. But if you are intrigued by the new trackpad and you want longer battery life, faster processing, more RAM capacity, thousands of colors, PCMCIA capabilities, and the option of upgrading to a PowerPC CPU, you won't be disappointed in the new-look 500-series PowerBooks.

Contributing editor CARY LU writes Macworld's PowerBook Notes column.
If you really want to do the cool stuff, climb aboard our newest version of the leading multimedia authoring software for the Macintosh®. Because even if you've never worked in multimedia, Director® 4.0 can help you develop the most persuasive presentations, most inspired CD-ROM titles, most entertaining kiosks, most enlightening demos, most realistic visualizations, and most anything else you have in mind.

DEVELOPERS... START YOUR ENGINES.

If you've used a previous version of Director®, you'll feel the extraordinary performance of version 4.0 as soon as you start it up. If you're a first-time user, our new and improved interface will enable you to cruise through the program like a pro.

For starters, we've made it easier to organize text, graphics, music, digital video, and sound effects in the Cast, our visual database that now stores up to 32,000 media elements per movie for virtually unlimited flexibility. And you can just as easily synchronize all those Cast members in the Score, which we've upgraded to include 48 separate channels, color layout, and drag & drop editing.

To make sure you can use all this new functionality, we've even
eliminated the 16MB file size limit. Now, Director files are limited only by the amount of disk space in your system.

PUT YOUR PRODUCTIONS INTO HIGH GEAR.

Not only is our newest version of Director more friendly, it's also a whole lot more powerful.

All that power starts with our Lingo™ command language, which you can use to write scripts that add interactivity, create presentation frameworks, control external devices, and build logic into your productions. And since all Lingo scripts are compiled in Director 4.0, they'll run up to eight times faster!

Speaking of speed, we've actually made it possible for you to determine when individual cast members go in and out of RAM. This unique memory management feature, which we call Purge Priority, optimizes movie playback to dramatically reduce hard disk and CD-ROM access times.

What's more, our new object-oriented Lingo commands provide reusable code and simplified scripting, enabling you to add even the most complex interactivity without all that tedious programming. You can also play and manipulate Director movies within other movies using regular Lingo commands.

MOTOR FROM MAC TO WINDOWS.

Once you complete any production, Director 4.0 ensures a seamless transition to Windows™, using our new 100% binary-compatible file format with the soon-to-be-released Director for Windows. In other words, Macromedia continues to provide the industry's one-and-only set of cross-platform solutions; from Mac to Windows—plus 3DO and other popular consumer platforms—Director productions will play on your platform of choice.

We've also added high-level security features so that the code you create can't be pirated by anyone else. And that's good to know, since any production developed in Director 4.0 can be distributed royalty free to millions of users worldwide.

LEAN INTO THE (LEARNING) CURVE.

All these impressive features won't do you much good if you can't use them to their potential. That's why we've included new step-by-step tutorials, online help, and sample movies to guide you through the program.

With all that, it won't be long before you discover why the 200 professional developers who tested Director 4.0 found it to be the most exceptional authoring tool they had ever used.

If you're ready to see why, call 1-800-947-7049 for the name of the Macromedia Authorized Reseller nearest you (current Director users should call 1-800-457-1774 for the Version 4.0 Upgrade Kit).

Because you're only as cool as your next production.

MACROMEDIA

MACROMEDIA

Tools to power your ideas.
Top dye-sublimation printers, from top to bottom: The Tektronix Phaser 480, the 3M Rainbow, the Tektronix Phaser II SDX, and the SuperMac ProofPositive Full-Page.
When you want images that look as good on paper as they do on the screen, you want a dye-sublimation printer. Dye-sub color printers are those upper-class scribes whose output looks like a photograph—glossy and vivid, with none of the distracting dot patterns that most other color-printing technologies use to simulate continuous-tone images.

Most people who print color presentation materials rely on less-expensive thermal-wax or ink-jet printers. But some applications, including professional publishing, digital photography, and scientific and medical imaging, demand dye-sublimation's photo-realism.

For this roundup, Macworld Lab tested ten printers. Overall, the latest machines produce better output and operate much faster than the eight models I examined last year (see "Dye-Sublimation," Macworld, May 1993). They're also less expensive, although prices haven't fallen as dramatically as they did in 1992.

The past year has also brought the first personal dye-sub printer. Fargo Electronics' Primera Color Printer, also sold by NuDesign, sells for less than $1450. The machine has some serious limitations, but that low price tag goes a long way toward offsetting them.

The Primera can also operate as a thermal-wax machine, as can a new high-end printer from Seiko Instruments, the Professional ColorPoint 2 PSF Model 14. This may be a new trend: versatile hybrids that let you choose between dye-sub photo-realism and the lower operating costs of thermal wax.

Of Pigments and Paper
Both thermal-wax and dye-sub printers use heat to transfer pigment from a plastic ribbon to the paper. The ink ribbon contains successive panels of pigment in cyan (C), magenta (M), yellow (Y), and, optionally, black (K). (Many printers accept either three- or four-color ribbons. A three-color ribbon produces blacks that are a composite of CMY. Three-color printing is faster and more economical, but four-color printing produces richer, often sharper blacks.)

A dye-sub printer's print head contains thousands of heating elements, each of which produces different temperatures, allowing the printer to apply varying amounts of pigment. After the printer has applied one color's dots, the print engine draws back the paper for the next pass. Maintaining accurate registration for each pass requires precise paper feeding—one reason these machines are costly.

Thermal-wax printers use opaque wax that, when melted, sits on top of conventional (although extremely smooth) paper. Dye-sub machines use transparent dyes that the print head converts from a solid to a gas in a process called sublimation. The gaseous pigment is absorbed by paper coated with a polyester resin. As it soaks into the polyester, each puff of dye bleeds slightly, causing the dots to merge. These fuzzy-edged dots contribute to a dye-sub printer's continuous-tone talents.

All dye-sub papers are similar, but some printers use a heavier stock that looks and feels like photographic paper.
How accurately can dye-sublimation printers reproduce a photo? These images show the broad range of quality variations as compared against the original image (top left). The SuperMac's output (top right) shows extraordinarily sharp details, as seen in the folds in the runner's shorts and the crumpled quality of his shirt. The Kodak ColorEase PS (middle left) shows good color fidelity, in contrast to the yellow cast that throws off colors produced by the Tektronix Phaser IISDX (middle right). Despite its 163-dpi resolution, the Sony (bottom left) does well with this image, though it sometimes suffers from jaggies in fine diagonal lines. The Fargo Primera (bottom right), which uses dither patterns rather than blending colors, suffers from banding and posterizing—both symptoms of uneven transitions between colors.
Of the printers tested, machines that use this high-opacity stock include Kodak's ColorEase PS, Tektronix's Phaser 480, SuperMac's ProofPositive family, 3M's Rainbow, and Sony's UP-D7000.

Year by year, laser printers continue to increase resolution—from 300 dpi to 600 dpi and more. No such evolution is occurring in dye-sublimation, due to the soft-edged fuzziness of dye-sub dots. It can be difficult to differentiate between an image printed by a 163-dpi printer and one produced by a 300-dpi machine, although lower-resolution output can exhibit more banding (jarring color shifts) in areas of subtle color transitions. If you print a great deal of text or line art—which benefit from higher resolution—steer away from machines such as Sony's UP-D7000 and toward the 300-dpi pack (see “Features for Photo-realism”).

Quality Comparisons

To judge output quality, we assembled a panel of eight staffers from Macworld's editorial and art departments. Each judge compared unlabeled printouts against photographic prints of the original images, looking at highlights, shadows, color accuracy, and text.

The overall winner: SuperMac's ProofPositive Full-Page. Finishing second—first among tabloid-size printers—was Tektronix's new Phaser 480. Other top finishers included the 3M Rainbow (another tabloid machine) and the SuperMac ProofPositive Two-Page.

That the winner's circle is occupied by SuperMac, Tektronix, and 3M shouldn't come as a shock: all three companies know their color science. More to the point, all three firms' printers provide a larger variety of color-matching and color-management features than do their competitors. SuperMac's printers include Electronics for Imaging's EfiColor processor. The 3M Rainbow also supports EfiColor and provides several 3M-proprietary color systems, including one designed to simulate the characteristics of 3M's photographic Matchprints. The Tektronix machines include Tektronix's TekColor matching schemes, which simulate a variety of printing processes. Tektronix's printers also support the EfiColor, Apple ColorSync, and Kodak ColorSense color-management systems.

A dye-sub printer's blurry dots are ideal for continuous-tone images but give text—especially small sizes—a fuzzy, out-of-focus appearance. Photofine technology from Tektronix handles this problem by adjusting the placement of dots in text and line art to compensate for spreading. It works the Tektronix Phaser 480 and its smaller sibling, the Phaser IJS3X, earned high marks for text output. (Don't confuse this feature with text anti-aliasing, which involves adding faint pixels to the edges of characters to smooth their jagged edges.) GCC Technologies' ColorTone, which finished eighth in overall output quality, also impressed the judges in the text competition. The printers that did the worst job with text were the two low-resolution machines: Sony's UP-D7000 and Fargo's Primera.

PostScript Variations

Of the ten printers tested, only the Sony and Fargo units do not speak PostScript. They rely on the Mac's QuickDraw graphics language, making their output quality generally unsuitable for printing publishing layouts or illustrations created with programs such as Adobe Illustrator. (Both units work well with Adobe Photoshop and other bitmap-oriented programs, however.)

Within the PostScript clan are several variants, all of which deal with the PostScript interpreter, which deciphers the PostScript-language commands generated by the Mac. Some machines use true Adobe PostScript interpreters, while others use so-called clone interpreters, such as Phoenix Technology's PhoenixPage. Macworld Lab encountered only one...
compatibility problem—with RasterOps’ CorrectPrint 300i clone. The company supplied a ROM update that fixed the problem. Just before Macworld went to press, Tektronix acquired RasterOps’ printing business, however, and promptly removed the CorrectPrint 300i from the market. Tektronix will fully support the RasterOps customer base, and now offers a $2995 upgrade from the CorrectPrint 300i to the Phaser IISDX.

Clones are better than ever, but problems could still surface. A few years ago, many clones choked when Adobe released its Multiple Master font technology.

### Speed Factors
Next to the relative beauty of their output, the next most critical performance factor for these units is speed. For most of our tests, the Sony UP-D7000 page printer and Tektronix Phaser 480 tabloid printer were fastest in their respective categories by a healthy margin (see “How Fast for Great Color?”). They achieved these commendable results via contrasting approaches. The Sony printer combines a low-resolution (163-dpi) engine with a fast SCSI interface and a simple QuickDraw-based driver, while the Tektronix unit relies on a sophisticated controller containing a fast RISC processor and built-in image-processing hardware.

### Features for Photo-realism

<table>
<thead>
<tr>
<th>Company</th>
<th>Phone</th>
<th>Toll-free Phone</th>
<th>Product</th>
<th>Tested by Macworld Lab</th>
<th>List Price</th>
<th>Standard Ports/Option Ports/All Active</th>
<th>RAM (base model/maximum)</th>
<th>Resolution (In dpi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3M</td>
<td>612/733-1110</td>
<td>800/338-1684, ext. 350</td>
<td>Rainbow</td>
<td>•</td>
<td>$20,000**</td>
<td>SCSI/****/NA</td>
<td>8MB/***</td>
<td>300</td>
</tr>
<tr>
<td>GCC Technologies</td>
<td>617/275-5800</td>
<td>800/422-7777</td>
<td>ColorTone</td>
<td>•</td>
<td>$7,999</td>
<td>E, L, P, S/T</td>
<td>16MB/64MB</td>
<td>300</td>
</tr>
<tr>
<td>Codonics</td>
<td>216/243-1198</td>
<td>800/444-1198</td>
<td>NP-1600 Photographic Network Printer</td>
<td>•</td>
<td>$10,495</td>
<td>E, P, R/none</td>
<td>16MB/96MB</td>
<td>300</td>
</tr>
<tr>
<td>Fargo Electronics</td>
<td>612/941-9470</td>
<td>800/327-4622</td>
<td>Primera Color Printer</td>
<td>•</td>
<td>$14,455</td>
<td>P, S,名额/32K16MB</td>
<td>16MB/16MB</td>
<td>300</td>
</tr>
<tr>
<td>Kodak</td>
<td>716/253-0740</td>
<td>800/344-0006</td>
<td>ColorEase FS</td>
<td>•</td>
<td>$7,999</td>
<td>L, P, E/T</td>
<td>16MB/16MB</td>
<td>300</td>
</tr>
<tr>
<td>NuDesign</td>
<td>612/832-5622</td>
<td>800/762-3531</td>
<td>NuDesign Color Printer</td>
<td>•</td>
<td>$12,959</td>
<td>P, S,名额/32K</td>
<td>32K/32K</td>
<td>203</td>
</tr>
<tr>
<td>Seiko Instruments</td>
<td>408/922-5800</td>
<td>800/873-4561</td>
<td>Professional ColorPoint</td>
<td>•</td>
<td>$16,495</td>
<td>L, P, E/T</td>
<td>24MB/136MB</td>
<td>300</td>
</tr>
<tr>
<td>Sony</td>
<td>201/930-7796</td>
<td>800/327-4622</td>
<td>2 PSF Model 14</td>
<td>•</td>
<td>$8,995</td>
<td>SCSI/none/NA</td>
<td>7MB/7MB</td>
<td>163</td>
</tr>
<tr>
<td>SuperMac Technology</td>
<td>408/541-6100</td>
<td>800/762-3531</td>
<td>ProofPositive Full-Page</td>
<td>•</td>
<td>$7,999***</td>
<td>SCSI/****/NA</td>
<td>***</td>
<td>300</td>
</tr>
<tr>
<td>Tektronix</td>
<td>800/547-8949</td>
<td>800/547-8949</td>
<td>Phaser IISDX</td>
<td>•</td>
<td>$9,995</td>
<td>L, P, S, E/T</td>
<td>32MB/64MB</td>
<td>300</td>
</tr>
</tbody>
</table>

Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company’s support products. Macworld Lab tests. • = yes; O = no; NA = not applicable. E = Ethernet, L = LocalTalk, P = parallel, S = serial, SCSI = small computer system interface, T = TCP/IP. * Vendors’ estimated costs. ** The XLT 7720 unit, with 11” x 11”*, L, and A4 paper options, sells for $11,995. **** ProofPositive models without PostScript are also available for $6995 (Full-Page) and $12,999 (Two-Page).
Businesses that use more than one color printer sometimes want to obtain a high degree of color fidelity across printers. EFIWorks offers a method of making different printers create similar-looking output. The uncorrected images (far left and immediate left) show substantial color differences, particularly evident in the bold reds, greens, and blues of the runners' uniforms, and in the cinder track. In contrast, the images corrected with EFIWorks (the two central images) look much more similar to each other.

On the downside, setting aside a Mac to run the CPSI server application adds a few thousand dollars to the printer's effective cost. (SuperMac recommends at least a Quadra 650 with 64MB of memory for best performance.) You can run other programs on the CPSI server, but it may slow unacceptably while processing print jobs. What's more, a Mac's 68040 processor is slower than the RISC processors found in the other PostScript machines tested; the ProofPositive models finished near the bottom in most of Macworld Lab's tests. 3M's Rainbow was generally faster, but still didn't sizzle.

Network Speed Factors
The type of network interface a printer uses also plays a large role in speed, particularly in the color world, where huge image files can cause digital gridlock on LocalTalk networks.

If you primarily plan to print large scanned images, don't even think about attaching a dye-sub printer to a LocalTalk network—not unless you have the patience of Job. You'll need the faster data-transfer rates that Ethernet provides.

To gauge the differences, Macworld Lab tested a Tektronix Phaser IISDX on both a LocalTalk and an EtherTalk network. Performance didn't vary significantly for an Aldus Freel-land document.

<table>
<thead>
<tr>
<th>Imaging Language</th>
<th>Processor/Clock Rate</th>
<th>SCSI Port for Font Storage</th>
<th>Number of Fonts</th>
<th>Text Antialiasing</th>
<th>Photoshop Export Module</th>
<th>Paper Sizes</th>
<th>Technical Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>PostScript Level 2 (CPSI)</td>
<td>*</td>
<td>*</td>
<td>35</td>
<td>*</td>
<td>*</td>
<td>A, SA, SB</td>
<td>acceptable</td>
</tr>
<tr>
<td>Phoenix Page Level 2</td>
<td>AM29050/25MHz</td>
<td>yes (includes drive)</td>
<td>35</td>
<td>*</td>
<td>*</td>
<td>A, A4, Igl, SA4</td>
<td>acceptable</td>
</tr>
<tr>
<td>Jaws Level 2</td>
<td>Sparc/50MHz</td>
<td>*</td>
<td>35</td>
<td>*</td>
<td>*</td>
<td>A, A4, SA, SA4</td>
<td>not rated</td>
</tr>
<tr>
<td>QuickDraw</td>
<td>*</td>
<td>*</td>
<td>0</td>
<td>*</td>
<td>*</td>
<td>A, A4, long A4</td>
<td>excellent</td>
</tr>
<tr>
<td>PostScript Level 2</td>
<td>Sparc/40MHz</td>
<td>(includes drive)</td>
<td>35</td>
<td>*</td>
<td>*</td>
<td>A, A4</td>
<td>acceptable</td>
</tr>
<tr>
<td>Power Page Level 2</td>
<td>AM29050/25MHz</td>
<td>*</td>
<td>35</td>
<td>*</td>
<td>*</td>
<td>A, A3, A4, B, SA, SB</td>
<td>unacceptable</td>
</tr>
<tr>
<td>QuickDraw</td>
<td>*</td>
<td>*</td>
<td>0</td>
<td>*</td>
<td>*</td>
<td>A, A4, long A4</td>
<td>not rated</td>
</tr>
<tr>
<td>PostScript Level 2</td>
<td>IB0960CA/33MHz</td>
<td>(includes drive)</td>
<td>104</td>
<td>*</td>
<td>*</td>
<td>A3, A3 long, B, B long</td>
<td>not rated</td>
</tr>
<tr>
<td>QuickDraw</td>
<td>*</td>
<td>*</td>
<td>0</td>
<td>*</td>
<td>*</td>
<td>optional ($150)</td>
<td>A, A4</td>
</tr>
<tr>
<td>PostScript Level 2 (CPSI)</td>
<td>*</td>
<td>*</td>
<td>17</td>
<td>*</td>
<td>A, A4, SA, SA4</td>
<td>excellent</td>
<td></td>
</tr>
<tr>
<td>PostScript Level 2 (CPSI)</td>
<td>*</td>
<td>*</td>
<td>17</td>
<td>*</td>
<td>A, A3, A4, B, SA, SA3, SA4, SB</td>
<td>excellent</td>
<td></td>
</tr>
<tr>
<td>PostScript Level 2</td>
<td>AM29000/24MHz</td>
<td>*</td>
<td>39</td>
<td>*</td>
<td>*</td>
<td>A, A4, Igl</td>
<td>excellent</td>
</tr>
<tr>
<td>PostScript Level 2</td>
<td>AM29000/24MHz</td>
<td>*</td>
<td>39</td>
<td>*</td>
<td>*</td>
<td>A, A4, B, Igl, SB</td>
<td>excellent</td>
</tr>
</tbody>
</table>

Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose street price: no list price available. ** These printers rely on the host Mac to process print jobs and store fonts. Any network interface available on the host Mac is available to the printer.
PHOTO-REALISTIC COLOR PRINTERS

object-oriented illustration programs don’t ship megabytes of data across a network. Where we did see the EtherTalk advantage was with a 7MB Adobe Photoshop image: a file that took 4.5 minutes to print via EtherTalk took more than 9 minutes to print over LocalTalk.

Only two of the PostScript printers tested include a built-in EtherTalk interface: GCC’s ColorTone and Tektronix’s Phaser IISDX. EtherTalk is an extra-cost option for the Kodak ColorEase PS ($495) and the Tektronix Phaser 480 ($695). The 3M Rainbow and SuperMac ProofPositive models connect to the host Mac via SCSI; to get the best performance when using these printers on a network, you should run CPSI on an EtherTalk-equipped Mac. EtherTalk is also a $700 option for the Seiko Instruments Professional ColorPoint 2 PSF Model 14.

Connecting a hard drive to a PostScript printer is another way to improve performance and decrease network traffic. The hard drive can store fonts that would otherwise have to be downloaded over the network. GCC’s ColorTone and Kodak’s ColorEase PS each contain a hard drive, as will Seiko’s Professional ColorPoint 2 PSF Model 14. The remaining embedded-PostScript machines have a SCSI port for an external drive.

With the 3M Rainbow and SuperMac ProofPositive models, all fonts are stored on the CPSI Mac’s hard drive. Version 2.0 of SuperMac’s ProofPositive family, which should be available by the time you read this, will also accept a dedicated hard drive that will hold the bitmap of the most recently printed job. This feature will enable you to reprint a document without having CPSI reprocess it—an important time-saver.

If you anticipate a lot of printing within Adobe Photoshop, look for a printer that includes a Photoshop export module, which bypasses the Mac’s PostScript driver and sends the image’s RGB or CMYK data directly to the printer. In our tests the Tektronix Phaser 480 needed only about three-fourths as much time to print using the module as it needed using the driver. Note, though, that quality may suffer if you print images whose resolution is greater than 300 dpi. Among all the export modules we tested, only the 3M Rainbow’s was able to scale down a 400-dpi image to 300 dpi without introducing distortion. Export modules come with all the machines tested except Fargo’s Primera and Sony’s UP-D7000 (Sony sells an optional export module for $85).

Combination Plotters

Thanks to that polyester-coated paper, dye-sub output is the costliest in the color world. Letter-size output costs roughly $2 to $5 per page, while tabloid-size pages cost about $7. Thermal-wax output costs less than a dollar for a letter-size page, and about a buck for a tabloid-size one.

This is one reason the dual-media approach of the Fargo Primera and the Seiko Professional ColorPoint 2 PSF Model 14 is appealing: you can choose the imaging technique appropriate to the document’s quality requirements (see “Wax and Dye Printing From One Printer”). In the graphics world, it’s routine to print numerous tests while refining a lay-

MW LAB

How Fast for Great Color?

PHOTOSHOP-RGB

Using Plug-in
Print speed for a 7MB, 200-dpi, RGB Photoshop file using plug-in modules supplied with the printers.

Using Driver
Print speed for a 7MB, 200-dpi, RGB Photoshop file using the printer’s driver.

PHOTOSHOP-CMYK

Using Plug-in
Print speed for a 9.35MB, 200-dpi, CMYK Photoshop file using plug-in modules supplied with the printers.

Using Driver
Print speed for a 9.35MB, 200-dpi, CMYK Photoshop file using the printer’s driver.

Page Layout
Print speed for a two-page QuarkXPress 3.2 document (one page for tabloid printers) with three fonts and a 10MB graphic.

Macworld Lab gauged printer speed with a variety of documents and techniques, each designed to test performance from a different perspective.

The Photoshop tests measured the printer’s ability to handle large bitmapped images as well as network interface performance. We ran both RGB and CMYK tests using the Mac’s PostScript printer driver and using the Photoshop Export modules that accompany most of the tested printers. The page-layout test used a two-page QuarkXPress document containing three downloadable fonts with different sizes on one page, and a 10MB graphic on the second page. This test gave the printers a good overall workout and demonstrated how well each machine handles typical publishing jobs.

The Aldus FreeHand document tested the performance of a PostScript printer’s controller. The MacDraw Pro document also tested controller processing performance.

To judge output quality, eight staffers from Macworld’s editorial and art departments compared four different unidentified printouts against photographic prints of the original images, looking at highlights, shadows, color accuracy, and text.—Macworld Lab testing supervised by Mark Harlow
out’s design and typography. Printing these using the thermal-wax ribbon and paper can cut costs dramatically.

In Seiko’s Professional ColorPoint 2 PSF Model 14, a sensor determines whether you’ve installed a thermal-wax or dye-sub ribbon and media and adjusts the print-head temperature and paper-transport speed accordingly. The printer, expected to sell for $16,495, can print tabloid-size pages with bleeds, and it packs an impressive list of features, including a built-in hard drive containing a whopping 104 Adobe fonts. The Model 14 didn’t ship in time to be formally tested for this article.

Seiko offers an array of unique thermal-wax media options, including iron-on fabric transfers and static-elastic plastic for window signs. This means designers can do small runs of promotional doo-dads on the same printer they use to produce proofs.

**Picking a Printer**

What are the top choices this time around? For prepress proofing of tabloid-size jobs, the 3M Rainbow and Tektronix Phaser 480 share first place. Both offer outstanding output and a wide range of color-matching and color-proofing options. The Rainbow is the more complete proofing device; unlike the Phaser 480, it lets you proof traps and overprints. (SuperMac says this capability will also be available in version 2.0 of the Proof-Positive line, which should ship by the time you read this.)

The Rainbow costs several thousand dollars more than the Phaser 480, however, and you’ll also need to add to the Mac to running the Rainbow’s PostScript interpreter. Besides costing less and being far faster, the Phaser 480 prints text significantly better than does the Rainbow.

If you buy the base-model (32MB) Phaser 480, you’ll need to add at least 16MB to the printer to use a four-color ink ribbon. (Tektronix omitted the extra RAM in order to cut the printer’s cost for the scientific- and medical-imaging markets, which don’t require CMYK printing.) Tektronix’s price for the 16MB upgrade is $1595, but the printer uses standard SIMMs, so you might be able to do better. A 32MB upgrade retails for $3190 and provides an overall performance improvement of roughly 20 percent, according to Tektronix. The Phaser 480 tested by Macworld Lab included this 32MB upgrade as well as the optional ($695) EtherTalk interface, bringing the price of the test unit to $18,880.

For letter-size proofing applications, SuperMac’s ProofPositive Full-Page takes first place. But keep in mind that for the most critical publishing jobs, there’s still no substitute for a photographic proof. Because a proof is made from the same color-separation films that are later used to burn the printing plates, it can show flaws those films might have, such as moiré patterns caused by halftoning.

As for the rest, for the second straight year the $8995 Kodak ColorEase PS also performed well, although its text lacked the sharpness of Kodak’s output is superior to Sony’s). Technically, the Primera doesn’t even produce continuous-tone images; it actually uses a minute but still-discriminable dither pattern.

Still, the Primera’s output is impressive and more photo-realistic than that of any mainstream thermal-wax or ink-jet machines. The Primera and its repackaged twin, NuDesign’s NuDesign Color Printer, are solid, if slow, choices for low-budget electronic photography or digital-video applications.

**PostScript**

<table>
<thead>
<tr>
<th>Print speed for a FreeHand illustration that includes special PostScript effects, such as nonlinear blends and Bézier curves.</th>
<th>Print speed for a complex color MacDraw Pro document containing more than 140 color objects, most of them gradient-filled.</th>
</tr>
</thead>
<tbody>
<tr>
<td>179</td>
<td>224</td>
</tr>
<tr>
<td>252</td>
<td>407</td>
</tr>
<tr>
<td>268</td>
<td>458</td>
</tr>
<tr>
<td>463</td>
<td>936</td>
</tr>
<tr>
<td>532</td>
<td>1106</td>
</tr>
<tr>
<td>546</td>
<td>907</td>
</tr>
<tr>
<td>598</td>
<td>574</td>
</tr>
<tr>
<td>789</td>
<td>988</td>
</tr>
</tbody>
</table>

**Object Oriented**

<table>
<thead>
<tr>
<th>performance: we used an external drive for this.</th>
<th>Plug-in requires file to be in CMYK format.</th>
</tr>
</thead>
<tbody>
<tr>
<td>252</td>
<td>479</td>
</tr>
<tr>
<td>338</td>
<td>755</td>
</tr>
<tr>
<td>395</td>
<td>923</td>
</tr>
<tr>
<td>529</td>
<td>988</td>
</tr>
<tr>
<td>629</td>
<td>1131</td>
</tr>
<tr>
<td>490</td>
<td>665</td>
</tr>
</tbody>
</table>

NA = not applicable.

A. ProofPositive Two-Page requires extra disk space, we used an external drive as a scratch disk.

B. Tested with a dedicated Centris 650 server.

C. Plug-in does not support network printing.

D. Tested with 32MB RAM upgrade and EtherTalk.

3M recommends 160MB of disk space for better.
Gain access to a world marketplace.

In 1994, tens of thousands of Macintosh professionals will gather for MACWORLD Exposition where they will make decisions about what products and services they’ll buy now and in the coming year. Based on what they see and learn at MACWORLD Expo, they’ll decide how to expand their system to expand their world.

MACWORLD Expo/Boston – August 2-5, 1994
MACWORLD Expo/Canada – October 18-20, 1994
MACWORLD Expo/San Francisco – January 4-7, 1995

Reserve your booth space today for MACWORLD Exposition and see how some floor space can turn the world into your marketplace.

Please send me more information on MACWORLD Expo. I am interested in exhibiting in:

☑ Washington, D.C. ☑ Boston ☑ Canada ☑ San Francisco

Name ____________________________
Title ____________________________
Company _________________________
Address __________________________
City/State/Zip ______________________
Phone ____________________________ Fax ______________________

Mail to: Mitch Hall Associates
260 Milton Street, Dedham, MA 02026
Or Fax to: 617-361-3399 Phone: 617-361-6000
If it seems like obtaining accurate desktop color proofing is just a fantasy, then step into reality with NewGen's Chromax Color Printer. NewGen has developed this full-bleed, tabloid size, dye-sublimation color printer to break through barriers that previously existed only as a fantasy. Accurate color, true photographic quality and unmatched performance can now be achieved at a price that seems like a figment of your imagination!

Chromax produces uniform color that is unattainable from other dye-sublimation printers. Streaking, banding and ghosting are virtually non-existent which allows you to rely on a Chromax proof for design, proofing and pre-press applications. Furthermore, support for the EFIColor™ Color Management System assures color reliability. In addition, PostScript™ Level 2 compatibility, RISC-based performance and networking capability are second to none.

If you are tired of fantasizing about accurate color proofing, and want to move up to reality, visit your NewGen dealer today, or call (800) 756-0556 for more information.
Macworld Lab tests virus software and survives

Macintosh users ignore computer viruses at their peril. Viruses can cause irreparable damage to the system or destroy megabytes of data. Fortunately, unlike their biological namesakes, computer viruses are relatively easy and painless to control. With a leading virus-protection software program, it takes only a few minutes a day to remain virus-free.

Macworld Lab tested four antiviral products—the freeware application Disinfectant, Central Point Software’s MacTools ($149.95), Symantec’s Symantec AntiVirus for Macintosh (SAM, $99), and Virex ($99.95) from Datawatch—against every Macintosh virus known at the time of testing, 52 in all. We also looked at each product’s features and measured how fast the programs detected viruses.

We found that all four programs effectively combat the most important and prevalent viruses, but not all could handle certain strains. And the products varied widely in how fast they operate, with Virex blazing a new performance standard for virus detection. At the speed of Virex, dealing with viruses becomes a virtually painless exercise.

Know the Enemy
To understand the relative quality of these products, first take a step back to consider your insidious opponent: computer viruses are software programs. But unlike normal software, viruses operate unseen, on their own initiative, often hiding inside other programs and running when those programs are launched.

Many Macintosh viruses are benign; they simply spread from computer to computer without doing damage. But others erase files and cause other mayhem. Viruses can be spooky because they rarely put up dialog boxes or prompt users for input—once your machine is infected, unseen damage can go on for some time until you notice a problem. By then it may be too late to correct. Other viruses leave files or applications untouched, but cause system incompatibilities that lead to crashes and other problems.

Computer viruses spread by modifying another program to include an executable, and possibly altered, copy of the virus. They enter your machine on removable disks, files downloaded from bulletin boards, files shared on servers, and sometimes even shrink-wrapped software or blank preformatted disks.
Typically, the virus code executes when a user launches the program the virus is attached to. The virus then attempts to infect other programs, thereby reproducing itself. A virus may start reproducing right away, or it may lie dormant until it is triggered by some event (the computer's clock registering Friday the 13th, for example). Some viruses duplicate themselves when you open an infected file. Others infect the system and infect other volumes when you access them.

Performance Variations
All four antiviral programs are easy to install and use. Each consists of an INIT and an application. The SAM interface is slightly more complex—and therefore takes a bit more concentration—than the other products, but this shouldn't cause problems for most users. These are relatively simple applications, and each user interface is relatively easy to use.

All four products did a good job destroying the known viruses that they are designed to detect. Detection is relatively easy because each virus leaves a distinct signature—a string of bytes that uniquely identifies the viral code. Antivirus software merely recognizes these signatures.

When any of these products discovers a known virus, it informs you of the infection and asks if you want the virus removed. Say yes. The program then removes the virus and, to the best of its ability, restores your system to its pre-viral state. We found that once any of the products detects a virus, eradication is 100 percent effective.

Differences between the products emerge, however, in what viruses they can detect (see “Antivirus Performance Factors”). All four detected Macintosh System viruses, the most common and dangerous strain. Only SAM and Virex detected HyperCard viruses, however, so if you routinely use HyperCard those two products represent your only viable options. Disinfectant cannot detect Trojan horses—stand-alone applications that must be launched in order to be activated, and that are similar to viruses in the damage they can cause.

Every virus program can scan files compressed with all driver-level compression products, including Fifth Generation Systems’ AutoDoubler and Aladdin Systems’ StuffIt SpaceSaver. When it comes to archiving programs, the virus-detection products are less effective. SAM scans archives compressed with both Aladdin Systems’ StuffIt series and Compact Pro; MacTools scans Compact Pro archives but not StuffIt archives; and neither Virex nor Disinfectant scans compressed archives. Such deficiencies make it imperative to use other program features regularly to catch viruses that may be released when a compressed file is expanded.

Speed is a critical and clear-cut differentiating factor. Most people scan for viruses with diligent regularity only if the process is convenient and quick. All four products are convenient, but only Virex, with its impressive SpeedScan, is fast. Scanning operations that take SAM upwards of 5 minutes take Virex less than 30 seconds to complete. With Virex it is reasonable to scan your entire hard disk every time you boot up your Macintosh.

Unknown Viruses
Detecting new or undocumented viruses is much harder. Since an antivirus program does not have unknown viruses’ signatures to go on, it cannot scan for those signa-
**Antivirus Performance Factors**

### Scanning Speeds

**Launched from Floppy Disk**
- Time to scan hard drive containing 5 apps and 985 files totaling 88.5MB, after launch from a floppy disk.

<table>
<thead>
<tr>
<th>Product</th>
<th>Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virex</td>
<td>12</td>
</tr>
<tr>
<td>Disinfectant</td>
<td>51</td>
</tr>
<tr>
<td>MacTools</td>
<td>95</td>
</tr>
<tr>
<td>SAM</td>
<td>225</td>
</tr>
</tbody>
</table>

**Launched from Hard Drive**
- Time to scan hard drive containing 5 apps and 985 files totaling 88.5MB, after launch from the hard drive.

<table>
<thead>
<tr>
<th>Product</th>
<th>Time (seconds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Virex</td>
<td>11</td>
</tr>
<tr>
<td>Disinfectant</td>
<td>47</td>
</tr>
<tr>
<td>MacTools</td>
<td>87</td>
</tr>
<tr>
<td>SAM</td>
<td>194</td>
</tr>
</tbody>
</table>

### Antivirus Detection Scoreboard

Antivirus software faces two critical performance questions: How comprehensive is the software's detection filter, and how fast does the product scan your drive? A third factor—how fast the product eradicates the virus—is fairly constant across the four applications tested.

We tested detection speed two ways—launching the antivirus application from the hard drive as a user might do during routine maintenance, and launching from a floppy, as would be necessary before installing the antivirus software or if the System Folder on the hard drive has been infected and disabled. The speed tests were done on a Centris 650 equipped with 8MB of RAM and a 230MB hard drive, using System 7.1 with AppleTalk off and 32-bit addressing enabled. The speed tests were done on a Centris 650 equipped with 8MB of RAM and a 230MB hard drive, using System 7.1 with AppleTalk off and 32-bit addressing enabled.

To test the detection filter, Macworld Lab obtained 52 strains of Macintosh viruses, Trojan horses, and HyperCard viruses. We scanned this set with each product. Not every product could detect every virus, but every product successfully eradicated the viruses it could detect—Macworld Lab testing supervised by Matthew Clark.

### BEHIND OUR TESTS

### VIRUS-DETECTION SCOREBOARD

A = Detects and eradicates

- **Virus Family** (number of strains)
- **Virus Type**
- **Virus Effects**
- **SAM**
- **MacTools**
- **Disinfectant**
- **Virex**

<table>
<thead>
<tr>
<th>Virus Family</th>
<th>Virus Type</th>
<th>Virus Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANTI (3)</td>
<td>virus</td>
<td>A, C, G, H</td>
</tr>
<tr>
<td>CDEF (1)</td>
<td>virus</td>
<td>A, H</td>
</tr>
<tr>
<td>Code 252 (3)</td>
<td>virus</td>
<td>A, D, F, G</td>
</tr>
<tr>
<td>Code 1 (1)</td>
<td>virus</td>
<td>A, D, F, G</td>
</tr>
<tr>
<td>Dukakis [HC] (1)</td>
<td>HyperCard virus</td>
<td>A, E</td>
</tr>
<tr>
<td>Frankie (1)</td>
<td>virus</td>
<td>A, C, G</td>
</tr>
<tr>
<td>INIT 17 (1)</td>
<td>virus</td>
<td>A, D, F, G</td>
</tr>
<tr>
<td>INIT 1984 (1)</td>
<td>virus</td>
<td>B, F</td>
</tr>
<tr>
<td>INIT 29 (1)</td>
<td>virus</td>
<td>A, C, D, E, F, G, H</td>
</tr>
<tr>
<td>INIT-M (3)</td>
<td>virus</td>
<td>B, E, F, G, H</td>
</tr>
<tr>
<td>MacMag (1)</td>
<td>virus</td>
<td>A, D, F</td>
</tr>
<tr>
<td>MBDF (3)</td>
<td>virus</td>
<td>A, F, G, H</td>
</tr>
<tr>
<td>MDEF (3)</td>
<td>virus</td>
<td>A, E, F, G, H</td>
</tr>
<tr>
<td>MDEF (strain D) (1)</td>
<td>virus</td>
<td>A, C, G</td>
</tr>
<tr>
<td>MerryXmas [HC] (1)</td>
<td>HyperCard virus</td>
<td>A, E</td>
</tr>
<tr>
<td>nVIR (8)</td>
<td>virus</td>
<td>A, D, F, G</td>
</tr>
<tr>
<td>Scores (1)</td>
<td>virus</td>
<td>A, F, G, H</td>
</tr>
<tr>
<td>CPro (1)</td>
<td>Trojan horse</td>
<td>B</td>
</tr>
<tr>
<td>Mosaic/FontFinder (2)</td>
<td>Trojan horse</td>
<td>B</td>
</tr>
<tr>
<td>Steroid (1)</td>
<td>Trojan horse</td>
<td>B</td>
</tr>
<tr>
<td>Tetricycle [TH] (1)</td>
<td>Trojan horse/virus</td>
<td>B</td>
</tr>
<tr>
<td>Virus Info (1)</td>
<td>Trojan horse</td>
<td>B</td>
</tr>
<tr>
<td>China Talk (1)</td>
<td>Trojan horse</td>
<td>B</td>
</tr>
<tr>
<td>T4 (5)</td>
<td>virus</td>
<td>B, F, G, H</td>
</tr>
<tr>
<td>WDEF (2)</td>
<td>virus</td>
<td>A, H</td>
</tr>
<tr>
<td>ZUC (2)</td>
<td>virus</td>
<td>A, C, D, G</td>
</tr>
<tr>
<td>3 Tunes [HC] (2)</td>
<td>HyperCard virus</td>
<td>A, E</td>
</tr>
</tbody>
</table>

A = May cause system errors and crashes.
B = Damages or destroys system or application files.
C = Infects without application launch.
D = Nondamaging effects, such as system beeps, appearance of funny phrases, or bouncing cursor.
E = Infects or modifies document files.
F = Infects or modifies system files.
G = Infects or modifies applications.
H = Infects desktop files and/or Finder.

*Either documentation or vendor has acknowledged that this product will not find this type of virus. **This Trojan horse was not detected, but it releases a virus, MBDF A, which was detected. ***Detected one of two strains; second strain should be detected by later versions of SAM.*
Virus-Fighting Options

<table>
<thead>
<tr>
<th>Price</th>
<th>Disinfectant 3.3</th>
<th>MacTools 3</th>
<th>Symantec AntiVirus for Macintosh</th>
<th>Virex 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>freeware*</td>
<td>$149.95</td>
<td>$99</td>
<td>$99.95</td>
</tr>
<tr>
<td>Phone</td>
<td>NA</td>
<td>Central Point Software</td>
<td>Symantec</td>
<td>Datawatch</td>
</tr>
<tr>
<td>Toll-free phone</td>
<td>NA</td>
<td>503/690-8088</td>
<td>503/334-6054</td>
<td>919/549-0711</td>
</tr>
<tr>
<td>Tested by Macworld Lab</td>
<td>•</td>
<td>800/964-6896</td>
<td>800/441-7234</td>
<td>•</td>
</tr>
<tr>
<td>Stops infected applications from launching</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Automatically scans start-up disk (at start-up/at shutdown)</td>
<td>•/•</td>
<td>•</td>
<td>•</td>
<td>•/•</td>
</tr>
<tr>
<td>May prevent unknown viruses</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Automatically scans floppy drives and removable media</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Scans and ejects multiple floppy drives</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Contains emergency disk or instructions to create one</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Notifies users of new viruses</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Scans compressed files</td>
<td>**</td>
<td>Compact Pro***</td>
<td>Stuff series, Compact Pro***</td>
<td>***</td>
</tr>
</tbody>
</table>

= yes;  = no; NA = not applicable. *Available on the Internet, CompuServe, GEnie, and America Online. **For using to recover from System Folder infections.

All products scan driver-level compression products.

Panic Attack
Some viruses may damage your psyche more than your computer. The message above is a ruse. This virus, a strain of Code 252, cause enough damage to the System computer. The message above is a didn’t actually erase any disks but did cause enough damage to the System file to require reinstallation.

Updating Software Is Vital
Still, the inventory of known Mac viruses is growing, if slowly. For example, after Macworld Lab completed its testing, we learned of two new viruses, Init 9403 and Init 29-B. Init 9403, a highly destructive virus that spreads only through Italian versions of Mac system software, attempts to erase all drives connected to the infected system. This example shows why it is vital that you keep your antivirus software up-to-date. New versions of antivirus software are released days (sometimes even hours) after a new virus is discovered. (All products should have long since added Init 9403 and Init 29-B to their roster by the time you read this.) If you’re a registered user of one of the commercial programs, you’ve mailed a postcard that gives you the signature of the new virus; you have to enter that string into the program.

These signature strings are also available on America Online, on other services in some cases—CompuServe and AppleLink for SAM, and CompuServe for MacTools—and from the companies’ own bulletin board services. All three companies can also, for a small fee, send updated software disks to registered users. Disinfectant users can get updated versions on network servers on the Internet, CompuServe, GEnie, and America Online.

SAM is the best antivirus program for network distribution. It allows a central network administrator to automatically install or update SAM on every machine on an AppleTalk network. MacTools requires that each user on a network download the new version from a server, but MacTools has a reporting feature so that the administrator can see which users have updated their antivirus software and which have not. Virex has a speed scan feature, though Datawatch plans to fix it in the next version. Disinfectant has no networking features.

Be Alert
Whichever product you select, you’ll be safer if you employ some simple preventive antivirus techniques:

• Keep original software on locked master floppy.
• Don’t install software on one computer from another.
• Make periodic backups of your hard drive, and lock your backup disks. Run your antivirus software before each backup to make certain the backups do not become infected.
• Check all new software—commercial software, shareware, and freeware—for possible infections. Despite the best efforts of vendors and sysops, viruses sometimes slip through.
• Be on the lookout for common symptoms of a virus infection—frequent system bombs for which no explanation can be found; mysteriously malfunctioning applications; disks that are damaged and cannot be accessed; unexplained printing difficulties; distortions in pull-down menus; and windows that don’t open, close, or zoom correctly.

Fortunately, you shouldn’t run into such problems too often—at least not as a result of viral infections. The Macintosh virus threat has diminished, both in the number of new viruses discovered and the number of reported incidents of infection. This is mostly due to the excellent quality of these four antiviral packages. So viruses can be an annoyance, or even an occasional problem. But if you use a little common sense, they should never become a computing nightmare.

BRUCE SCHNEIER is a computer security consultant and the author of Protect Your Macintosh (Peachpit Press, 1994).

VIRUS KILLERS

All four antivirus programs operate reliably, but substantial differences in price and speed made the selection easy.

Virex
Virex’s SpeedScan makes it the fastest antivirus software by a wide margin. Combine that with a detection mechanism that catches every known virus and a price comparable to that of other commercial products, and you have a program that’s hard to beat. Company: Datawatch. List price: $99.95.

Disinfectant
Free software is appealing, especially a product as well written as this one. Unless you are concerned about HyperCard viruses or Trojan horses, you need a program with networking capabilities. Disinfectant is a great choice. Company: Not applicable. List price: Free from online services.
Ten hours per day.
One hundred and thirty words per minute.
Introducing the MultiSync® 3V.
The affordable solution for those who make your business run.

They're the people you count on to get the job done. And from secretaries to shipping, they need all the help you can give them. Luckily, the 15" MultiSync® 3V monitor was designed to work for them. It works with the latest Macs and gives you the great colors and sharp display you'd expect from an NEC MultiSync monitor. Plus, it supports multiple resolutions and lets you switch between them with NEC's DPl-on-the-Fly® software. So you can choose the resolution that's best for your application. You also get a monitor that's MPR II compliant and has a 3-year limited warranty. It's more than you'd expect at such a great price. But then again, you're probably used to getting the most for your money. Questions? Call 1-800-NEC-INFO. Or, for info via fax, call 1-800-366-0476 and request our Mac products catalog #4. The easiest monitors to live with for hours and hours: Ours.

*15" CRT yields 13.8" viewable screen area. Optional cable adapter, required for Macintosh connection, available free from NEC. MultiSync is a registered trademark of NEC Technologies, Inc. The Energy Star emblem does not represent EPA endorsement of any product or service. © 1994 NEC Technologies, Inc.

Circle 28 on reader service card
One-Stop Graphics Shop

NEED A STOCK BACKGROUND IMAGE of coffee beans right this minute? Some new fonts before sunrise? According to International Typeface Corporation, that won't be a problem—as long as you're a subscriber to its Design Palette service. Combining CD-ROMs, search software, and a special SCSI device with a built-in modem, Design Palette gives graphic artists instant, 24-hour access to a variety of electronic stock photos, clip art, fonts, backgrounds, and textures, as well as multimedia tools and utilities.

With an ITC Design Palette credit account you can preview, purchase, and decrypt any graphical element or utility stored on Design Palette CD-ROMs. When the service becomes available in September, ITC expects to offer subscribers a collection of 10 to 15 CDs storing thousands of design items, and will issue new CDs quarterly. The Design Palette software enables you to search the CDs in various product categories. The software tells you the cost of each element and keeps a record of your purchases.

Design Palette requires that you add its external SCSI device to your Macintosh and connect its customized, 2400-bps modem to a telephone line. The SCSI device includes the hardware necessary to decrypt the items stored on the CDs. ITC's computers will dial up each subscriber's SCSI-device modem daily (in the wee hours) and download invoicing information based on that day's purchases.

There will be a small, one-time service fee (around $30) and a required monthly expense minimum, which wasn't set at press time but could be $100 to $200. At press time, ITC would not announce the names of any specific content providers for Design Palette. ITC, 212/371-0699.—J.A.M.

Spreading the News about Trapping

WHETHER YOU USE QUARK-XPress or Aldus PageMaker, the process of trapping promises to become easier, thanks to the updated version of Island Graphics Corporation's IslandTrapper, a Quark XTension, and a new Aldus PageMaker Addition.

IslandTrapper 2.0, scheduled to be available in both native PowerPC and 680X0 versions by late June, now offers the ability to set up batch trapping and color separations in QuarkXPress, with help from Island Graphics' new IslandTrapper Quark XTension. You use the XTension to set trapping and color-separation parameters within XPress for all objects (including EPS files) on each page of a document, then send the document to IslandTrapper 2.0. The program performs all necessary trapping functions and color separations based on the parameters set in QuarkXPress. (Previous versions of IslandTrapper did not offer color-separation capabilities.) Regardless of its origin, any EPS file that has been trapped in IslandTrapper 2.0 can then be color-separated by the program.

IslandTrapper for Power Macs is more than four times faster than the
PixelCraft tries Beating the Drum

PixelCraft (formerly Barneyscan) is now shipping the Pro Imager 8000, a single-pass, 36-bit flatted color scanner that captures reflective and transparency artwork at resolutions up to 4000 dpi—within the same resolution range as some drum scanners.

The Pro Imager 8000 is unusual in that it uses three digital signal processors (DSPs) to speed scanning operations. While most scanners rely on the Mac's CPU to enhance the scanned image, the Pro Imager 8000 uses the DSPs for automatic sharpening, halftone descreening, and thresholding—as well as enhancing the image's contrast during scanning.

The $12,995 scanner supports a maximum image size of 11 by 17 inches and ships with PixelCraft's image-acquisition software (called QuickScan) and ColorAccess for color correction and separations. PixelCraft, 510/562-2480, 800/933-0330.—J.A.M.

Expanding Dimensions

A MAJOR UPGRADE OF ADOBE DIMENSIONS—a tool for creating simple 3-D objects and type to incorporate into two-dimensional illustrations—will offer artists more control and flexibility in the design process. Version 2.0's more interactive approach will allow you to create 2-D objects within Dimensions, instead of having to import them from a 2-D program, and to view an object in 2-D and 3-D mode simultaneously. With the new pen tool, you'll be able to edit two-dimensional objects while seeing them updated in 3-D, as well as modify extruded or revolved objects without losing their 3-D attributes.

Other new capabilities include creating and editing custom colors, shading objects using any color, and printing from within the application. The program also offers multiple undos, background rendering, and more-powerful blend controls.

Dimensions 2.0 is expected to ship in the second quarter of 1994 and retail for $199. Upgrades are $69 (free for those who registered on or after March 14, 1994). Adobe Systems, 415/961-4400, 800/833-6687.—CATHY ABES

Using Adobe Dimensions 2.0's pen tool, you can create 2-D profiles and then revolve or extrude them into 3-D shapes. Custom colors can be imported from Illustrator or created within Dimensions and applied to an object.

IN BRIEF

- To Scitex and Back
Taking PostScript files to a Scitex service bureau used to be a one-way street. But in addition to accepting PostScript files, Scitex America has announced that files created or manipulated on a Scitex Whisper workstation can now be saved in Adobe Illustrator EPS format, enabling Mac-based designers and illustrators to proof or archive final files. 617/275-5150.

- Supporting ColorSync
Apple Computer, Adobe Systems, Agfa, Eastman Kodak, Microsoft, Silicon Graphics, Sun Microsystems, and Talgent have formed a group called the ColorSync Profile Consortium (CPC). By joining the CPC, the companies agree to support Apple's ColorSync 2.0 in their operating systems and color-management products, and to ensure their ColorSync-capable products are compatible across platforms.

- Agfa Manages Color
Agfa's FotoTune Pro software, due in August, will characterize any output device to ensure that colors on a computer screen match those of the final output. FotoTune is Agfa's device-independent color-management system; FotoTune Pro uses Agfa's ColorTags color profiles, now available on CompuServe. Pricing wasn't available at press time. 508/658-5600.

- Roaring RIP
SuperMac Technology's ProProofPositive 2.0 PostScript Level 2 dye-sublimation printer includes a hardware buffer, which frees up the Mac while an image is being printed; improved RIP performance; and a lower price ($6999; $14,999 for the two-page system) than SuperMac's original ProProofPositive. 408/541-6100, 800/334-3005.

- Photoshop Gets a Charge
DayStar Digital's updated Charger Suites Volume 1 software promises to boost Adobe Photoshop filter speeds up to 50 percent for the digital signal processor (DSP) boards it supports. Version 1.5 of Volume 1 ships free with DayStar's DSP products; it sells separately for $119; as an upgrade it costs $49. 404/967-2077, 800/962-2077.
Imagine a high-performance 650hp mower with 10 sets of blades. Welcome to the world of MicroNet. We're reshaping the desktop landscape with storage products and a technical support network designed to increase your productivity. Our 17.3 GB Raven array has displaced the solitary drive. A 200 MB SyQuest has eclipsed the 88. The 1.3 GB optical rivals the speed of a hard disk. And our 32 GB DAT backs up those irreplaceable moments.
between conception and completion. So in a world where time is measured in milliseconds and capacity in gigabytes, MicroNet provides productive solutions that can change the way you work. To impact your company's throughput, call your local reseller or 1-800-800-DISK.
by Cathy Abes

Artist: San Francisco–based John Lund has been a commercial photographer for 17 years. He began using Photoshop three years ago, and within six months was doing all his work digitally. He has been using Live Picture since he got his hands on a beta version last October.

How It Was Done: Lund created this conceptual image, which illustrates that time is money, for his growing stock-photo collection. He began by scanning in a photo of a dollar bill, which he converted to Live Picture’s proprietary IVUE format and “inserted,” or imported, into Live Picture.

After erasing parts of the dollar bill, Lund scanned the hourglass photo and inserted it as the second layer of the image, where he rotated it counterclockwise 10 degrees and created a stencil around it. Then he erased the image inside the hourglass, allowing the underlying image—the dollar bill—to show through the glass.

For the squeezed dollar bill inside the hourglass, Lund inserted another scanned photo as the third layer. After rotating it to align with the hourglass, he created a stencil around it and squeezed it into the shape he wanted. Then he rendered out the bottom portion of the distorted dollar, saved it in TIFF format, and imported it into Photoshop, where he applied a filter from Kai’s Power Tools to give it a sandlike effect. Next he converted the image back to IVUE format and inserted it into Live Picture as layer four, then sized and positioned it.

The last layer of the illustration was Abraham Lincoln’s profile taken from a scanned photo of a penny. After inserting it, Lund rotated, sized, and positioned it. He used a stencil to remove everything but the face to give the profile a hard edge, then with the eraser he added a soft edge to the back of Lincoln’s profile.

Finally, using the Add/Edit command (View menu), Lund created the view of the image for final rendering by dragging a selection box around the area of the image he wanted to build.

The Tools

Hardware: Mac Quadra 950 with 140MB of RAM and a 1.6GB internal hard drive; Quantum 1.2GB external hard drive; SuperMac Thunder/24 accelerated graphics card; Relax Technologies 4MB SyQuest removable-cartridge drive; SuperMac SuperMatch 21 color monitor; Wacom 12-by-12-inch graphics tablet.

Software: Live Picture 1.5 B2; Adobe Photoshop 2.5.1; Kai’s Power Tools 2.0.
Using the pen tool to outline the scanned dollar bill, Lund made a stencil to eliminate the background area so that only the dollar bill itself would show.

Lund used the distorted setting of the brush to push and squeeze the dollar bill until it appeared to be passing through the narrow middle of the hourglass.

In Photoshop, Lund applied the Pixelstorm filter from Kai’s Power Tools 2.0, which gave the dollar bill the appearance of turning into sand.

To intensify the color on the dollar bill in the background, Lund manipulated the curves in Live Picture’s Color Control dialog box. In the Preview window, you can move the image around to zero on any part of the image.

Once Lund finished manipulating the image, he drew a selection box around the area he wanted to render out for what’s known in Live Picture as the final build. Displayed along the right side are the individual images—each on its own layer—that make up the illustration.
Click the button. It’s so simple. Click. It’s the easiest way to get things done. Which is why new WordPerfect® 3.0 for the Mac® puts all the things you want from your interface in your face.

Giving you more buttons to click than any other word processor. So features are easy to find. And use. Want to change your text formatting? Click. Apply a style? Click. Create a table? Click. Then you can bring up a different bar with all the table functions you want. Borders, editing—even math functions—it’s all right there. Click. Our customizable button bars put your favorite tools right there, too. Like spell checking, Grammar checking. Our integrated drawing program. Whatever you want. There’s even buttons for common tasks like bulleted indents. So you’ll seldom have to do anything. Besides click. (And type, duh. This is a word processor.) But you can do other cool stuff, too, like run QuickTime.” Or WordPerfect native on the Power Macintosh®. So visit your local reseller or call us at (800) 526-7820 for our $99 competitive upgrade. If the number was nine buttons shorter, it’d be as easy as our interface. Click.
Color printing is always a dicey proposition. With a lot of skill—and a little luck—you may get your final output to closely resemble your on-screen original.

If you use a dye-sublimation device for proofing, you already have a big advantage in reconciling the final output with the original artwork, because dye-sub devices can mix the cyan, magenta, yellow, and black (CMYK) inks to create millions of colors.

But creating a wide range of output colors is a far cry from matching a particular set of colors on screen. Adobe Systems gave publishers a boost when it released its long-awaited PostScript Level 2 drivers last year. Level 2, the second generation of Adobe's page-description language, added several features to reflect users' growing demand for color, a wider selection of fonts, and higher-resolution output. PostScript Level 2 drivers are bundled with printers that support Level 2, and they can be purchased directly from Adobe (Adobe PostScript Printer Driver 8.1.1, $24.95; 415/961-4400, 800/833-6687).

The latest revision of Level 2 cleans up a batch of code that had been muddied by the myriad extensions that were written to the original PostScript over the years. Color extensions, which gave PostScript the ability to describe and print colors, are now a part of the base language, as is Display PostScript, which uses the language to describe on screen the same graphics and fonts rendered on the printed page.

Level 2 also adds to PostScript's repertoire of printing capabilities. Printers that support Level 2 can fax PostScript documents, cache patterns and forms between multiple printings of the same document, and generate accurate screen angles for smoother halftone printing. Level 2 also compresses and decompresses documents.

Still a Little Off-Color
A big promise for Level 2 was device-independent color—a way to view documents on any monitor, print them on any printer, and have the colors appear the same (or as close as possible) from device to device. To achieve this level of consistency, a technology must take colors described in red, green, and blue (RGB) data, from a scanner or monitor, and match them to CMYK data, which printers use to describe colors. Color translation is a fundamental obstacle to achieving true device-independent color. Even with Level 2 drivers, color translation is still a stumbling block, and device-independent color remains a dream.

But don't just blame Adobe. Other pieces of the device-independent color puzzle must come from applications developers, monitor and printer manufacturers, and Apple. Apple's contribution is ColorSync, a system-level color-management scheme that will eventually encourage other parties to deliver device-independent color—provided they all write applications to support the scheme.

ColorSync is a system extension that allows your Mac to describe the colors although these dictionaries help you get better color fidelity between monitors and printers, they don't guarantee it. While the Level 2 drivers support an unlimited number of color-rendering dictionaries, most Level 2 printers ship with only one general dictionary. This can cause problems if your needs are specialized—if, for example, you want to print presentation graphics on transparencies, while the dictionary in your printer is geared for plain paper.

Printer vendors can and will provide additional dictionaries, but clearly this won't close all the gaps in the colormatching process. For instance, not all monitor and scanner vendors have written ColorSync profiles for their devices. By the end of this year, however, one of the most important compatibility gaps—between the ColorSync profile and Level 2 driver—will most likely be bridged when Apple releases version 2.0 of ColorSync, which will describe colors the same way Level 2 does.

Meanwhile, by the time you read this,
Adobe should be close to shipping version 8.2 of its Level 2 driver, which will fully support ColorSync 1.0 and 2.X and should work to match the color profiles that ColorSync sends to the printer (see “Moving toward Device-Independent Color”). Just as Adobe Acrobat substitutes a similar font when the actual one isn’t available, PostScript Level 2 will substitute a similar color profile when it doesn’t find the required one in the output device.

**Small Features, Big Results**

One boost to color printing that does not depend on future versions of ColorSync or printer drivers is Level 2’s halftoning algorithm. Through this scheme, PostScript is able to describe more lines per inch and smaller angles on screen and thus generate a higher-resolution image. The result is more color and image information, which allows for smoother color separations. PostScript Level 2’s halftoning feature also enables you to create a low-resolution image for faster printing (as you may want to do when proofing).

The PostScript Level 2 drivers support a number of other printer-specific features. One way that they do this is through PPD (printer page description) files, portable ASCII files that tell the printer driver about a device’s specific features. PPDs, which generally come from printer vendors, can tell the driver what type of paper is in which tray. For instance, if you need to print legal-size transparencies, or want to print on letterhead paper, the Print dialog box reflects that choice (see “Working Smart,” *Macworld*, June 1994). Moreover, PPD files make it easier for printer vendors to offer new features that existing applications will readily support.

**New Fax Standards**

Level 2 also extends the benefits of PostScript printing to fax technology. The new drivers let printers that support PostScript Fax receive faxes as PostScript documents and send files to other PostScript Fax devices as well as to conventional fax machines. Output from a PostScript Fax printer is superior to that from an ordinary fax machine—documents are output on plain paper at the printer’s highest resolution. And if the receiving printer supports large-format media, gray-scale, or duplex output, you can send PostScript Fax files that use those features.

PostScript Fax printers support the CCITT Group III fax protocol, a worldwide standard establishing the base resolution for a fax at 200 dpi by 100 dpi, and a fine mode at 200 dpi by 200 dpi. And PostScript Fax includes the Error Correction Mechanism, a special feature of the Group III protocol that allows a receiving fax machine or printer to request retransmission of data that is corrupted in the sending process. The net result is a higher-quality fax.

PostScript Fax technology brings advantages beyond higher resolution. Network managers can avoid the hassle of hooking up individual fax modems, since network printers with faxing capabilities can double as network fax machines. Because these devices are also printers, they treat incoming and outgoing faxes the same as other documents, so there’s no extra configuration involved. If the device is in the middle of a print job when it receives a fax, it holds the incoming fax in the print queue.

PostScript Fax also has built-in LZMW compression and decompression capability; a PostScript Fax device generates a file that’s more compact than ordinary fax files, reducing the time and cost of transmis-
Moving toward Device-Independent Color

ColorSync, Apple’s system-level color-management system, is a critical step toward ensuring better color fidelity between monitors and printers. ColorSync will work much better, however, when it combines forces effectively with PostScript Level 2’s color-conversion prowess. Currently, PostScript offers more-detailed device profiles—descriptions of a device’s color capabilities. ColorSync 2.0, due out by the end of the year, should eliminate this discrepancy.

ColorSync is a repository for profiles of various color devices; it’s also a system for managing colors and translating them between devices. PostScript Level 2 offers an alternate conversion engine. When combined, ColorSync and PostScript Level 2 offer various options for printing an on-screen image, each of which should yield reasonable color fidelity. One of these options creates device-independent color files.

In that case, ColorSync combines the RGB data from the screen image and a corresponding monitor profile. The profile contains three parts: the monitor’s white point, data on the minimum and maximum strength of each phosphor, and information on how the RGB values can be described as values within CIE-XYZ—a color-designation system that represents a common language for describing the RGB values created by a monitor and the CMYK values created by a printer.

The printer driver or application hands off this combined file to the Level 2 printer, where PostScript converts the RGB colors into CMYK equivalents, using a printer-resident Color Rendering Dictionary (CRD)—a profile of the printer’s capabilities. This method offers device independence because the transmitted file contains all the essential RGB and CIE-XYZ coordinates needed for transformation. Any Level 2 color printer can use that information to render a color image with reasonable fidelity.

No More Memory Drain

Perhaps the biggest improvement in PostScript is that Level 2 makes printing faster and more efficient. Under Level 1, each operation that a PostScript printer performed—such as rendering and caching fonts—had its own memory allotment, and the user didn’t know how the printer allocated memory for each task. One pool of memory stored fonts downloaded to the printer; another served as a temporary storage area for a document while it was being built. Once the document was printed, the memory was free to build another document.

If one operation—building the page, for example—ran out of memory, your document might not print. Adding more memory to the printer wouldn’t necessarily alleviate the problem, because you had no way of knowing whether the printer would allocate the extra memory to the function that required it. Level 2 remedies this situation by making all printer memory available to all printing tasks.

Level 2 adds another important efficiency factor—pattern and form caching. Earlier high-speed printers had to rebuild common elements, such as logos or even entire forms, for each page within large, repetitive jobs. This negated some of the benefit of having a high-speed printer. Level 2 does for forms and patterns what the original PostScript did for fonts commonly used in a series of print jobs—it renders and downloads them into a cache of printer memory, where they can be used for each successive job. They do not have to be rendered and downloaded each time they are needed.

Level 2 also speeds up printing with compression and decompression filters. It supports several industry standards for compression, decompression, and ASCII encoding of binary data. The Level 2 drivers can compress various components of a print job before sending them over a network to the printer, where the Level 2 interpreter then decompresses each file before printing it. By generating smaller, compressed files, Level 2 reduces network traffic and speeds up printing.

Faster Rasters

Adobe has also incorporated a revamped Adobe Type Manager (ATM) rasterizer in Level 2. ATM, a set of PostScript subroutines, generates scalable font outlines on the fly for display on screen and speeds up font rendering for non-PostScript output devices.

Moreover, version 8.1.1 of the driver finally supports TrueType font rendering—something that, till now, PostScript clone vendors could claim as an advantage over PostScript. Generally, PostScript clones such as Phoenix Technology’s PhoenixPage have closed the gap in performance, while Adobe has narrowed the gap in price. Since the clones support most of the major Level 2 features, consider your needs for printer features and your price range first. Support for official Adobe PostScript should be secondary.

Buying a clone is not entirely risk-free, however. Clone vendors are sometimes slow to implement their versions of new PostScript features; most, for example, have yet to build in support for PostScript Fax. (QMS is the only clone vendor to claim that its software supports PostScript Fax, but the company does not offer a printer with faxing capability.)

Proof Is in the Printing

The continuing absence of device-independent color is frustrating. But while Adobe and other parties keep working on this elusive goal, professional publishers can rely on relatively effective (if complex and costly) color-matching systems such as Cachet ($299; Electronics For Imaging, 415/286-8600, 800/285-4565).

Still, PostScript Level 2 is an impressive update. The latest drivers offer faster performance and better control over many aspects of printing. Plus, these drivers help unify two similar functions—printing and faxing—under one interface, with one device. This is no small feat. In the coming months, look for a rush of new printers with Level 2 support as well as the features we’ve been craving for years.

Free lance writer KRISTI COALE has covered Macintosh desktop publishing and design for the past six years.
There are really only two reasons to buy a new Apple Multiple Scan Display.
It does more.

Instant resolution switching. With the new Apple Multiple Scan 20 and Multiple Scan 17 Displays, you can instantly change to the resolution that's best for the job—without restarting. Enlarge images for presentations or to edit pixels. Shrink images to display more on-screen or view full-page layouts.

PC compatibility. Good news for Mac- and PC offices. With over 10 resolutions, our 20- and 17-inch displays can meet virtually any video standard, including SVGA and VGA. Both of our new displays come with a PC adapter for instant plug-and-play compatibility.

Brighter screen. Both displays feature Trinitron screens. So the picture is noticeably cleaner and sharper. It's also up to 30% brighter than Apple's previous large-screen displays. The flat screen shape minimizes distortion and reflected glare.

Easier on your eyes. The Multiple Scan 20 Display seen here and the new 17-inch display both have 75 Hz screens with special antiglare, antistatic treatments. Each display also passes strict Swedish MPR-II electric and magnetic emissions standards.

Powerful options. Add the Apple Macintosh Display Card 24/3C to your computer and you'll bring 24-bit color to either Multiple Scan Display. You'll also enjoy QuickDraw acceleration up to 20 times faster than with unaccelerated video cards.

Energy-saving. Meet EPA Energy Star standards. With our unique Energy Saver software, you decide how long the screen is idle before going into power-saving mode. You'll cut your power costs by up to 70% and extend the life of your picture tube at the same time.

And it's from Apple. As you might expect, both Apple Multiple Scan Displays are designed to work seamlessly with all Macintosh computers. That includes rigorous testing to ensure plug-and-play compatibility with our new line of Power Macintosh computers.
Here's the perfect upgrade offer.

Now there are two great reasons to upgrade to new WordPerfect® 3.0 for the Macintosh® today:

- $99* special upgrade price for users of competitive word processors.
- Get the Random House Webster’s Electronic Dictionary and Thesaurus, College Edition for just $49—a 50% savings—when you upgrade.

To get this new upgrade, visit your reseller or fill out this order form and mail it. For faster service, fax to (801) 228-5277, or order by phone at (800) 526-7820.

Name ____________________________
Company Name ____________________________
Address __________________________________________
City __________________ State ____ Zip ____________
Daytime Phone (______) _______________________
Current Word Processor is ____________________________ Version __________
My License Number is ____________________________
Credit Card Number ____________________________
Expiration Date ____________________________
Cardholder’s Signature ____________________________

Please send me ____ copies of the $99 WordPerfect 3.0 for the Macintosh upgrade.
(Plus $4.50 shipping and handling.)
Please send me ____ copies of the half-price Random House Webster’s Electronic Dictionary and Thesaurus, College Edition. ($49 plus $4.50 shipping and handling.)

$ __________ Total cost

☐ My check or money order is enclosed.
☐ Mastercard  ☐ Visa  ☐ American Express

*Direct order from WordPerfect Corporation. Or visit your reseller—reseller prices may vary. Offer good through 9-30-94.
WordPerfect is a registered trademark of WordPerfect Corporation. All rights reserved. ©1994 WordPerfect Corporation. WHMAA
BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 36 OREM, UT

POSTAGE WILL BE PAID BY ADDRESSEE

WordPerfect
Priority Orders Processing Q2300
WordPerfect Corporation
1555 North Technology Way
Orem, UT 84057-9912
Subscribe today and...

SAVE $23.40!

YES! Send me a one-year (12 issues) subscription of Macworld for $24. I'll save $23.40 off the annual newsstand price. Please bill me later.

name

company

address

city/state/zip

Macworld
Enter e·World™ now with your free starter kit. I'd like to know more about the exciting, new on-line service from Apple. Please send me the eWorld starter software package—a $19.95 value—free.

Name
Company Name
Home Address    Apt./Suite #
City
State  ZIP  Phone ( )  23MW794
Check one:  □ 1.4MB Disk  □ 800K Disk

©1994 Apple Computer, Inc. All rights reserved. Apple, the apple logo, and Macintosh are registered trademarks of Apple Computer, Inc. eWorld and the eWorld logo are trademarks of Apple Computer, Inc. The Logos are copyrighted by the name of Apple Computer, Inc. Offer does not include on-line charges. Offer expires 10/31/94. To enter eWorld, you'll need the free eWorld software, an Apple Macintosh computer with system software version 7.5 or later and at least 4 megabytes of RAM, a phone line, and a Hayes-compatible modem.
eWorld Starter Kit
Apple Computer, Inc.
PO Box 4493
Bridgeton MO 63044-9718
Free Power Solutions Handbook

What are the myths and musts of Mac protection? What are the 10 most common power protection mistakes? The top tips for adding reliability to your LAN? Get your FREE copy and find out!

☐ YES! I’m interested in trading up a competitive or older UPS to a Back-UPS. Please send Trade-UPS info.

☐ YES! I’m interested in APC’s Reseller Partner Program. Please send more info and an application.

☐ No! But I would like a FREE Power Protection Sales Handbook.

Name ......................................................... Title .........................................................
Company ....................................................................................................................
Street/City/State ........................................................................................................
Phone/Fax ...................................................................................................................
Brands of UPS sold? ...................................................................................................
# of UPSs sold per month? ..........................................................................................

D 7
It costs less.

Surprise, surprise. At $2,149, the Apple Multiple Scan 20 Display actually costs less than other 20-inch displays, such as the SuperMac 204 XL and the Radius Intellicolor 20K. Considering that the Multiple Scan 20 has more unique, built-in features, that is a surprise.

The economical new Apple Multiple Scan 20 Display.
PowerPoint Dresses for the Office

Microsoft is modifying PowerPoint's interface to make the program look and work more like its Microsoft Office-mates, Word and Excel. For example, PowerPoint version 4.0 will have customizable tool bars and a status bar across the bottom of the window. The presentation package will also have what Microsoft calls Wizards, helpers (first seen in Excel) that walk you through such tasks as choosing an effective template or formulating ideas into bite-size bullet points.

Besides Wizards, PowerPoint 4 has other features that take the guesswork out of creating presentations; these include transition-effect previews in the slide-sorter view and a rehearsal mode that records how long you spend on each slide as you practice your speech before an audience of pencil holders, tape dispensers, and coffee mugs.

PowerPoint relies on OLE to connect to a separate, hot-linked graphing module, and to create tables using Word's table editor. A button can also send the content of a PowerPoint file into Word or import a Word document.

PowerPoint 4.0 will include about 1100 pieces of clip art with a keyword index, and the program has a wide range of drawing tools for modifying clip art or creating new art. PowerPoint 4.0 will list for $495 and be included in the $695 Office. Microsoft, 206/882-8080, 800/426-9400.—D.L.

ActiGraf Models Business

To restructure your business and make it operate more efficiently you must understand how it works now. That requires modeling your business—its manufacturing, decision-making, paper-tracking, transportation, and other processes—to find the efficient steps, the bottlenecks, and how they affect each other. A whole class of software has emerged to help managers grasp the big picture by linking iconic representations of steps in a process, such as waiting for something else to happen, acting in a certain way based on a decision, and so on.

A new company called Business Modeling Systems is entering the market with ActiGraf. ActiGraf is based on IDEF, a modeling technique developed by the Air Force to analyze manufacturing. ActiGraf uses an iconic version of Petri nets, which represent sequential and parallel steps and decision points where processes diverge. You can designate that steps take a certain amount of time; send their results to another step; and embed basic calculations. After you connect all the icons, you can run the model as a simulation to see an animated representation of what happens.

ActiGraf is $795; its ship date was not set at press time. Business Modeling Systems, 415/941-3901.—D.L.

Claris Enters PIM Market

Nobody knows just what a PIM—personal-information manager—is, but software vendors agree that we all need one. That's why Claris, which sticks to products with broad horizontal appeal,
is launching a PIM under the low-price Claris Clear Choice label.

Claris Organizer (CO) follows in the footsteps of products like Common Knowledge’s Arrange and Rae Technology’s Rae Assist with an ability to understand information as you enter or manipulate it and to automatically build relationships between different pieces of information. For example, if you drag Joe Smith’s name and phone number from the address book to the to-do list (yes, data can be dragged between windows), CO creates a new to-do item labeled “Call Joe Smith.”

CO provides all the standard PIM capabilities: printing labels and standard pocket-booklet formats, searching for items using highly specific criteria, and interrupting other applications with its reminders, among others. Creating new contacts, to-dos, and notes can be partially automated with templates that can include priority level, category, boiler-plate text, and other information.

With CO, Claris has solved some problems that beset competing products. Banners—colored bars that indicate events lasting several days—appear in an area above the calendar itself to avoid obscuring information. You can change the field name for some fields across all records, and for other fields, on individual records.

CO should list for $75 to $100 and should ship in July. Claris Clear Choice, 408/727-8227, 800/325-2747.—D.L.

Automating Sales and Operations

O SALESMAN IS AN ISLAND. IN FACT, a salesperson’s work is just part of a series of steps that begins when a prospect is identified and continues long after the prospect becomes a customer. With the complete sales cycle in mind, James Tech-

ologies developed the Customer to roll sales-automation support into an operations-oriented database for managing inventory and receiving, invoicing and receivables, and other tasks.

James Tech has been marketing the 4th Dimension-based program in custom versions for several years, but 3.0 is the first version of the Customer to be generally available. All transaction information can be associated with general-ledger account codes for export to an accounting system. theCustomer includes SuperReport, an embedded 4D extension for generating reports. The program lists for $649 for one user, including a runtime version of 4D; pricing is less per user for quantity buys. James Technologies, 612/484-9549, 800/735-0635.—D.L.

IN BRIEF

Time-Billing for Newton

The Newton continues to attract new developers of practical business-oriented software. Time-Reporter, from iambic software, is designed for attorneys, consultants, and others to record the time spent with clients and then generate billing statements. Time-Reporter can import and export information including contact and calendar information, as well as accounting information. iambic, 408/746-3709. (For more on time-billing, see this month’s Working Smart.)

SQL, New Analyses for MapInfo

MapInfo 3.0 for the Mac will include MapInfo Corporation’s SQL DataLink for access to Sybase and Oracle databases. Version 3.0 also has improved features for creating and balancing regions such as sales districts. In addition, the new version has improved thematic maps and can display a raster image, such as an aerial photo, underneath a vector map. Version 3.0 should ship in the fall for $1295. MapInfo, 518/285-6000.

WordPerfect’s Paperless Future

WHEN WORDPERFECT RECENTLY announced plans to wrap its future around networking giant Novell, WordPerfect—so well known for word processing software that creates electronic documents—also announced a future in documents that are distributed and read electronically.

Like the competing Adobe Acrobat, Farallon’s Replica, and No Hands’ Common Ground, WordPerfect’s Envoy consists of a print-to-disk utility and a viewer. The viewer can be embedded in documents so that the recipient can open them without owning Envoy. The viewer also provides mark-up tools for commenting on documents; Envoy owners can later import comments into the original file. Envoy can embed TrueType fonts or try to match font metrics to fonts installed on the recipient’s system. For navigating inside Envoy documents, the person creating the document can include hypertext links and bookmarks, and the viewer provides text-

search capability and thumbnail views.

Envoy is not the product’s final name. It should ship in mid-1994 for $189, with no license charge to embed the viewer. WordPerfect, 801/225-5000.—D.L.
"A valuable tool that should be on the shelf of anyone who manipulates images on the Macintosh."

MacWEEK, January 24, 1994

Specular Collage lets you quickly combine high-res images, without using a lot of RAM. Each image is a separate object—even after it's been blended with others. Layout images with the convenience of rulers, guides, image grouping and layers. Enhance your composition with a rich selection of effects such as transparency, automatic drop shadows, feathering, and Photoshop filters. Anything you do in Collage can be changed at any time, giving you total creative freedom!

Design an infinite variety of textures for print, video, and multimedia. Design the exact texture you want, or one you've never imagined possible! TextureScape gives you the control to design detailed and rich textures, while freeing you to play with color, light, and motion. TextureScape's files take up little disk space (under 30K each), yet textures can be rendered at any size or resolution needed.

TextureScape can also morph between textures! Compose a QuickTime movie of a marble background morphing into your logo. Achieve astonishing effects for your next presentation, video, or multimedia project.

An unlimited collection of textures... for less than the cost of one CD-ROM.

CALL SPECULAR INTERNATIONAL AT 1-800-433-SPEC

Circle 41 on reader service card
TIME is NOT MONEY—NOT IF YOU DON'T keep track of it. Many professionals, from attorneys and architects to consultants and freelancers, bill by the hour. But too many of these folks rely on time-billing systems that are, shall we say, informal: notebooks with entries scrawled in the margins, slips of paper tossed in an envelope, guesses jotted down during the bus ride home. And every time these casual timekeepers forget to log a phone call or record a consultation, they lose money.

If you're in this group, you should know about software that helps you track—and charge for—your time. Time-billing software keeps a database of the work you do and provides accounting features for generating invoices and performing other functions. Some time-billing programs can link directly to an accounting system's receivables file; some even offer project-management and project-analysis capabilities that let you create charts and reports showing how you've allocated personnel to projects.

**How Time Billing Works**

At the core of a time-billing package is a database manager that stores each variable in the time-billing equation: the names of your clients, the services your company provides for them, the personnel who perform the work, and the rates you charge for each service.

To set up a time-billing program, you generally begin listing the kinds of services you render, along with the hourly rate you charge. All time-billing programs let you specify details, such as whether the activity is taxable, billable, or nonbillable, and they all provide a category for keeping track of such expenses as couriers and mileage. With some programs, including Timeslips Corporation's Timeslips III and LapTrack, you can specify a markup or discount on labor and expenses.

Another phase of the setup process involves pecking in the names and addresses of existing clients. If you've already entered this information elsewhere—for example, in a database or a contact-management program—there's a good chance you can import it into the time-billing package instead of retyping everything. Most programs can import tab- or comma-delimited text files (for details on importing and exporting database information, see *Working Smart*, December 1993).

You don't have to set up everything in a rigid order. All time-billing programs allow you to enter new clients and define new activities at any time. But it's a good idea to define a set of activities at the outset to ensure that you're naming them consistently. This is especially important if several employees will be sharing a time-billing database on a network.

You also need to specify how your company charges for work. In most companies, rates vary depending on three criteria: the employee (consulting with a senior partner might command a higher rate than working with a junior partner), the task (an architect might charge more for design work than for drafting), and the client (a big customer might get a discount). Overall, Timeslips III, Satori's Project Billing, and DesignSoft Time & Billing do a better job accommodating this three-dimensional billing grid than the competition. Brainchild's Shortlist doesn't even let you specify a different rate for each employee—not surprising, given this program's personal-information-manager orientation.

**Timing Is Everything**

The real fun begins after you've survived the initial setup and started tracking your time. You can manually enter data in batches—at lunchtime, at the end of the day, or whenever you get a moment. But unless you have an elephant's memory, the batch-entry method requires you to write everything down until your data entry session—and that's not much better than the notebook or shoebox method you're trying to replace.

If you work with a computer at hand, you can use the built-in timers that Timeslips III, LapTrack, Satori's Job Cost/Time Billing, and Project Billing provide. These timers work with the Mac's built-in clock to calculate the amount of time you spend at a task. You just notify the program when you start and stop.

In keeping with manual time-billing traditions, most programs call their time-tracking windows time slips. Generally, you create a time slip by selecting a client, specifying the activity to be performed (and, in an office, who's performing it), and noting whether or not it's a billable activity (see "Making a Time Slip"). You then enter the time data manually or activate the program's timer. All time-billing programs allow you to annotate time slips. 

---

**Article:** Working Smart

**Author:** Jim Heid

**Source:** *Macworld* July 1994

---

**Image:** Diagram of a time-billing system.
Making a Time Slip  In Timeslips III you record activities in the time-slip window. Note the charge being run up (next to the Slip Value field name). Clicking on the Mini View button shrinks the window to show the client, time, and current charges.

with comments that you can optionally include in invoices or reports.

If clients can see your screen as you work, you might not want to use a timer feature. Such timers display a running tally of how much a given activity is costing, and clients might not enjoy watching the charges mount as they sit at your desk. Only taxi drivers can get away with that sort of thing.

Reporting Results

Like database managers, time-billing programs provide features for locating time slips by various search criteria—who performed the work, the type of work performed, the client, and so on. You might use a search feature to determine who worked on a particular project on a given day, perhaps to follow up on a customer’s question or complaint. Or you might use it to determine how much nonbillable work was performed on a given job—perhaps to monitor an employee’s performance or to locate weak links in your company’s processes. Part of what makes a time-billing package valuable is how well its reports let you examine and analyze the information you’ve gathered.

Most often, the reports you create are invoices that summarize the work performed for clients and show the amounts due. If you already use accounting software, you can export the data to your accounts receivable module. Better still, Timeslips III users can turn to TAL (Timeslips Accounting Link), which ties Timeslips III into many popular accounting packages. Satori’s Job Cost/Time Billing meshes with Satori’s other Components products of accounting modules.

What other types of reports might you create? That depends on what you want to know. With employee-oriented reports, you see who is doing what for which clients—good for monitoring employee performance and determining who is available to take on a new project. You can apply multiple sorting levels when creating the report to look at each employee’s activities from different angles: time spent on specific tasks, on specific projects, and so on.

Client-oriented reports tally up the year-to-date or monthly billings for specific clients, show past-due amounts, and list activities performed for a client. Work-in-progress reports give you the up-to-the-minute status of accounts to help you make informed billing decisions.

Of the programs I looked at, Satori’s Job Cost/Time Billing has the best report-design features (for $1495, it had better). The package provides on-screen rulers and other layout tools for designing reports, as well as straightforward dialog boxes for specifying their contents. Reports can even contain charts of, say, billings by employee by month. The program comes with more than 25 canned report designs that appear in a menu for quick recall. The reporting features in Satori’s Legal Billing II and Project Billing are less comprehensive; overall, they lack the depth of Timeslips III and Job Cost/Time Billing. But both are good basic programs that need only about 300K of memory to run (Job Cost/Time Billing, by comparison, needs 1.4MB)—something to keep in mind if you’re using a PowerBook or an entry-level Mac.

Timeslips III also has strong reporting features, although its layout tools aren’t as polished. LapTrack’s reporting features are less complete, but they’re adequate for a program intended to be used on the road. LapTrack provides other features useful to road warriors, such as a telephone-dialing command that dials customers using the PowerBook’s internal modem. LapTrack can even begin logging time automatically when the dialing is complete.

Watching Your Windows

I’ve mentioned that time-billing packages let you make entries manually and also provide a stopwatchlike timer you can start and stop. But if the work for which you charge takes place on the Mac itself—for example, doing online research with a telecom program, or designing pages in a desktop publishing program—there are even easier ways to track your time. Coral Research’s TimeLog and ASD Software’s WindoWatch can watch over your shoulder and automatically record the amount of time you spend in various applications and documents. Both packages include

<table>
<thead>
<tr>
<th>MORE TIME-TRACKING BENEFITS</th>
</tr>
</thead>
</table>

Ease of tracking and charging for your time is reason enough to consider a time-billing package. But there are other benefits.

- By isolating billable and nonbillable time, you can find weak links in your business’s organization. For example, if you’re a graphic artist and often spend a nonbillable hour to drive across town to use a service bureau’s color printer, tallying up all those nonbillable hours might show that it makes more sense to buy your own printer.
- If you charge by the job instead of by the hour, you can still use a time-billing program to find out how much you’re making on each aspect of a job. By comparing reality against your estimated charges and costs, you can adjust future estimates.
- If you’re a department manager, a time-billing package can help you determine staffing requirements, by keeping track of how many jobs and how much work goes through your department. Large institutions can also use time-billing software for interdepartmental billing—for example, an in-house publishing department might track the time it spends on projects for the marketing, training, and personnel departments.

These examples show that a time-billing program can help you gauge your business’s efficiency. But don’t let yourself become a slave to such software. Anyone who has worked in a service business that charges by the hour knows that time slips can be fudged and finessed to cover up, say, an extra-long lunch break or an error that required work to be redone. Basing major staffing decisions solely on time-billing data ignores the way people actually work.

What’s more, employees may find it demoralizing to know that their activities are being monitored minute by minute. Nonetheless, it’s happening more and more in fields that rely on computers. For example, calls taken by directory-assistance operators are timed, and operators who don’t meet their quotas can expect to hear from their supervisors. I’d hate to see this kind of digital dogging make its way into the personal-computer world. Time may be money, but employees are people.
Bye Bye Bernoulli.  
See Ya SyQuest.  
Hello Pinnacle!

3.5" Magneto Optical Drive  
230 Megabyte  
3600 RPM

Some technologies come and go... but optical is here to stay.  
Say hello to Pinnacle's new Tahoe™ 230 Portable 3.5" Optical Hard Drive.

The Tahoe™ provides ISO interchangeability and removable storage with multiple media sources, while Bernoulli™ and SyQuest™ offer no standards support.

And there’s no doubt that over time optical storage costs less than magnetic storage.

It’s a perfect solution for both portable and desktop computing.

Thousands of graphic designers, pre-press facilities, multimedia creators and personal computer users are making the change to optical storage.  
So say hello to optical — and see ya later to magnetic technology.

For more information or to order call:  
800.553.7070

Pinnacle Micro
The Optical Storage Company

Optical Drive $999.00  
Travel Case & Battery Pack $199.00  
Optical Media $69.00
control panels that do the monitoring, as well as programs that let you create reports on window usage and configure the control panel to omit certain windows from the logging process. (After all, do you really need to know how much time you spend in the Finder?)

Coral Research also offers SlipMinder, a window-monitoring utility that uses Apple events to transfer window-use information into Timeslips III and LapTrack. This utility eliminates the need to manually invoke these programs' timers when tracking your time on the Mac.

The Apple events support in Timeslips III and LapTrack means you can create your own links to these programs with any application or utility program that also supports Apple events. For example, you might use CE Software’s QuickKeys to create a keyboard shortcut that automatically begins or ends a timing session. If you’re a consultant creating customized FileMaker Pro or Microsoft Excel templates, you might use Apple events to automatically retrieve a client’s time-slip data when you type the client name into a field or cell.

Finally, if you’re a QuarkXPress user and want to track only how long you work in that application, consider Trias Development’s Time Logger, a Quark XTen­
sion that records the time spent working on an XPress document. It’s available through the XTensions clearinghouse XChange (303/225-2484, 800/788-7557).

Watch Your Printer, Too
Window-watching utilities are also potentially useful for service bureaus, college computer centers, copy shops—any organization that rents Mac time by the hour. But such groups also need to keep track of who’s printing what on which printer so they can charge for the output. KansasBay Systems’ DeskTracy tracks network printer use and tallies up charges. You can even specify different per-page rates for different printers—for example, a low rate for black-and-white printing and a higher rate for color output—and establish discount rates for multipage jobs (see “Paying for Pages”). DeskTracy can also track Mac time, although it tracks only the total amount of time someone spends at a given machine—not the time spent in various applications or documents. The utility also provides security features that can lock folders to prevent anyone from copying, changing, or trash­
ing their contents. DeskTracy is a must-have for any organization that needs to control and charge for access to its printers but can’t afford to hire a security guard to watch over them.

KansasBay Systems is also working on DeskWatch, a time-billing application that will combine window-watching features with manual time logging. The program should be available by the time you read this.

WHERE TO BUY

Components Job Cost/Time Billing 1 $1495; Project Billing II 2.6 $295; Satori Software; 206/443-0765.
DeskTracy 2.3 one user $149, five users $495, ten users $695; DeskWatch 1.0 (price not set at press time); KansasBay Systems; 510/268-8100.
DesignSoft Time & Billing 1.87 $149.95; DesignSoft; 708/858-5363, 800/426-0265.
Shortlist 1.0.1 $99; Brainchild; 513/881-8451.
TimeLog 2.0 $149; SlipMinder 1.0 (less than $100—price not set at press time); Coral Research; 702/831-9346.
Time Logger 1.2 $59; Trias Development; available through XChange; 303/225-2484, 800/788-7557.
Timeslips for the Mac 2.1k one user $299.95; network edition, five users $699.95;
LapTrack for the Mac 1.0g $79.95; Timeslips Accounting Link 1.1 $79.95; Timeslips Corporation; 508/768-6100, 800/285-0999.
WindowWatch 1.55 one user $119, five users $449, ten users $749; ASD Software; 909/624-2594.
Missions don't get much more critical than this. Motorola is currently developing the IRIDIUM System, a massive cellular communications system involving a constellation of 66 satellites orbiting the earth. Equally critical is the massive amount of documentation required to get the IRIDIUM System off the ground. And naturally, Motorola selected the best tool for the job: FrameMaker. FrameMaker delivers exactly what Motorola needs for all their hardware and software documentation. The ability to easily integrate text, charts and graphics in long, structured formats. On-line document distribution with hypertext capabilities for fast and easy access to technical information. And multiplatform capabilities for file compatibility across the PCs, Macintoshes, and UNIX workstations on site, as well as remote access from systems all over the world. Now imagine what FrameMaker can do for your business. Call 1-800-U-4-FRAME Ext. 613 today for our comprehensive Guide To Document Publishing with FrameMaker 4. And see what FrameMaker can accomplish with your mission critical documents.
unless you speak in public on a regular basis or you’re a natural extrovert, the prospect of standing before an audience for half an hour can be daunting at best and sheer terror at worst. Your Mac can’t help you sleep soundly the night before you go on stage, but with good presentation software it can help you prepare for your talk. Whether you’re selling an idea to 5 midlevel managers at your company or addressing 500 colleagues in a convention hall, presentation software allows you to organize your thoughts and gives your audience something to look at besides your sweaty brow.

I tested four traditional presentation programs—CA-Cricket Presents III 1.0, Symantec’s More 3.1, Microsoft PowerPoint 3.0, and Aldus’s Persuasion 3.0—to see how they handle organizing slides, text, and graphics; creating charts; and giving on-screen presentations. I also looked at three programs designed for various kinds of graphics work but that include some presentation capabilities: chart animator what a presentation program can do for you is in order.

You typically begin by organizing your speech into an outline, which the program automatically converts into slides, apportioning one slide to each major outline topic and creating subtitles and bulleted lists from subtopics. The program can format text and add graphic embellishments based on templates that come with the package or that you create. If your presentation involves numerical information, you can create graphs. When you finish designing your presentation, you can produce overhead transparencies or 35mm slides, or show the presentation directly from a computer using a large-screen projection device. You may also want to print handouts for your audience.

The four traditional presentation programs—Presents III, More, PowerPoint, and Persuasion—offer basic functions to meet the above demands, but they vary dramatically in ease of use and flexibility.

SEVEN PROGRAMS THAT HELP YOU MAKE AN IMPACT

Astound 1.01 from Gold Disk, graph master DeltaGraph Pro 3.0.3 from DeltaPoint; and the new integrated-graphics entry ClarisImpact 1.0 (see “When Presenting Is Only Part of the Picture”).

How Presentation Software Helps
So few people make a career out of presenting, and so many of us are required to do it occasionally, that presentation programs must appeal primarily to an audience of casual users. If you’re a casual user yourself, a brief explanation of

Ease of Use  Because few of us use these programs regularly, we need some help slogging through the interface. Currently Persuasion is the easiest to use—it brings a new element of hand-holding to creating presentations. After you launch Persuasion and create a new document, the program automatically fashions a slide, complete with a dummy title, subtitle, and bulleted list, based on the default template design. As you click on the dummy text, Persuasion highlights it so you can immediately replace it.

Presentation Software That Delivers
But while Persuasion now leads the pack in ease of use, PowerPoint may best it before the year is out. Already available for Windows and scheduled to ship this summer for the Mac, PowerPoint 4.0 will include Excel-type “Wizards” to help you structure your speech and select and customize templates.

**Flexibility**  No one creates a presentation right the first time, so you need to be able to conveniently reorganize, reword, and redesign your slides. All four programs provide a master layer for creating and positioning repeating background elements such as logos and conference titles. All but More provide a thumbnail slide-sorter view for quickly changing the order of slides, and all but Presents allow you to adjust titles, subtitles, and bulleted items in your slides as easily as editing text in the outline view.

Presentation programs make it easy to change backgrounds, reformat text, and adjust the location of charts and other graphics by simply applying a new template. This gives you the option of experimenting with layouts and designs without committing yourself. You can also experiment with color schemes that affect all aspects of your presentation. One minute the background is black, the text is yellow, and the chart is green; apply a new color scheme and the background becomes navy, the text white, and the chart red. The colors in each scheme are designed to work in harmony, a real bonus if you’re in a hurry to slap together something attractive.

**CA-Cricket Presents III 1.0**

Despite a recent face-lift, Presents III lags considerably behind the competition. It lacks an integrated outliner; you create your outline using a separate utility, Portfolio Systems’ Dyno Notepad (which comes with Presents), and then import the outline, but you can’t edit and dynamically apply the changes to your slides. Templates are similarly crippled. You can apply a template to format an outline as you import the outline into Presents, but you can’t use a template to reformat text and reposition charts in an existing presentation.

At $129, Presents III lists for much less than More ($395), Persuasion ($495), or PowerPoint ($395). But inexpensive doesn’t mean easy. Presents III greets you with a blank, ten-page document when you start the program, a distinctly unfriendly sight for the uninitiated, and the program is rife with strange limitations—for example, you can’t create tables when working in a reduced view, you can’t cut and paste values inside the
# Quick Show of Hands: How Presentation Packages Compare

## TRADITIONAL PRESENTATION PROGRAMS

<table>
<thead>
<tr>
<th>General Company</th>
<th>Computer Associates International</th>
<th>Microsoft Corporation</th>
<th>Syntec Corporation</th>
<th>Aldus Corporation</th>
<th>Gold Disk</th>
<th>Claris Corporation</th>
<th>DeltaGraph Pro 3.0.3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phone</strong></td>
<td>516/342-5224</td>
<td>206/882-8080</td>
<td>408/253-9600</td>
<td>206/622-5500</td>
<td>408/982-0200</td>
<td>408/727-8237</td>
<td>408/648-4000</td>
</tr>
<tr>
<td><strong>Toll-free phone</strong></td>
<td>800/225-5224</td>
<td>800/426-9400</td>
<td>800/441-7234</td>
<td>0</td>
<td>800/982-9888</td>
<td>800/544-8554</td>
<td>800/446-6955</td>
</tr>
<tr>
<td><strong>List price</strong></td>
<td>$139</td>
<td>$395</td>
<td>$395</td>
<td>$495</td>
<td>$399</td>
<td>$399</td>
<td>$195</td>
</tr>
</tbody>
</table>

## Slide Construction

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Integrated outline</strong></td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Slide sorter</strong></td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Automatic templates with placeholders</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Multiple layouts per template</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Global color-scheme control</strong></td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Multiple color schemes per slide</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

## Publish and subscribet

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Publish and subscribe</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

## Import file formats

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Import file formats</strong></td>
<td>AFF, ASCII, EPS, MacPaint, PICT, QuickTime, Scrapbook, SND, SYLK</td>
<td>ASCII, EPS, MacPaint, PICT, QuickTime, TeachText, Word, WKS, Word</td>
<td>ASCII, EPS, MacPaint, PICT, QuickTime, TeachText, Word, WordPerfect, Scrapbook, SND</td>
<td>Acts, AIF, Works, ASCII, BMP, EPS, Excel, GIF, MacDraw, MacPaint, QuickTime, PICT, QuickTime, RTF, SYLK, TIFF, Trageze, WKS</td>
<td>ASCII, CGM, DIF, EPS, Excel, GIF, MacDraw, MacPaint, QuickTime, PICT, QuickTime, RTF, SYLK, TIFF, Trageze, WKS</td>
<td>ASCII, EPS, Illustrator, PICT, Scrapbook</td>
<td></td>
</tr>
</tbody>
</table>

## Export file formats

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Export file formats</strong></td>
<td>PICT, QuickTime, Scrapbook</td>
<td>RTF, Scrapbook</td>
<td>same as import formats</td>
<td>Acts, ASCII, More, PICT, Scrapbook</td>
<td>PICT, QuickTime</td>
<td>CGM, EPS, MacDraw, PICT</td>
<td></td>
</tr>
</tbody>
</table>

## Text and Graphics

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manual kerning</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Style sheets</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Search and replace</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Editable drop shadow</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Table editor</strong></td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Equation formatter</strong></td>
<td>○</td>
<td>●</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Number of drawing tools</strong></td>
<td>10</td>
<td>29</td>
<td>6</td>
<td>8</td>
<td>20</td>
<td>27</td>
<td>11</td>
</tr>
<tr>
<td><strong>Arrowhead editor</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Graphic rulers/graphic guides</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td><strong>Radial gradations/shape gradations</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

## Charting Capabilities

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Provides formulas</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Org-charts/flowcharts</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Time lines/calendars</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Pictographs</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Hi-low-open-close charts</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Histograms</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Polar charts/radar charts</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Contour map/3-D surface map</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Perspective spatial controls</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Fill chart elements with gradations</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Chart animation</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

## On-Screen Presentations

<table>
<thead>
<tr>
<th></th>
<th>CA-Cricket</th>
<th>Microsoft</th>
<th>More</th>
<th>Persuasion</th>
<th>Astound</th>
<th>ClarisImpact</th>
<th>DeltaGraph Pro</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On-Screen Presentations</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Mac/Windows run-time utilities</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Number of transition effects</strong></td>
<td>42</td>
<td>45</td>
<td>23</td>
<td>15</td>
<td>60</td>
<td>33</td>
<td>2</td>
</tr>
<tr>
<td><strong>Automated build function</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>Animation effects</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>QuickTime movies/sounds</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
<tr>
<td><strong>On-screen slide annotation</strong></td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>●</td>
<td>●</td>
<td>○</td>
<td>●</td>
</tr>
</tbody>
</table>

---

* = yes; ○ = no. ¹ Separate application. ² Linked OLE utility. ³ Select from dialog box. ⁴ Not all elements. ⁵ Saves as self-running application. ⁶ Flying bullets only.
Organizing Your Thoughts

PowerPoint's outline lets you sketch out the main points in your presentation and fill in the details. Every major headline translates to a new slide; lesser headlines become bulleted items. You can also promote and demote headlines and move entries between slides simply by dragging items to different locations.

Coordinated Colors

PowerPoint makes selecting attractive color schemes almost automatic. When you select a background color from the 50 available (left), PowerPoint makes only appropriate complementary colors available for text (middle), and then limits choices for other colors to appropriate palettes.

Swiveling Charts

Persuasion's charting module lets you create spectacular three-dimensional charts that you can rotate, zoom, and pan dynamically from a floating palette. You can also format text on the fly and move chart elements around by dragging.

Take Note

Persuasion's Player utility lets you annotate on-screen presentations using pencils, erasers, text tools, and an eight-color palette. You can save the markings with the file and edit them later.

More 3.1
Despite having gone for years without a significant upgrade, More 3.1 manages to keep up better than Presents III. More includes an integrated outliner—no surprise since outlining was originally More's primary function—and you can automatically reformat and reposition text and charts by switching templates (more on More's strengths as an outliner, see "Smart Thinking," Macworld, May 1994). When playing presentations on screen, More lets you create automated builds with each bulleted item appearing in sequence and with the transition effects of your choosing. You can also run More presentations on two screens—one for your audience that shows only the slides, and one for yourself that includes your speaker's notes.

Where More shows its age is in the charting department. More Graph is a separate utility with no live links to More, so editing charts is inconvenient. And More Graph can produce only the most rudimentary charts, including bars, lines, and pies.

More lacks other useful functions as well, such as a slide sorter and global color-scheme control. And while More is in need of an update, it is unlikely to get one. At press time, Symantec had no plans to release a PowerPC-native version of More or upgrade the current 680X0 version. So, while More is adequate in many respects, and certainly more capable than Presents III, there's no sense in investing in a program that lacks even a potential upgrade path.

Microsoft PowerPoint 3.0
PowerPoint 3.0 provides everything you expect from presentation software, including a built-in outliner (see "Organizing Your Thoughts"), automated templates, and a color-scheme function. PowerPoint goes a step further by walking intrepid users through the daunting process of designing custom color schemes. After you select a background color, PowerPoint suggests several complementary text colors (see "Coordinated Colors"). Based on the text color you select, the program suggests several palettes that go well with both background and text. With faith in Microsoft's designers, you can't go wrong.

Like More's, PowerPoint's graphing capabilities are segmented off into a separate utility, but they are linked via Object Linking and Embedding (OLE). This allows you to edit charts and dynamically update them in the slides. Furthermore, if you use Microsoft Word or Excel, you can establish hot links to text or data from these programs. It's one happy OLE family.

For displaying finished presentations on screen, PowerPoint takes the best from Presents III and More and throws in a few tricks of its own. Like Presents, PowerPoint plays QuickTime movies. Like More, PowerPoint lets you create automated builds. But PowerPoint goes a couple better, letting you specify the duration of transition effects and animate bullets by having them fly onto the screen. And if you like to doodle while you talk, you can annotate slides by actually drawing on them with the on-screen equivalent of a yellow highlighter.

Persuasion 3.0
Persuasion matches PowerPoint's current capabilities and goes a few steps further. Instead of applying one color scheme to a slide at a time, you can maintain several color schemes—for example, one for color display, a second for gray scale, and a third for black-and-white output. Better still, you can apply different fill patterns to every element on every slide in each mode, fine-tuning your handouts without sacrificing the vibrancy of your slides or on-screen effects.

Persuasion 3.0's charting capabilities have been completely revamped. Persuasion now includes a separate OLE-linked graphing utility that completely eclipses the competition. Most helpful is the preview system, which demonstrates what the chart will look like after you modify it with commands and options. The data sheet's support for formulas means you can perform calculations without resorting to a separate dialog box or calculator. And of any program in this article, Persuasion provides the best controls for editing charts. The spatial controls for editing 3-D charts are especially satisfying, enabling you to rotate, zoom, pan, and change perspective with immediate feedback (see "Swiveling Charts").

Persuasion offers the best on-screen options of any program except Astound. You can assign objects to different layers, which gives you great control over builds and other sequences as well as transitions and simple animation effects. This means you can fade text and graphics on screen in any order. Persuasion improves on PowerPoint's slide annotation by letting...
Not everyone needs a traditional presentation program, and some people have specific requirements that Persuasion and PowerPoint simply don’t address. Both programs, for example, lack chart-animation capabilities, scientific charts, and integrated graphics functions. These sorts of features are unnecessary for many people who give presentations, but if they’re on your list, other products might provide the capabilities you need.

**Astound 1.01** For presenting on a large-screen monitor or projection device, Astound is ideal. In addition to the usual stable of slide-production and basic charting options, Astound is packed with animation effects. Its templates can set up amazing animations of text and graphics without your so much as selecting an option.

While Astound’s charting is nowhere near as comprehensive as Persuasion’s, its chart-animation capabilities are superb. Columns grow out of the horizontal axis, pie wedges fan out into thick slices, and lines draw themselves up and down across the chart. For something even more interesting, experiment with Astound’s pictographs. The program includes several animated clip-art sequences for charts, including banners ascending a flagpole and glasses filling with water (see “Automatic Animation”).

**DeltaGraph Pro 3.0.3** Business types aren’t the only presenters on earth. Scientists, statisticians, and engineers also have to stand up and speak. And when they do, they’re frustrated by the lack of charting options in most presentation packages. Even Persuasion can’t match DeltaGraph Pro’s variety of chart types. OK, so it can’t animate your charts, but DeltaGraph Pro is alone in supplying Pareto-style histograms, triangular ternary charts, spider graphs, Japanese-style candlestick charts, and many others. And if you’re overwhelmed by the number of charts available, you can consult the new Chart Adviser, which makes suggestions based on parameters you select.

DeltaGraph Pro 3.0.3 provides many more presentation functions than its predecessor, including global color schemes and a built-in outliner, bringing it up to speed with PowerPoint 3.0 and even occasionally surpassing it. For example, DeltaGraph Pro is the only program besides Astound that lets you copy text and graphics by dragging and dropping them from one open window to another. But perhaps my favorite new DeltaGraph feature is its list price of $195—less than any other product in this article except Presents III, and worth every penny. Even though DeltaGraph Pro is primarily a graphing package, it earns my vote as the best presentation value on the Mac.

**ClarisImpact 1.0** The best way to describe ClarisImpact is as an integrated business-graphics package. Equal parts drawing, desktop publishing, and presentation program, Impact is designed to get new users in the door. To create an organization chart, for example, you simply click on or drag arrow icons to add assistants, subordinates, coworkers, and managers (see “Organize Your World”). ClarisImpact brings this straightforward approach to bear on flowcharts, time lines, and a calendar maker. Who doesn’t mention a date or two when making a presentation?

As a presentation program, ClarisImpact compares more favorably to Presents III than to Persuasion. Though it supplies the obligatory slide sorter and automated templates, it lacks an outliner, so you have to create your presentation one slide at a time. Also, you can’t change the color scheme for your presentation globally, except by introducing a new template, and ClarisImpact’s collection of templates is paltry.

Luckily, ClarisImpact’s array of general business-graphics capabilities and its straightforward creation options easily make up for some interface complexities. In fact, if I had to select a graphics program—with or without presentation features—to recommend to a nonartist, this would be the one.

you write with any color, not just yellow; supplying a variety of tools, including a text tool and eraser; and allowing you to save your annotations (see “Take Note”). Finally, you can create buttons that jump to specified slides in your document for use in self-running demos and electronic kiosks, or simply for making your own presentations more intuitive and flexible.

**Persuasion Wins**

Supplying the most features, the friendliest interface, and the best charting module, Persuasion is the clear champion among traditional presentation packages. PowerPoint ranks a close second, however, which brings up an interesting question: If you already own Microsoft Office—which includes PowerPoint—should you also purchase Persuasion? Or is PowerPoint sufficient? Much as I like Persuasion, the truth is that most folks will find PowerPoint more than satisfactory. And if you’re willing to wait, PowerPoint 4.0 promises to wow even Persuasion fans. For more on 4.0, see *At Work* news in this issue.

Contributing editor DEKE McCLELLAND has recently given presentations at the Photoshop Conference in San Francisco, at Macworld Expo in Tokyo, and at Photocomp in Miami.

**PRESENTATION SOFTWARE**

**PERSUASION 3.0** With its revamped interface, great slide control, vast charting capabilities, and on-screen multimedia options, Persuasion is the best overall. Company: Aldus Corporation. List price: $495.
MAYBE YOUR SLIDE HOUSE SHOULD GET A SMALLER PIECE OF THE PIE.

$20, 12 hours. 50¢, 4 minutes.

If you're paying rush charges for 35mm slides from a service bureau, you're paying too much. Even if you're not, you're still paying too much — unless you're using the Polaroid Digital Palette 35mm desktop slide printer. Slide for slide, it's the same quality but 10 to 40 times less expensive. And 10 to 100 times faster. Making the slides is as easy as pie, too — just a few mouseclicks with your computer. Give the Digital Palette slide printer a try. And give your slide house their just desserts.

For a free interactive demo diskette on this award-winning technology, call 1-800-662-8337, ext. 963.
When manipulating 24-bit color images on large-screen displays, the last thing you need is another delay. But even the most powerful Macintosh® suffers bottlenecks.

That's why Horizon 24 from RasterOps is your ticket to higher performance 24-bit color. Fast. Responsive. Driving high-resolution displays to the limit, Horizon 24 speeds up more graphics primitives than any other Macintosh accelerator, making it the fastest graphics card the state of technology allows.

Doing time in Photoshop?

Sporting twin AT&T 3210 digital signal processing chips, the RasterOps DSPro™ daughtercard makes Photoshop™ barely street legal. It runs through time-intensive filters like a trooper, assuring you of optimum performance in Photoshop.

So get out of the slow lane. Call 1-800-SAY-COLOR for more information or the location of a dealer near you.
Tips, Tricks, and Shortcuts

Quickmail lets you use Address books to simplify the addressing of messages, but QM Remote doesn’t automatically update your address books when you use it to send and receive messages by modem. If you need to send a message with QM Remote to someone whose address is not in your address book, have that person send you a message (which can even be blank). Then simply reply to that message, and QM Remote will fill in the correct address.

You can also use QM Remote to copy and paste addresses to your address books from memos you receive. Here’s how: Click the address area of a memo that contains one or more addresses you want to copy, bringing up the addressing dialog box. In that dialog box click the From List button to bring up a dialog box that lists the addressing history of the message (the originator of the message along with all the people who forwarded the message before it reached you). Select one or more of the listed addresses (shift-click or shift-drag to select multiple addresses) and click the Copy button. Dismiss the dialog box by clicking its OK button, and dismiss the addressing dialog box by clicking its Cancel button. Then choose Address Books (⌘-G) from the Mail menu, select the address book to which you want to add the copied addresses, click the Edit button to open the selected address book (or double-click it), and press ⌘-V to paste the copied addresses. Put away the address book by clicking its OK button, and dismiss the address-book-selection dialog box by clicking its Done button.

At any time, you can install an entire address book copied from a Mac that’s directly connected to the local network (for example, with LocalTalk, Ethernet, or Apple Remote Access) by dragging the copied address book file to your Address Books folder. The path to that folder is System Folder: Preferences: QuickMail Stuff: Address Books. You can, for example, copy an address book from a networked Mac to a floppy disk or have someone connected to the network envelope it with a QuickMail memo.

Updates

After reading my suggestions in February’s Quick Tips for graphing mathematical equations, several readers wrote to recommend additional applications. Gerald L. Gottlieb of Chicago uses KaleidaGraph ($155 direct; Synergy Software, 215/779-0522) and notes that DeltaGraph Pro ($129.95 direct; DeltaPoint, 408/648-4000, 800/446-6955) and Cricket Graph ($129 direct; Computer Associates International, 516/342-5224, 800/225-5224) would work too. He says they can plot almost any kind of function (DeltaGraph Pro even has some 3-D capabilities) and let you have fancy axes, grids, labels, and so on. Patrick J. Boyle of Sebastopol, California, finds that PSMathGraphsII ($79.95 direct; Mary Ann Software, 415/662-2486) provides the kind of control a mathematician or scientist needs for producing publication-quality mathematical art. PSMathGraphsII constructs graphs with Bézier curves rather than lots of tiny line segments (the method Wolfram Research’s Mathematica uses) and can output a PICT graphic with embedded PostScript (which you could paste into a word-processing document) or output a PostScript file (which a page-layout program or a PostScript draw program can import).

In response to my advice in April’s Quick Tips about connecting two Macs for file sharing, several people suggested using an ordinary serial printer cable (such as a StyleWriter or ImageWriter II cable) instead of network connectors and cable. When a tip in May 1992 recommended this kludge for connecting the Mac to a LaserWriter, one reader reported unreliable printing, and a dealer reported seeing several Macs with serial ports damaged by using serial cables for network connections. Therefore, I recommend spending the extra $30 or less that phone-type network connectors and cable cost. The last thing you need when sharing files is unreliable data transfer.

Power Mac Update Worries

Q. I have been reading about Macs with PowerPC chips and am pleased to know that most application programs can be used with the help of an on-board emulator until the software continues
The free Stars and Stripes extension (available from most online services and user groups) adds a Starburst tool to the QuarkXPress tool palette. Few people need to make starbursts often—there are only so many times you want to yell NEW! or FREE!—but Matthew Frederick of Phoenix discovered you can also use the Starburst tool to create perfect stars and polygons. You double-click the Starburst tool to access the Starburst Preferences dialog box, and change the settings in it as indicated here. While drawing with the Starburst tool, hold down the shift key to keep all sides and angles equal.

### Starburst Preferences
- Random spikes
- Spike depth 10%

#### Perfect Polygons

<table>
<thead>
<tr>
<th>Five-Pointed Star</th>
<th>Six-Pointed Star</th>
<th>Pentagon</th>
<th>Hexagon</th>
<th>Other Polygons</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 spikes, 62% spike depth, rotate result 18°</td>
<td>6 spikes, 42.5% spike depth, rotate result 30°</td>
<td>5 spikes, 19% spike depth, rotate result 18°</td>
<td>6 spikes, 13% spike depth, rotate result 0°</td>
<td>Same number of spikes as sides, select Reshape Polygon, delete inner starburst points</td>
</tr>
</tbody>
</table>

Kevin Farley
Holly Hill, Florida

**Power Switching**

**Q.** Is it safe to switch off a Macintosh Classic and an external hard drive from a power switch rather than the built-in switches?

**A.** You can safely turn off everything with a power strip’s switch after using the Finder’s Shut Down command, and most systems work fine if you turn off the power to all devices at once from the power strip. Some hard drive manufacturers recommend switching on the hard drive first and waiting 15 to 30 seconds so it’s ready when you switch on your Mac. However, with an internal hard drive, the drive is powered on at the same time as the Mac, a process that works fine. If your system does have trouble starting up when you turn on everything at once, then use the power-strip switch to turn on everything except the Mac, wait a few seconds, and then turn on the Mac.

It’s possible to use the power-on button at the top of your keyboard to switch on an entire system (not just the Mac) by plugging everything into a PowerKey device ($119 retail; Sophisticated Circuits, 206/485-7979, 800/769-3773). It works with most Macs that have an ADB port, including Classics, LCs, and other Macs that don’t ordinarily respond to the power-on button. The PowerKey does not work with 100-series PowerBooks.

Robert Schnitzer
Redondo Beach, California

**Changing Your Cover**

**TIP** The Fax Center program that comes with Global Village Communication modems is great for making new cover sheets, but it’s a pain when you have to correct or change the background graphics in an existing cover sheet. After modifying the graphics in a draw program and saving the result as a PICT file (easy enough), you must import that file as a new cover sheet, reposition all the cover-sheet fields (date, destination, fax number, memo, and so on) one by one, and change the fonts’ size, style (unless you like Chicago 12, the default for new cover sheets). You can use ResEdit to avoid that hassle.

First make your changes to the cover-sheet graphics with a draw program such as SuperPaint or Canvas, or the graphics module in ClarisWorks. (The folder path to the cover-sheet documents is System Folder : GlobalFax Documents : Cover Sheets.) In the draw program you can see and change the cover-sheet graphics but not the cover-sheet fields. If you move any graphic objects that act as field borders or field labels, you will probably have to adjust field positions later in the Fax Center program (not a big deal). Use the Save As command to save the modified cover sheet in PICT format with a new name, and then close it.

Next open the original, unmodified cover-sheet document in ResEdit. Choose Select All and then Copy from the Edit menu. Close the original document. Then use ResEdit to open the document.
Please complete reverse side

✔ YES! Please send me my FREE catalog today!

With Over 100 New Products!

Samples of FOCUS' Unbeatable Prices:

Lapis L•TV Portable $299.99
EtherLAN Print $279.99
TurboNet ST LocalTalk Connectors* $15.99
Ethernet Boards for all Macs from $74.99
Ethernet SCSI Connectivity Devices from $199.99
FaxModems, 14.4 and 24/96 from $85.99
SyQuest™ Removable Drives from $299.99
CD-ROM Drives $449.99

*Manufactured under patent license from Farallon Computing, Inc.

Quality Macintosh Products at Great Prices!
Our EtherLAN Family Keeps Growing.
(But Our Prices Keep Shrinking!)

Plug into On-Board Ethernet
FOCUS Enhancements transceivers allow you to use the on-board Apple Ethernet ports in high-end Macs and Apple printers (AUI port), so you can take advantage of Ethernet speed without the additional purchase of an Ethernet network interface card. Each model attaches in seconds to a thinnet backbone or versatile 10BaseT network for plug-and-play speed and convenience. The Trill/T, our 10BaseT transceiver, has one RJ-45 connector for standard twisted pair Ethernet connection, includes a FREE 6-foot 10BaseT patch cord.

Easy Expansion For Smaller Networks
The EtherLAN Hub6 offers the same outstanding features as the Hub16, in a streamlined case that's perfect for smaller networks, workgroups, or expansions. Only $219.99! Features include an extra RJ-45 crossover port for easy cascading of hubs. Like the Hub6, this convenient unit features auto-partitioning and auto-reconnect. Designed for easy, trouble-free use, it's simple to install, and requires no management software.

Convenience and Value, Times 16
Compare the new EtherLAN Hub16 to other Ethernet hubs - it gives you the best value around, with the features and quality your larger network needs. In one easy-to-use, self-contained unit, the Hub16 provides 16 10BaseT ports and one thinnet port. It offers auto-partitioning and auto-reconnect to bring a port back on line quickly once it's clear, and it requires no management software - just connect it and forget it! It installs quickly and easily in offices with an existing thinnet wall jack or BNC connection. Separate brackets are available for mounting on a standard 19-inch rack.

The Better Print Router
Easily bridge your LocalTalk LaserWriters to an Ethernet network. It works with any brand of LocalTalk-compatible network printer or other LocalTalk devices such as Macs. With a BNC connector for thinnet and RJ-45 for 10BaseT, you have the ultimate in network flexibility. Includes an easy-to-use security and management utility. For a limited time, get a FREE TurboNet to connect your LocalTalk thru to the EtherLAN Print. One free with any EtherLAN Print purchase. Choose the EtherLAN Print which supports two printers for $279.99 or the EtherLAN Print Plus which supports up to six LocalTalk devices for $399.99.

Over 30 Quality Ethernet Solutions To Choose From. Call FOCUS Enhancements!

To Order And Get Your Free Catalog:
800-538-4888

©1994 FOCUS Enhancements, Inc. All rights reserved. All FOCUS Enhancements products are registered trademarks of FOCUS Enhancements, Inc. All prices, items, and availability are subject to change. All product names are trademarks of their respective holders. All prices verified on April 11, 1994. TurboNet manufactured under license from Farallon Computing, Inc.
Invest a stamp

Save a bundle

For the price of a stamp, you can get the latest edition of the federal government's free Consumer Information Catalog listing more than 200 free or low-cost government publications on topics such as federal benefits, jobs, health, housing, education, cars, and much more. Our booklets will help you save money, make money, and spend it a little more wisely.

So stamp out ignorance, and write today for the latest free Catalog. Send your name and address to:

Consumer Information Center
Department SB
Pueblo, Colorado 81009

A public service of this publication and the Consumer Information Center of the U.S. General Services Administration.

Dynamic Graphing

You can create a Microsoft Excel 4.0 chart that dynamically changes as you select different lines in a spreadsheet, always graphing the currently selected line. Shane Devenshire of Walnut Creek, California, has devised a simple method that achieves this effect without macros or formula changes. The following steps illustrate this method with a sample table of product-sales figures.

1. Enter the column headings and data in a table (cells A1:D4) and copy the column headings to any available empty area (cells A11:D11). In the cell under the first copied heading, enter the formula =INDIRECT("a"&CELL("row")). Do not be alarmed if Excel displays a message that it cannot resolve circular references; they are a temporary artifact of this setup step. Copy this formula to the cells under the other headings (cells B12:D12). Change the a to b in the first copied formula (cell B12), to c in the second copied formula (cell C12), and so on.

2. Highlight the copied headings and the formulas (cells A11:D12), click the Chart Wizard button in the toolbar, drag in the spreadsheet to indicate where you want to embed your dynamic chart, and in the Chart Wizard dialog box, click the >> button to create a basic column chart. Alternatively, you can use the Next button in the Chart Wizard dialog box to select a custom chart format (like the one shown here).

3. To see the dynamic chart in action, select any cell in the original data table (in row 2, 3, or 4) and press = to calculate now. The chart changes to graph the data from the row in which you selected a cell.

This method demonstrates a little-known feature of the Cell function: omitting the second argument of the Cell function makes Excel use the currently selected cell. This method also illustrates calculating a cell reference and getting the cell's value with the Indirect function.

modified cover-sheet document, and choose Paste from the Edit menu. From ResEdit's File menu choose Get Info for your document, and in the dialog box that appears change the Creator item to GVCJ (capitalization matters here), thereby identifying the modified cover sheet as a Fax Center document. Save and close the document.

Finally, use the Fax Center program to open the modified cover sheet and adjust the positions of any fields whose labels you changed in the draw program.

Chris Stone
Yamanashi-ken, Japan

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to Quick Tips, Lon Poole, at the address listed in How to Contact Macworld at the front of the magazine (include your address and phone number). All published submissions become the property of Macworld. Due to the high volume of mail received, we're unable to provide personal responses.

The only statistics package you'll ever need.

"For Mac-based statistical analyses and presentations, choose SYSTAT."  
P. Wayner. BYTE, 1-92

The most comprehensive and powerful statistics software for Macintosh now provides the most advanced multivariate general linear hypothesis program. Yet it remains the easiest to use—with a friendlier-than-ever interface. New SYSTAT 5.2 for Macintosh enables you to perform statistical analyses you can't do with any other Macintosh statistics program. It offers more advanced statistical procedures, more types of graphs, and greater data management capabilities.

More statistics, from basics to the most sophisticated
A full range of univariate and multivariate statistics—including multidimensional scaling and nonlinear modeling.

Basics include descriptive statistics, t tests, correlations, autocorrelations, simple regression, and frequency tables. With a few clicks you can turn each statistic into a graph.

SYSTAT offers the most advanced multivariate general linear hypothesis program available for Macintosh. SYSTAT can estimate and test any univariate or multivariate model including:

- **REGRESSION**: simple linear, multiple linear, stepwise, polynomial, mixture, and weighted;
- **ANOVA** (analysis of variance): one-way, two-way, factorial, nested, unbalanced, post-hoc tests, mixed, repeated measures, split plot, multivariate, means model coding;
- **MULTIVARIATE**: discriminant analysis, principal components, canonical correlations.

Just point and click
SYSTAT is truly Mac-like. Just point and click: SYSTAT works with the pull-down menus, dialog boxes, icons, buttons and graphics tools you're accustomed to on the Mac.

The most graphics
No other statistical or graphics package can produce all the scientific and technical graphs available on SYSTAT—nor surpass its ease of use. And you can save SYSTAT graphics and data in QuickTime movie file formats. Graphics options include:

- linear, quadratic, step, spline, polynomial, LOWESS, exponential, and log smoothing
- confidence intervals and ellipses
- scatterplot matrices
- single, multiple, stacked, and range bar graphs
- single and grouped box plots
- stem-and-leaf diagrams
- histograms
- log and power scales
- maps with geographic projections
- Chernoff faces
- pie charts
- contour plots
- control charts
- 3-D data and function plots
- complete color spectrum

For more information, upgrades, and demo disks phone:

708-864-5670

Circle 29 on reader service card

Now, from the leader in network printing, comes an exceptional 8 ppm laser printer offering unmatched performance, high-resolution graphics and expandability. The new DEClaser™ 5100. Designed to handle anything with an all-star line-up of features. Like a RISC processor, graphical coprocessor and Digital's Intelligent Printing System to deliver the fastest first page in the industry. Standard 600 dpi, upgradeable to true 1200 dpi for superb image quality. Simultaneously active serial, bi-directional parallel and AppleTalk® ports, and a built-in network interface slot for multiprotocol Ethernet or Token Ring connectivity. Two PCMCIA Type II slots and a user-installable optional hard disk for additional fonts and forms. Plus EPA "Energy Star" compliance to save you energy and money. How can you get network printing's MVP on your team? Just call 1-800-777-4343 to order your DEClaser 5100 today, or for the name of your local reseller. Outside the U.S., contact your local Digital Sales Office.

DEClaser 5100 includes:
- 8 ppm, 600 dpi (1200 dpi optional)
- Adobe PostScript® L2 (73 fonts)
- PCL® 5E support (47 fonts)
- RISC and graphical processors

- Serial, parallel and AppleTalk hot ports
- EPA "Energy Star" compliant
- 2 PCMCIA Type II slots
- Optional Ethernet card
- Optional internal hard disk
NetWare Cachet for Power Mac Servers

APPLE'S NEW POWERPC-BASED SERVERS waltzed in this spring to the sweet music of promises that Novell's NetWare 4.X will someday run on the blazingly fast RISC-based servers. For the present, however, there is no server software that can take full advantage of the new PowerPC 601 processor used in the Workgroup Servers 6150, 8150, and 9150.

Based on the pizza-box-shaped Power Mac 6100/60, the Workgroup Server 6150 ($4200 to $5000) comes with AppleShare 4.0.2, an upgrade that runs on a PowerPC-based machine. Running the 60MHz PowerPC 601 chip, the WS 6150 comes with 8MB of RAM, with room for up to 72MB. It ships with a 256K RAM cache, a single PDS expansion slot (convertible to a short NuBus slot using Apple's $99 adapter), on-board Ethernet, a CD-ROM drive, a floppy drive, and one 500MB internal hard drive.

Both the Workgroup Server 8150 ($7500 to $10,000) and 9150 ($10,300 to $15,000) use the 80MHz PowerPC 601. Housed in the same squat case as its AWS 80 counterpart, the WS 8150 comes with 16MB of memory (expandable to 264MB), a 256K cache, three standard NuBus90 slots, on-board Ethernet, a CD-ROM drive, a floppy drive, a DAT drive, and a 1GB internal hard drive.

The WS 9150 comes in the improved, tower-style case of the AWS 95 and supports up to eight internal devices. It ships with two 1GB internal hard drives, a CD-ROM reader, a DAT drive, and a floppy drive, with room for three other half-height internal drives. Standard configuration includes 16MB of memory (expandable to 264MB), a 512K RAM cache card, four NuBus90 slots, plus one PDS slot. It also offers a SCSI-2 bus for attaching up to seven external drives. Unlike the AWS 95, however, the 9150 does not offer an accelerated SCSI bus and cannot run AppleShare Pro, the server software that depends on A/UX, which has not yet been adapted to run on the PowerPC chip.

Users of the 8150 and the 9150 will be able to buy NetWare or AppleShare separately. Since AppleShare 4.0.2 depends on elements of the Macintosh Operating System that haven't been converted to native PowerPC code, AppleShare can't now run any faster on PowerPC-based Mac servers than on 68040-based Macs. Apple would not say when native AppleShare would be available.

Novell plans to release NetWare for PowerPC by year's end, with a new Mac client capable of using NetWare 4.X's directory services, something the current Mac client can't do. However, the client will still use AppleTalk (rather than IPX) to access a server that is based on AppleShare Filing Protocol and runs within NetWare for file and print services, meaning that initially Mac clients won't benefit much from the hardware's speed. Novell says subsequent versions will gradually add more access to native NetWare protocols so that Macs get faster, more fully functional access to NetWare servers of all types. (Ironically, Windows, DOS, and Unix NetWare clients will immediately reap the speed benefits if they connect to Mac servers running NetWare for PowerPC.)

Although counting on NetWare to serve as its high-end server software, Apple will continue to develop AppleShare for small and medium-size, mostly Macintosh networks. For the few Intel-based machines in these setups, Apple has reassumed from Farallon Computing the development of an AppleShare client for DOS and Windows.
The WS 8150 and 9150 ship with software that allows users to create RAID Levels 0 and 1 (striping and mirroring). They also include Dantz Development's native PowerPC Retrospect Remote server software and licenses for three clients.

Apple will ship PowerPC upgrades for the AWS 60 ($1259), AWS 80 ($1899), and Quadra 900 or 950 ($2499). Apple, 408/996-1010; Novell, 801/429-5900, 800/638-9273.—MARGIE WYLIE

### AppleShare 4's Secret

**HOW WOULD YOU LIKE TO RUN**

speedy AppleShare 4.0 for the $699 cost of upgrading the software—without the additional cost of a Quadra?

Using a ResEdit fix to bypass the software's test for an 68040-based processor, users have found that AppleShare 4.0 runs just fine on the Mac IIx and IICI machines they already own, allowing them to boost server speed without allocating a Quadra.

Apple admits that there's nothing inherent in AppleShare 4.0 that limits it to running on Quadras. The company says it made a "marketing decision" to artificially limit the server software to 68040-based Quadra hardware for a number of reasons. According to producer manager Gary Sehare, even with AppleShare 4.0's extensive caching systems, it outperforms AppleShare 3.X by a mere 10 to 20 percent running on a 68030. The software operates 200 to 300 percent faster than 3.X when running on an 040, Sehare claims. A user who has been running AppleShare 4.0 on a Mac IIx for six months, however, claims that in a side-by-side comparison, AppleShare 4.0 reads and writes at about 70 percent the speed of the same software running on a Quadra 700. Subjectively, network users reported that navigating the server's files and folders with 4.0 on a Mac IIx seems nearly as fast as on a Quadra 700.

Apple says that testing and tailoring 4.0 for a single Mac processor cut down on development costs and time to market. The company says it is only looking out for the best interest of its customers who need to start migrating to Quadras so that they can then upgrade to PowerPC. Besides this gentle persuasion, Apple holds a trump card: if you patch AppleShare 4.0 so it runs on a lesser processor, Apple refuses to support the patched software.

### The Patch

Making the following modifications to AppleShare 4.0 or 4.0.1 will allow you to run the server software on a Mac IIx or IICI. Technically, these steps do not modify the AppleShare code itself, only the parameters used to check if Apple allows the code to run on the machine. (The fix changes the required minimum processor from a 68040 to a 68020.)

You can modify an installed server; modify a new server after installation and then apply AppleShare TuneUp 4.0.1 before launching AppleShare Admin.

1. Open a copy of the AppleShare File Server extension with ResEdit; keep the original extension in a separate folder. (You should never change your original AppleShare 4.0.)
2. While pressing the option key, open the GNRL ID #259 resource.
3. Change the initial 0005 to 0003.
4. Save and close the AppleShare File Server extension.
5. Open a copy of the AppleShare Admin application. Then modify the GNRL ID #256 resource, as in steps 2, 3, and 4.
6. Open a copy of the AppleShare Print Server application. Then modify the GNRL ID #356 resource, as in steps 2, 3, and 4.
7. Restart the server.

For more information, see the AppleShare 4.0 manual. Macworld Lab tested this patch using AppleShare 4.0.1 on a Mac IIx. We don't recommend using this patch to run AppleShare 4.0 on any pre-IICI machines.

—MARGIE WYLIE and MATT CLARK

### Streamlined ARA Servers

**DAYNA COMMUNICATIONS AND** Shiva Corporation have both announced Apple Remote Access servers that promise to do away with external modems, power supplies, and extra cabling. Both servers are ARA 2.0-compatible but not yet compliant with that version, meaning users can't access any new 2.0 features (see Network news, Macworld, June 1994). Both also include thick and thin coax and 10BaseT connectors.

Dayna's DaynaLink (under $3000) features eight PCMCIA Type II slots into which you can plug just about any third-party PCMCIA modem. When it ships at the end of June, the DaynaLink will support only AppleTalk, but IPX and TCP/IP support are in the works.

Shiva's LanRover/Plus ARA server ($4299 to $8499), based on the LanRover/E design, includes eight slots that can be filled with either modems or cards that provide standard serial ports for external modems or high-speed communications links.

Shiva's server supports multiple protocols, including AppleTalk, IPX, TCP/IP, and NetBEUI; it is SNMP-manageable; and allows users to dial out through the LanRover/Plus as if it were a NetDedem.

Dayna Communications, 801/269-7200, 800/511-0600; Shiva, 617/270-8300, 800/458-3550.—CAMERON CROTTY

---

**The Shiva LanRover/Plus ARA server supports many protocols.**

---

**IN BRIEF**

- **DataClub's Demise** Novell has discontinued the Mac-based virtual-server networking software it acquired from International Business Systems. Owners of some DataClub versions can trade up to NetWare server software or AppleShare 4.0. Novell, 510/976-4491, 800/639-9273; Apple, 408/996-1010, 800/767-2775.

- **DaVinci Upgrade** DaVinci Systems has finally released its fully functional Macintosh product. Based on the NetWare Message Handling Service (MHS), DaVinci eMail for the Macintosh v2.5 ($595) fully interoperates with and offers the same functionality as the company's DOS and Windows E-mail. 919/881-4320.

- **Security Net** Network Security Guard 2.0.1 from MR Mac Software scans AppleTalk networks and compiles reports detailing shared files, folders, and volumes. It also points out risky behavior, such as guest access to an entire hard disk or an application; scans for specific file names, and runs schedule unattended scans. Three-, ten-, and unlimited-zone versions cost $89, $169, and $210, respectively. MR Mac Software, 619/453-2645, 800/566-7622.
Protocol analyzers help you identify trouble on the LAN

BY JOEL SNYDER

Your clients are complaining and sound increasingly frustrated. Some of the servers on the network you manage seem to play hide-and-seek whenever a user looks for them in the Chooser. You realize that the problem must be a recalcitrant root server screwing up your AppleTalk zones. But which root server?

Every LAN manager needs a protocol analyzer to help solve this kind of network anomaly. A protocol analyzer can capture all the packets on a network (even those addressed to another station), store the packets in a buffer, and decode the network-protocol information to show what's happening on a network. When a network is running fine, an analyzer can check network usage levels, but the most common reason to buy an analyzer is to help track down network problems.

The most popular protocol analyzers run on MS-DOS laptops, cost a ton of money, and have poor user interfaces. If you've put off spending hard-earned money for that, rest easy: you can now get a top-quality analyzer—plus the PowerBook to run it on—for about $3500. I tested Cabletron Systems' MacLanview, Neon Software's NetMinder series (NetMinder Ethernet and NetMinder LocalTalk), and AG Group's Peek series (EtherPeek, LocalPeek, and TokenPeek). The results were encouraging. Mac network managers can now choose from several easy-to-use, versatile products that are powerful enough to help solve real-world network problems.

Protocol analysis is a three-step process. First, you decide which traffic you need to look at. Next, you capture the traffic with the protocol analyzer. Third, you examine the captured frames to see what the problem is. (Ideally, you should be able to capture everything and then whittle down from there. Both NetMinder Ethernet and EtherPeek let you do this by filtering frames after capturing them; MacLanview doesn't.)

To test these analyzers, I set up a network with a mixture of protocols, including AppleTalk, TCP/IP, DECnet, Novell's IPX, and Open Systems Interconnection (OSI). I tested the Ethernet versions of the product, though everything that applies to Ethernet also applies to LocalTalk versions.

To see how the software behaves in a portable environment, I tried three PowerBooks: a 100, a 145, and a 160. Connecting a PowerBook to Ethernet requires an external SCSI-to-Ethernet adapter. I used the Asante Mini EN/SC, a top performer (see "The SCSI-to-Ethernet Connection," Macworld, January 1994), to test NetMinder Ethernet and EtherPeek; I used the Cabletron EA412 SCSI-Ethernet adapter to test MacLanview. For a desktop Macintosh, I used a Quadra 800 with a Cabletron E6100 DNI Ethernet card in it. (Cabletron only supports MacLanview on a Cabletron Ethernet adapter.)

If you plan to run these analyzers on your desktop Mac, install an Ethernet card for the analyzer's exclusive use.
Because the analyzers intercept all network traffic, anything else (such as AppleTalk or TCP/IP) using your normal Ethernet interface will be disconnected. I saw many crashes when trying to switch between protocol-analyzer mode and normal Macintosh mode on the same interface (something the software manufacturers specifically discourage).

All three packages performed adequately well. On the Quadra 800 with an Ethernet loaded to 6MB per second, the packages caught most everything. The PowerBook 100 lost packets as loads went above 0.5 MBps; on the PowerBook 145, loads above 1.2 MBps showed packet loss; and at 1.5 MBps the PowerBook 160 locked up. For serious protocol analysis, faster PowerBooks are better.

Capturing Network Packets

Capturing traffic with any of the three packages is simple: click on the Start button, and away they go. A main window gives brief information on each frame, scrolling as frames are captured. The analyzers also display statistics during capture, such as the type of frames, the network bandwidth used, and what nodes are sending and receiving traffic.

On a 21-inch screen, MacLanview and EtherPeek offer the most flexibility. Both allow you to resize windows to show more or less information. EtherPeek and NetMinder Ethernet also color packets, turning an Ethernet frame-trace into a Technicolor display. On a PowerBook, MacLanview and NetMinder Ethernet win points for cramming the most information into the smallest space. That feature becomes a detriment, though, when you have lots of screen real estate, since it circumscribes the amount of information that you can display.

On a multiprotocol Ethernet, capturing just the frames you're looking for can be difficult. Busy Ethernets create another problem: I filled up a 16MB buffer in less than a minute with 40,000 medium-size frames. So it's important to be able to capture and store the lot of data that you can sift through later.

To see how efficiently the packages use memory, I gave each application 2MB of memory and then collected the same data stream with each. All three held about 11,000 short frames. If you have more disk space than memory, EtherPeek

Network Mysteries

has a valuable feature that lets you automatically store accumulated frames on disk and continue capturing. NetMinder Ethernet won't do that, but it will maintain a sliding window, throwing out old frames to hold new ones. MacLanview came in last in this area. When its buffer is full, it's full, and that's all there is to it.

To overcome this limitation, all three packages offer triggers and filters. Triggers start capturing frames when a specific event has occurred, such as when a particular type of packet goes ("next time the Jan router sends an RTMP update packet, start capturing") or at a specific time ("start capturing at 1:17 a.m."). Each package has ample trigger capabilities.

Filters tell the protocol analyzer which frames to keep and which to discard. Setting up filters in MacLanview can be very difficult. Filters based on station address or frame type are a few clicks away. A filter based on higher-level protocol information, such as filtering out all AppleTalk printer traffic, is almost impossible to get right. EtherPeek improves on MacLanview by including hundreds of sample filters. Starting with a sample similar to what I wanted, it took only a trivial effort to make the perfect filter. NetMinder Ethernet lets you build most filters with a minimum knowledge of protocol internals. The downside of a simpler interface is that some operations that are possible in EtherPeek (such as matching multiple fields in the same filter) just can't be done in NetMinder Ethernet.

MacLanview supports up to six filters active at any time. NetMinder Ethernet allows only five. EtherPeek has effectively no limit on the number of filters that can be active at any one time. The number of filters you need depends on the complexity of your task. A serious network problem can require more than five

filters, but network managers responsible for only a few protocols will not find a five-filter limitation onerous.

It was when I was creating filters that I first had to break into the documentation. MacLanview's documentation has the best layout, making it easy to find information. MacLanview and NetMinder Ethernet include tutorial information on analyzing Ethernets, something EtherPeek leaves out. With all the packages, though, it was often simpler to try something and see how it worked than to
Analyzing Protocol Analyzers

| Protocol Analyzers | AG Group               | Neon Software          | Cabeltron Systems
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethernet product/ price</td>
<td>EtherPeek 2.0.3/$795</td>
<td>NetMinder Ethernet 3.01/$595</td>
<td>MacLanview 2.00.02/$1495</td>
</tr>
<tr>
<td>LocalTalk product/ price</td>
<td>LocalTalk 2.0.3/$495</td>
<td>NetMinder LocalTalk 1.1.1/$395</td>
<td>*</td>
</tr>
<tr>
<td>Token Ring product/ price</td>
<td>TokenRing 2.0.3/$595</td>
<td>NA</td>
<td>*</td>
</tr>
<tr>
<td>FDDI</td>
<td>NA</td>
<td>NA</td>
<td>**</td>
</tr>
<tr>
<td>Phone</td>
<td>510/937-7900</td>
<td>510/283-9771</td>
<td>603/332-9400</td>
</tr>
<tr>
<td>Toll-free phone</td>
<td>800/466-2447</td>
<td>800/334-6366</td>
<td>none</td>
</tr>
<tr>
<td>Protocols decoded</td>
<td>AppleTalk, TCP/IP, XNS, DECnet, LAT, NetWare's IPX, Banyan VINES, SNA, ISO NL &amp; TL, SMB, NetBEUI, NetBIOS, OSI</td>
<td>802.2, 802.3, AppleTalk, TCP/IP, XNS, DECnet, LAT, NetWare's IPX, Bridge/3Com, Banyan VINES, ISO NL &amp; TL, NetBIOS, SMB, Cabletron</td>
<td>*</td>
</tr>
<tr>
<td>Statistics and graphs</td>
<td>built-in</td>
<td>built-in and via Excel</td>
<td>built-in</td>
</tr>
<tr>
<td>Trigger basis</td>
<td>filter or absolute time</td>
<td>filter, relative time, absolute time, traffic, or error level</td>
<td>filter</td>
</tr>
<tr>
<td>Alarms</td>
<td>new node, new protocol, threshold (high), network intruder</td>
<td>various, included in packet inference</td>
<td>new node, threshold (high/low), network errors, network intruder</td>
</tr>
<tr>
<td>Capture buffer options</td>
<td>clear buffer and continue; save to disk and continue</td>
<td>stop when full; clear oldest packets and continue</td>
<td>stop when full; clear buffer and continue</td>
</tr>
</tbody>
</table>

NA = not available. * Included in MacLanview package. ** Product should be available by September 1994.

puzzle through confusing manuals.

Only NetMinder Ethernet comes with online help, as a combination of balloon help, a liberal assortment of help buttons, and some protocol tutorial information (available through an Explain button) that could be helpful to novice users.

From Capturing to Decoding

Once I captured a buffer full of frames, I broke up and deciphered what they meant to the health of the network—a procedure called decoding. In this tricky process, a protocol analyzer can really make your life easy. All three packages claim to decode a wide variety of protocols; the difference is in the details.

MacLanview’s decodes always appear in its main window, as tightly summarized information. This summarized data is good for a quick look at your network, but most problems require more data than MacLanview provides. Double-click on a particular Ethernet frame, and you get a window showing the raw frame data—in other words, the actual contents of the packet. (That’s what makes protocol analyzers dangerous in the hands of hackers or snoops, who can capture E-mail, passwords, or other sensitive data.) Conversely, EtherPeek and NetMinder Ethernet decode protocol frames on command: double-click on a frame, and up comes a decode window showing each field inside the frame for each level of protocol.

EtherPeek has the most versatile decoding capabilities, offering multiple decoders for many different packet types. NetMinder Ethernet also did an excellent job, figuring out almost all the packets I threw at it. For these two products, your main concern is to make sure that the protocols on your LAN are included in the product you buy (see "Analyzing Protocol Analyzers"). Serious network managers should also get a good protocol reference book, such as Matthew Nagle’s Network Protocol Handbook ($49.50, McGraw-Hill, 1994). MacLanview’s decodes were almost useless above the network layer. It took 40 minutes with detailed protocol specifications to figure out what was instantly revealed in EtherPeek and NetMinder Ethernet.

Pick the Right Features

To choose the appropriate product, look at features and case of use. My favorite is AG Group’s EtherPeek. I was impressed with its powerful filtering capabilities, which let me grab the packets I needed more easily than did NetMinder Ethernet or MacLanview. Experienced network programmers or managers will find this a quality tool.

For novice managers, Neon Software’s NetMinder Ethernet may be the best choice. Its new Packet Inference feature helps detect potential protocol errors and network problems, such as new nodes, routing misconfigurations, excessive error rates, and unreachable systems. Packet Inference, combined with NetMinder Ethernet’s online help can guide beginners through the complex world of protocol analysis. Cabletron’s MacLanview comes in third. Its PowerBook-friendly display and trimmed-down interface are strong features, but the difficulty of filtering packets is something that Cabletron has to work on.

JOEL SNYDER is senior analyst with Opus One, a consulting firm in Tucson, Arizona. He specializes in networks and the international aspects of information technology.
Networking Macs With Built-In Ethernet Is Now A Small Matter.


When buying Power Macs and other computers with built-in Ethernet, don’t overlook one small thing. The hot new EasyNet™ transceivers from Dayna. These clever little connectors are the easiest and most affordable way to connect devices with an on-board Apple Ethernet port to either thin Ethernet or 10BASE-T networks.

They’re ideal for Power Macs, Quadras, LaserWriters and other Apple products with built-in Ethernet, as well as non-Apple devices that use the same mini-Ethernet port.

FAX Response: 801-269-7340, Doc.#1250

Part Of Our Complete Solution.

EasyNet transceivers are the smallest addition to Dayna’s large family of Ethernet products. Our full line of adapters and SCSI connectors support all Macintosh models and all Ethernet cable types.

Getting Power Macs connected to Ethernet is no big deal. In fact, with Dayna, it’s a very small matter indeed.

For more information on Dayna’s Ethernet networking products, call 1-800-443-2962, ext. 831, or use our 24-hour FAX response service.
Okay, so what's on your Xircom Pocket EtherTalk Adapter?

Jill Byron
Account Executive

My PowerBook, which I take everywhere.
My LAN which I can finally get on!
Access to all the network applications that don't fit on my PowerBook.
E-mail thanking Sean for my Xircom Pocket EtherTalk Adapter.
My Syquest and CD ROM drives daisy-chained on my SCSI port.
Phantom Power cable so I never have to worry about packing an AC adapter.
The same dependable Xircom brand name as all the PC notebook users have on their LAN adapters.
My calendar appointments from the server.
Xircom's phone number in case someone asks for a recommendation.
A lifetime warranty and upgrade policy.

Sean Scullion
MIS Director

The Xircom name.
Xircom guaranteed compatibility.
Choice of 10Base-T or thin Ethernet via the SCSI port.
10Mbps Ethernet vs. AppleTalk's 230 Kbps access to all my file servers.
Special pass-through SCSI feature for Syquests, CD ROMS and other peripherals for my PowerBook users.
Phantom Power cable that draws from the Apple Desktop Bus so I don't get hassled about AC adapters.
Reversible SCSI cable so both my Powerbook and Macintosh desktop users can use it.
30-day free product evaluation and 37% discount when I purchase the evaluation unit.
Lifetime warranty and upgrade policy.
All my PowerBook users.

For more information on the Xircom Pocket EtherTalk™ Adapter, call 1-800-438-4526 ext. 31R.
WITH ITS NEW POWERBOOKS, APPLE HAS at last begun shipping a full complement of software tailored to portable computing. Out of the software listed in "PowerBooks: The Next Generation," in this issue, every PowerBook owner should at least have Apple's PowerBook control panel 7.2. Many will also find Apple's Control Strip and File Assistant appealing. File Assistant is sold by Apple for about $65; at press time, Apple had not announced how PowerBook owners could get the PowerBook control panel and Control Strip.

There are many other ways to handle the host of little functions that can enhance and/or simplify PowerBook operations. For example, you can buy one of the big commercial utility packages, such as Connectix PowerBook Utilities. Here, though, I focus on Apple's software and on free and low-priced shareware utilities.

**Power Management**

The PowerBook control panel 7.2 (which first shipped with the Duo 250 and 270c) still has a single slider for power management, with the Better Conservation setting at one end and Better Performance at the other. That was the only control in version 7.1; but if you switch to the Custom setting in 7.2, you can individually set time delays for sleep, hard drive spin-down, and screen backlighting. You can also override Apple's default settings for battery and AC power.

Apple's new Control Strip gives you fairly quick access to the PowerBook control panel and other power-management features (see "Take Control" in "PowerBooks: The Next Generation" in this issue). However, Control Strip has some potential problems. It uses up screen real estate—its floating window cannot be covered up by application windows. Although you can collapse the strip to a short stub, even the stub can get in the way. Second, Control Strip's default location in the lower left corner of the screen is not ideal, since many programs use that area to display information. So to keep the strip away from active windows, I usually put it in either the upper or lower right corner, near the disk icon or the Trash Can (hold down the option key and drag the strip).

To use Control Strip to spin down the hard drive or put the PowerBook to sleep, you must open the strip, select an icon, and set the switch. Keyboard commands are much faster. The Toolbox in Apple File Assistant gives you function keys for hard drive spin-down (shift-control-#-0) or sleep (shift-#-0).

Several shareware and freeware programs also give you keyboard controls. Jon Pugh's ToggleAT Fkey 3.0 (pay whatever you want) switches AppleTalk—if it's loaded—on or off. PowerSleep Fkey 1.0 (free; by Urs Calibran, Stefan Frey, and Alexis Gehrt) invokes sleep, first turning off AppleTalk if necessary. Bill Steinberg's SpinD 1.0 (free) spins down the hard drive.

Many programs, including Control Strip, display battery status with a gauge; some estimate the time remaining. But unless you have a new 500-series PowerBook with "intelligent" batteries, such a display offers little more information than does the simple battery control panel included with every PowerBook.

Some gauge programs do offer special features. Volts 1.3.1, a $5 application by Lawrence Anthony, gives you the option of graphing voltage levels over time, in a choice of three formats.

Three shareware programs by Jeremy Kezer deal with battery power; all offer additional features when you register and receive your password. MyBattery 2.2.2 ($10) shows the voltage levels for three different batteries, and it lets you switch AppleTalk and your modem on and off. Threshold 1.0.2 ($10) resets the voltages for first and second low-power warnings and for final shutdown as you run out of battery power. You can reset the threshold for an external battery, or—if you have a PowerBook 140 or 170 and the new type of higher-capacity internal battery—you can get a little more battery life by setting a lower threshold. DeepDischarge 1.0.2 ($5) runs the battery down to prepare for recharging; it works like an external conditioner except that it doesn't start recharging automatically— you have to do it manually.
Plug Alert 1.0.1 (free) by Sean Hummel puts very clear warnings on screen if the AC adapter isn’t getting power or if its plug has slipped out.

**Keyboard Utilities**

No PowerBook keyboard has the full set of keys found on an Apple Extended Keyboard. Even the new 500-series PowerBook keyboards include just 12 of the 21 function keys (F1 through F12), and none of the 18 keypad keys. Several programs remap the F-keys onto PowerBook keyboards, mostly by using the control key in combination with another key. The most complete F-key program—better than any commercial program—is Keyboard Plus 1.1.1, a $15 shareware control panel by Berrie Kremers. It maps all keypad and function keys and it also supports compound keys (option-F1, for example).

Many PowerBook users frequently hit the caps lock key by accident. Apple’s Caps Lock extension shows the caps lock status in the menu bar—but you’ll see it only if you are looking for it. On the other hand, Ed Ludwig’s Caps Lock Notify (free) puts a prominent notification on screen each time you hit the key. Other programs, including S. Kevin Hester’s free CapsControl 1.02, simply disable the caps lock key altogether.

**Screen and Sound Utilities**

Backlight Control 1.0a3, a free control panel by Ricardo Batista, conserves power by turning off the backlight after a specified period of inactivity. (You don’t need this if you have PowerBook control panel 7.2.)

The Fat Cursors 1.1 control panel ($5) by Robert Abatecola enlarges the arrow and the I-beam cursor, improving visibility on a passive matrix screen. The Find Cursor 1.0 extension (free) by Mike Samuels puts a box around the cursor if you hold down the control key and click the mouse or trackball button. These programs work well together.

Two programs simplify changing the screen bit-depth (number of grays or colors) and the sound level. Ambrosia Software’s ColorSwitch 2.3.0 ($10) adds an icon to the menu bar for changing the volume level and bit depth without leaving your application. Grant Dair’s free Fast Switches 1.0.0 includes six bit-depth switches and eight volume switches that set to volume levels 0 through 8. Typically, you need only two or three of the switches; simply run the application for the screen depth and volume level you want. But you have to leave your current application to run Fast Switches.

An annoying sound problem of PowerBooks results from one of their power-saving techniques: after about ten seconds of inactivity the sound circuit shuts down. When the sound circuit turns back on, you hear a click. Shhh! (no version number) by Patrick C. Beard, a free extension, patches the Sound Manager to prevent the sound circuit from shutting down—at a very slight cost in battery life—thus avoiding the click.

**System Utilities**

Insomniac 1.0.2 ($10) from Jeremy Kezer sets as many as 50 scheduled times at which a PowerBook will wake up. It works with the PowerBook 100, the Duos, and the new 500 series. For example, you can set a Duo to send electronic mail or a fax when phone rates are lowest, or when the receiving fax device is least likely to be in use. Insomniac does not shut down the computer.

How can you shut down the computer automatically, whether you have a Duo that has woken up for an online session, or you just have a PowerBook with a task to finish while you want to go somewhere else? You simply set your PowerBook to go to sleep after a delay; just make sure that none of the many functions that inhibit sleep (AppleTalk turned on, for example) are in effect.

PwrSwitcher 1.1.2, David Lamkins’s free control panel, uses the escape key to switch between active applications, saving you a trip to a window or to the application icons in the menu bar. SoftwareFPU 2.45, a $10 control panel from John Neil, enables a PowerBook without a floating-point unit to run software that expects one. The program improves software compatibility but does not speed up math computation. It does not run on 68000-based Macs such as the PowerBook 100, but it works with the new 040 PowerBooks.

The Duo has a split personality; it’s both a lightweight portable and a desktop computer with a dock. The system configuration you need probably depends on whether you are using a Duo alone or with a dock. Alan Sterenberg’s free Duo Extension Picker 1.0 checks the hardware during start-up and loads the proper extensions, depending on how you’re using the Duo. For users of multiple docks, Steve Martin’s $15 Dockernaut 1.4.2 remembers the color-depth capability of each dock and sets the Duo accordingly. It also lets you create multiple preference files for several popular programs (including Microsoft Word) and then selects the appropriate preference file for your work situation: Duo alone, with a dock, or with a minidock. You can set Word, for example, to display its tool bar on large monitors and suppress the tool bar on the Duo’s screen.

Dockernaut requires an extension manager (Now Utilities or Conflict Catcher II) to selectively load extensions depending on which dock you use.

**Software Sources**

Most of the programs I’ve listed are shareware or freeware; you can get them from major online services, such as America Online and CompuServe, which tend to have the most up-to-date versions. Many are also available from user groups. Keyboard Plus, Caps Lock Notify, and Duo Extension Picker were not available from the commercial online services as I wrote this—I found them on the Internet at mac.archive.umich.edu. If you get your shareware on a CD-ROM, look for one that is updated frequently, such as the quarterly BMUG PD-ROM ($40) from BMUG (510/549-2684). Remember that paying for connect time or for a floppy disk or CD-ROM is not the same as paying the shareware fees.

**More on SCSI Cabling**

In last month’s column on managing SCSI devices, I included a table (“Connecting Cables,” page 164) that showed the most commonly used methods of connecting a PowerBook to a SCSI device and of connecting a PowerBook in SCSI disk mode to another Mac. However, one of the cables shown (labeled B in the table) is an unusual one—a DB-25 male to C-50 female cable ($8 from Computer Gate International, 408/730-0673). You can substitute instead a standard SCSI cable, DB-25 male to C-50 male, with a female-to-female C-50 gender changer.

CARY LU is a Macworld contributing editor who covers mobile- and remote-computing issues in this monthly column. His books include *The Apple Macintosh Book* (Microsoft Press, 1992).
"The best solution if you regularly need longer battery life" — MacWeek

Now use your PowerBook up to five times as long — without swapping and recharging batteries, dimming your screen, slowing your processor, or staying within six feet of an AC outlet.

Remember the day you first brought your new PowerBook® home?
It was faster than a speeding bullet. More powerful than a locomotive. Able to leap tall buildings in a single bound. In fact, the two of you could do anything.

But then it happened... The Big Chill
Your first low battery warning. That's when everything changed.
You quickly discovered that if you use all the performance your PowerBook offers, the battery just doesn't last long enough.

Finally, there's a solution.

Power Breakthrough
Introducing PowerPlate™ rechargeable power systems, designed specifically for PowerBooks.
Quite simply, PowerPlates solve all your battery frustrations. (In fact, you may wonder how you ever got along without one.)

PC LapTop Magazine concluded, "This is the best computer purchase you'll make all year." And thousands of users agree. One even wrote to say his PowerPlate was "The best product I've ever purchased in the Mac world."

Call Toll-Free Today
See your dealer today, or for more information, just call us toll-free.

©1994 Technöggin Inc. Technöggin and PowerPlate are trademarks of Technöggin Inc. PowerBook is a registered trademark of Apple Computer, Inc. CPU is a trademark of Connectix Corporation.
WHERE IT ALL COMES INTO VIEW

A WORLD OF OPPORTUNITY

How can you maximize the potential of the Macintosh? See the latest and best Macintosh products and services? Learn how best to put the Macintosh to work for you? Discover all this and more at MACWORLD Expo.

With over 400 exhibiting companies presenting the latest in Macintosh technology, MACWORLD Expo is the single best resource for learning how to harness the power of the Macintosh. Visit exhibits from the leading Macintosh vendors. Make practical decisions on how to configure your Macintosh system to meet your business or personal needs. Envision tomorrow's technology, under development today. At MACWORLD Expo, the world of Macintosh all comes into view.
Discover the Creative Possibilities

At MACWORLD Expo, make side by side comparisons of thousands of Macintosh hardware, software, peripheral and service products. Have a question? Need an expert opinion? Our on-site Macintosh professionals lend their expertise to help you choose the best products for your individual needs. We'll help you take your Macintosh to the max!

MACWORLD Expo/Boston; August 2-5, 1994

MACWORLD Expo/Boston will cover over 350,000 square feet of exhibit space at both the World Trade Center and Bayside Exposition Center. When you come to MACWORLD Expo/Boston, you'll see uses and applications for the Macintosh in a variety of areas including: Networking, Spreadsheet Analysis, Databases, Education, Research, Word Processing, Accounting, Law, CAD/CAM, Forecasting, Design, Publishing, Illustration, Animation, Music, Programming, Entertainment and Multimedia. You'll see all this spread out over both locations so plan to be in Boston from August 2-5 and experience the Macintosh at its absolute best!

Pre-Registration Savings!

Now is the time to pre-register for MACWORLD Expo. Return the attached pre-registration form with your payment by June 24 and save $30 on all conference sessions and exhibits ($120 now vs. $150 at the door). An exhibits-only admission saves you $15 ($25 now vs. $40 cash only at the door). And since your time is as valuable as your money, we'll send your admission badge early when you pre-register. Avoid the registration crowds and get a jump start on the exhibition!
Tomorrow's Innovations Today

MACWORLD EXPO/BOSTON 1994 CELEBRATES THE 10TH ANNIVERSARY OF THE MAC’S DEBUT WITH A PANORAMA OF EMPOWERING OPPORTUNITIES AND POSSIBILITIES. FROM APPLE’S TECHNOLOGICAL BREAKTHROUGHS TO THE IMPACT OF DIGITAL CONVERGENCE, YOU’LL DISCOVER NEW DIMENSIONS TO THE MAC.

HERE'S A PREVIEW OF MACWORLD EXPO/BOSTON'S 14 SEPARATE CONFERENCE PROGRAMS. CREATE YOUR OWN AGENDA:

1 The PowerPC Conference.
EVERYTHING THERE IS TO KNOW ABOUT POWERPC — FOR USERS, VENDORS, AND DEVELOPERS — INCLUDING: WHAT POWERPC DELIVERS; APPLE’S IMPLEMENTATION VS. IBM’S; COMPATIBILITY; UPGRADING; WHEN/WHAT TO BUY; NATIVE VS. EMULATION; HOW COMPETITIVE IS POWER PC? POWERPC DEVELOPMENT TOOLS; AND MORE.

2 The Design Conference.
CREATED MAC DESIGNERS SHARE CREATIVE INSIGHTS AND POWER-USER TIPS ON: COLOR MANAGEMENT; CREATIVE IMAGING; PREPRESS; DIGITAL PHOTOGRAPHY; MIXING MEDIA; DIGITAL ART; KPT; AND MORE.

3 The Entertainment Conference.
THE BEST IN THE BUSINESS PRESENT TOOLS AND TECHNIQUES FOR TV, FILMS, AND COMMERCIAL APPLICATIONS, FEATURING: INTERACTIVE CINEMA; QUICKTIME MOVIES; DIGITAL VIDEO; HIGH-END MUSIC; INNOVATIVE EFFECTS; INTERACTIVE EROTICA; LIVE THEATRE; AND BROADCAST QUALITY GRAPHICS.

4 The Connectivity Conference.
ENHANCE COMMUNICATIONS, MAXIMIZE NETWORKS, AND SEE WHAT'S IN STORE FOR THE FUTURE WITH: CONNECT-ANYWHERE NETWORKING; MAXIMIZING THE INTERNET; NETWORKING NEWTONS; TCP/IP; CLIENT/SERVER; NETWORK MANAGEMENT TOOLS; APPLETALK NETWORKING.

5 The Small Office/Home Office Conference.
YOUR NEEDS ARE DIFFERENT THAN GIANT ORGANIZATIONS! SPECIAL SOHO TIPS ON MARKETING, TELECOMMUTING, FINANCE/ADMINISTRATION.

6 The Science/Technology Conference.
THE MAC AS A CRITICAL TOOL IN LABORATORY AND SCIENTIFIC SETTINGS, INCLUDING TIPS ON VISUALIZATION USING QUICKTIME, SCIENTIFIC DATA ANALYSIS, AND VIRTUAL REALITY.

7 The Programmer/Developer Conference.
FOR IN-HOUSE DEVELOPERS, VETERAN INDEPENDENTS, AND NOVICE MAC TECHIES ALIKE: THE NEW WORLD OF OPPORTUNITIES WITH NEWTON, POWERPC, OPENDOC, APPLESCRIPT — PLUS ULTIMATE MAC PROGRAMMING TIPS.

8 The Education Conference.
TEACHERS AT THE ELEMENTARY, SECONDARY, AND UNIVERSITY LEVELS SHARE SUCCESSFUL MAC EXPERIENCES WITH MULTIMEDIA, CD-ROM, HYPERCARD, QUICKTIME, BBSs, INTERNET — AND STUDENTS DEMO THEIR MOST OUTSTANDING MAC PROJECTS IN SCIENCE, MATH, SOCIAL STUDIES AND DESKTOP PUBLISHING.

9 The How-to-Get-Started Conference.
LEARN THE BASICS — OF NEWTON, DESKTOP PUBLISHING, MUSIC, INTERNET, TELECOMMUNICATIONS, DESIGN, MULTIMEDIA, QUICKTIME, AUTHORTING, INTERACTIVITY, AND USING CD-ROM.

10 The Advanced User Conference.
VETERAN USERS SHARE THEIR EXPERTISE ON CUSTOMIZING YOUR MAC, RESOLVING SYSTEM CONFLICTS, MAXIMIZING FONTS, AND POWERIZING YOUR POWERBOOK.

11 The Special Interest Group Conference.
LOOKING TO COMPARE MAC NOTES WITH OTHERS? DEVELOP AN INVALUABLE "USER NETWORK." HERE YOU'LL FIND SESSIONS ON THE MAC IN THE LAW OFFICE, HEALTH CARE, REAL ESTATE, AND IS; AND THE PERENNIAL FAVORITE MUSE (MACWORLD EXPO USER GROUP EXTRAVAGANZA).

12 Application Workshops.
INTENSIVE TRAINING SESSIONS BY MACACADEMY ON: BEGINNING MACINTOSH; ADVANCED MACINTOSH; MACINTOSH FONTS; BEGINNING MAC NETWORKING; CLARIS FILEMAKER PRO; MICROSOFT WORD; ALDUS PAGE MAKER; MICROSOFT EXCEL.

13 The Multimedia Conference.
CREATE QUALITY PRODUCTIONS AND PRESENTATIONS WITH BOTH HIGH-END AND LOW-END MULTIMEDIA TOOLS. SHARE INSIGHTS FROM THE WORLD'S MOST SUCCESSFUL MULTIMEDIA EXPERTS ON INTERACTIVITY, DESKTOP VIDEO, ANIMATION, INTERFACE DESIGN, AUTHORING TOOLS — AND SEE THE PROFITABLE IMPACT IN EDUCATION, TRAINING, AND MUSEUMS.

14 The CD-ROM Conference.
WANT TO PUBLISH AN ENTERTAINMENT OR CONSUMER CD? START WITH THE MAC. LEARN ABOUT PHOTO CD; KIOSKS; BUILDING SUCCESSFUL TITLES; DEVELOPING INTERACTIVE GAMES; CONTENT LICENSING; DOCUMENT CONVERSION AND MANAGEMENT; AND MARKETING YOUR CD.

MACWORLD EXPO/BOSTON
BAYSIDE EXPOSITION CENTER & WORLD TRADE CENTER

Exhibition Hours
August 2-4 10:00AM-6:00PM
August 5 10:00AM-4:00PM

Conference Hours
August 2 10:30AM-5:30PM
August 3-4 11:30AM-5:30PM
August 5 11:30AM-2:30PM
Please register me for:

- **Package One $120.** Conference sessions* and exhibits. Pre-register by June 24 ($150 at the door).
- **Package Two $25.** Admission to exhibits only. Pre-register by June 24 ($40 cash only at the door).

- **Check if applicable.** I'm an international attendee. Please ship my badge by Federal Express. Enclosed is an additional $45.

Please choose your package and fill out the form completely. Incomplete forms will be returned. One form per person; make photocopies for additional people. Please do not staple check to form. Registration forms received after June 24, will be returned unprocessed. Purchase orders cannot be accepted. All registration fees are nonrefundable. A $20 fee will be charged for all returned checks. Send completed forms to:

**MACWORLD Expo/Boston**
P.O. Box 4010
Dedham, MA 02027

U.S. Badges: Mailed around July 18.
International badges: held on-site.

Badge Pickup hours are:
Aug. 1, 11am - 3pm; Aug. 2-4, 9am - 6pm; Aug. 5, 9am-4pm

Please send my registration badge and further information to:

Please check one: **Home Address**  **Company Address**

First Name ___________________________ Middle Initial ___________________________ Last Name ___________________________

Street Address ___________________________

City ___________________________ State ___________ Zip Code ___________________________

Country (Other than U.S.) ___________________________

Telephone ___________________________

If mailing to company address: (If mailing to your home address, leave the next two lines blank).

Title ___________________________

Company ___________________________

- **Check enclosed (make payable to MACWORLD Exposition)**
  - **Amount $**

- **Master Card**  **Visa**  **American Express**
  - **Amount $**

Account Number ___________________________

Expiration Date (include all numbers) ___________

Card Holder Signature (Signature necessary to be valid) ___________________________

If card holder is other than registrant, please print card holder's name below:

First Name ___________________________ Middle Initial ___________ Last Name ___________________________

Cash only at the door. After June 24, you must register at the show.

Please check the appropriate information:

**YOUR INDUSTRY**

1. Account/Finance
2. Architecture/Construction
3. Art/Design/Graphic Services
4. Arts & Entertainment
5. Communications/Printing/Publishing
6. Computer Peripherals/VAD
7. Consulting
8. Corporate/General Management
9. Distributor/Dealer/Reseller/Service
10. Engineering/R&D
11. Government/Military
12. Health/Medical Services
13. College/University
14. Elementary/High School
15. Legal Services
16. Manufacturer (Computer Industry)
17. Manufacturer (Non-computer Industry)
18. Marketing/Sales/P.R./Communications
19. Other
20. Does not apply

**YOUR TITLE**

21. CEO/President/VP
22. Controller/Treasurer/Accountant
23. C.P.A./Manager
24. Network Manager
25. Programmer/Analyst
26. Engineer/Scientist/Research
27. Manager/Department Head
28. Professional (Lawyer, Doctor, etc.)
29. Consultant
30. Marketing/Sales
31. Educator
32. Artist/Director/Graphic Artist
33. Editor/Writer
34. Student
35. Other
36. Does not apply

**SIZE OF YOUR ORGANIZATION**

(Number of Employees National & International) Choose one only
37. Under 50
38. 50 - 99
39. 100 - 499
40. 500 - 999
41. 1,000 & over
42. Does not apply

**WHICH PERSONAL COMPUTER(S)**

Do you own/use?

Choose all that apply.
43. Macintosh Plus/SE/SE30
44. Macintosh Classic Series/LC Series
45. Macintosh PowerBook Series/Duo/Quad Series
46. Macintosh II Series
47. Macintosh Performa Series
48. Macintosh Centris Series
49. Macintosh Quadra Series
50. Macintosh Workgroup Series
51. IBM PC or compatible
52. Other
53. None

**DO YOU RECOMMEND, BUY, OR APPROVE MICROCOMPUTER SOFTWARE AND/OR PERIPHERALS?**

54. Yes
55. No

If yes, please indicate for how many Macintosh computers you have this involvement.

56. 1
57. 11 - 25
58. 26 - 50
59. 51 - 100
60. 101 - 500
61. 501 +

*MACWORLD Expo conference sessions are on a first-come, first-served basis with no guaranteed seating and are subject to change without notice. All registration fees are nonrefundable. Do not staple check to form. Send completed form, with check or money order to MACWORLD Expo, P.O. Box 4010, Dedham, MA 02027. For overnight packages, ship to 245 High Street, Dedham, MA 02026.
ATTENDING MADE EASY
MACWORLD Expo/Boston 1994, Bayside Exposition Center, 200 Mount Vernon Street
AND WORLD TRADE CENTER, 164 Northern Avenue.

Tuesday, August 2 - Thursday, August 4, 10:00 A.M. - 6:00 P.M. and Friday, August 5, 10:00 A.M. - 4:00 P.M.

OFFERING ATTENDEES DISCOUNTS OF 5-10% ON APPLICABLE FARES ONLY.

THE OFFICIAL CAR RENTAL COMPANY FOR HILTON AT DEDHAM PLACE $125/$125 (617) 329-7900.

CALL ONE OF THE HOTELS LISTED BELOW AND REQUEST GROUP J.C. RATES.

A NON-REFUNDABLE DEPOSIT FOR THE FIRST NIGHT, NO LATER THAN JUNE 20.

FOR THE BEST SELECTIONS PRICES REFLECT SINGE AND DOUBLE OCCUPANCY. IF YOU ARE RESERVING 10 OR MORE ROOMS, YOU MUST SUPPLY THE HOTEL WITH A ROOMING LIST AND A NON-REFUNDABLE DEPOSIT FOR THE FIRST NIGHT, NO LATER THAN JUNE 20.

U.S. Attendants.
BADGES WILL BE MAILED ON OR ABOUT JULY 18. BE SURE TO CHECK BOX INDICATING WHERE BADGE SHOULD BE SENT.
INTERNATIONAL Attendees.
INTERNATIONAL BADGES (INCLUDING CANADIAN) WILL BE HELD FOR PICK-UP AT THE INTERNATIONAL PRE-REGISTRATION COUNTER AT BAYSIDE EXPO CENTER FOR FEDERAL EXPRESS SERVICE, CHECK THE APPROPRIATE BOX BELOW AND ADD $45 TO YOUR PRE-REGISTRATION FEE. Fill in your exact street address (no P.O. BOXES) and include your telephone number and country code. WE WILL FEDERAL EXPRESS YOUR BADGE DIRECTLY TO YOU. BADGE PICKUP HOURS ARE: AUG. 1, 11AM - 3P.M.; AUG. 2-4, 9AM - 6PM; AUG. 5, 9AM-4PM.

Fly American Airlines and Save.
ENJOY SAVINGS ON APPLICABLE FARES WHEN YOU FLY AMERICAN AIRLINES, THE OFFICIAL AIRLINE OF MACWORLD EXPO. AMERICAN IS OFFERING ATTENDEES DISCOUNTS OF 5-10% ON MOST FARES. CALL 800-433-1790 TO SPEAK WITH AN AMERICAN AIRLINES RESERVATIONIST AND REFERENCE STAR FILE #50174A. SAVINGS ARE AVAILABLE ON APPLICABLE FARES ONLY.

Car Rental Discounts From Alamo.
ALAMO RENT A CAR HAS BEEN APPOINTED THE OFFICIAL CAR RENTAL COMPANY FOR MACWORLD EXPO/BOSTON, AND SPECIAL DISCOUNTED RATES HAVE BEEN EXTENDED TO ATTENDEES. THESE RATES ARE AVAILABLE ONE WEEK BEFORE AND AFTER THE MEETING AND INCLUDE UNLIMITED FREE MILEAGE. FOR PRE-RECORDED INFORMATION CALL ALAMO AT 1-800-732-3232 AND REQUEST GROUP I.D. #378360 AND RATE CODE GR.

Advance Reservations are Required.

Hotel Accommodations
Participating hotels in the Boston area are offering MACWORLD EXPO discounts. To receive the preferred rate, call one of the hotels listed below and mention you'll be attending MACWORLD EXPO. There are a limited number of rooms available and they sell out quickly. Make your reservations by June 20 for the best selections; prices reflect single and double occupancy. If you are reserving 10 or more rooms, you must supply the hotel with a rooming list and a non-refundable deposit for the first night, no later than June 20.

Services for the Physically Challenged.
WE'RE COMMITTED TO ENSURING THAT OUR PHYSICALLY CHALLENGED ATTENDEES RECEIVE ALL THE SERVICES THEY NEED TO MAKE THEIR SHOW VISIT ENJOYABLE. CALL US AT 800-945-3313 FOR DETAILS.

Pre-recorded Information.
FOR PRE-RECORDED INFORMATION ABOUT MACWORLD EXPO/BOSTON, CALL THE MACWORLD EXPO INFORMATION HOTLINE AT 617-361-3941. 24-HOURS PER DAY, SEVEN DAYS A WEEK.

Early Bird Registration.
MISSED THE PRE-REGISTRATION DATE? YOU CAN STILL REGISTER BEFORE THE START OF THE SHOW! ON-SITE EARLY BIRD REGISTRATION IS FROM 11:00 A.M. - 3:00 P.M. ON AUGUST 1 AT THE FULL REGISTRATION RATES OF $150 FOR ALL CONFERENCE SESSIONS AND EXHIBITS, AND $40 (CASH ONLY AT THE DOOR) FOR EXHIBITS-ONLY ADMISSION.

Macworld 
Exposition 
Information Hotline
ABOUT TUESDAY, AUGUST 2 - THURSDAY, AUGUST 4, 10:00 A.M. • 6:00 P.M. AND FRIDAY, AUGUST 5, 10:00 A.M. - 4:00 P.M.

A BOUT}
--------------------------
So you finally get your hands on the hottest new Mac and what happens? Somebody insists that you run Microsoft Windows applications. Don't despair. Just double click on SoftWindows and hang on tight.

You see, SoftWindows not only lets you use your Mac as a Mac, it also lets you run thousands of popular Windows programs — as fast as a 486SX.

You can run DOS programs, too. Not to mention PC network applications such as NetWare, LAN Manager and TCP/IP.

How can SoftWindows be so utterly compatible? Because it includes Windows 3.1 and MS-DOS 6.2, optimized to run at top speed.

And since both DOS and Windows are prein- stalled, you don't have to put up with tedious installations.

With SoftWindows, you can copy and paste between PC and Mac applications. You can even use Macintosh peripherals — CD-ROMs, printers, modems and more — with PC programs.

Call us today at 800-848-7677 Dept. B. Or visit your dealer. What you discover will blow you away.

Windows Compatibility for the Power Macintosh.
Skinflint Software
Cheapie shareware substitutes for pricey programs

By David Pogue

PowerBar is Square One with a twist. It’s a resizable, reshappable bank of icon tiles (see “Hanging Out in the Bar”). You install your favorite icons—files, folders, programs, desk accessories, aliases, control panels, and the like—on the tiles. Once you’re in PowerBar, you can open an icon with one idiot-proof click of the mouse. PowerBar’s ease-of-use masterpiece: you install, rearrange, and move the palette icons by simply dragging them around.

PowerBar’s list of secondary features would fill a CD-ROM. You get a floating status bar showing gauges for memory, disk space, and (for PowerBooks) battery juice; instant creation or repair of aliases; a nifty window-management option (autohide when you switch programs, for instance); and single-click tiles that start, shut down, empty the Trash, put selected icons into the Trash, and so on. My personal favorite: you can install tiles that, when clicked, execute the QuickKeys macros of your choice.

That last feature is, again, shades of Square One ($74); but as Apple might say, PowerBar does more and costs less ($25). Yes, I wish PowerBar would not hide its icons’ names; and yes, I wish it didn’t conflict with PopupFolder. But it’s staying on my screen anyway. (Scott Johnson, 281211 Macintosh Ln. [really!], Maineville, OH 45039.)

Town Meeting 2.0
When you drive onto the information superhighway, the Mac screen is your windshield, and you carry no passengers. In the age of anonymous online encounters, doesn’t anybody worry about the loss of face-to-face human contact?

Certainly not Fortune magazine, which recently extolled the virtues of electronic-meeting software. Nor IBM, which sells just such a program for $50,000. Nor Adam Stein, who wrote a shareware version.

With Town Meeting, you and the other meeting participants remain comfortably at your desks. Everyone communicates by typing. As the discussion goes on, the comments scroll up your screen like a movie script, much as in the chat rooms of America Online. It’s fast, it’s simple, and it forces participants to be concise. According to Fortune, it also encourages shy people to speak up. And—because you can choose to be anonymous—it lets participants toss out risky ideas without fear of ridicule or subsequent snubbing at the watercooler.

OK, maybe the future won’t be so bad—as long as we get up once a month to wander around the office and remember what everyone looks like. (Adam Stein, 303/872-8651; $24.98; 5-, 10-, and 20-user packs available from $112.98 and up. Prices will double in 1995.)

Do It All 3.020
This scheduling/reminder/to-do-list manager is gorgeous, fast, and simple to use. You can note a scheduled appointment by dragging through a vertical time line, exactly as you can in Now Up-to-Date and its rivals. (You cannot, however...
ever, reschedule an appointment by dragging its description.)

One brilliant exclusive feature: you can assign priority levels to a to-do-list item that increase over time. For example, today I might assign a priority level of 4 to "Eat leftover ziti in fridge." But two weeks hence, as the ziti completes its gradual disintegration, Do It All begins waving that message wildly at the top of the list, with an urgency level of 9.

There's also an Appointment option I wish every similar program had: you don't have to painstakingly type in a start and end time for every appointment. Instead, you can click on an Anytime check box, as you'd do for such day-oriented reminders as "Jennifer's birthday," "Vote today!," and "Throw out ziti." Other Do It All features include alarms; one-step, recurrent-event programming; and online help. (J. Christopher Bell, 1830 Austin Ave., Los Altos, CA 94024; $40 per business, or $15 to $35 for individuals.)

**Idealiner 3.4**

What ever happened to outlining programs, anyway? Remember Acta? ThinkTank? More? In the late 1980s, they and Madonna were all anybody talked about.

Those programs may have faded from prominence, but the concept of outliners is still golden. Any structured piece of writing or speaking is easier to create if you put its skeleton together first and add the flesh later.

Idealiner is a relic; its last update was in 1990. But it offers many of the same features as the pricier dinosaurs: you can "collapse" subpoints to view only your main headings; you can rearrange, promote, and demote headings from the keyboard; and you can double-click on any heading or subheading to open a text window in which to write the body of your speech, thesis, or article.

Ultimately, though, Idealiner's generous import and export options are its best feature. The program allows you to save any portion of your outline as a correctly numbered and indented MacWrite or text file—which, of course, you can then open with any word processor alive. Perhaps the only feature that users of More will miss is the ability to set up different fonts for each level of heading. (Free; Clifford Story, currently available only online, as far as I know.)

**Mariner 2.16**

There was this witty Microsoft ad that said something like, "99 out of 100 spreadsheet owners use Excel. What are we doing wrong?"

If you're willing to be one of the rebel 1 percent, you can save mucho moohah. Mariner looks and works exactly like Excel: it comes with 75 functions, 9 graph types, 3-D worksheets, split panes, individual cell fonts, resizable column widths and heights, a floating tool bar, named cell references—the works. And you can export your spreadsheet (sans graphs) to Excel. It's so complete that the Read Me file's apologetic note stating "[Mariner] does not yet support color, 3-D charts, macros, or an external command language" is almost comically forgivable.

In fact, it could be argued that for plain-vanilla number crunching, Mariner is actually superior to Excel. Mariner runs in 763K of memory (Excel uses 2048K) and requires 236K of disk space (Excel takes up 1885K, without support files). Mariner costs $40 (Excel is street-priced at $300). And Mariner has nine levels of undo. Snap this program up before it goes commercial later this year. (William Paar, 1903 FoxTrain Dr., LaGrange, KY 40031.)

**Two Nifty Telephone Utilities**

Some programs I describe here are indeed David's battling the Goliaths of commercial software. But others fulfill a more traditional shareware function: they fill a tiny niche. AreaFinderFinder 3.1.0.1 is a great example of this. It's a stylish and sleek one-trick pony that looks up a city if you know the area code—or vice versa. It's got 2400 cities in its little brain, and you can add your own. It even blinkers your target city's location on a U.S. map, so you can check the time zone and avoid waking your mother at an ungodly hour. (John J. Calande III, 619 S. Clayton St., Philadelphia, PA 19147; $5.)

Talk about nichey. The puny program called 800-SAY-WHAT? is on a miniature mission from God: to translate those mnemonic but irritating-to-dial 800 numbers, like 800-SOS-APPL or 800-CAR-RENT, into normal numbers. Crude but fast. (William Modesit, 2620 Baldwin Ave., #204, Makawao, Maui, HI 96768; $5.)

**Sample Editor 1.0.3**

For years, Apple has waffled on its dedication to the Mac as a tape recorder. Exhibit A: its on-again, off-again practice of including a microphone with each computer. (At the moment, it's off again.)

If everybody knew all about Sample Editor, things might be different. This shareware program gives your Mac a visually stunning sound-editing interface, much like the high-priced $295 SoundEdit Pro from Macromedia. As long as you have System 7, a color monitor, and not too many extensions, you can enjoy Garrick McFarlane's polished piece of powerware.

Using Sample Editor, you can cut, copy, and paste snippets of sounds you have recorded; touch them up with cross-fades, rever, and other effects; play them backward; speed them up or slow them down; raise James Earl Jones's voice to the pitch of Cyndi Lauper's; zoom in and study the actual waveform of a sound; and so on. And what does the kindly Englishman want in exchange for this software studio? "E-mail or a small cash donation," he says. Think you can manage that? (Garrick McFarlane; available only online.)

**The Upshot**

This is not your father's shareware. No longer should you think of shareware as the domain of first-time BASIC program­mers and game junkies. Much of today's shareware is solid, polished stuff, featuring slick 3-D interfaces, balloon help, and quick performance.

Ironically, as shareware becomes more sophisticated, the commercial software deal is simultaneously getting worse. Used to be that you'd buy a commercial package because of the support it offered (phone help and all that). But today, you might wait on hold for 30 long-distance minutes. And, in a trend perpetuated recently by Microsoft, Claris, Quark, and many other companies, you might have to pay extra for the privilege of phone support—as much as $25 per call. A shareware author, on the other hand, is likely to respond to your frantic E-mail within a day. For free.

Do you, too, find the pay-for-support trend revolting? Download some shareware, send in a few dollars, and start doing a little revolting of your own. m

---

Contributing editor DAVID POGUE is the author of IDG Books Worldwide's Macs for Dummies, More Macs for Dummies, Le Mac Pour Les Nuls, Macs für Dummies Anfänger, Usare il Macintosh Senza Fatica, Macintosh Para Leigos, Mac for Dosmere, and the Japanese title, which this font doesn't have the right symbols for.
You're well acquainted with this megabyte-eating beast.

But perhaps you're not yet familiar with DynaMO, the magneto-optical solution that eliminates the horrors of data storage.

This compact little set-up will save you big. Like Syquest, you put an external drive on-line and save your files to removable, rewritable cartridges. But unlike Syquest, you don't have to break the bank each time around.

With DynaMO, you can use 128 and 230 MB industry standard 3.5-inch cartridges. The cartridges aren't vulnerable to the everyday abuse that might otherwise do in your data. In fact, Fujitsu cartridges are so reliable we back them with a lifetime warranty.

There's nothing frightening about setting-up DynaMO either. You just plug the drive into your PC or Macintosh.

Get the data on DynaMO by calling 1-800-831-4094. Or request information by fax at 1-408-428-0456 (document 1368). We'll show you how to enjoy some monstrous savings.

© 1994 Fujitsu. All rights reserved. DynaMO is a trademark of Fujitsu Computer Products of America, Inc. All brand names and product names are trademarks of their respective holders.

FUJITSU

COMPUTERS, COMMUNICATIONS, MICROELECTRONICS

Circle 202 on reader service card
HERE'S PROOF...

WHY MORE THAN 700 SERVICE BUREAUS HAVE CHOSEN DISPLAYMAKER™

Super-large-format, PostScript™ color printing. That's what you get with LaserMaster's® Big Color® Digital Printers. It's easy to see why hundreds have chosen DisplayMaker and DisplayMaker Professional—the proof is in the product and the performance.

Proof—The Product

With output that's 36 inches wide by almost any length, the DisplayMaker line offers the best and easiest way to produce Big Color prints. And it has the features professionals demand:

- Photographic-quality output
- ColorMark® Color-Management System
- PostScript Level 2 compatibility
- 235 pre-installed typefaces

Plus, DisplayMakers attach quickly to Macintosh® and IBM®-compatible computers and print directly from all popular illustration, photo-manipulation, and desktop-publishing applications.

Proof—The Performance

When it comes to high-volume printing, nothing beats DisplayMaker Pro's performance. The Big Ink™ Delivery System increases its ink capacity 10-fold and reduces ink costs up to 70 percent! And with DisplayMaker Pro's Advanced Color Server, you're in control of print jobs and consumables management.

It's easy to see why LaserMaster's DisplayMaker printers are the choice of so many professionals. Prove it to yourself and call LaserMaster today! Ask about our complete, fully integrated Big Color WorkStation, too.

“I waited about three days to make up my mind. I waited two days too long. I wasted two days worth of profits.”

Tom Welsch, President
Visual Horizons, Inc.

“This is the first product that I have had in my store that I can literally walk down the street and sell to every business.”

David Kempton, Manager
Kinko’s Copies

“After only six weeks of actual production, I have already paid for half of my initial investment, if I include all the mounting and laminating I have done as a result of the output.”

Robert Evans, President
EPI Graphics

1-800-688-8342
or 612-944-9330
Fax: 612-944-1244

© 1994 LaserMaster Corporation, 6920 Shady Oak Road, Eden Prairie, MN 55344. LaserMaster and the LM logo are registered trademarks. Big Color, DisplayMaker, ColorMark, The Professional's Choice, and Big Ink are trademarks of LaserMaster Corporation. PostScript is a trademark of Adobe Systems, Inc. This product incorporates the PowerPogo® interposer from Pigeon Associates, Inc. All other product or brand names are trademarks of their respective holders. DisplayMaker output is not intended for extended use in direct sunlight. Specifications and prices subject to change without notice. Prices in U.S. dollars.

Circle 49 on reader service card
Optimism about the Net

And now, the good news on hitting 100

Sunny-Side Up
This issue marks my 100th column for Macworld. (Reminder to self: send picture to Willard Scott!) My first column, in April 1986, was an attack on Lotus Jazz. Through the years, I've compiled a record of peevish assessments: The Macintosh Portable. The original StyleWriter. John Sculley's ego. I really hadn't noticed how dour was my demeanor until the day when software developer Dave Winer asked me in total seriousness, When was the last time I liked something? (And this was before my not overly favorable review of Winer's product Frontier.)

His point was well taken. Though I am cynical by nature, I am a lover of good technology. So as I reach the century mark, it's appropriate to devote this space to a phenomenon I thought about as I listened, spoke, and networked at the CFP—the key development in the computer world since I began addressing my readers as The Iconoclast eight-plus years ago, and one that makes me uncharacteristically upbeat.

I am referring to the best imaginable consequence of easy-to-use, powerful computers: the emergence of an electronically linked global community. The greatest human work-in-progress these days is the variegated edifice of connections called cyberspace. But some people, including some speakers at the CFP conference, worry that the very popularity of the Internet may be its undoing. Millions of people are arriving as new members of services such as America Online and CompuServe; more will be attracted by newer nets such as Apple's forthcoming eWorld. Increasing numbers of these newcomers are finding their way onto the daddy of all nets, the Internet. Whereas computer networks to date have been relatively civilized arenas, this historic digital immigration threatens to make things downright unfriendly. Call it the urbanization of cyberspace. Will the influx erode the convivial culture?

I don't think so. In fact, I anticipate the opposite—that the open, exploration-friendly nature of the Net is more likely to change the newcomers than the other way around. That prospect is delicious.

Lessons of History
To help you understand why, let me give you a brief history of cyberspace. It began with a government project called the ARPANet, a network that allowed a group of computer-science-oriented universities and institutions to exchange files and notes among themselves. Its designers were quickly astonished by an unexpected phenomenon—users took advantage of its efficient communications facilities to establish informal yet deep communication of a human nature. The ARPANet became a cultural transmitter of sharing-oriented values, particularly those of MIT's Artificial Intelligence lab. As the network grew to many more sites from 1969 to 1989, it preserved the best of MIT's hacker culture and really became the focus of computer culture in general.

In the late 1970s, an important tributary to that culture opened: a decentral-
ized archipelago of privately operated, no-cost bulletin board systems. These were typically set up by people whose main goal was establishing a free flow of information and software. So by the time the first commercial systems, including The Source and CompuServe, opened in the 1980s, the tone of cyberspace was set. Those commercial nets that ignored the protocols of open communications and free exchange (for example, the first iteration of Prodigy) did so at some risk.

In the 1990s, the character of the Net—from conferencing systems such as The WELL in the San Francisco Bay Area and Echo in New York City, to America Online, to the Internet itself—has become well established. While the verbiage can get pretty heated in cyberspace, there is a solid focus on the free exchange of information. This is best exemplified by the fact that one can cruise through various networks picking up valuable shareware, freeware, and priceless nuggets of information for little or no cost. And when someone posts a request for help on CompuServe or a Usenet group, the normal response is a flood of assistance from altruistic users.

Despite the invasion by hordes of outsiders and tourists, I think this spirit will continue.

**Items on the Menu**

Is my optimism unjustified? I don’t think so. Consider a fascinating article by Natalie Glance and Bernardo Huberman of Xerox PARC that appeared in the March issue of *Scientific American*. The subject was the various behavioral possibilities in the so-called Unscrupulous Diner’s Situation. This occurs when a group of people decide in advance to split a restaurant check evenly. This presents each individual with a dilemma: Should you order lobster and Dom Perignon, knowing that the high cost will be amortized among several diners? Or should you order chicken and a house wine to keep costs down? The optimal solution seems to be for everyone to order moderately; then the bill for all will be low.

Remarkably, the Xerox PARC researchers found that in both human studies and computer simulations, cooperation works. The biggest threat to cooperation is the fear that some freeloader (known as a “defector”) will eat high on the hog, while you order peanut-butter sandwich wind up paying for the louse. This makes you a “sucker,” and no one wants to be a sucker. But in most cases, especially when there is reason to believe that the group will dine together again, people take the hopeful step of ordering reasonably—as long as they have even a slight indication that their fellow diners will also do so.

This hypothetical situation seems to exist for real on the global network. Cooperative behavior in cyberspace is firmly established; in fact, so many people donate their time and product for little or no money that the sucker factor has been virtually eliminated. Potential defectors—who would greedily scoop up (or screw up) the efforts of others while failing to contribute themselves—have to violate the communal spirit very consciously. Can they do that? Sure. But then those defectors forfeit one of the main benefits of the Net—the sense of connectedness that comes from participating in such a unique cooperative effort. I think this factor will ensure that the Net’s openness will remain self-sustaining.

There are other factors, too. Did you ever notice what happens when someone posts a nasty flame on a conferencing system, something really out of line? While it sometimes evokes a like response, more often than not observers step in and warn the offending flame that he or she should back off. (And almost always, the original ranter posts an apology for the rash message.) Likewise, a particularly astute commentary commonly draws a series of digital pats on the back (“Great stuff, Roger!”). Good citizens of the Net act as a sort of antibody, rising from the data muck to cluster around an invader and limit the damage. And if you view the Net as an organism, you’ll see all kinds of ways that its immune system resists bad-attitude postings from newcomers and malcontents. For instance, to squelch the most virulent flamers, some people have designed “bozo filters” to allow users to literally tune out those who simply aren’t worth listening to.

**Bigger than All of Us**

I’m not saying that everything is sweetness and light on the Net, or that digital vandals and just plain selfish people won’t perturb the rhythms of cyberspace. But the Net will handle it. The Net, really, is a stable system that’s bigger than all of us and has ways of maintaining its positive equilibrium. And that is what makes it so exciting—I can’t really think of an antecedent for the Net. Despite the unpleasant distractions of the Clipper chip and Digital Telephony, we’re breaking new ground here. And there’s no telling where this momentum will take us.

STEVEN LEVY’s latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994).
anytime.
anywhere.
any printer.

Now you can print from your Macintosh™ to over 1,000 PC-compatible printers—
even if you're sharing one on a network.

PowerPrint's cable-and-software package gives you instant access to just about any laser, inkjet, dot matrix, color, or fast wide-carriage printer. So you can have the power to print whether you're on the road with your PowerBook™, or using an old PC printer at home.

**PowerPrint Costs Less Than $150.**
And includes features like built-in spooling, scaling, and custom paper sizes. It's compatible with TrueType™ and Adobe Type Manager™ fonts.

**Available in Network Versions.**
PowerPrint/LT™ for LocalTalk™ networks. PowerPrint/NW™ for Novell® NetWare® printing services.

Call 800-663-6222 for information, or contact your dealer.
EXPLORE the INTERNET!

FREE

DELPHI is the only major online service to offer you full access to the Internet. And now you can explore this incredible resource with no risk. You get 5 hours of evening/weekend access to try it out for free!

Use DELPHI’s Internet mail gateway to exchange messages with over 20 million people at universities, companies, and other online services such as CompuServe and MCI Mail. Download programs and files using FTP or connect in real-time to other networks using Telnet. You can also meet people on the Internet. Internet Relay Chat lets you “talk” with people all over the world and Usenet News is the world’s largest bulletin board with over 4500 topics!

To help you find the information you want, you’ll have access to powerful search utilities such as “Gopher,” “Hytelnet” and “WAIS.” If you aren’t familiar with these terms, don’t worry; DELPHI has hundreds of expert online assistants and a large collection of help files, books, programs, and other resources to help get you started.

Over 600 local access numbers are available across the country. Explore DELPHI and the Internet today. You’ll be amazed by what you discover.

FIVE HOUR FREE TRIAL!

Dial By Modem 1-800-365-4636. Press return until you get a prompt At Username, enter JOINDELPHI. At Password, Enter MCW47

Offer applies for new members only. A valid credit card is required for immediate access. Other restrictions apply. Complete details are provided during the self-free registration.

Attention Current Internet Users: See what DELPHI can offer you! Stock quotes, Grolmer’s Encyclopedia, newswires, and hundreds of other services are just a few keystrokes away. Telnet to delphi.com and enter the username and password above for a free trial.

Questions? Call 1-800-565-1005.
Send e-mail to INFO@delphi.com

Circle 173 on reader service card
THE TIME HAS COME FOR THE FIFTH ANNUAL ROUNDUP OF TERRIFIC MAC RESOURCES. ONCE A YEAR I LIKE TO SHARE INFORMATION ON SERVICES, PUBLICATIONS, AND SOFTWARE THAT AID AND ABET COMPUTING. SOME ARE SPECIFICALLY AIMED AT MAC OWNERS; OTHERS COVER WIDER TERRITORY BUT ARE STILL INTERESTING. THIS YEAR'S CROP INCLUDES A PUBLICATION FOR CLARISWORKS USERS, NEWS SERVICES THAT BRING THE LATEST TO YOUR DESKTOP, AND BOOKS THAT HELP YOU STAY HEALTHY.

**ClarisWorks in Detail**

ClarisWorks users have a friend in *ClarisWorks Journal*, an unusually helpful publication from the ClarisWorks Users Group of Plymouth, Michigan (313/454-1969, fax 313/454-1965). This 24-page newsletter, published ten times a year, offers clear, specific tips on using this best-selling application. The February and March issues are packed with great information, including a database primer on using dates in calculations; spreadsheet tips; a section for teachers on creating reports and tests with ClarisWorks; and an article written by Robert Duvall, author of the charting module in ClarisWorks, on how to use the program's undocumented charting features.

CWUG also offers monthly disks of shareware fonts, graphics, and ClarisWorks templates. Shareware disks ($8 each) and a public-domain catalog ($5) are available to nonmembers. CWUG's 10,000-plus members worldwide don't meet, but they do get benefits such as a training-tape rental service and an active BBS (615/359-8238). One big advantage for members outside the U.S. is that they can order software products through CWUG, giving them access to U.S. programs at U.S. prices. *Macworld* readers in the U.S. can join for $29 annually; memberships outside North America are $48 annually ($71 for airmail).

**Troubleshooting Tips**

There are many good books on troubleshooting, and I cited several in last July's column. One I didn't cover then, but that's worth noting, is *Desperately Seeking Solutions: A Troubleshooting Guide to the Mac* (Hayden Books, 1993). Author Erica Kerwin, a tech-support maven, explains problems and solutions in clear, helpful prose. An especially useful feature is a list of questions covered in each chapter and where to find the answer ("Why can't I delete this file? page 117," for example). The $29.95 tome also includes a shareware disk with Disinfector, SCISIProbe, TattleTale, Systems Errors DA, and System Picker.

**News on Your Desktop**

Individual, Inc., of Cambridge, Massachusetts (617/354-2236, 800/474-1000), offers two news services for tracking computer-industry developments (or anything else) right from your desktop. HeadsUp offers a brief trial service, as well as a three-month subscription.

**A Guide to the Internet**

A couple of years ago there were virtually no books about the Internet; now we have about a gazillion. Navigating the Internet to find the information you want can be difficult; *The Internet Yellow Pages* (Osborne/McGraw-Hill, 1994) makes this task much easier. This $27.95, 400-plus-page tome is organized alphabetically.
so are tips and tricks for safe computing. Two new books offer just such advice.

**ZAP! How your computer can hurt you—and what you can do about it** (Peachpit Press, 1994) offers an overview of health issues that may affect computer users, including eyestrain, physical injuries, and monitor emissions. Author Don Sellers takes a sane approach to sometimes emotional issues. The book’s abbreviated coverage means that much gets left out. But that’s OK—this useful, friendly volume ($12.95) points readers to additional sources of information. (Peachpit is selling 77,000 copies of *Zap!* at cost to U.S. corporations until September 5. The minimum order is 30 books; call Hannah Onstad for details at 510/548-4393 or 800/283-9444.)

A book dedicated to helping prevent computer-related physical injuries is *Repetitive Strain Injury: A Computer User’s Guide* (John Wiley & Sons, 1994). This $14.95 volume was written by physician Emil Pascarelli and Deborah Quitter, a writer who has experienced RSI (also known as cumulative trauma disorder). They suggest a seven-point program for treating and preventing injuries, offer advice on choosing a doctor, and list support groups and organizations that may be helpful. If you’re in pain from using your computer, this book may help you understand why (you should consult your doctor before following its advice). The authors warmed my consumer-advocate heart with this prose: “Don’t be a sucker. Don’t buy keyboards . . . or gimmicky devices or accessories unless you are positive they are worth the cost—and preferably have been evaluated by a competent doctor or occupational therapist.”

**CD-ROM Madness**

A La Jolla, California–based company is producing a fascinating, maddening exploration into CD-ROM publishing called think[an interactive]. Adhoc Technologies (619/551-0109) and editor-in-chief Aaron Singer describe think as a mainstream, interactive, multimedia magazine. It has many beautiful screens, and several so-called interactive sections are compelling or amusing. But the information in the premier issue is thin. The review section, for example, covers two record albums, the 1941 film *Citizen Kane*, and a book. The review of Larry McMurtry’s book *Streets of Laredo* begins, “I wish I had something profound to say about *Streets of Laredo*.” Me too. The opening “Reviews” screen is lovely, but it promises more than the content delivers. And I don’t know whom to blame: the reviews have no bylines. Multimedia fans should still check it out think—it’s no threat to print media, but it’s fun to explore.

Speaking of fun, last year I mentioned Owen W. Linzmayer’s *Cruel Mac Tricks*. The disk grew into a book (with disk) called *The Macintosh Joker* (Hayden Books, 1993), which is equally useless to society and includes 11 new tricks. If you have an annoying sense of humor, this is the book for you.
Introducing the ScanMaker® III, the first 36-bit, single-pass, color flatbed scanner that’s also the best value in the cosmos.

The ScanMaker III’s 36-bit color scanning capability allows it to capture an astronomical 68 billion colors. It has an optical density that reaches 3.4, unprecedented for a flatbed scanner, which results in a vastly expanded dynamic range. What all this means is, that your scanned images will have smoother color gradations, denser color values and substantially increased detail in shadow and highlight areas.

Performing like scanners priced somewhere in the stratosphere, the ScanMaker III’s scans are so sharp, you will actually reduce the amount of time spent in post-scanning software to sharpen images. And its optical resolution of 600 x 1200 dpi (enhanced through software to 2400 x 2400 dpi) is great for enlarging small originals.

For accurate scanned color, DCR™ (Dynamic Color Rendition), Microtek’s award-winning color calibration/correction system calibrates the ScanMaker III to a photographic industry-accepted calibration target creating a custom profile of your specific scanner. This ensures the most accurate color possible as you scan an image, so you spend a lot less time adjusting the color of your scans to match your originals.

Windows users also get Microtek’s ScanWizard™, a drag and drop application for instant image management, faxing and printing. The ScanMaker III also includes the full-version of Adobe Photoshop for complete image editing and color separations.

See why Microtek is the universally accepted leader in image quality. For more information about the ScanMaker III, DCR, ScanWizard, or for the name of your nearest authorized Microtek reseller, call 1-800-654-4160.

See Microtek at PC Expo/New York Booth #2226 June 28-30.
Say goodbye to Trinitron. Mitsubishi's DiamondTron CRT ushers in a new era in high-performance monitor design for all high resolution Macintosh® II and Quadra® applications.

With a big 21-inch screen (20" viewable), the DiamondTron CRT is nine square inches larger than the largest desktop-size Sony® Trinitron.

The DiamondTron CRT also delivers superior performance. Its new hybrid design incorporates a vertically-flat, square-cornered screen with an aperture grille mask to minimize glare while increasing brightness. Plus Mitsubishi's proprietary NX-DBF™ (Dynamic Beam Forming) electron gun provides exceptional center-to-corner focus and brilliant edge-to-edge clarity. And the exclusive Diamond Control software (available August 1994) lets you set up the expanded array of monitor adjustment functions on-screen, including full-power management capabilities for auto-dimming or shut down.

Best of all, you can get all the benefits of advanced DiamondTron technology in our Diamond Pro 21T monitor for just $2,525 MSRP.

For more information about DiamondTron and the Diamond Pro 21T monitor, call us at 1-800-843-2515. In Canada call 1-800-387-9630.

For immediate product specifications, call Mitsubishi Quickfax at 1-800-937-2094.
Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in Macworld's comparative articles. A next to a product indicates that we chose more than one product in that category. A next to a product listing indicates that a native Power Mac version is available.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93
Portrait monitor: 15-inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4590; $399, with video-display board $549.

Two-page monitor: [description not clear], $199, with video-display board $1398. MD 202 Two Page Display, Mobius Technologies, 510/654-0556; $699, with video-display board $798.

COLOR MONITORS, Oct 93
16- and 17-inch: ErgoView 17; Sigma Designs, 510/770-0100; $1549. Multisync 5G; NEC Technologies, 708/860-9500; $1355 (NEC's estimated dealer price).

SMALL COLOR MONITORS, Jan 94
14-inch display: Sony CPD 1430; Sony Corp. of America, 800/222-7669; $779.95. NanoFlexScan FS340+V; Nanao USA, 800/800-5202; $799.

15-inch display: NEC Multisync 4Ge; NEC Technologies, 708/860-9500; estimated street price $755.

NETWORK HARDWARE

HARDWARE ROUTERS, Jul 93
Under $1500: EtherRoute; Compatible Systems, 303/444-9532; base model $1495 (no TCP/IP support).

Between $1500 and $3500: InterRoute/5; Farallon Computing, 510/814-5000; $2399 to $3499.

HIGH-SPEED FAX MODEMS, Oct 93
Teleport Gold and Silver with Global Fax; Global Village Communications, 415/390-8200; Gold $499, Silver $429.

POWERBOOK TOOLS

DUO DOCKING CONNECTORS, Feb 93
PowerLink DeskNet; E-Machinek, 503/646-6699; $699.

EXTERNAL HARD DRIVES, Feb 93
Companion 120; APS Technologies, 800/874-1428; $599. PocketDrive 120MB; La Cie, 503/520-9000; $699.

INTERNAL FAX MODEMS, Feb 93
PowerModem series; PSI, 408/559-8544; $195 to $495. PowerPort series; Global Village Communication, 415/390-8200; $229 to $499.

PRINTERS

DYE-SUBLIMATION PRINTERS, Jul 94
Prepress proofing—tabloid size/fastest: Phaser 480; Tektronix, 503/682-7377; $14,995.

Prepress proofing—tabloid size/most complete: Rainbow; 3M, 612/733-1110; estimated street price of $20,000.

Prepress proofing—letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; $7999.

PERSONAL PRINTERS, Sep 93
Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; $359.

PostScript laser: TI microLaser Series; Texas Instruments, 512/250-6679; $1199 to $1599.

QuickDraw laser: LaserWriter Select 300; Apple Computer, 408/996-1010; $839.

WORKGROUP PRINTERS, Feb 94
High-speed: Hewlett-Packard 451MX; Hewlett-Packard, 800/752-0900; $5499.

Best buy: Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; $2299.

SCANNERS

LOW-COST COLOR SCANNERS, Nov 93
1800 to 16000: La Cie Silverscanner II; La Cie, 503/520-9000; $1599. Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; $1599.

Under $1500: Sharp 800 Plus Color Scanner; Sharp, 310/434-4550; $1299.

OCR, Nov 93
OmniPage Professional; Caere Corp., 408/395-7000; $995.

SYSTEMS/STORAGE

DOUBLE-SPEED CD-ROM DRIVES, Jul 93
Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; $1795.

Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.

Budget choice: NEC MultiSpin 3B; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93
2.7GB drives: Nova XL 2700; Microtech International, 203/468-6223; $3999. Vista 3.5GB; Relax Technology, 510/471-6112; $3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; $499.

MACINTOSH UPGRADES, Jan 93
SE accelerator (25MHz): Quick320; Navy Systems, 904/427-2358; $449 (without FPU).

SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU). 33MHz $499 (without FPU).

LC and LC II upgrades: Macintosh LC II Logic Board Upgrade; Apple Computer, 408/996-1010; $599.

Mac II accelerators: Radius Rocket 2Si, Radius Rocket 33; Radius, 408/434-1010; $1199, $3249.

Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.

ILfx SCSI accelerator: QuickSCSI; PLI, 800/288-8754; $499.

Quadra static-RAM cache cards: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadro 700 and 900, $499 for Quadra 800 and 950.

MIDRANGE HARD DRIVES, Mar 93
Low-capacity drive: La Cie Cirrus 240; La Cie, 503/520-9000; $769.

Notable technology: DiamondDrive 510; Mass Micro- systems, 408/522-1200; $2089.

Bargain: APS Fujitsu 520; APS Technologies, 800/874-1428; $1149.

All-around quality: hammers 525FMF; FWB, 415/474-8055; $2799.

OPTICAL DRIVES, Dec 93
3½-inch: [description not clear].

128 MB; APS Technologies, 800/874-1428; $899.

5¼-inch: Sharp J5-750; ClubMac, 800/258-2622; $189.

Infinity MaxOptical 11 m; Peripheral Land Inc., 800/258-8754; $4113.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94
Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; $599.

continues
BUYERS' TOOLS

MACWORLD

Editors' Choice

Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; $499.

HIGH-END VIDEO EDITING, June 94
Presentation Video: MoviePak Pro Suite; Raster-Ops, 801/785-9750; $499. VideoVision Studio; Radius. 408/434-1010; $499.

Corporate Video (Offline): Media Composer 400s; Avid Technology, 508/640-6789; $14,995.

Corporate Video (Online): VideoCube; ImMix, 916/272-9800; $40,500.

PHOTO SHOP ACCELERATORS, Apr 94
PhotoBooster; Radius, 408/434-1010; $999.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-business system: M.Y.O.B.; Teleware, 201/586-2200; $199.

Home office/personal finance: MacMoney; Surviv or Software, 310/410-9527; $119.95.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $995.

Comprehensive packages: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

CD-ROM

TOP 10 CD-ROMS, Mar 94
Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; $79.99.

COMMUNICATIONS/NETWORKS

HIGH-SPEED FAX MODERN SOFTWARE, Oct 93
Faxsoft; Telefocus, 816/886-9800; $79.

NETWORK CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

2-D CAD, Jan 93
Low-end: Blueprint; Graphisoft, 410/461-9488; $295.


3-D DESIGN, Aug 93

All-in-one solution: Infiniti D 2.5; Spectral Information, 413/253-3100; $695. StrataVision 3D; Strata, 801/628-5218; $995.

PHOTOSHOP ACCELERATORS, Apr 94
PhotoBooster; Radius, 408/434-1010; $999.

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94
ClarisWorks; Claris Corporation, 408/727-8227; $299.

ORGANIZATION/PROMOTIVITY

CALENDARS, Jul 93
Alarm system: First Things First; Visionary Software, 503/246-6200; $79.95.

Smart Alarms Plus; JAM Software, 203/630-0055; $75.

All-around scheduler: Now-Up-To-Date; NowSoftware, 503/274-2800; $99.

Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack $495.

SALES-AUTOMATION SOFTWARE, Oct 93
Contact Ease; WestWare, 619/274-5053; one user $395, five users $1495.

CBS; Colleague Business Software, 512/345-9564; $495.

TEXT-RETRIEVAL SOFTWARE, Dec 93
Small system: On Location; On Technology, 617/374-1400; $129.

Multuser system: Personal Librarian; Personal Library Software, 301/990-1155; $995.

PRESENTATION TOOLS

MULTIMEDIA AUTHORING, Mar 93
Entry-level: Action; Macromedia, 415/252-2000; $495.

Passport Producer; Passport Designs, 415/726-0280; $495.

PRESENTATION SOFTWARE, Jul 94
Persuasion 3.0; Aldus Corp., 206/662-6500; $495.

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94
Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; $189.95.

Book-length documents: FrameReader; Frame Technology, 800/843-7263; $84.95.

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GD TSoftworks, 604/291-9121; $149.

VIRUS KILLERS, Jul 94
Commercial software: Virex; Datawatch, 919/549-0711; $99.95.

Free software: Disinfectant; free from online services.

VIRTUAL MEMORY SOFTWARE

VIRTUAL MEMORY, June 94
Virtual memory Software: Virtual 3.0; Connectix Corp., 415/571-5100; $99.

Memory boosting Software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; $99.
Put CompuServe to work for you.

Join CompuServe and connect yourself to more than a thousand services—and to a world of information, resources, and support ready to go to work for your business.

For more information about CompuServe, just mail this card, or call 1 800 848-8199.
CompuServe®
NEW MEMBER DEPARTMENT  Mac World/July
PO BOX 20961
COLUMBUS OH 43220-9988
As far as you're concerned, CompuServe makes you lean. As far as your competition's concerned, it makes you mean.

There's one thing you learned when you started working with CompuServe. You don't have to be big for the competition to be nervous.

That's the power CompuServe puts in your hands when it links you to information and resources typically available only to big companies.

Stay in touch with your market, and the world, with E-mail, fax, and international telecommunications (for the price of a local phone call). Professional forums let you talk with the experts who have the answers. Control your own flight and hotel bookings. Get the news you need, straight off the wire. Reference libraries, all filled with archived articles from thousands of magazines, newspapers, and newsletters, mean more information on markets, clients, and competitors, in less time. And keep all your parts and programs running smoothly with CompuServe's hardware and software support.

Getting started is easy. A one-time membership fee and $8.95 a month let you use our basic services as often as you like. Plus, you get the first month free. Then keep going with hundreds of other services available at nominal additional charges. For more information or to order, see your computer dealer or call 1 800 848-8199.

Outside the U.S. and Canada, call 1 614 529-1349.

Special offer for Newton Developers. Call 800 621-1258 and ask for the Newton Representative.

Circle 66 on reader service card
Your mind's eye visualizes the finished work ... and, you are drawn to the screen of the new ViewSonic 17. This is where perfection is found. The image on the screen is vital to you — not all monitors are created equal. That's why we developed the New Generation ViewSonic 17 color monitor. There is a difference!

The revolutionary super dark screen of the ViewSonic 17 is designed to increase contrast and produce pure, sharp colors. In addition to a vivid, luminescent image, our digitally controlled 17" monitor offers ViewMatch, a color control system designed to accurately match the screen to printer output. To customize settings, such as screen size or pincushioning, there is OnView, an easy-to-use array of on-screen adjustments. And the monitor supports non-interlaced resolutions up to 1,600 x 1,200 pixels.

The ViewSonic 17 is even equipped with BNC connectors, which allows two systems to be attached to the monitor at the same time. As a matter of fact, the entire line of ViewSonic's 15-through 21-inch New Generation monitors is MAC and PC compatible, and meet Swedish MPR-II standards for low radiation.

Unleash your creative forces with the new ViewSonic 17 ... and See The Difference!

20480 Business Parkway Walnut, CA 91789
Tel: (800) 888-8583 or (909) 869-7976 Fax: (909) 869-7958

ViewSonic®
See The Difference™

Circle 237 on reader service card
Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of Macworld's authoritative product reviews from the past year. The number of stars at the beginning of each capsule review indicates quality: our reviewers assign five stars to outstanding products and one star to poor ones. The symbol indicates that a product is available in a native Power Mac version, although unless stated otherwise the version we reviewed was the 68000 version.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendor: Please write to Macworld Star Ratings, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

** BUSINESS TOOLS **

★★★ 4D First 1.0, ACI US, 408/252-4444, $295. This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. It's not much easier to use, however, than the full-fledged 4D. May 94

★★★ 4D Server 1.0.1 (1.0.5), ACI US, 408/252-4444, $1495 to $3495. Database server uses the ingenious multitasking technology built into 4D to make it appear that each client has the full resources of the server. If you use 4D on a network, you need this product. Jun 93

★★★ Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, $195 to $2495. Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★ @Risk 1.1, Pallisade Corp., 607/277-8000, $395. Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★★ BaseMap 1.0.1, GeoPoint, 415/557-1560, $149. For simple maps displaying simple data, this mapmaking tool may be useful. It's not for the cartographic sophisticate, however, as it offers very limited data-display abilities and only one projection. May 94

★★★ Clarisimpact 1.0, Claris Corp., 408/727-8227, $399. Business graphing, project management, object-oriented drawing, word processing, and presentation functions merge in this business graphics software. The outstanding integration offers versatility that dedicated programs are pressed to match. Jun 93

★★★ ClarisWorks 2.0, Claris Corp., 408/727-8227, $299. Integrated program provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

★★★ Common Ground 1.0, No Hands Software, 415/502-5800, $189.95. Simple, robust document-interchange system is the choice for correct documentation-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★★ Cricket Graph III 1.5, Computer Associates International, 516/342-6000, $129. Basic and foolproof charting program produces cleaner charts than Excel with little effort, although its feature set is fairly modest. Apr 94

★★★ DeltaGraph Pro 3, DeltaPoint, 408/648-4000, $195. At its new lower price, this charting program is the best feature-for-feature value in Macintosh charting. There's even a new Chart Advisor function that suggests the appropriate display for your data. Apr 94

★★★ EasyFlow 1.1, HavenTree Software, 617/544-6035, $229. The rough edges and distinctly unMac-like attributes of this flowcharting software reflect its DOS heritage, but on the whole it's easy to use. Sep 93

★★★ Helix Express 1.0 (2.0), Helix Technologies, 708/645-0242, $439. This relational database has an iconic programming language that sometimes baffles programmers, but provides an easy route into basic database handling for nonprogrammers. Jul 93

★★★ Helix Tracker 1.0, Helix Technologies, 708/645-0242, $439. Well-designed workgroup-document-managing program with strong audit and annotation features; imposes just the right amount of administrative discipline. For large documents, however, Ethernet will look mighty attractive. Nov 93

★★★ Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, $459 per client. Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★ Map II 1.5, ThinkSpace, 519/661-4006, $395. Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS and for alert first-time users who just like maps. May 94

★★★ MarblePop 2.0, Mainstay, 805/484-9400, $395. Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents, whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★ Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, $395 to $1995. Sales-automation software designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module, but it has some odd user-interface features. Oct 93

★★★ Memorizer 2.0, Brains Software Engineering, 432-231-28973 (Austria), $100. Software records dictation, and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appliance and its propensity to crash. Aug 93

★★★ Micro Planner Manager 1.1, Micro Planning International, 303/757-2216, $695. When you require cross-project resource sharing and leveling for a reasonable price, this project-management software has the edge. It has a generally intuitive interface, though there's a steep learning curve for its advanced features. Nov 93

★★★ Microsoft FoxPro for Macintosh 2.5, Microsoft Corp., 206/882-0800, $495. Dazzlingly fast and easy to use relational database has a greatly improved interface and cross-platform compatibility. For projects of 4 to 20 users that handle large amounts of data (hundreds of thousands to millions of records) it offers excellent performance. Apr 94

★★★ Office Tracker 1.1, Millum Corp., 512/272-2255, $195 to $995. The efficient user interface of this software sign-out board, in both single-user and networkable versions, makes it easy to learn and use; but it has some minor flaws. Dec 93

★★★ Project Scheduler 5, Sector Corp., 415/570-7700, $695. For midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards; so you get consistent, predictable results. Aug 93

★★★ Useful Voice Processor for Macintosh 1.1v7 (1.1v9), Useful Software Corp., 508/774-8233, $179.95. Dictation software lets you record and transcribe on a Mac. It has some useful features, but you must take uncommon care to avoid crashes. Dec 93

★★★ Wing 1.1ae, Informix Software, 913/599-7100, $399. Low-overhead spreadsheet offers advanced-math functionality, a competent calculating engine and superior charts; but is missing outlining, real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. Jul 93

★★★ WordPerfect Works 1.2, WordPerfect Corp., 801/225-5000, $249. This program offers seven well-integrated and flexible modules. It has a few shortcomings, including some memory-management problems.
Star Ratings

**COMMUNICATIONS/NETWORKS**

★★ AccessPC 3.0, Insignia Solutions, 415/694-7600, $129.95. Utility translates most word-processing and some database formats, but it doesn't translate graphics and some of its translations result in data loss. Apr 94

★★ Crosstalk for Macintosh 3.0, Digital Communications Associates, 404/442-4600, $195. Commendable communications product has a feature set that well matches its competition. Still, the script editing is complex and you must manually enter phone numbers each time you use it. Apr 94

★★ Delrina FaxPro for Macintosh 1.0, Delrina Corp., 408/363-2345, $129. Fast, efficient fax software has an excellent address-book feature but also has some interface quirks and minor bugs. Feb 94

★★ DOS Mounter Plus 4.0, Dayna Communications, 801/269-7200, $100. File-transfer and translation utility works with floppy drives, removable drives, and network volumes and supports wild cards in DOS extensions. Apr 94

★★ EtherPeek 2.0.3, LocalPeek 2.0.3, TokenPeek 1.0 (2.0.3), AG Group, 510/937-7900, $495 to $995. Priced at a fraction of the cost of dedicated hardware analyzers, these network analyzer tools give you better analysis with a friendlier interface. They're a worthwhile investment. Jun 94

★★ MacLink Plus Translators Pro 7.5, DataViz, 203/268-0030, $149. If your PC files are in archival formats, you'll need this file-transfer and translation utility. It's a great option for most users, but it doesn't support removable drives or network volumes. Apr 94

★★ On The Air 1.0.1 (1.0.2), Digital Eclipse Software, 510/547-6101, $79.99 to $639.99. Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. Aug 93

★★★★ On The Road 1.1, Connectix, 415/571-5100, $59. Helpful PowerBook utility looks at what's hooked up to your computer and adjusts accordingly—for example, printing when a printer is available and otherwise deferring printing. It only supports some hardware, however, so check before buying. Dec 93

★★ Silver Cloud 1.2, AG Group, 510/937-7900, $495. If you are administering a large network and are drowning in a sea of devices and zones, this network-management software will make your life simpler. Feb 94

★★ SitComm 1.0, Aladdin Systems, 408/761-6200, $120. Inexpensive telecommunications software is fairly easy to set up and use, and will do well for people who use just one or two online services. Still, it lacks true scripting and has limited protocol options. Apr 94

★★ Snap Mail 1.01, Casady & Greene, 408/844-9228, $200 to $1440. Software will put you on the electronic-mail trail more easily and more cheaply than any competing product, if you can live with some minor (but surprising) shortcomings. Jun 94

★★ SoftPC 3.1, Insignia Solutions, 415/694-7600, $499. While the speed of this Windows PC emulator is greatly improved, buying an add-in PC card for your Mac is more efficient. Mar 94

★★ Timbuktu Pro, Farallon Computing, 510/814-5000, $199 to $1999. Terminal emulation product is a must-have for in-house technical-support staff and for people who need direct connection to computer systems on a variety of networks. The major enhancements of this version are TCP/IP support for Macs and noticeably faster screen redraw. May 94

★★ TrafficWatch 2.0, Neon Software, 510/283-9771, $495. The price of this AppleTalk traffic monitor is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. Without printing, alarms, triggers, or true multithread support, this product misses the mark. Jun 94

★★★★ VersaTerm 5.0, Synergy Software, 215/779-0522, $195. The price and feature set of this network terminal-emulation package make it a terrific value, in spite of its complex documentation and limitations. If you're looking for a fast path to internet connectivity, this is it. Jan 94

**DESKTOP PUBLISHING**

★★ AboutFace 1.1.1 (1.1.2), Big Rock Software, 716/286-2860, $69.95. Type-specimen generator has many serious deficiencies that need to be addressed. Jan 94

★★ Aldus Fetch 1.0, Aldus Corp., 206/622-5500, $295. The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. Aug 93

★★ Aldus PageMaker 5.0, Aldus Corp., 206/622-5500, $895. Desktop publishing software has added the features, both great and small, that it's been lacking, while still retaining the ease-of-use advantages that it's always had. It's a superb upgrade. Nov 93

★★ Cumulus 1.2 (1.2), Canto Software, 415/431-6871, $295 to $895. Good network supporter, plus a feature that creates a protocol file for recording user actions, can make this image-cataloging program a good choice for workgroups. It doesn't have an Image-preview feature, nor does it offer 32-bit thumbnails. Aug 93

★★ Expanded Book Toolkit 1.0 (2.1), The Voyager Company, 310/451-1383, $295. Using this hypemedia publishing program, average mortals can create highly functional multimedia books in a fraction of the time it would take to do the job unassisted. Be aware, though, that it's no QuarkXPress. Jun 93

★★ FontMonger 1.5.7, Ares Software Corp., 415/578-9050, $149.95. Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create complete, subscript, superscript, and rotated characters. Sep 93

★★ FotoTune 1.1, Agfa Division of Miles, 508/768-5600, $795. Color-management software has a capable engine, but it's not the complete color-management system Agfa touts. Inexpensive tech support and poor documentation were only part of the problem. Apr 94

★★ FrameMaker 4.0, Frame Technology Corp., 408/433-3111, $895. For such projects as long, structured documents—books, instruction manuals, and textbooks—this desktop publishing program is one of the best tools available. It's fast, well mannered, and a real timesaver. Mar 94

★★ ImageAccess 1.0, Nikon, 516/547-4355, $495. This expensive imaging-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. Aug 93

★★ Kodak ColorSense 1.0, Eastman Kodak, 716/253-0740, $495. Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. Oct 93

★★★★ Kudo Image Browser 1.0 (1.1), Impulse Systems Corp., 619/272-2600, $195. This image-cataloging software cannot control thumbnail depth or compression and doesn't have a keyword feature or allow multiple users to access the catalog simultaneously. The unique recipe feature lets you quickly scan images. Aug 93

★★★★ Print Shop Deluxe, Braeburn Software, 415/382-4400, $50. Even the most ham­

pered can create professional-looking greeting cards, signs, banners, letterhead stationery and calendars with these desktop publishing templates and graphics. While it's not a substitute for a high-end program, it is easy to use and inexpensive. Apr 94

★★★★ QuarkXPress 3.2, Quark, 303/894-8888, $895. This upgrade adds the EliColor XE悌son to ensure the greatest possible fidelity of color images and is a must-have for professional color publishers who use Quark. For others, the enhancements are welcome but minor enough that they provide little incentive to upgrade. Nov 93

★★★★ Tableworks Plus 1.05, Npath, 206/392-7745, $99. Publishing utility adds a fully table­

editor to QuarkXPress and is a must-have for anyone doing even mildly complex tables. Jan 94

**EDUCATION**

★★★★ Decimal & Fraction Maze 1.2 (1.2.3), Great Wave Software, 408/438-1990, $69.95 to $89.95. Education software weaves the threads of eight math curricula—from third grade to eighth, along with two levels of adult education—into an interesting and visually stimulating game. Jul 93


★★★★ HyperStudio, Roger Wagner Publishing, 619/442-0522, $179.95. Hypermedia authoring software supports color and many multimedia functions through easy-to-use dialog boxes, but the interface doesn't always follow Apple guidelines. Dec 93

★★★★ MacGrade 1.5.5, CallEd Software, 800/795-0641, $85 to $245. Grade-book program has a straightforward, simple interface and clear documentation. Although there's room for improvement, it's easy to use and flexible. Feb 94

★★★★ Millie's Math House 1.0 (1.1), Edmark Corp., 206/556-8400, $49.95. Math-education soft­

ware provides ways for preschoolers to experiment with numbers and counting. It's engaging, but more advanced levels would keep children challenged longer. Jul 93

★★★★ The Rosetta Stone, Fairfield Language Technologies, 703/432-6166, $395. Foreign-lang­

uage instruction on CD-ROM is a valuable educational tool and fun to use. The lessons are well paced, and the content is generally excellent and diverse. Jan 94

**ENTERTAINMENT**

★★★★ Blackjack Trainer, ConiCo, 412/492-9210, $75. Learn the strategies you need to win at blackjack with this program. There are a number of trivial bugs, but they won't get in the way. Oct 93

★★★★ Crystal Crazy, Casady & Greene, 408/494-9228, $49.95. Ultraglossy, superpolished version of the classic Crystal Quest is challenging and fun without being overly difficult. Each level retains some old elements, and adds some new ones to keep you on your toes. Jun 94

194 July 1994 MACWORLD
Daily Sports Quiz 1.0, DreamTime, 619/236-1341, $49.95. If you think you know a lot about sports and love to play trivia games, then this entertaining and informative game is for you. Oct 93

** Falcon MC 1.0, Spectrum HoloByte, 510/523-1164, $69.95. Whether you're an armchair jet jockey or an experienced fighter pilot, you're bound to be impressed by the 4-bit color, enhanced graphics, and sophistication of this latest incarnation of the original Macintosh combat flight simulator. Dec 93

** Firefall Arcade, Inline Software, 203/435-6995, $49.95. If you loved the classic video game Centipede, or are just looking for a fun shoot-'em-up, this arcade-style game will satisfy. Jun 94

** Hell Cab 1.0.1, Time Warner Interactive Group, 818/955-9999, $99.99. Take a diabolical New York cabby with a penchant for time travel, toss in the Empire State Building, add a few brain teasers, and you've got this engaging game on CD-ROM. It's row and the arcade sections are hard to control, but overall it succeeds. Jan 94

** Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3394, $59.95. In this game, the whip-wielding archaeologist goes looking for Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it diverting. Oct 93

** The Journeyman Project 1.0 (1.2), Presto Studios, 619/689-4895, $79.95. Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

** Myst 1.0, Brderbund Software, 415/382-4400, $59.95. The smooth pacing of actions and sounds in this beautiful CD-ROM game give it a dreamlike quality. This is a game that's been polished until it shines. Mar 94

** Seven Days in August, Time Warner Interactive Group, 918/955-9999, $99.99. Compelling, interactive documentary on CD-ROM eats a slice from history and offers Aug 10 through August 16, 1963, (the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

** SimCity 2000, Maxis Software, 510/254-9700, $69.95. In essence, your goal with this marvelous city-simulation software is to build a city and run it successfully. The game is fascinatingly complex, but it's simple to use, and the elaborate graphics are so lovely that it's even fun just to watch. Jun 94

** Spectre Supreme, Velocity Development, 415/274-8840, $69.95 to $89.85. The pleasure of this game comes not in high scores, but in the almost addictive sense of control you get from moving your tank around the screen. It's so much fun that it's even fun when you lose. Dec 93

** Spin Doctor, Callisto Corp., 508/655-0707, $59.95. In the tradition of the best Macintosh games, this game tests your wits and reflexes alike. It's part strategy game, part kinetic sculpture. Jun 94

** V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, $69.95. The post-D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

** Andrew Tobias' TaxCut 1993, MECA Software, 203/255-1441, $79.95. The free-form approach and flexible Help menus of this tax-preparation software make filling out your tax return a smooth, almost relaxing process. The only state versions available are California and New York. Apr 94

** BestBooks 1.0, Teleware, 201/586-2200, $99. In a straightforward, unimpeachable manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. Jul 93

** ExpensPlus 1.0.1, State of the Art, 714/753-1222, $139.95 to $159.95. Software uses a Newton MessagePad to record expenses, then sends the data to a Mac to create and print expense reports. While it's a real time-saver, you'll need AppleScript expertise to modify the expense reports. Apr 94

** MacinTax 1993, ChipSoft, 602/295-3110, $110, $69.95. Tax-preparation software provides a reasonably detailed manual and a reliable, structured interface for building your tax return. Its inability to accept figures containing amounts in cents or round off to whole dollar amounts will frustrate some users. Apr 94

** MacinTax Tax Planner, ChipSoft, 602/295-3110, $19.95. Software allows you to construct a five-year forecast of your tax liability, projecting tax figures through 1997 in a concise summary format. If you have a tax preparation program, you can do the same thing by creating alternative tax returns. Apr 94

** MacinTax Tax Savings Guide, ChipSoft, 602/295-3110, $19.95. Simple, straightforward collection of well-written, fully indexed tax tips and suggestions is designed to help you better understand your tax return and reduce your tax liability. Although strong in content, it doesn't allow you to copy and paste, export as a text file, or even print. Apr 94

** Managing Your Money 6.0, Meca Software, 800/820-7475, $79.95. Personal-finance program does a good if somewhat roundabout job of keeping track of your total financial picture. Although it isn't as easy to use as the competition, it excels in tax, investment, and financial planning. Jun 94

** Quicken 4, Intuit, 415/858-6095, $69.95. Personal-finance software is powerful and easy to learn, even for a financial neophyte. Although slower than previous versions, 4.0 lives up to its promise of making financial chores easier and better organized. Nov 93

** addDepth 1.0.2, Ray Dream, 415/860-0678, $179. The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but its complex interface gets tedious because of the automatic application of styles. Aug 93

** Adobe Illustrator 5.0, Adobe Systems, 415/961-4400, $595. The Mac's most dependable drawing program has added enough new features to boggle the mind. It still can't import TIFF images, but it catches up with, and in some areas surpasses, the competition. Nov 93

** Adobe Photoshop 2.5 (2.51), Adobe Systems, 415/961-4400, $595. No graphics program is an universally loved this one, but while this upgrade builds on the program's capabilities, it ignores some minor weaknesses that have begun to peek through the product's armor. It's still great but perhaps not perfect. Jun 93

** Aldus FreeHand 4.0, Aldus Corp., 206/622-5500, $595. The new page-design and text-editing functions of this powerful draw program make it more than worth the price of admission. Aside from some bewildering interface elements, it's an outstanding program. Mar 94

** Atlas Sketch 1.5, Alias Research, 416/362-9181, $995. The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users. Jul 93

** Blueprint 4, Graphsoft, 410/290-5114, $295. Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

** BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, $139. If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

** CA-Cricket Draw II 3.0 (2.01), Computer Associates International, 516/342-5224, $249. This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward, and the price is right. Oct 93

** Canvas 3.5, Denaea Software, 305/596-5644, $399. Draw program offers two to three times as many features as any competing program, but our reviewer would prefer an interface that you can navigate without scrambling for the manual. Jan 94

** ColorSprip 1.0, Pantone, 201/935-5500, $99.95. Professional graphic designers don't need the advice of this color tutorial and series of palettes. Although nonprofessionals might benefit from the information on color theory, it may not be worth the money. Nov 93

** Debabelizer 1.5 (1.5.5), Equilibrium Technologies, 415/332-4343, $299. Bitmapped-graphics-conversion software supports a huge number of file formats and can work wonders. If you spend any significant time dealing with file conversion, you should have this program. Nov 93

** Design Workshop 1.0 (1.1), Artifice, 503/345-7421, $895. The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

** Easy Color Paint 3.0, MECC, 612/569-1500, $59.95. For a program that purports simplicity, this color paint program is anything but. Possibly the weakest, least intuitive paint program for the Mac, it's unnecessarily complex and frustrating. Jul 94

** Expert Draw 1.0, Expert Software, 305/567-9990, $49.95. Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone on a budget. Aug 93

** Folio 1 Media Kit-Print Pro, D'Piz, 614/299-7192, $499.95. Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; it's free of artifacts, and is crisply focused. Aug 93

** Fractal Design Painter 2.0, Fractal Design Corporation, 408/688-8800, $399. If you can put up with a few inconveniences, this color paint software provides the tools required by professional artists, and many of its functions—natural-media brush tools, the color-sensitive magic wand—are entirely without peer. Jul 93

** Generic CADD 2.0, Autodesk, 206/487-continues
Star Ratings

2233, $495. Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

Infinit-D 2.5.1, Specular International, 413/253-3100, $695. Serviceable 3-D graphics program has a wide range of modeling, rendering, and animation options, with a straightforward interface and quick operation. Feb 94

Kai's Power Tools 2.0a, HSC Software, 310/392-8441, $195. Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate, the ways you can apply them, and the artwork you can create. May 94

MacroModel, Macromedia, 415/252-2000, $1495. This 3-D modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple, making the Mac's inner space a more pleasant place to work. May 94

Ofoto 2.0 (2.02), Light Source Computer Images, 415/461-8000, $395. Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

Paint Alchemy 1.0, Xaos Tools, 415/487-7000, $99. For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. May 94

PosterWorks 3.0, S. H. Pierce & Co., 617/383-2222, $395. This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. Aug 93

PowerDraw 4.0 (5.0), Engineered Software, 910/299-4843, $795. The best new feature of this polished 2-D drafting program is an open architecture that supports modules that you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

Showplace 2.0, Pixar, 510/236-4000, $495 to $695. Adequate, entry-level, 3-D modeling is suitable for illustrating and other graphic arts applications. This version offers improved access to MacRenderMan, one of the best renderers around, plus plug-in modeling tools. Apr 94

StrataVision 3.2.6.3, Strata, 801/628-5218, $995. 3-D program includes animation, and is a superior rendering tool and versatile modeler. It's a challenge to learn, however, as the interface is overly dense and sometimes sluggish. Feb 94

StudioPro 1.0, Strata, 801/628-5218, $1495. If you need a well-balanced, all-in-one 3-D modeling, rendering, and animation solution, this is an application of excellent choice. Mar 94

Transverter Pro 1.0 (1.51), TechPool, 216/291-1922, $395. Remarkable graphics-conversion software can read PostScript files and convert them to a variety of formats. As you might expect of a program attempting to fill such a tall order, its conversions are not always flawless, but it can be a lifesaver nonetheless. Nov 93

Typerect 2.0, Pixar, 510/236-4000, $299. An approachable interface, animation support, and outstanding RenderMan rendering technology make this 3-D type-renderer a popular choice. This version improves on the original, but still lacks canned positioning effects. Jun 94

upFront 2.0, Alias Research, 416/362-9181, $299. Capable modeler is something of an acquired taste. However, take the time to learn it and you'll find useful, if unconventional and demanding, tools that are well suited for architectural modeling. Jan 94

Virtus WalkThrough 1.1, Virtus Corp., 919/467-9700, $195. Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value. Jun 94

WarpImages One, WarpImages Two, Form and Function, 619/536-9999, $95 each. The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

MATH/SCIENCE

Alchemy III, Tripos Associates, 314/647-1099, $950. Molecular-modeling software can model decapendides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac or better. Sep 93

Amazing Universe 2.1 (2.1a), Hopkins Technology, 612/931-9376, $79.95. Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (Vomission II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

CADuceus Science Review Macintosh Project 1.0, Scientia, 617/776-3427, $150 to $250. If you're taking the MCAT, you'd be nuts not to buy this interactive science review. With proper use, its 5MB of files are certain to improve your score. Apr 94

CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, $199.95. Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. Aug 93

CSC ChemicalOffice 2.0, Cambridge Scientific Computing, 617/491-6862, $995 to $1595. Comprehensive chemistry software is the Mac equivalent of software that seven years ago would have cost $200,000 and required an equally costly minicomputer. It's a winner. Feb 94

FASTACT 2.0, SYSTAT, 708/864-3670, $99.5. Exceptional calculator utility is packed with advanced features, including a mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach can save a great deal of time. Sep 93

lnStat 2.0, GraphPad Software, 619/457-3909, $95. For scientists with limited statistics background, this program can do all the things a stats textbook, making it a great educational bargain. Sep 93

MATH/SCIENCE

Achieving Your Career 1.02 (1.04), Up

Software, 415/592-4691, $69. HyperCard-based job-search software succeeds by compactly organizing the work you need to know about this astronomy program. In a firmament of mostly faint and forgettable astronomy software, it's a supernova. Jul 93

ORiGANIZATION/PRODUCTIVITY

No products were rated in this category.
415/325-9900, $349. This personal information database's flexible, intuitive approach to data-handling makes it an excellent tool for storing all kinds of day-to-day information. May 94

CalendarMaker 4.0, CE Software, 515/224-1995, $59.95. Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

ClientTrac 1.7 (1.7.2), Whiskey Hill Software, 415/851-8702, $135. Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

Contact Ease 2.0 (2.0.2), WestWare, 619/274-5053, $395 to $1495. Contact-management and sales automation helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks, but is overall a good program. Aug 93

DateBook and TouchBase Pro Bundle, Aldus Corp. Consumer Division, 619/558-6000, $149.95. Calendar and contact manager offer a superior combination of integration, usefulness, and features. If you want to get organized, make sure you look at this dynamic duo. Feb 94

In Control 2.0, Attain Corp., 617/776-1110, $89.95. The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. Aug 93

Now Contact 1.0 (1.0.1), Now Software, 503/274-2899, $59. This contact manager has some innovative features and could easily become the top address-book program for the Mac by adding some features, such as file reconciliation. Mar 94

Power Team 1.0, ProVue Development Corp., 714/892-8199, $149.95. Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. Oct 93

Rae Assist 1.0.2, Rae Technology, 408/725-2800, $199. Although this personal-information manager offers some fresh ideas, including automatic linking of company and contact information, it's too big and too slow. Jan 94

PRESENTATION TOOLS

Adobe Premiere 3.0, Adobe Systems, 415/961-4400, $695. Solid and dependable QuickTime video-editing software offers a structured, responsive, and flexible interface with enhancements that range from the mundane to the dramatic. It can now mix 99 tracks. Jan 94

Astound 1.0, Gold Disk, 408/982-0200, $399. Presentation software lets you include sound, text, and graphics animation with no more effort than pasting in a chart or other new products. It's a good value. Nov 93

Authorware Professional 2.0.1, Macromedia, 415/252-2000, $4995. Multimedia authoring and -presentation software lets you develop complex presentations with amazing speed. Although expensive, it's wonderfully done and will pay for itself in time saved. Feb 94

Avid VideoShop 2.0, Avid Technology, 508/640-6789, $495. QuickTime video-editing program shines in its intuitive, easy-to-use interface, although it may fall short on features for hard-core video professionals. Feb 94

CoSA After Effects 1.1, CoSA, 401/881-2672, $1295. QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It produces results that simply can't be created in other packages. Oct 93

Deck II 2.1, OSC, 415/252-0460, $399. AV Mac turns into digital-audio workstations with this software that enables you to record, mix, modify, and play back CD-quality sound. It doesn't include equalization features. Jun 94

Elastic Reality 1.0, ASGD, 608/273-6585, $349. Excellent morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate technical support make that a difficult task. Feb 94


Hi Rez Audio Volume 1.0, Presto Studios, 619/689-4903, $149.95. The enjoyable, high-quality music on this CD-ROM adds a nice touch to presentations. The software for browsing the music is quirky, and the product could use some documentation. Jul 93

Morph 2.0, Gryphon Software, 619/454-6836, $239. Easy to use morphing software is beautifully designed, with delightful new features, including the ability to morph QuickTime movies. Using it is as painless as morphing gets. Apr 94

Passport Producer Pro 1.0, Passport Designs, 419/726-0280, $595. Superb, albeit quite expensive, media-integration package makes assembling even complex presentations surprisingly easy. Path animation is limited to entrances and exits. Apr 94

QuickFlix 1.0, VideoFusion, 419/891-1090, $149. Approachable QuickTime moviemaking software lacks the high-end features of other programs but costs a whole lot less. Feb 94

QuickTime 1.0, Microsoft, 419/891-1090, $449. QuickTime player allows users to watch QuickTime movies. Oct 93

QuickTime 1.0.1 (1.5), VideoFusion, 419/891-1090, $649. Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos, then go ahead and indulge. Jul 94

QuickTime 2.0.2, Apple Computer, 408/266-6300, $349. Exciting morphing tool can create professional-caliber results—if you can figure out how to use it. The needlessly convoluted interface, poor documentation, and inadequate technical support make that a difficult task. Feb 94

RealPlayer 1.0, RealNetworks, 415/553-8153, $995. Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. Oct 93

PROGRAMMING

CL Matic 1.0, Orchard Software, 617/876-4608, $59.95. With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irreplaceable package. Oct 93

Future BASIC 1.0 (1.02), Zedcor, 602/881-8101, $259.95. Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. Jul 93

Macintosh Common Lisp 2.0 (2.0.1), APDA, 716/871-6555, $495. Anyone who likes programming in LISP will love this environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. Oct 93

Object Logo Student Edition, Paradigm Software, 617/576-7675, $49.95. This book-plus-disk package offers a wide-ranging introduction to programming concepts. It's aimed roughly at the high-school educational level and lets you see something happen for every few lines of code you type. Jul 93

Object Master for Think C and C++, ACI US, 408/252-4444, $255. Object-oriented development environment is full of goodies and will pay for itself in about a week due to increased programmer productivity. Apr 94

PGPro 1.5 (2.1), Sazu Software, 601/255-7085, $169. For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. Jul 93

PowerPack 2.0, NDG Phoenix, 301/718-8880, $225. Programmers' toolkit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-stellar performance in most areas, though. Oct 93

Smalltalk/v for Macintosh 2.0, DigitalTalk, 714/513-3000, $495. Object-oriented development system is now even more viable for commercial projects, while DigitalTalk's customer support and documentation set a standard other vendors should emulate. Feb 94

SoftPolish 1.1, Language Systems Corp., 703/476-0181, $295. Program-quality-assurance utility systematically checks the resources in a program's interface against a huge library of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. Sep 93

SourceSafe 2.1, One Tree Software, 919/821-2300, $295 to $1195. Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. Sep 93

Symantec C++ for Macintosh 6.0, Symantec Corp., 408/253-9600, $499. If you like Think C, you'll like this software-development system, too. For the Mac, it's an excellent opportunity to catch a new wave in programming. Nov 93

VIP BASIC 1.0.1, Mainstay, 805/484-9400, $295. Popular programming language lets programmers who know only BASIC get started producing real, interpreted Mac programs. It's a serious developer's tool, though it's not on the same footing as VIP-C. Jun 94

VIP-C 1.0.1, Mainstay, 805/484-9400, $495. If you've mastered the rudiments of C, this programming-code generator will let you code about ten times faster than you could using only an editor. Its real strength is in rapidly assembling smaller projects. May 94

UTILITIES

7th Heaven 2.5 (2.5.1), Logical Solutions, 612/659-2495, $99.95. Our reviewer found the seven enhancements to System 7 fun and elegant, but not all of them were useful. Jul 93

Aliki Seek 2.1, Aliki Software Corp., 206/286-2600, $39.95. Competent file-finding utility scans by file name or content and lets you combine multiple search criteria. It cannot search in the background or find text in compressed files. Jul 93

AppleSearch 1.0, Apple Computer, 408/996-1010, $1799. Although it has some tough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts continues.
application automatically catalogs the disks you mount on the desktop. It has a few problems, including limited search options, but can help bring order to disorganized disk collections. May 94

Billy Steinberg's PBTools 1.0.1, Inline Software, 203/435-4995, $59.55. If you want basic PowerBook management without added frills or complex menu bar displays, this collection of four utilities may be just your cup of tea. Jul 93

CD-ROM Toolkit 1.0.5, FWB, 415/474-8055, $79. Software accelerator can accelerate the time it takes to open files and search on a CD-ROM. The product supports a wide variety of formats and CD-ROM drives, but users should be aware that playback of QuickTime movies is often uneven. May 94

Chameleon 2.0.3 (2.1), Logical Solutions, 612/659-2495, $59.95. Stealthy desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. Sep 93

ClickChange 2.0, Duble-Click Software, 818/888-2068, $59.95. Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements of the Mac's look and feel. Aug 93

Connectix Desktop Utilities 1.0 (1.0.1), Connectix Corp., 415/571-5100, $99. Although some of the 16 utilities offered in the package are more at home on a PowerBook, this collection offers one-stop shopping at a low price. It's worth it for the file-synchronization, Keyboard Power, and Hot Keys features alone. Nov 93

CopyDoubler 2.0 (2.0.1), Symantec/Fifth Generation Systems, 504/291-7221, $59. This utility speeds up copying, lets you queue jobs for background copying, and offers a variety of other useful, copying-oriented features—all at a very reasonable price. Nov 93

Copyright Pro 1.0.3, CSG Technologies, 415/717-7070, $79. Utility, copied over the Finder's copying function, copies in the background, and allows you to regularly schedule copying. It doesn't speed up copying, however. Nov 93

Cpu2 2.0 (2.0.1), Connectix Corp., 415/571-5100, $99. Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. Sep 93


DiskLock PB 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $59. PowerBook security software balances security with simplicity and ease of use. It's much harder to crack than most PowerBook utility collections' security features, and will keep out all but the most determined. Jan 94

The Disney Collection Screen Saver, Berkeley Systems, 510/540-5355, $49.95. Mickey, Goofy, Peter Pan, Ariel, and other Disney favorites cavort around your screen with this screen saver that includes 16 different modules. Mar 94

DriveShare 1.03, Casa Blanca Works, 415/461-2227, $129.95. This utility allows users to share a removable drive over a network. It's most useful if your network consists of both System 6 and System 7 users, as its advantages over System 7 file sharing are slight. Nov 93

DriveTech 1.0, MicroMat Computer Systems, 415/898-6227, $59.95. Without decent documentation or clearer error messages, this floppy-drive cleaning and diagnostic program is essentially a $60 floppy-drive cleaning kit. Since you can buy a cleaning kit without software for $10, that makes it a bad deal. Jan 94

Duplocator 1.03, Midnight Software, 303/933-1018, $99. For new Macintosh users who don't have a general file utility, this software that locates duplicate files, as well as performs basic file commands such as moving and renaming files, may be useful. Jan 94

DynPage 2.0, Portfolio Software, 802/865-2700, $59.95. While this utility simplifies the printing of booklets and double-sided pages, it doesn't support PostScript graphics, is incompatible with some popular applications, and has a buggy drag-and-drop feature. Jul 93

eDisk 1.0 (1.2), Alysis Software Corp., 415/566-2263, $149.95. Driver-level compression software has little to recommend it over file-level, idle-time compression. The biggest drawback is the strong potential for disk or file corruption. Oct 93

Freedom of Press Classic, ColorAge, 508/667-8585, $149. Utility allows you to print PostScript graphics on almost any non-PostScript printer—easily and with impressive results. Mar 93

Icon 7, Inline Software, 203/435-4995, $79.95. Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. Sep 93

Icon-It Pro 3.0.6, Olduvai Corp., 305/670-1112, $129. Utility allows you to attach custom tool bars to almost any application, including the Finder. The interface is quirky, but you get used to it. Dec 93

I Like Icon 1.0, Baseline Publishing, 501/682-9676, $59.95. Utility has tools for icon editing, has a nice library of icons, and can create animated icons. Some basic features, such as a tool, are missing, and the animated icons are fun but impractical. Sep 93

MacPak 1.0, Symantec/Fifth Generation Systems, 504/291-7221, $149. The quality of this utility collection is uneven—some modules are unpolished—but if you don't already own AutoDoubler, CopyDoubler, and a good file-management program, it's worth the price. Jan 94

MacTools 3.0, Central Point Software, 503/690-8090, $149. Recovering damaged files is a snap with this utility package that fixes more disk problems than its competition. It includes disk-and-file maintenance, disk repair, virus protection, and backup. Mar 94

Magic Typist 2.0, Olduvai Corp., 305/670-1112, $129. If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful, but some functions work erratically or not at all in Microsoft Word. Sep 93

Mr. File 2.0, Softways, 408/978-9167, $99. The well-designed background capabilities of this Finder utility make it a handy tool for copying, finding, moving, launching, and renaming files, although it has a few interface quibbles. Dec 93

Now Compress 1.0 (1.0.1), Now Software, 503/274-2899, $59. Compression utility holds its own in a crowded market; it's easy to use, it's complete, and it compresses as well as or better than other options. Oct 93

Now Fun, Now Software, 503/274-2899, $45. Five control panels let you liven up your Mac by customizing everything from menu colors to system sounds. The included screen-saver modules and desktop patterns are fairly limited, though. Dec 93

Now Utilities 4.01 (4.0.2), Now Software, 503/274-2899, $129. Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. Aug 93

Open Sesame 1.02, Charles River Analytics, 617/491-3474, $99. Utility automates Finder operations, such as opening and closing files, without resorting to macros or scripts. It has an elegant interface, but people with stick-in-the-mud habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. May 94

OptiMem 1.4.1, Jump Development Group, 412/681-2692, $129. Systemwide memory manager monitors RAM use and allocates RAM where it's needed. Works best with software that handles temporary memory situations effectively. Mar 94

Power To Go 2.0, Claris Corp., 408/727-8227, $59. PowerBook utility collection has a few unique slants—including a floating palette that can display battery-life estimates—that keep it above the also-rans. It lacks feature of similar products. Dec 93

QuickKeys 3.0, CE Software, 515/221-1801, $169. Simple, unintrusive interfacing of this macro-building utility allows you to build a set of useful shortcuts quickly. Mar 94

RAM Doubler 1.0.1, Connectix Corp., 415/571-5100, $99. Inexpensive expansion doubles available RAM for many Macintosh users. There are a number of requirements, however, including System 7.4, 4MB of physical RAM, and a 68030 board. May 94

Redux Deluxe 2.0 (2.5), Inline Software, 203/435-4995, $79.95. Easy to learn and relatively simple to use, this backup program has some powerful features, such as scripting, but it doesn't have a compression option. Jan 94

Retrospect 2.0, Dantz Development Corp., 510/253-3000, $249. Powerful backup and archiving software has an improved interface and scripting capabilities, and works well for all levels of users. Sep 93

Retrospect Remote 2.0, Dantz Development Corp., 510/253-3000, $449. Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. Sep 93

SafeDeposit 1.2, Dayna Communications, 801/269-7200, $189. Automated backup program is easy to set up but slow. Also, untouched backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. Sep 93

Safe or Sorry 1.0, Olduvai Corp., 305/670-1112, $59. Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

SAM 3.5.8, Symantec Corp., 408/235-9600, $99. Efficient, thorough virus-protection software slows down system start-up and application launching, but this program is a worthwhile investment for anyone who exchanges or downloads files. Mar 94

Screenscapes 1.0.1, Kiwi Software, 805/685-4031, $44.95. With more than 600 desktop patterns—and a suite of well-designed modules to transform those patterns—this fun and frivolous utility lifts desktop-pattern design to new heights of elegance. Nov 93 continues
Subscribe today and...

SAVE $23.40!

YES! Send me a one-year (12 issues) subscription of Macworld for $24. I'll save $23.40 off the annual newsstand price. Please bill me later.

name__________________________
company_______________________
address________________________
city/state/zip___________________

Macworld
SAVE $23.40!

BUSINESS REPLY MAIL
FIRST CLASS MAIL   PERMIT NO. 1167   BOULDER, CO
POSTAGE WILL BE PAID BY ADDRESSEE

Macworld
SUBSCRIPTION DEPARTMENT
P.O. BOX 51666
BOULDER, CO 80321-1666
Star Ratings

★★★★ Square One 1.5.2, Binary Software, 310/582-8293, $74. Flexible, attractive icon-based file launcher provides incredibly customizable palettes, including one that displays active applications. The application will consume 400K of your system memory. Aug 93 ★★★ Stacker for the Macintosh 1.0.1, Stac, The Data Compression Company, 619/434-7474, $149. As long as you pay attention to the capacity of your hard drive, this driver and compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93 ★★★★★ Star Wars Visual Clips, Sound Source Unlimited, 805/494-9996, $89.95. Control panel lets you play QuickTime movie clips from Star Wars at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will make you remember why you've your Mac. Sep 93

Hardware

AC5100, Altec Lansing Consumer Products, 717/296-2818, $180. Lightweight powered speakers don't sound as good as they should. There's too much emphasis on the high end at the expense of the midrange, and they hiss noticeably. Dec 93

Apple Adjustable Keyboard, Apple Computer, 408/996-1010, $219. Keyboard is only a slight improvement on the flat slab keyboard. Theoretically, it corrects linear deviation, but many sufferers of repetitive stress injuries want a keyboard that adjusts vertically. Jul 93

Apple Color OneScanner, Apple Computer, 408/996-1010, $139.9. Tests of this color scanner demonstrate unpolished colors and sharp image details, perhaps due to color filters and lenses that Apple claims were designed and tuned for the scanner. Jul 93

Apple Design Powered Speakers, Apple Computer, 408/996-1010, $179. Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

Apple Newton MessagePad, Apple Computer, 408/996-1010, $699. Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very well designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. Jan 94

ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, $449. Combining pressure-sensitive operation, manageable size, and a beautiful pen-style stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics systems.

Microsoft

★ ★ ★ ★ ★ WriteNow 4.0.1, WordStar International, 415/382-8000, $119.95. Tidy word processor's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will continue to win it enthusiastic fans. This version adds elegant table capabilities and several PowerBook-friendly features. Jun 94

A Zillion Killjoys Rhymes 1.0, Eccentric Software, 206/628-2687, $49.95. Rhyming dictionary is quick, small, simple, and self-contained; but it only rhymes with the roots of search words (and ignores -ed, -s, and -ing endings). Nov 93

SOFTWARE

MacWrite Pro 1.5, Claris Corp., 408/727-8227, $249. The clean, uncluttered interface of this low-to-middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. May 94

MasterWord 5.1, Aliki Software Corp., 206/286-2600, $99.95. The centerpiece of this package is a add-on Microsoft Word command set of customizable toolbars. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

The Oxford English Dictionary, Oxford University Press, Electronic Publishing, 212/679-7300 ext. 7370, $895. CD-ROM dictionary contains 20 print volumes, including half a million words, but the flaws, omissions, unreliability and unforgivably poor design are unbearable. Apr 94

Random House Unabridged Dictionary, Random House Electronic Publishing, 212/572-2600, $179. The most comprehensive American-made dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. May 94

Spelling Coach Professional 4.0.1, Deneba Software, 305/596-6445, $195. If you're considering investing in reference software, this spelling checker, dictionary, and Thesaurus is a relatively capable, if expensive, alternative. Oct 93

MacInteiors, Microspot, 408/253-2000, $129. Correctly placing objects is unduly cumbersome in this interior-design software, but once you catch on to the program's quirks, it's useful. Feb 94

Musicshop 1.0, Opcode Systems, 415/856-3333, $149.95. MIDI sequencer is an excellent choice as a first sequencer. It's powerful enough to satisfy the needs of most MIDI users. Oct 93

Call Roll 2.0 (2.5.6 or 3.0), By the Numbers, 603/927-4508, $495 to $595. 4th Dimension database application for church management helps track donations, attendance, church group membership, and visits. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

Sailing Master 1.1, Starboard Software, 313/662-4398, $64.99. Though the slow speed and jerky motion point to less-than-panache programming, this sailboat-racing simulation offers good tactical play and is fun—well worth the price for sailing competitors. Nov 93

WillMaker 5.0, Nolo Press, 510/549-1976, $69.95. Legal software quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents. It offers excellent supporting explanations, examples, and background. Jun 94

Academic Power CD, Apple Computer, 408/996-1010, $499. Flaky performance and system crashes plagued this envelope-and-label printer in our tests, but the print quality was good. Oct 93

Apple Design Powered Speakers, Apple Computer, 408/996-1010, $179. Tall and curvy powered speaker set looks and sounds good and can produce uncomfortably high volumes without noticeable distortion, but the bare-wire-and-terminal connections aren't user-friendly. Dec 93

Apple Newton MessagePad, Apple Computer, 408/996-1010, $699. Although Apple released this personal digital assistant too early and marketing hype led to mistaken expectations, this is a very well designed portable CD-ROM drive offers impressive audio and Photo CD features, but if you're a serious CD-ROM user, it's too slow to satisfy. Jan 94

ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, $449. Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics systems.
a bit when plugged in but provides fine support for a variety of displays, plus ports for ADB, floppy drive, and sound output. Nov 93

PowerPlate, Technoggin, 513/321-1777, $169.95 to 299.95. Line of long-lived, external PowerBook battery packs, each of which lets you work for three to five times as long as the usual Powerbook battery.

Unfortunately, the System 7 power manager periodically alights you that your battery is not charging and dims the screen though battery pack has hours of time left. Mar 94

RCD-202, Pinnacle Micro, 714/277-3300, $3995. Writable CD-ROM drive is good for archiving data simply and inexpensively, but it's incompatible with many hard drives. Mar 94

ScanMaker 35t, Microtek, 213/321-2121, $1999. Speedy 35mm film scanner accommodates loose film and delivers a good image, but the included software is dork. Dec 93

ThinPack, VST Power Systems, 508/287-4600, $199.95. External battery pack for PowerBooks is compact, with a lightweight design. It comes with handy power-management utilities. Mar 94

TrakMate, Key Tronic Corp., 509/928-8000, $149. Input device integrates a trackball into a wrist pad. While the design is interesting, it's not for everyone. Feb 94

Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, $749. Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. May 94

Yamaha YST-M10 Powered Monitor Speakers, Yamaha, 714/522-9420, $149.95. Powered speakers have a good balanced sound and a great volume range at an outstanding price. Apr 94

MODEMS/NETWORK HARDWARE

AsanteHub 1012, Asante Technologies, 408/435-8388, $1299. This 12-port, 10BaseT Ethernet hub works right out of the box and is a premium device at a bargain price. Dec 93

DataLink PB; Accell Cellular Interface, Applied Engineering, 214/241-6060, $824. If you need a full-blown office on the beach, this PowerBook cellular-modem package with automatic answering machine is a well executed solution. Each recorded second requires 2% of disk space. Nov 93

EtherWave, Farallon Computing, 510/814-5000, $129. If you need to expand your network at a reasonable price with minimal fuss, get this Ethernet transceiver. Instead of providing only one 10BaseT twisted-pair jack, it includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. May 94

Perfit Port-A-Com, Perfit, 303/530-7333, $349. Compact, ADB-powered, high-speed fax/data modem is difficult to configure, due to its Spartan and poorly organized documentation, but it is still a solid product at a reasonable price. Nov 93

SupraFaxModem 144PB, Supra Corp., 503/676-2400, $349.95. If you're looking for a high-speed internal modem for your PowerBook, and you want to save a few bucks, this modem is worth considering. Disabling its fax software solved occasional transfer problems. Nov 93

PRINTERS

Apple Color Printer, Apple Computer, 408/996-1010, $2349. If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. Aug 93

Apple Portable StyleWriter, Apple Computer, 408/996-1010, $439. Sleek, portable ink-jet printer weighs 4½ pounds and is a pleasure to use. It uses standard StyleWriter cartridges. Jan 94

Brother HJ-400, Brother International, 908/356-8880, $369. Compact, 360-dpi ink-jet printer is fairly slow and does not allow back-ground printing. Some large files require additional application memory to print. Brother

DeskWriter 310, Hewlett-Packard, 800/752-0900, $179 to 5455. Versatile, low-cost ink-jet printer is a 3-pound, battery-powered portable. With its 60-page sheet feeder, it's a great desktop printer; and with a $49 color print cartridge, it offers inexpensive three-color printing. Mar 94

HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, $1279. Primarily for those who use a PC or work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. Its advanced PC features may not be worthwhile for those who use Macs only. May 94

LaserWriter Select 300, Apple Computer, 408/996-1010, $839. Inexpensive, low-capacity printer is networkable, and an excellent buy, despite a few weaknesses. Add a 4MB SIMM to take advantage of the amazing PhotoGrade capabilities, which allow the printer to generate 91 shades of gray. Aug 93

LaserWriter Select 310, Apple Computer, 408/996-1010, $1099. This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communications Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides. Aug 93

LaserWriter Pro 600 and 630, Apple Computer, 408/996-1010, $2099 to $2529. From their paper handling to their print quality, these laser printers are Apple's best. Unfortunately, they don't support emulation sensing, and thus may be less desirable for mixed-platform offices than other possibilities. Jan 93

LaserWriter Select 360, Apple Computer, 408/996-1010, $1599. Low-cost, high-performance, 10 ppm printer is perfect for small LocalTalk or mixed networks. For bigger networks, consider buying more than one; they're more cost-effective than a 20-ppm printer. Apr 94

MobileWriterPS, Mannesmann Tally Corp., 206/251-5524, $999. Fast, portable printer is currently the only PostScript portable available. While the print quality is quite good on glossy laser paper, it's mediocre on inexpensive bond. Dec 93

Notebook Printer II, Citizen America, 310/453-0614, $399. If weight and size are your biggest concerns in choosing a portable printer, and you print primarily in black and white, this thermal-fusion printer may be a good choice. If speed is at all an issue, however, other options may be preferable. Jun 94

Personal LaserWriter 320, Apple
Centris 610, Apple Computer, 408/996-1010, 4/80 $1,859. Slim-design Mac uses a 20MHz 68LC040 processor at a price-performance ratio that comes close to competing with Windows PCs; however, its expandability is severely limited. Jun 93

Centris 650, Apple Computer, 408/996-1010, 4/80 68LC040 $2,699. Moderately priced but fast 640 system offers three expansion slots and one drive bay, and (except for the base model) has built-in EtherDock circuitry and a 68040 microprocessor. Jun 93

DataPak 105, Mass Microsystems, 408/522-1200, $949 to $1,049, Well-built 100MHz SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. Sep 93

DOS Compatible Card, Apple Computer, 408/996-1010, $399. If you want to integrate a PC into your Macintosh, this card will let you—if you have a Centris or Quadra 610, don't need network support, and don't intend to upgrade to a Power Mac. All in all, it's pretty limited. Jan 94

EtherDock, E-Machines, 408/541-6100, $699. Heavy-duty DuO docking option is equipped with a full set of 11 ports, including an Ethernet port. The locking mechanism is alarmingly wobbly—although reliable enough to ensure a good connection. May 94

Expert Pad PI-7000, Sharp Electronics Corp., 800/999-9737, $699. Personal digital assistant features the advantages of the Newton, in a better industrial design and at a competitive price. If the battery lasted longer and the message network were implemented, the PDA revolution could begin. Feb 94

HP Optical Disk Library 10LC, Hewlett-Packard, 800/752-0900, $9,495. Optical jukebox may fill the need for 10 gigabytes of online storage, but its performance is poor, and the software lacks the features needed for adequate management. Jan 94

Infinity 105 Turbo, Peripheral Land, 510/657-2211, $795 to $894. Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. Sep 93

LC III, Apple Computer, 408/996-1010, 4/80 $3149. Base system comes equipped with a 25MHz 68030 processor and 512K of VRAM. This is a machine that fits the bill and the pocketbook of most home users and small-business owners. Jul 93

LC 575, Apple Computer, 408/996-1010, $1,699. For students and small-business professionals who want high power and the convenience of having everything integrated into one case, this 33MHz 68040 system is an ideal choice. Jun 94

MultiDisk 150, Iomega, 808/778-1000, $999. Durable cartridges are one of the strongest reasons to choose this Bemolli removable drive. Although it's slightly more expensive than a 5.25-inch drive, the drive is fast and reliable, and the disks are competitively priced. Jun 93

NuTek Dust, NuTek USA Corp., 408/987-8729, $999. Mac workaholics will both a PC and a Mac in a single box, but because of many incompatibilities and problems, the Duo is not a computer anyone should consider using for serious work. Feb 94

OrangePC, Orange Micro, 714/779-2772, $1,799. Nullus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. Oct 93

PLI 2.4 GB MiniArray, PLI, 510/657-2211, $4,815. Slick and elegant RAID drive worked beautifully in tests, but it costs more than other options and the QuickSCSI board is sensitive to minor SCSI problems. Apr 94

PowerBook 140 F/25 Upgrade, Digital Eclipse Software, 510/547-6101, $399. By changing the oscillators and adding an FPU, Digital Eclipse changes PowerBook 140s into 170s, minus the active matrix screen. While the upgrade seems expensive, it's the only way to extend the viability of a 140. Dec 93

PowerBook 165c, Apple Computer, 408/996-1010, 4/80 $3,199. The passive matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant work environment. Jul 93

PowerBook 180c, Apple Computer, 408/996-1010, 4/80 $4,169. The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. Sep 93

PowerBook Duo 270c, Apple Computer, 408/996-1010, 4/240 $3,099. Notebook computer meets all the demands of power users; it weighs less than five pounds, features a color active matrix display, and offers longer battery life. The lack of a floppy drive can be inconvenient, though. Feb 94

Power Macintosh 6100/60, Apple Computer, 408/996-1010, base model $1,819. Given its price and performance, this Power Macintosh is hard to resist. When developers offer in PowerPC format the software that most business users run daily: this should be a system that will give you power to spare. Jun 94

Quadra 605, Apple Computer, 408/996-1010, 4/80 $795. Never before has Apple offered so much performance for so little money. The performance and price of this 040-based machine match those of a standard entry-level 486SX-based Windows PC. Mar 94

Quadra 800, Apple Computer, 408/996-1010, 8/230 $4,679. Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. Aug 93

Quadra 840AV, Apple Computer, 408/996-1010, 8/230 $4,679. Technological tour de force uses a 40MHz 68040 and an AT&T 3210 digital signal processor, and is brimming with sophisticated speech-recognition and audiovisual technology. Beware of some hardware and software incompatibilities. Dec 93

SCSI MicroDock, Newer Technology, 316/685-4904, $175. Tiny PowerBook Duo docking station is just under 4½ ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. May 94

SledgeHammer2000FMF, FWB, 415/474-8055, $3,179. RAID drive is both fast and inexpensive. Although it can be a bit noisy when accessing data, it's a good deal. Apr 94

SmartStack, Envisio, 612/628-6288, SmartSource $119; SmartModules $289 to $1,379. The SmartStack line of modular storage peripherals may be nestled on top of a common power supply to reduce desktop clutter and cabling problems. Sep 93

Turbo 400, DayStar Digital, 404/867-2077, $1,899. This accelerator card is equipped with the fastest 68040 chip available, and is as fast as or faster than any Macintosh in processor-intensive tasks. For the price, however, it may make more sense to trade up to a faster computer. Dec 93

AudioVision 14 Display, Apple Computer, 408/996-1010, $769. Monitor integrates audio and video with built-in speakers that produce surprisingly rich, full-bodied sound. The display, while nice, is small for multimedia work. Dec 93

Dycam Model 3, Dycam, 818/998-8008, $895. Low-end, digital still camera is easy to use, and is a solid product if instamatic grade gray-scale meets your image-quality requirements. Sep 93

Editing Aces Suite, RasterOps, 801/785-5750, $3,899. Video professionals can record and play back full-screen moves in 24-bit color with 16-bit CD-quality sound with these products. Despite some flaws, this package represents a step forward in QuickTime technology. Nov 93

Intellicolor Display/20, Radius, 408/434-1010, $3,199. Although with its exceptional brightness and clarity this monitor would be a system that will give you power to spare. Jun 94

MovieMovie, Sigma Designs, 510-770-0100, $349. This 7-inch video capture-board may be what you've been waiting for. The price is right, and the addition of on-board audio input is a plus, even if it is only mono. Dec 93

PaintBoard Turbo, RasterOps, 408/562-4200, $1,149. Wide-angle video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. Oct 93

Video Toolkit 2.0.1, Abbate Video, 508/376-3712, $279. Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. Sep 93
Now You Can Cover the World

With The Macworld Global Network.

With the Macworld Global Network, you can start covering the world. Because Macworld reaches over 3 million people in over 20 countries. Now that’s market reach. So, if you’re interested in expanding your sales to the world, then call the Macworld Global Network, today.
Streetwise Shopper

SPECIAL HARDWARE AND SOFTWARE BUYING OPPORTUNITIES

Selected and edited by Charles Barrett

The following listings represent special promotions being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in Macworld's Reviews (products rated ** or lower are not eligible for inclusion), have been selected as an Editors' Choice, or have won a World-Class award. In some cases, the editorial evaluation quoted is for an earlier product version. The symbol indicates that the product is Power Mac related.

When placing an order, please mention that you saw the offer in Macworld. Should any problems arise, contact the Streetwise Shopper editor by fax (415/442-0766), phone (415/978-3241), or mail (Macworld, 501 Second St., San Francisco, CA 94107).

Vendor and resellers desiring to have products and services included in this section are encouraged to contact the Streetwise Shopper editor with particulars.

BUNDLES

Collage 1.0.1 + Adobe Photoshop 2.51 Specular International is bundling its $349 Collage image-compositing software (Jul 94 ***) with Adobe's $189 color-image editor (Jun 93 *** for version 2.5; 1993 World-Class) for $699. Available through MacWarehouse (800/255-6227). Offer not to expire before 7/31/94.

DayStar Turbo 040 + Secondary Cache DayStar Digital is now offering its 33MHz and 40MHz Turbo 040 and 040i accelerator boards bundled with a 128K high-speed static RAM cache for $999, $1149, and $749. This represents a $100 savings over purchasing a board and FastCache Turbo separately. Call 800/962-2077 for more information.

Epson E5-800C-ProMAC + Astound 1.0 + $50 Rebate Epson is including a free copy of Gold Disk's $399 Astound multimedia application (Nov 93 *** for version 2.0) with its $695 E5-800C-ProMAC with a 300MHz PowerPC. Offer is good through MacWarehouse (800/295-6227). Offer not to expire before 7/31/94.

Macintosh Quadra 605 + 8 applications Apple Computer is now including the following preinstalled applications with its Quadra 605 systems (Mar 94 ***): Claris's $299 ClarisWorks 2.0 integrated software (Aug 93 ***); Intuit's $69.95 Quick personal finance package (Nov 93 ***); ASO's $149 FileDuo 1.02 backup software; Gold Disk's $399 Astound 1.0 multimedia application (Nov 93 ****); No Hands Software's $189.95 Common Ground 1.1 electronic-document-distribution program (Oct 93 **** for version 1.0; HIT Software's $169 Full Contact personal information manager; Working Software's $49.95 Working Watermarker 1.02 printing utility (Jan 94 ***), and SoftKey International's $19.95 American Heritage Electronic Dictionary. Third Edition. This bundle does not include master disks for the installed applications. In addition, the price of the Quadra 605 816/160 has been reduced by 16%, to $1099. Call 800/538-9686 for reseller information.

PageMaker 5.0 + OfoTo 2.03 Customers who order either Aldus's complete $895 PageMaker 5.0 desktop publishing program (Nov 93 ****) for $579, or the $5.0 upgrade for $199, can also buy Light Source's $395 OfoTo scanning software (Jul 93 *** for version 2.0; 1993 World-Class) from MacWarehouse for $99. Call 800/295-6227 to order. Offer not to expire before 7/31/94.

PowerPlate Battery System + CPU 2.0 Technology is now including a free copy of Connectix Corporation's $999 CPU PowerBook utility (Sep 93 ****) with its PowerPlate line of external PowerBook battery systems priced as follows: the Mini 3 for $169.95; the 3x for $329.95; and double-capacity 5x for $599.95. For more information, call 800/705-7936.

Professor Office Individual Software has combined a $69.95 Microsoft Word 5.1 tutorial and a $69.95 Microsoft Excel 4 tutorial, together with a bonus copy of its $299 Learn to Use Mac tutor, into a $49.95 suite of interactive computer-based training solutions for boosting productivity—particularly for Microsoft Office users. Available through resellers for under $30. Call 800/822-3522 for further information.

RISC Workgroup Server + GraceLAN Server Manager 3.0 Apple Computer is providing a complimentary copy of TechWorx's $399 GraceLAN Server Manager to customers who purchase any one of its three new Powermac processor-based Workgroup Servers—the 6150 for $4219, the 8150 for $7459, or the 9150 for $9229—and return the registration card. Offer not to expire before 12/31/94.

SunPack PB + CPU 2.0 Keep It Simple Software is offering Connectix Corporation's $999 CPU PowerBook utility (Sep 93 ****) for $49 when customers purchase its $229 portable solar panel for $189. The SunPack can supplement the battery of a running PowerBook, as well as recharge nickel-cadmium power packs. Call 800/327-6882 for more information and to order.

SIDEGRADES/UPGRADERS

Hard Disk Toolkit 1.5.1 FWB is offering this $199 hard-drive-management utility (Jan 94 *** for version 1.1.2 of the $79 Personal Edition) for $99 to owners of any non-Apple formatting utility. Available direct (415/474-8059) or through MacConnection (800/800-2222).

QuarkXPress 3.3 Quark is offering a $999 PowerPC upgrade of this desktop publishing system (Nov 93 **** for version 3.2; 1993 World-Class) at the introductory price of $199 until October, and for $229 from then through December. For more information, call 800/788-7835. Offers expire 10/1/94 and 12/31/94.

Virex 5.0 DataWatch Corporation is offering this $99.95 antivirus utility (Jul 94 "Virus Killers" Editors' Choice; May 94 **** for $39.95 to users of Symantec AntiVirus for Macintosh (SAM) or Central Point Software's MacTools. Call MacWarehouse (800/225-6227) or DataWatch (919/549-0711) for qualification requirements and to order. Offer expiration extended to 8/31/94.

SPECIAL DISCOUNTS/REBATES/OFFERS

Apple Exchange Program Apple Computer, through the Macworld 'MacSwap' program, is offering trade-in dollars, which must be applied against the purchase of new Apple equipment, to owners of virtually any name-brand CPU, printer, or monitor. Based on a trade-in pricing schedule, resellers provide customers with a firm price quote within 24 hours, good for 30 days. If Micro Exchange does not revise the price quote when it evaluates the old equipment, Micro issues a check directly to the customer within ten days. Call 800/950-9066 for more information.

Colorize Jr. DS Design is offering a special introductory price of $79 on this $99 utility for coloring black-and-white TIFF line drawings, clip art, illustrations, and scans. Colorize Jr. automatically traps colors as you paint. Offer includes the option to upgrade to DS Design's $199 Colorize 2.0—a full version that includes the ability to do gradients, blends, and airbrush effects—for $299. Call 800/745-4037 for more information and to order. Offer expires 7/31/94.

Medieval & Renaissance Clip Art Library Carried Art Connection is offering Bill Typhograph's $250 collection (Volumes 1 through 6) of 437 ornaments and decorative alphabets from the 14th, 15th, and 16th centuries for $195. Call 800/455-1278 for further details and to order. Offer expires 7/31/94.

PortfolioMaker 1.2 Crit is offering a special introductory price of $79 (plus $7.95 S&H) on this $129 program that makes it possible to create an electronic portfolio of up to twenty 24-bit color images with ten on a single floppy disk. The program includes a floating palette of authoring tools that is deleted once an electronic portfolio is complete and locked. Call 800/410-2748 to order. Offer not to expire before 7/31/94.

XpressServe Emerald Systems is offering this $795 network-file-server-based backup software for Novell NetWare LANs at the special introductory price of $995. Call 800/767-2587 for more information. Offer expires 6/30/94.

MACWORLD July 1994 205
<table>
<thead>
<tr>
<th>Capacity</th>
<th>Size</th>
<th>Access</th>
<th>Warranty</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>240MB</td>
<td>2.5&quot;</td>
<td>14MS</td>
<td>5YR</td>
<td>$950</td>
</tr>
<tr>
<td>330MB</td>
<td>3.5&quot;</td>
<td>6MS</td>
<td>5YR</td>
<td>$825</td>
</tr>
<tr>
<td>1.2GIG</td>
<td>3.5&quot;</td>
<td>5.8MS</td>
<td>5YR</td>
<td>$1,261</td>
</tr>
</tbody>
</table>

**Sony GDM-17S**

1.0GIG

$1,049

2.0GIG

$1,099

4.0GIG

$1,169

6.0GIG

$1,249

**UP TO 84 GIG CUSTOM DESIGNED.**

* FAST AND WIDE SCSI II INTERFACE.

**30-DAY SATISFACTION GUARANTEE!**

One Year Free On-Site Service!

**Kodak ColorEase PS**

Color DyeSub Printer/PS level 2

$6,589

**PowerBook SCSI Switch**

Includes DOD & SCSI mode switching

$31

**Digital Axis Internaitonal**

17" Trinitron

$769

- Plug & Play with On-Board Video for the Quadras, AVS, Centris, LCMS, PowerMacs!
- WYISYG, 832x624, 256 dot, 75Hz
- 1 Year Warranty
- Dealers, call for volume discounts
- $1,149 with 24-bit Acl. NoBus Card
- $1,389 (Regami CL-20A 20" Multisync)

**Umix Scanners**

Umax 630 - 600dpi

$579

Umax 840 - 800dpi

$690

Umax 1260 - 1200dpi

$986

Umax 1200SE - 1100dpi/PhotoShop 2.5.1

$2,199

Typewriter OCR Software, with scanner purchase

$299

PhotoShop 2.5.1 with scanner purchase

$1,299

PhotoShop LE with scanner purchase

$1,199

UMAX Transparency Scanner

$449

Wacom Digitizer

12" x 18" Til with 2 Handheld Input

$719

Calligraphy/Cordless Pen

$719

**Digital Axis Internaitonal**

512-329-7001

800-691-7111

Fax 512-327-0921
## Advertiser Index

Say you saw it in Macworld. To purchase products advertised in this issue call the phone numbers below or use the reader service number for our Fast Facts Product Information Card located after the product index.

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader/Scr. No.</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-48</td>
<td>Adobe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>76</td>
<td>AEC Software</td>
<td>44</td>
<td>800/459-1982</td>
</tr>
<tr>
<td>8</td>
<td>Agie</td>
<td>8</td>
<td>800/588-2446</td>
</tr>
<tr>
<td>222-223</td>
<td>Alliance Peripheral Systems</td>
<td>62</td>
<td>800/674-1428</td>
</tr>
<tr>
<td>36-37</td>
<td>American Power Conversion</td>
<td>72</td>
<td>800/788-2208</td>
</tr>
<tr>
<td>15</td>
<td>Apple Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16-17</td>
<td>Apple Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>Apple Computer</td>
<td>800/538-9696</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Apple Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Apple Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Apple Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>133-135</td>
<td>Apple Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Atsam Corporation</td>
<td>6</td>
<td>617/776-1110</td>
</tr>
<tr>
<td>32</td>
<td>Berkeley Systems</td>
<td>800/248-8800</td>
<td></td>
</tr>
<tr>
<td>230-231</td>
<td>Bottomline Distribution</td>
<td>63</td>
<td>512/472-4956</td>
</tr>
<tr>
<td>50</td>
<td>Carre Corporation</td>
<td>69</td>
<td>800/535-SCAN</td>
</tr>
<tr>
<td>44</td>
<td>CORDA Expo</td>
<td>617/651-8000</td>
<td></td>
</tr>
<tr>
<td>218-219</td>
<td>Club Mac</td>
<td>98</td>
<td>800/CLUB MAC</td>
</tr>
<tr>
<td>181</td>
<td>ComServe</td>
<td>800/848-4199</td>
<td></td>
</tr>
<tr>
<td>94-95</td>
<td>Computer Discount Warehouse</td>
<td>2</td>
<td>800/861-4CDW</td>
</tr>
<tr>
<td>52</td>
<td>Connectix</td>
<td>189</td>
<td>800/590-5880</td>
</tr>
<tr>
<td>27</td>
<td>Contemporary Cybernetics Group</td>
<td>168</td>
<td>800/873-9600</td>
</tr>
<tr>
<td>88</td>
<td>Corel Corporation</td>
<td>78</td>
<td>800/836-3729</td>
</tr>
<tr>
<td>220</td>
<td>CRA Systems</td>
<td>800/207-9000</td>
<td></td>
</tr>
<tr>
<td>59</td>
<td>Dantz Development Corp.</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Datwatch</td>
<td>37</td>
<td>519/549-0711</td>
</tr>
<tr>
<td>163</td>
<td>Dayna Communications</td>
<td>161</td>
<td>800/443-2962</td>
</tr>
<tr>
<td>162</td>
<td>Delphi</td>
<td>173</td>
<td>800/695-4005</td>
</tr>
<tr>
<td>82</td>
<td>Denira Corporation</td>
<td>137</td>
<td>800/268-6882</td>
</tr>
<tr>
<td>24</td>
<td>DirectSoft Software</td>
<td>57</td>
<td>800/6-CANVAS</td>
</tr>
<tr>
<td>231</td>
<td>DDR Technologies</td>
<td>65</td>
<td>800/235-9748</td>
</tr>
<tr>
<td>205</td>
<td>Digital Axis</td>
<td>83</td>
<td>800/691-7111</td>
</tr>
<tr>
<td>156-157</td>
<td>Digital Equipment Corporation</td>
<td>120</td>
<td>800/DIGITAL</td>
</tr>
<tr>
<td>206</td>
<td>Direct Connections</td>
<td>121</td>
<td>800/572-4305</td>
</tr>
<tr>
<td>270-271</td>
<td>Eduscop</td>
<td>157</td>
<td>800/843-9497</td>
</tr>
<tr>
<td>10</td>
<td>Engineered Software</td>
<td>12</td>
<td>910/299-4843</td>
</tr>
<tr>
<td>12-13</td>
<td>Epson</td>
<td>800/BUY-EPSON</td>
<td></td>
</tr>
<tr>
<td>228-221</td>
<td>Express Direct</td>
<td>81</td>
<td>800/765-0020</td>
</tr>
<tr>
<td>153</td>
<td>Focus Enhancements</td>
<td>201</td>
<td>800/538-4888</td>
</tr>
<tr>
<td>142</td>
<td>Fractal Design</td>
<td>193</td>
<td>800/647-7443</td>
</tr>
<tr>
<td>143</td>
<td>Frame Technology</td>
<td>800/U-4FRAME</td>
<td></td>
</tr>
<tr>
<td>177</td>
<td>Fujitsu</td>
<td>202</td>
<td>800/831-4094</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader/Scr. No.</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>181</td>
<td>GDI Softworks</td>
<td>32/42</td>
<td>800/563-6222</td>
</tr>
<tr>
<td>74</td>
<td>HSC Software</td>
<td>5</td>
<td>310/392-4441</td>
</tr>
<tr>
<td>28-28</td>
<td>IBM</td>
<td>179</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Image Club Graphics</td>
<td>50</td>
<td>800/387-9193</td>
</tr>
<tr>
<td>174</td>
<td>Insignia Solutions</td>
<td>68</td>
<td>800/848-7677</td>
</tr>
<tr>
<td>6-7</td>
<td>Intel Corporation</td>
<td>800/395-7009</td>
<td></td>
</tr>
<tr>
<td>19-23</td>
<td>La Cie</td>
<td>52</td>
<td>800/999-1488</td>
</tr>
<tr>
<td>86</td>
<td>La Cie</td>
<td>51</td>
<td>800/999-4099</td>
</tr>
<tr>
<td>178</td>
<td>LaserMaster</td>
<td>49</td>
<td>800/950-6868</td>
</tr>
<tr>
<td>38</td>
<td>LaserMaster</td>
<td>43</td>
<td>800/950-6868</td>
</tr>
<tr>
<td>72</td>
<td>MacAcademy</td>
<td>105</td>
<td>800/527-1914</td>
</tr>
<tr>
<td>79-81</td>
<td>MacConnection</td>
<td>800/900-3333</td>
<td></td>
</tr>
<tr>
<td>211-217</td>
<td>MacMail</td>
<td>131</td>
<td>800/222-2808</td>
</tr>
<tr>
<td>224-225</td>
<td>MacNews</td>
<td>172</td>
<td>800/723-7744</td>
</tr>
<tr>
<td>226</td>
<td>MacProducts, USA</td>
<td>175</td>
<td>800/622-8271</td>
</tr>
<tr>
<td>104-105</td>
<td>Macromedia</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>MacTable/ScanCo</td>
<td>800/722-6263</td>
<td></td>
</tr>
<tr>
<td>234-235</td>
<td>MacWarehouse</td>
<td>150</td>
<td>800/255-6227</td>
</tr>
<tr>
<td>168-172</td>
<td>Macworld Boston Expo</td>
<td>617/361-8000</td>
<td></td>
</tr>
<tr>
<td>114</td>
<td>Macworld Expo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>204</td>
<td>Macworld Global Network</td>
<td></td>
<td></td>
</tr>
<tr>
<td>232</td>
<td>MegaHaus Corporation</td>
<td>245</td>
<td>800/786-1184</td>
</tr>
<tr>
<td>124</td>
<td>MicroNet Technology, Inc.</td>
<td>133</td>
<td>800/800-DISK</td>
</tr>
<tr>
<td>14C-1</td>
<td>Microsoft Corporation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>185</td>
<td>Microtek Lab, Inc.</td>
<td>287</td>
<td>800/654-4160</td>
</tr>
<tr>
<td>50</td>
<td>Mirror Technologies</td>
<td>58</td>
<td>800/643-4142</td>
</tr>
<tr>
<td>186</td>
<td>Mitsubishi Display Products</td>
<td>261</td>
<td>800/843-2515</td>
</tr>
<tr>
<td>52</td>
<td>Mobius Technologies Incorporated</td>
<td>109</td>
<td>800/4334</td>
</tr>
<tr>
<td>14</td>
<td>Momentum Incorporated</td>
<td>8</td>
<td>800/263-0088</td>
</tr>
<tr>
<td>56</td>
<td>Multi-Ad Services</td>
<td>187</td>
<td>800/447-1950</td>
</tr>
<tr>
<td>2-3</td>
<td>NEC Technologies</td>
<td>25</td>
<td>800/NEC-INFO</td>
</tr>
<tr>
<td>120-121</td>
<td>NEC Technologies</td>
<td>28</td>
<td>800/NEC-INFO</td>
</tr>
<tr>
<td>114</td>
<td>NewGen Systems</td>
<td>74/75</td>
<td>800/756-0556</td>
</tr>
<tr>
<td>34</td>
<td>nView Corp.</td>
<td>117</td>
<td>800/736-8439</td>
</tr>
<tr>
<td>14</td>
<td>Panelight Display Systems, Inc.</td>
<td>1</td>
<td>800/726-3599</td>
</tr>
<tr>
<td>33</td>
<td>Pinnacle Micro</td>
<td>115</td>
<td>800/553-7070</td>
</tr>
<tr>
<td>141</td>
<td>Pinnacle Micro</td>
<td>179</td>
<td>800/553-7070</td>
</tr>
<tr>
<td>116</td>
<td>Polaron</td>
<td>119</td>
<td>800/816-2511</td>
</tr>
</tbody>
</table>

**For instant faxed back information, call 1-800-234-0455 enter extension 502 for QMS Incorporated**
## Product Index

A quick and easy product index from Macworld. Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the following page.

### SOFTWARE

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>76</td>
<td>AEC Software</td>
<td>44</td>
</tr>
<tr>
<td>16-17</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>68</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>66</td>
<td>Attain Corporation</td>
<td>6</td>
</tr>
<tr>
<td>82</td>
<td>Delrina Corporation</td>
<td>137</td>
</tr>
<tr>
<td>113</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>137</td>
<td>Microsoft Corporation</td>
<td></td>
</tr>
<tr>
<td>155</td>
<td>Systat</td>
<td>29</td>
</tr>
<tr>
<td>128-129</td>
<td>WordPerfect Corporation</td>
<td></td>
</tr>
</tbody>
</table>

### CAD/CAM

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Engineered Software</td>
<td>12</td>
</tr>
</tbody>
</table>

### CD ROM

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>Corel Corporation</td>
<td>78</td>
</tr>
<tr>
<td>272</td>
<td>Educorp</td>
<td>157</td>
</tr>
</tbody>
</table>

### COMMUNICATION

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>82</td>
<td>Delrina Corporation</td>
<td>137</td>
</tr>
</tbody>
</table>

### DATA MANAGEMENT

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>143</td>
<td>Frama Technology</td>
<td></td>
</tr>
</tbody>
</table>

### EDUCATION

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>268-270</td>
<td>Quality Computers</td>
<td>263</td>
</tr>
</tbody>
</table>

### ENTERTAINMENT

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Berkeley Systems</td>
<td></td>
</tr>
</tbody>
</table>

### GRAPHICS/DTP

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-48</td>
<td>Adobe</td>
<td></td>
</tr>
<tr>
<td>88</td>
<td>Corel Corporation</td>
<td>78</td>
</tr>
<tr>
<td>42</td>
<td>Denise Software</td>
<td>57</td>
</tr>
<tr>
<td>124</td>
<td>Fractal Design</td>
<td>190</td>
</tr>
<tr>
<td>74</td>
<td>HSC Software</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>Image Club Graphics</td>
<td>50</td>
</tr>
<tr>
<td>104-105</td>
<td>Macromedia</td>
<td>21</td>
</tr>
<tr>
<td>21</td>
<td>Multi-Art Services</td>
<td>187</td>
</tr>
<tr>
<td>136</td>
<td>Specular</td>
<td>41</td>
</tr>
</tbody>
</table>

### MULTIMEDIA

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>113-135</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>228</td>
<td>Corel Corporation</td>
<td>20</td>
</tr>
<tr>
<td>206</td>
<td>Digital Axis</td>
<td>83</td>
</tr>
<tr>
<td>12-13</td>
<td>Epson</td>
<td></td>
</tr>
<tr>
<td>177</td>
<td>Fujitsu</td>
<td>202</td>
</tr>
<tr>
<td>185</td>
<td>Micropak, Inc.</td>
<td>237</td>
</tr>
<tr>
<td>90</td>
<td>Micro Technology</td>
<td>58</td>
</tr>
<tr>
<td>145</td>
<td>Polaroid</td>
<td>295</td>
</tr>
</tbody>
</table>

### DISPLAY

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>133-135</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>228</td>
<td>Corel Corporation</td>
<td>20</td>
</tr>
<tr>
<td>206</td>
<td>Digital Axis</td>
<td>83</td>
</tr>
<tr>
<td>224-225</td>
<td>MacNews</td>
<td>172</td>
</tr>
<tr>
<td>90</td>
<td>Micro Technology</td>
<td>58</td>
</tr>
<tr>
<td>186</td>
<td>Mitsubishi Display Products</td>
<td>261</td>
</tr>
<tr>
<td>53</td>
<td>Maxim Technologies Inc.</td>
<td>109</td>
</tr>
<tr>
<td>120-121</td>
<td>NEC Technologies</td>
<td>28</td>
</tr>
<tr>
<td>34</td>
<td>nView Corp</td>
<td>117</td>
</tr>
<tr>
<td>14</td>
<td>Panelight Display Systems</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Polaroid</td>
<td>119</td>
</tr>
<tr>
<td>18</td>
<td>Triax, Inc.</td>
<td>211</td>
</tr>
</tbody>
</table>

### PRINTERS

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>156-157</td>
<td>Digital Equipment Corporation</td>
<td></td>
</tr>
<tr>
<td>181</td>
<td>GDT Softworks</td>
<td>32/42</td>
</tr>
<tr>
<td>30</td>
<td>LaserMaster</td>
<td>43</td>
</tr>
<tr>
<td>178</td>
<td>LaserMaster</td>
<td>49</td>
</tr>
<tr>
<td>2-3</td>
<td>NEC Technologies</td>
<td>25</td>
</tr>
<tr>
<td>114</td>
<td>NewGen Systems</td>
<td>74/75</td>
</tr>
<tr>
<td>70</td>
<td>QMS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tektronix</td>
<td>143</td>
</tr>
</tbody>
</table>

### EXPANSIONS/UPGRADES

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>MoToSys Technologies Incorporated</td>
<td>109</td>
</tr>
</tbody>
</table>

### HARD DISKS/STORAGE

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>222-223</td>
<td>Alliance Peripheral Systems</td>
<td>62</td>
</tr>
<tr>
<td>230-231</td>
<td>Bottomline Distribution</td>
<td>63</td>
</tr>
<tr>
<td>210-219</td>
<td>Club Mac</td>
<td>96</td>
</tr>
<tr>
<td>27</td>
<td>Contemporary</td>
<td></td>
</tr>
<tr>
<td>231</td>
<td>DGR Technologies</td>
<td>65</td>
</tr>
<tr>
<td>206</td>
<td>Direct Connections</td>
<td>121</td>
</tr>
<tr>
<td>19-23</td>
<td>La Cie</td>
<td>52</td>
</tr>
<tr>
<td>86</td>
<td>La Cie</td>
<td>51</td>
</tr>
<tr>
<td>226</td>
<td>MacProducts, USA</td>
<td>175</td>
</tr>
<tr>
<td>232</td>
<td>MegaHaus Corporation</td>
<td>245</td>
</tr>
</tbody>
</table>

### HARD DISKS/STORAGE

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>124</td>
<td>MicroNet Technologies, Inc.</td>
<td>139</td>
</tr>
<tr>
<td>33</td>
<td>Pinnacle Micro</td>
<td>115</td>
</tr>
<tr>
<td>141</td>
<td>Pinnacle Micro</td>
<td>178</td>
</tr>
<tr>
<td>233</td>
<td>ProDirect</td>
<td>135</td>
</tr>
<tr>
<td>229</td>
<td>SuperMicro</td>
<td>126</td>
</tr>
<tr>
<td>84</td>
<td>SyQuest</td>
<td>249</td>
</tr>
</tbody>
</table>

### INPUT DEVICES

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>Kensington Microware Ltd.</td>
<td></td>
</tr>
</tbody>
</table>

### MULTIMEDIA

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>Panelight Display Systems</td>
<td>1</td>
</tr>
</tbody>
</table>

### NETWORKING

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>36-37</td>
<td>American Power Conversion</td>
<td></td>
</tr>
<tr>
<td>163</td>
<td>Daya Communications</td>
<td>161</td>
</tr>
<tr>
<td>153</td>
<td>Focus Enhancements</td>
<td>201</td>
</tr>
<tr>
<td>14</td>
<td>Momentum Incorporated</td>
<td>8</td>
</tr>
<tr>
<td>164</td>
<td>Xerox</td>
<td>290</td>
</tr>
</tbody>
</table>

### POWERBOOK

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>Kensington Microware Ltd.</td>
<td></td>
</tr>
<tr>
<td>167</td>
<td>Panelight Display Systems</td>
<td>94</td>
</tr>
<tr>
<td>181</td>
<td>GDT Softworks</td>
<td>32/42</td>
</tr>
</tbody>
</table>

### PRINTERS

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>156-157</td>
<td>Digital Equipment Corporation</td>
<td></td>
</tr>
<tr>
<td>181</td>
<td>GDT Softworks</td>
<td>32/42</td>
</tr>
<tr>
<td>30</td>
<td>LaserMaster</td>
<td>43</td>
</tr>
<tr>
<td>178</td>
<td>LaserMaster</td>
<td>49</td>
</tr>
<tr>
<td>2-3</td>
<td>NEC Technologies</td>
<td>25</td>
</tr>
<tr>
<td>114</td>
<td>NewGen Systems</td>
<td>74/75</td>
</tr>
<tr>
<td>70</td>
<td>QMS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Tektronix</td>
<td>143</td>
</tr>
</tbody>
</table>

### VIDEO

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-61</td>
<td>Radius</td>
<td>14</td>
</tr>
<tr>
<td>150</td>
<td>RasterOps</td>
<td>90</td>
</tr>
</tbody>
</table>

### SERVICES

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>57</td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>191</td>
<td>CompuServe</td>
<td>66</td>
</tr>
<tr>
<td>182</td>
<td>Delphi</td>
<td>173</td>
</tr>
</tbody>
</table>

### TRADESHOWS/CONFERENCES

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>44</td>
<td>CDRom Expo</td>
<td></td>
</tr>
<tr>
<td>168-172</td>
<td>Macworld Expo</td>
<td>114</td>
</tr>
<tr>
<td>173-176</td>
<td>Macworld Expo</td>
<td></td>
</tr>
</tbody>
</table>

### TRAINING

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>MacAcademy</td>
<td>106</td>
</tr>
</tbody>
</table>

### ACCESSORIES

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>Agio</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>MacTable/ScanCo</td>
<td></td>
</tr>
</tbody>
</table>

### MISCELLANEOUS

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>MacTable/ScanCo</td>
<td></td>
</tr>
</tbody>
</table>

### MAIL ORDER

<table>
<thead>
<tr>
<th>Page No.</th>
<th>Advertiser</th>
<th>Reader Serv. No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>222-223</td>
<td>Alliance Peripheral Systems</td>
<td>62</td>
</tr>
<tr>
<td>218-219</td>
<td>Club Mac</td>
<td>96</td>
</tr>
<tr>
<td>94-95</td>
<td>Computer Discount Warehouse</td>
<td>2</td>
</tr>
<tr>
<td>206</td>
<td>Direct Connections</td>
<td>121</td>
</tr>
<tr>
<td>220-221</td>
<td>Express Direct</td>
<td>81</td>
</tr>
<tr>
<td>79-81</td>
<td>MacConnection</td>
<td>144</td>
</tr>
<tr>
<td>211-217</td>
<td>MacMail</td>
<td>131</td>
</tr>
<tr>
<td>224-225</td>
<td>MacNews</td>
<td>172</td>
</tr>
<tr>
<td>226</td>
<td>MacProducts, USA</td>
<td>175</td>
</tr>
<tr>
<td>234-235</td>
<td>MacWarehouse</td>
<td>150</td>
</tr>
<tr>
<td>233</td>
<td>ProDirect</td>
<td>135</td>
</tr>
<tr>
<td>266-270</td>
<td>Quality Computers</td>
<td>263</td>
</tr>
<tr>
<td>227</td>
<td>Third Wave</td>
<td>186</td>
</tr>
</tbody>
</table>
JUST FOR YOU. FREE PRODUCT INFORMATION FROM MACWORLD.

Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)?

A. 
- 1000+
- 999 - 100
- 99 - 25
- Under 25

There's no cost or obligation. We even pay the postage! Simply fill in the questionnaire, then circle the numbers on the card below for the products that interest you. Numbers for advertised products can be found in the ad. For faster results, just fax this sheet to 1-413-637-4343. Please indicate your fax number where indicated.

Please answer these questions so that we may better serve you.

C. What is the total number of Macs installed at this entire work-site? (Check one.)
- 500+
- 499 - 100
- 99 - 50
- 9 - 10
- None

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/or services? (Check one.)
- 500+
- 499 - 100
- 99 - 50
- 9 - 10
- None

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)
- Evaluate, recommend, or approve hardware/models
- Evaluate, recommend, or approve purchase source
- Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)
- Under $25
- $25 - $49.99
- $50 - $99.99
- $100 - $499.99
- $500 and over

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)
- Business software (Word processing, spreadsheet, database, etc.)
- Graphics, publishing, software
- Monitors/displays
- Printers/scanners
- Networking/communications hardware and software
- Multimedia/visual computing products (PowerBooks, peripherals, software, etc.)
- Multivendor hardware and/or software
- Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)
- Computer Reseller/ VAR/ VAR
- MIS/ CIO/IS/Network Management
- Engineering
- R&D/ Scientific
- Corporate/ General Management
- Accounting/ Finance
- Marketing/Sales/ PR/ Communications
- Art/ Design/ Creative Services

Please print or type all information.

Thank You!

Title: ____________________________
Co.: ____________________________
Phone: ____________________________
Fax: ____________________________

Please print or type all information.

Name: ____________________________
Address: ____________________________
City: ____________________________
State: __________________ Zip: ____________________________

Expries Sept. 8, 1994 51 July 1994

Check box and fill in the appropriate information to subscribe to Macworld. You will be billed $24.00 for a 1-year (12 issue) subscription (U.S. only).
FREE PRODUCT INFORMATION.

Get valuable information about the products that interest you. There's no cost; no obligation. Just fill out both sides of this FASTFACTS Information form. Circle the numbers for the desired products. Then mail the card. We pay the postage! For even faster results fill out and send the card via our FASTFAX. Now fast... get the facts, the competition's gaining on you.

Macworld
Creative Computers’ MacMall is the first full line...

Authorized Catalog Reseller

Now you can order Apple® Macintosh® computers by mail.

Creative Computers’ MacMall announces a breakthrough partnership with Apple® Computer, Inc. that will forever change the way you buy Apple Macintosh® products. As the first Apple Authorized Catalog Reseller, Creative Computers’ MacMall brings you the same level of award-winning service and low pricing that has made us the #1 Apple Macintosh® Reseller in Southern California and the fastest growing Macintosh mail-order company. You can now purchase any Apple product by mail through our catalogs. You benefit from a full Apple warranty, toll-free technical support, helpful salespeople, and the peace of mind that comes with buying from a company that is an Apple Authorized Catalog Reseller. For a free copy of our giant catalog, call 1-800-222-2808 today or fill out the form below and we will send you one right away.

Look over the following pages for a sample of our great selection and pricing.

For a copy of our catalog, call

1-800-222-2808

Hours: Monday–Friday 6am to 6pm (pst)
Saturday/Sunday 8am to 5pm (pst)

☐ Send me a one year catalog subscription

Name __________________________
Address ________________________
City ___________________ State _____ Zip ______

Mail to: MacMall, Dept. ADN, 2615 Manresa St., Tustin, CA 92680

FREE FedEx® on your first order, $3.00 future orders*
*Free FedEx & UPS offer applies to orders up to 10 lbs, contiguous U.S. only.

Apple, the Apple logo, and Macintosh are registered trademarks of Apple Computer, Inc.
The HP DESKWRITER

300 DPI Inkjet Printer

- 35 Scalable Fonts
- Built-in print spooler
- Three-year limited warranty

HP DESKWRITER 520
InkJet Printer
HP's most affordable high-quality printer

- Clear, sharp 600x300 dpi professional quality output – HP's exclusive Resolution Enhancement technology
- Gray-scale printing for dramatic black graphics
- 35 TrueType scalable fonts
- AppleTalk and serial interfaces

HP LASERJET 4ML
- HP Resolution Enhancement technology and microfine toner produce the best 300dpi output available
- PostScript Level 2
- 35 Adobe scalable fonts
- RISC-based Intel 80960KA processor
- 4 MB RAM standard memory
- Macintosh and Windows PC compatible

HP DESKWRITER 560C
3-YEAR LIMITED WARRANTY!
HP's affordable high-quality black and color printer for the Macintosh computer.

- Clear, sharp 600x300 dpi professional quality output HP's exclusive Resolution Enhancement technology
- Gray-scale printing for dramatic black graphics
- 35 TrueType scalable fonts
- AppleTalk and serial interfaces

HP LASERJET 4MP
- True 600dpi resolution utilizing Resolution Enhancement technology and microfine toner
- PostScript Level 2
- 35 Adobe scalable fonts
- RISC-based Intel 80960KA
- 6 MB RAM standard memory
- Macintosh and Windows PC compatible

HP SCANJET II SCANNERS

HP SCANJET IIp
300dpi, Greyscale Flatbed Scanner

Bonus: Includes FREE Calera WordScan OCR Software

HP SCANJET IIcx
The high performance color/greyscale scanner that provides advanced features at a breakthrough price!

- Superior image quality with 1600 DPI enhanced resolution; 400 DPI optical resolution
- 24-Bit color allows you to recognize and scan over 16 million colors
- HP AccuPage 2.0 for better text recognition
- Optional transparency adapter available
- Optional 50-page document feeder available
- One-year HP Express Exchange Warranty for 24-hour replacement service

Order Code: D462MG14

MacMall FAX Order Line: 310-222-5800
Order Status: 800-360-6800

INCREdiBLE!
$198

SUPER BUY!
LOWEST PRICES? YEAH!
If you see a lower price advertised in this magazine, please call us and we’ll do our very best to BEAT that advertised price!*
We do it very fast!
With our sophisticated order entry, computerized warehouse and FedEx* shipping system we get your order on its way the same day, so you can enjoy your purchase tomorrow!

**VividQuest™**

The Best in Removable Media
Removable hard drives, including the brand new 270MB 3.5" drive that reads and writes 105MB or 270MB cartridges, or the new 200MB 5.25" drive that will read and write 44MB, 88MB or 200MB cartridges. SyQuest is the industry standard format for removable hard drive storage devices.

**SyQuest Drives**
SyQuest 270MB External ....... $589 64203
SyQuest 200MB External ....... $629 64416
VividQuest 105MB External ....... $389 61945
SyQuest 88C (R/W 44) External ....... $469 61944

**Genuine SyQuest Cartridges**
Lowest pricing on high quality removable cartridges for any compatible SyQuest* drive mechanism.
270MB ............... $199* 64415
200MB ............... $199* 64417
105MB ............... $64* 61241
88MB ............... $98* 2104
44MB ............... $64* 1906

**SuperMac**

**E-Machines E20**

DUAL MODE COLOR MONITOR
The E20's 20-inch format allows a full page to be viewed in 1024 x 768 resolution exactly as it will appear when printed. Switching resolution to 1152 x 870, entire two-page layout can be viewed just as easily.

**SuperMac 17+T**

- 17" Multimode color monitor
- 24 mm dot pitch
- Extended-range brightness control

**SuperMac Thunder/24**

24-bit color video card with 4,200% acceleration in QuickDraw performance and resolutions up to 1152 x 870 supported.

**E-Machines T-161** ....... $1199* 10004
**Thunder II GX 1152** ....... $1269* 64307
**Spectrum Power 1152** ....... $1159* 63868

**WACOM**

**UD-1212R**

Drawing Tablet
New 12" x 12" tablet is the perfect fit for any computer artist! New features include a full menu strip, 120 levels of pressure, a transparent overlay surface, a fully customizable cordless batteryless pen, and a more powerful interactive interface.

**ArtZ**

6x8" Tablet
World's first high-speed ADB compatible graphics table. The batteryless, cordless pressure-stylus has 120 levels of sensitivity. Programmable side switch for Undo, macros or other commands. 6" x 8" work area. Plugs into ADB port.

**WACOM**

**ORDER TOLL FREE**

800-222-2808

Call us for all your Apple Macintosh® Needs!
MacMall has it all!

If you’re looking for a Macintosh peripheral or accessory and don’t see it then give us a CALL! We do our best to carry just about everything!

ORDER TOLL FREE
800-222-2808

Call us for all your Apple Macintosh® Needs!

Newer

Technology

PowerBook Duo
MicroDocks

Ultra-small and low cost, Newer’s 3 MicroDock™ models provide connectivity and portability for Duo Users.

SCSI MicroDock™, the first portable SCSI solution, provides SCSI and ADB ports. Exclusive features include active termination for low power consumption and more reliable connection to hard drives and other Macintosh computers.

Color MicroDock™, the first low-cost portable color solution, supports VGA, SVGA, and Apple’s 12- to 16-inch color monitor in 256 colors (8-Bit) and 19- and 20-inch monitors in 16 colors (4-Bit). Audio out and ADB ports included. NTSC adapter available.

Ethernet MicroDock, the first portable Ethernet solution, provides easy RJ45 10BaseT Ethernet network connection. Included software monitors hardware in the background for network errors. Full SNMP support. Promiscuous mode. Comes with a standard ten-foot 10BaseT cable.

Quadra Cache™

The Slot-Free
Cache Solution

Add 128K of high-speed "cached" cache to your Quadra 605, 610, 615, 620, 800, 810, 850, 910 and Centris 610 and 650 Macintosh computers. Quadra Cache™ allows users to enjoy improved performance while leaving the 605 and 610 alone for their high-speed upgrade. Fits in the same CPU socket, increasing your Macintosh computer’s performance by up to 40%.

Mario Teaches Typing $29.62
Winning Chess $29.95

RayDream Designer 3.0

"By far the best modeling and rendering value around..." —MacWorld, August 1993

Try the leading 3D illustration package. It handles the details — lighting, shadows, transparency, reflections, and perspective are automatically painted in the most complex objects in 3D!

Microsoft OFFICE

PLUS: FREE TrueType MasterSet

These best-selling programs in one integrated super package!

- Microsoft Word
- Microsoft Excel

"addDepth is the way to go!" —MacLife, June 1992

Type, draw, and print in 3D with this award-winning application! Use built-in text and drawing tools to type and draw directly in 3D. Or import popular clip art and graphics. Add depth and perspective automatically, then personalize with colors, textures, bevels and lighting. Export your files in Illustrator, FreeHand, PICT, or EPS format. A must-have for both business graphic users and creative professionals.

JAG II

"A+ A+ A+" —Publish

This award-winning graphics utility is packed with new features. Resolution boosting eliminates the jagges in your images or animations, especially scans and bitmaps, with a single mouse click. Supports PICT, TIFF, EPS, PhotoCD, QuickTime and more.

MacMail FAX Order Line: 310-222-5800
Order Code: D462MG14
Order Status: 800-560-6800
FREE FEDERAL EXPRESS
On your first order with MacMall! $3.00 shipping on future orders!

And No Credit Card Surcharges!

NEW 17" color monitor with "on-the-fly" resolution switching between 480x600 to 1152x870. Digital controls for precise settings and super sharp 32:22 dot pitch gives you quality you can see! Ask about the Radius worry-free service warranty!

* AFTER 100 MAIL-IN REBATE

FREE FEDERAL EXPRESS
Tonight ends Sept. 30, 1994

$989*

IntelliColor Display/20
The Intelligent 20" Color Display for Macintosh Computers

$1897

Precision Color 17T
New 17" color monitor with "on-the-fly" resolution switching between 480x600 to 1152x870. Digital controls for precise settings and super sharp 32:22 dot pitch gives you quality you can see! Ask about the Radius worry-free service warranty!

$1897

Call MacMall for Memory!
For the lowest prices on memory products for your desktop Macintosh or PowerBook, call us FIRST!

8-Bit 80ns SIMMs (30 pin)
1x8 80ns $44 2224
2x8 80ns $75 60274
4x8 80ns $155 2219

32-bit SIMMs (72 pin)
LC II, Performa, Conrols, Quatra, Power Mac
4 MB 80ns $149 4468
8 MB 80ns $309 41177
16 MB 70ns $678 41071

24-bit SIMMs (72 pin)
Quadra, Power Mac
4 MB 60ns $169 61203
8 MB 60ns $329 61203
16 MB non-composite $749 62024
32 MB non-composite $1,449 62024

PowerBook 140, 145, 170
4 MB $199 61751
6 MB $269 54741
PowerBook 160, 165, 180
4 MB $179 60773
6 MB $279 60774
8 MB $379 60775
10 MB $439 60776

PowerBook 165c, 180c
4 MB $199 61203
6 MB $299 61203
8 MB $389 61203
10 MB $479 61203

Duo (all models)
4 MB $195 61169
8 MB $359 61093

Mac Video
256K VRAM $22 55631
512K VRAM $39 60408

ORDER TOLL FREE
800-222-2808
Call us for all your Apple Macintosh® Needs!

$265

MacDraw Pro 1.5
Super Upgrade from MacDraw or MacDraw II '92

$265

Macintosh Version

$195

Native PowerPC Version

Macintosh Version...

$195

ClarisWorks Version Upgrade...

$74

Competitive Trade-Up...

$114

ClarisWorks 2.1
In addition to its award-winning word processing, spreadsheet, drawing, database, graphics, and communication capabilities, ClarisWorks 2.1 now offers a new and innovative feature that places you on the forefront of total productivity: "QuickTime" movies, digitized audio, and rich image processing. QuickTime makes it easy to create, view, and distribute your QuickTime movies, documents, and images. And Best of all, QuickTime is an open standard, allowing you to share QuickTime movies and images with anyone else using QuickTime. 

$259

FileMaker Pro 2.1
The #1 Cross-platform Database FileMaker Pro gives you database power with user friendly programming. New version has over 50 new features. Quite possibly the most powerful database in the world!

$265

MacDraw Pro

MacDraw Pro is an object-oriented drawing program that allows you to capture the full color and grayscale abilities of your Macintosh. It lets you create stunning business graphics, charts and diagrams then turn them into text-based reports or a slide presentation, all in one program!

$265

MacDraw II

MacDraw II is an object-oriented drawing program that allows you to capture the full color and grayscale abilities of your Macintosh. It lets you create stunning business graphics, charts and diagrams then turn them into text-based reports or a slide presentation, all in one program!

** Offer good through 8/31/94. **Pro 24xk price after $50 Radius mail-in rebate. 124xk price after $75 Radius mail-in rebate. Rebates expire 8/31/94.

Macintosh Version...

$259

Version 2.1 Upgrade...

$189

Competitive Trade-Up...

$179

$195

MacDraw II

MacDraw II is an object-oriented drawing program that allows you to capture the full color and grayscale abilities of your Macintosh. It lets you create stunning business graphics, charts and diagrams then turn them into text-based reports or a slide presentation, all in one program!
System Security: insures your Apple® Protects your system in the office, at home, and even on the road.

If you lost the use of your computer tomorrow, how would you manage? Unfortunately, it happened to about two and one-half million users last year. Their computers were stolen, destroyed by fire or natural disasters, accidentally dropped — even disabled by sudden power surges. Unforseen mishaps that no warranty covers. Fortunately, you can now insure your valuable APPLE equipment against external loss or damage, with System Security from Safeware®.

**Comprehensive coverage.**
Under the System Security policy, your system is insured against theft, fire, vandalism, water damage, power surges, lightning, accidental damage, earthquake, flood and windstorms. No matter whether your system is in transit, at the office or at home. What's more, the policy covers repair or replacement of your equipment without depreciation.¹

**You pay no deductible.**
When your premium is accepted, your system is covered for one year. There is no deductible. 10-day free trial period. You can try System Security for 10 days and if for any reason you're not completely satisfied, Safeware will refund your premium in full.

**Why not begin your System Security coverage today?** It's easy! Just phone the special Safeware toll-free number listed below to purchase a one year policy on any of the equipment listed here.

**One year coverage for just pennies a day!**

**DESKTOPS**

<table>
<thead>
<tr>
<th>Power Macintosh</th>
<th>1-yr Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh Quadra</td>
<td>$39</td>
</tr>
<tr>
<td>Macintosh Centris</td>
<td>$40</td>
</tr>
<tr>
<td>Printers &amp; Monitors</td>
<td>$60</td>
</tr>
<tr>
<td>$100 to $1,000</td>
<td>$39</td>
</tr>
<tr>
<td>$1,001 to $2,000</td>
<td>$40</td>
</tr>
<tr>
<td>$2,001 to $3,000</td>
<td>$60</td>
</tr>
<tr>
<td>$3,001 to $4,000</td>
<td>$80</td>
</tr>
<tr>
<td>$4,001 to $5,000</td>
<td>$100</td>
</tr>
</tbody>
</table>

**POWERBOOKS**

<table>
<thead>
<tr>
<th>Apple Macintosh PowerBooks</th>
<th>1-yr Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100 to $1,000</td>
<td>$39</td>
</tr>
<tr>
<td>$1,001 to $2,000</td>
<td>$44</td>
</tr>
<tr>
<td>$2,001 to $3,000</td>
<td>$64</td>
</tr>
<tr>
<td>$3,001 to $4,000</td>
<td>$96</td>
</tr>
<tr>
<td>$4,001 to $5,000</td>
<td>$128</td>
</tr>
</tbody>
</table>

**NEWTON**

<table>
<thead>
<tr>
<th>Apple Newton</th>
<th>1-yr Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>$52</td>
<td></td>
</tr>
</tbody>
</table>

¹ This is a general summary of the provisions and qualifications of the insurance benefits included in the System Security Policy. Read the policy for complete details and disclosures. System Security™ is the service mark of Safeware. System Security is offered exclusively by Safeware and is underwritten by American Bankers Insurance Company, 11722 Quail Roost Cir., Plantation, FL 33325.

² Available in the U.S. except HI. Pending approval in AK, CT, GA, IL, KS, LA, ME, MA, MI, MN, MO, NY, NC, ND, NV, NH, NJ, NM, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, WA.
Removable Hard Drives

FEATURING

SyQuest REMOVABLE TECHNOLOGY

All SyQuest drives include a TWO Year Warranty.

ClubMac Removables

ClubMac 44mb 5.25" (S0555) $249 $289
ClubMac 88c 5.25" (S03180C) $379 $419
ClubMac 200mb 5.25" (S02000) $559 $599
ClubMac 105mb 3.5" (S03105) $339 $379
ClubMac 270mb 3.5" (S03270) $619 $659

ClubMac Removables

ClubMac 200mb 5.25" Removable Drive

ClubMac 500MB SHARP OPTICAL

Seagate drives carry a ONE Year Warranty.

LPS & PRODRIVE SERIES

Capacity | Access | Internal | External
---------|--------|---------|---------
170mb | 14ms | $209 | $269
270mb | 11ms | $259 | $319
340mb | 11ms | $299 | $359
540mb | 10ms | $429 | $489
540mb | 9.5ms | $549 | $609
1080mb | 9.5ms | $799 | $859

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty.

Hard Drives

Quantum LPS 540MB

ClubMac Optical Drives

LPS 540MB

489

ClubMac Tape Backup

Capacity | Model | Format | Media | Internal | External
---------|-------|-------|-------|---------|---------
2.0GIG | ClubMac DAT | DDS | 60m, 90m | $749 | $949
2.4GIG | ClubMac DAT/DC | DDS-DC | 60m, 90m, 120m | $1329 | $1379
4-8GIG | ClubMac DAT/2 | DDS-2 | 60m, 90m, 120m, 180m | $1109 | $1159
2.0GIG | HP DAT | DDS | 60m, 90m | $749 | $949
2.4GIG | HP DAT/DC | DDS-DC | 60m, 90m, 120m | $1109 | $1159
4-8GIG | HP DAT/2 | DDS-2 | 60m, 90m, 120m, 180m | $1439 | $1489

All LPS and DAT DC drives include Autotape v2.0, USB and Ethernet, ONE YEAR Tape and ONE TWO Year Warranty. HP DAT-DC drive carry a ONE Year Warranty.

CLUBMAC CD-ROM READERS

NEC CD-ROM READERS

MultiSpin 3Xe (External, 195ms access time) $469 $569
MultiSpin 3Xl (Internal, 195ms access time) $399 $499
MultiSpin 3Xp (Portable, 250ms access time) $935 $1035

NEC 3Xp combines 3X performance, 250ms access time and a 256 KB continuous-flow buffer in a compact design, making it an incredible value. At only 2.4lbs, the 3Xp is the world's lightest triple loaded CD-ROM reader.

CLUBMAC CD-ROM BUNDLES $800 VALUE

ClubMac 2X Speed CD-ROM Reader

NO CADDY NEEDED!

$399

The ClubMac CD-ROM reader carries a ONE Year Warranty.

LPS & PRODRIVE SERIES

Capacity | Access | Internal | External
---------|--------|---------|---------
170mb | 14ms | $209 | $269
270mb | 11ms | $259 | $319
340mb | 11ms | $299 | $359
540mb | 10ms | $429 | $489
540mb | 9.5ms | $549 | $609
1080mb | 9.5ms | $799 | $859

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty.

Hard Drives

Quantum LPS 540MB

ClubMac Removables

ClubMac 44mb 5.25" (S0555) $249 $289
ClubMac 88c 5.25" (S03180C) $379 $419
ClubMac 200mb 5.25" (S02000) $559 $599
ClubMac 105mb 3.5" (S03105) $339 $379
ClubMac 270mb 3.5" (S03270) $619 $659

ClubMac Removables

ClubMac 200mb 5.25" Removable Drive

ClubMac 500MB SHARP OPTICAL

Seagate drives carry a ONE Year Warranty.

LPS & PRODRIVE SERIES

Capacity | Access | Internal | External
---------|--------|---------|---------
170mb | 14ms | $209 | $269
270mb | 11ms | $259 | $319
340mb | 11ms | $299 | $359
540mb | 10ms | $429 | $489
540mb | 9.5ms | $549 | $609
1080mb | 9.5ms | $799 | $859

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty.

Hard Drives

Quantum LPS 540MB

ClubMac Removables

ClubMac 44mb 5.25" (S0555) $249 $289
ClubMac 88c 5.25" (S03180C) $379 $419
ClubMac 200mb 5.25" (S02000) $559 $599
ClubMac 105mb 3.5" (S03105) $339 $379
ClubMac 270mb 3.5" (S03270) $619 $659

ClubMac Removables

ClubMac 200mb 5.25" Removable Drive

ClubMac 500MB SHARP OPTICAL

Seagate drives carry a ONE Year Warranty.

LPS & PRODRIVE SERIES

Capacity | Access | Internal | External
---------|--------|---------|---------
170mb | 14ms | $209 | $269
270mb | 11ms | $259 | $319
340mb | 11ms | $299 | $359
540mb | 10ms | $429 | $489
540mb | 9.5ms | $549 | $609
1080mb | 9.5ms | $799 | $859

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty.

Hard Drives

Quantum LPS 540MB

ClubMac Removables

ClubMac 44mb 5.25" (S0555) $249 $289
ClubMac 88c 5.25" (S03180C) $379 $419
ClubMac 200mb 5.25" (S02000) $559 $599
ClubMac 105mb 3.5" (S03105) $339 $379
ClubMac 270mb 3.5" (S03270) $619 $659

ClubMac Removables

ClubMac 200mb 5.25" Removable Drive

ClubMac 500MB SHARP OPTICAL

Seagate drives carry a ONE Year Warranty.

LPS & PRODRIVE SERIES

Capacity | Access | Internal | External
---------|--------|---------|---------
170mb | 14ms | $209 | $269
270mb | 11ms | $259 | $319
340mb | 11ms | $299 | $359
540mb | 10ms | $429 | $489
540mb | 9.5ms | $549 | $609
1080mb | 9.5ms | $799 | $859

Quantum Pro and LPS series carry a TWO Year Warranty. Go-Drives carry a ONE Year Warranty.

Hard Drives

Quantum LPS 540MB

ClubMac Removables

ClubMac 44mb 5.25" (S0555) $249 $289
ClubMac 88c 5.25" (S03180C) $379 $419
ClubMac 200mb 5.25" (S02000) $559 $599
ClubMac 105mb 3.5" (S03105) $339 $379
ClubMac 270mb 3.5" (S03270) $619 $659

ClubMac Removables

ClubMac 200mb 5.25" Removable Drive

ClubMac 500MB SHARP OPTICAL

Seagate drives carry a ONE Year Warranty.
When you purchase the following products...

SuperMatch 20TXL $1949
Thunder/24 v.2.0 $1429

200 REBATE

Bundles:

SuperMatch 20TXL $1949
Thunder/24 v.2.0 $1429

$3378

$200 REBATE

$3178

MULTIMEDIA SOLUTIONS

Digital Film (24MHz) $3199
Spigot II Tape (1440dpi) $689
Video Spigot Neubus 1150 $669
Video Spigot LC (1200dpi) $249

MULTIMEDIA

Turbo 140i with 128K code $1000

33 MHz Turbo 140i w/128K code $259

540 Turbo (w/ FPD support) $163

TURBO 140 ACCELERATORS

Turbo 140 (with FPD support) $299

FastCache PowerPC IMAC Cache (1GHz) $499

LARGE SCREEN DISPLAYS

SuperMatch 21+XLC Trinitron (1200x1080) $2199
SuperMatch 20+TXL Trinitron (1280x1024) $1949
SuperMatch 17+XL Trinitron (1280x1024) $1499
Platinum 21 Two-Page GS (1200x1080) $999
PressView 21 Display System $3349

MULTIMEDIA

Turbo 140i w/ 128K code $1000

Full Page Display/21gs (1200x1080) $489

PowerCache Turbo Adapt $99

FM Adapter * $5

GOLDEN AGE MODEMS

SupraFax Modem 14.4 LC $159

9.6k, 14.4, and 28.8 Modems $95

SupraFax Modem 14.4 $225

5.0, 14.4, and 28.8 Modems $139

PowerCache Adapter $99

PowerCache Turbo $149

28.8/33.6 K Line fax $319

Warranty: All items purchased from ClubMac are warranted to the original ClubMac Buyer against defects in material and workmanship for the lifetime of the product. If a ClubMac warranted product is found to be defective, customers are to return the item to ClubMac with a Return Authorization (RA) number. Returns must be made within 30 days of receipt. ClubMac customers must notify ClubMac immediately if an item is lost or stolen. All returns must be prepaid and insured. For more information please call ClubMac at 1-800-258-2622.

Circle 96 on reader service card
We're not like the other
We go the extra

Macintosh Systems

Whether you need a system for high-end color publishing, professional press applications, desktop design and production or simply business productivity – Express Direct can custom configure a Mac System that's right for your specific job and right for your budget.

$4,749
Power Macintosh 8100/80 with CD ROM Drive
128MB RAM, 500 MB HD, includes Ethernet & FPU.

And remember, all Macs aren't created equal! At Express Direct we do more than take orders and ship boxes. We install the memory, video card and system software. Then we test every System – so all you need to do is plug it in! And only Express Direct gives you Toll-Free Technical Support with every Mac!

Power Macintosh
PowerPC
Talk to an expert.

Newgen's superior engineered products bring high-resolution, “service-bureaucracy-like printing” to the personal printer. Newgen’s proprietary Image Enhancement Technology produces incredibly crisp output normally found in printers at twice the price. And patented Auto Recognition Technology allows all Newgen printers to be attached to multi platform networks for maximum flexibility and compatibility.

$5699
Newgen ImagePlus 12 produces 1200 dpi, 15x15 charcoal-ready output. Also available is the 900 dpi, letter size Newgen 900G. 919-04

SuperMac Thunder 24 (4) the latest 24-bit card will fit DOS & the award-winning 20TX-20” Treon monitor display the latest evolution of MacWorld magazine’s top 3 ratings for the fastest cards on the market. SuperMac’s large screen displays are tailored to the demands of the graphics professional.

+$1699

$2979

Get the RAID performance of any Mac or a Mac with the fastest combination of FWB’s SledgeHammer II 220 MB MultiDrive and FWB’s SC200 SCSI Accelerator card.

FWB produces the industry’s broadest range of affordable, high-performance disk array storage subsystems. Choose the solution that's best for you from the SledgeHammer family of disk arrays, which now includes the top performing SledgeHammer II and SledgeHammer Wide. No matter which Macintosh you have, you’ll benefit from the unsurpassed professional performance of an FWB disk array. Power Macintosh compatible.

We stock a complete line of quality products from all of the above manufacturers & more.

1-800-765-0020

Express Hours (CST) M-F 8am-7pm, Sat 10am-2pm • 24hr Fax • Customer Service Hotline: 1-800-236-3059
When it comes to product knowledge and understanding the needs of graphic professionals — nobody even comes close to Express Direct. Not the other mail-order companies, not the superstores, not even your local dealer.

When you call us - you'll talk with an expert. Someone who's done their homework, knows the product, knows what they're talking about. Not an order-taker, like you get with the other mail-order companies.

We carry only top-notch products from the industry's best manufacturers. No garbage. You demand quality and so do we. What's more, our strict criteria for selecting products means we always get the lowest price — directly from the manufacturer. So nobody can give you a better value than Express Direct.

But that's just the beginning. With customer service and technical support that's the best in the industry, we make it our business to take care of you. All this is just a free phone call away. So, call Express Direct today. You're going to love working with us!
All Drives Are Not Equal.

"In the fiercely competitive world of the humble desktop hard drive, nobody sweats the details more than APS. Elegant design, quality components, and rock-solid construction distinguish the compact APS SR 2000 Case." — Editors of MacUser

***STOP SCSI VOODOO***

DiTerm, APS's own patented digital active termination technology, helps you avoid SCSI Voodoo by eliminating SCSI line pulse fluctuations, as well as confusing signal and voltage reflections. Its unique impedance-matching characteristics provide superior signal-to-noise ratios, decreases SCSI retries, allows more reliable data transmission and improves SCSI chain stability. DiTerm is available in the award-winning APS SR 2000 enclosure, as well as our new portable Companion II enclosure and SCSI Sentry.

**SR 2000 StacKIT™ $24**

- End Cable Bondage Forever!
- Minimizes SCSI Chain Length
- Heavy Metal Shielding Protects SCSI Signal
- StacKIT Includes Four Concave Stacking Feet
- StacKIT Includes Exclusive APS SCSI "Connector"

**APS HARD DRIVES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Internal</th>
<th>SR2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS Q 170</td>
<td>163MB</td>
<td>199</td>
<td>289</td>
</tr>
<tr>
<td>APS Q 270</td>
<td>257MB</td>
<td>359</td>
<td>449</td>
</tr>
<tr>
<td>APS MX 290</td>
<td>276MB</td>
<td>299</td>
<td>389</td>
</tr>
<tr>
<td>APS MX 345</td>
<td>324MB</td>
<td>339</td>
<td>429</td>
</tr>
<tr>
<td>APS X 340</td>
<td>327MB</td>
<td>429</td>
<td>519</td>
</tr>
<tr>
<td>APS X 540</td>
<td>516MB</td>
<td>499</td>
<td>999</td>
</tr>
<tr>
<td>APS ML 12AV</td>
<td>965MB</td>
<td>949</td>
<td>1039</td>
</tr>
<tr>
<td>APS ML 121</td>
<td>1001MB</td>
<td>899</td>
<td>989</td>
</tr>
<tr>
<td>APS ML 1002B</td>
<td>1002MB</td>
<td>889</td>
<td>979</td>
</tr>
<tr>
<td>APS ML 102B</td>
<td>1029MB</td>
<td>749</td>
<td>849</td>
</tr>
</tbody>
</table>

**POWERBOOK DRIVES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>LP #630</th>
<th>Internal</th>
<th>Companion II</th>
<th>AC/DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS PB 85</td>
<td>80MB</td>
<td>$249</td>
<td>—</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>APS PB 170</td>
<td>160MB</td>
<td>349</td>
<td>$299</td>
<td>$439</td>
<td></td>
</tr>
<tr>
<td>APS PB 212</td>
<td>202MB</td>
<td>349</td>
<td>$299</td>
<td>$439</td>
<td></td>
</tr>
<tr>
<td>APS PB 250</td>
<td>204MB</td>
<td>449</td>
<td>$299</td>
<td>$539</td>
<td></td>
</tr>
<tr>
<td>APS T 340</td>
<td>324MB</td>
<td>579</td>
<td>$299</td>
<td>$669</td>
<td></td>
</tr>
<tr>
<td>APS T 520</td>
<td>500MB</td>
<td>949</td>
<td>$899</td>
<td>$1039</td>
<td></td>
</tr>
</tbody>
</table>

**APS MX 290**

The APS MX 290 provides great performance with transfer rates of 1.8MB per second, access speeds of 24ms and seek times as low 13.1ms. This 276MB drive is a terrific upgrade for any Mac.

**Just $299**

**SCSI Sentry™**

Now you can "stop SCSI Voodoo" on your SCSI Chain, even when you're not ready to buy a new drive. Our new SCSI Sentry™ gives you all the benefits of APS' acclaimed DiTerm technology in the form of an external SCSI performance monitoring instrument.

**Benefits**

- Optimizes Overall SCSI Performance
- Exclusive Digital Active Termination
- Provides Ideal Termination Power
- Dramatically Reduces SCSI Retries
- Regulates SCSI Line Voltage
- Solves Bus Impedance Issues
- LED Activity Indicators
- Easy Installation, Takes Seconds

**PORTABLE STORAGE**

The Perfect Home for your 2.5" PowerBook Drive. Companion II Enclosures AC/DC

- $89 $139

**Yes! $139**

4 Hour Battery!
Get the Best: APS DAT

Only APS DATs bring you all the benefits of our SR 2000 enclosure with DTerm, Digital Active Termination

**APS DAT**
The amazing APS DAT offers you great performance and reliability. Get up to 2 GB on a 90 meter tape with backup speeds as high as 10 MB per minute. All DATs include Automatic Retro-Feed, a SSUP Value. Free!

**APS HyperDAT Speed**
If you need high-speed backup (not the kind that ties your server up and slows down your network), you need the DDS-2 power of the APS HyperDAT! Back up locally at rates as high as 20 MB per minute! Pack up to 10 GB on a single tape! Best of all, your regular DDS and DDS compression tapes can be read in the APS HyperDAT, too!

---

**DAT**

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity*</th>
<th>Internal*</th>
<th>SR 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS DAT†</td>
<td>1.8 GB/90 min tape</td>
<td>$749</td>
<td>$799</td>
</tr>
<tr>
<td>APS Turbo DAT†</td>
<td>4.5 GB/90 min tape</td>
<td>$119</td>
<td>$119</td>
</tr>
<tr>
<td>APS HyperDAT†</td>
<td>1.1 GB/120 min tape</td>
<td>$139</td>
<td>$139</td>
</tr>
</tbody>
</table>

*Actual data compression and capacity vary greatly depending on the type of media recorded, other system parameters and environment. 60 meter DAT Tape: 112, 10 Pack – $110 90 meter DAT Tape: $16, 10 Pack – $130 120 meter DAT Tape: $35, 10 Pack – $350 All APS DAT Drives include Automatic RetroFeed DCC & 1 FREE DAT Tape

---

**CD ROM**

<table>
<thead>
<tr>
<th>Model</th>
<th>SR 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS T 4101</td>
<td>$299</td>
</tr>
<tr>
<td>APS T 3401</td>
<td>499</td>
</tr>
</tbody>
</table>

**MAGNETO OPTICAL**

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal*</th>
<th>SR 2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>APS 128MB MO†</td>
<td>$799</td>
<td>$799</td>
</tr>
</tbody>
</table>

Mechanism is Epson Magneto-Optical CMD-9010 All MO Drives include 1 FREE Cartridge 120 MO cartridge – $99 unformatted, $55 formatted

---

**POWERBOOK STUFF**

<table>
<thead>
<tr>
<th>Model</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>APS SCSI DOC w/ PowerMerge Lite</td>
<td>Palm Sized 25-30 PowerBook SCSI Adapter that includes a docking adapter for PowerBook and termination power indicator. Receive PowerMerge Lite Free with every APS SCSI DOC!</td>
<td></td>
</tr>
<tr>
<td>APS SCSI BOY</td>
<td>Rugged Palm-Sized 25-30 PowerBook SCSI Adapters</td>
<td></td>
</tr>
</tbody>
</table>

---

**APS Technologies**

Great Products. Priceless Support!
Our Break-Through Technology Caught the Competition by Surprise... Wait 'Til They See Our New Prices!

$599

- 2400 dpi Resolution
- Free Photoshop LE

$1299

- 2400 dpi Resolution*
- Free Transparency Unit
- Free Full Photoshop
- Free OmniPage OCR

* Increased hardware resolution now delivers true 1200x300 dpi scanning and enhanced resolution to 2400 dpi!

Now you can have all the features without the high cost.

Before now, buying a quality scanner meant spending a fortune. Relisys' new Cold Scan Technology changes everything. Finally, a family of full-featured scanners at prices you can afford!

Dust-Free, Cold Scan Technology. Ordinary hot-lamp scanners rely on a fan to circulate cool air - and dust - throughout the scanning process. But new cold scan technology allows Relisys to fully encapsulate the process. So you get unprecedented, dust-free accuracy.

Exceptional Value. What's more, our new technology is not only superior to the competition's - it's more affordable!

Plus, Relisys gives you free software with all of our scanners; like Caere OmniPage Direct, so you can scan text directly into your word processing program and Adobe Photoshop for image editing and manipulation.

Call today for details on the complete line, or to order direct.

Order Direct: 1-800-723-7744
Got questions? Get answers!

radius
Call

Precision Color Display
Built in video, Full page resolution, portrait and landscape.

$599
Avec Colour Scanner
600 dpi color scanner, interpolates up to 2400 dpi, with Free Adobe Photoshop LE.

AGFA
$999
Agfa StudioScan
600x300 dpi, interpolates to 2400 dpi, with Free Photoshop LE, Fotorune LE & FotoSnap

RasterOps
$1999
RasterOps 20T
20" Multimode Color Trinitron Display, 4 resolutions up to 1152x870.

Umax
$1199
Umax UC 1260
1200 dpi, 24 bit color, with free full Photoshop

SuperMac
Call/Call
SuperMac 20TV/1L/21TV/1L
Spectrum Power 1152 (")
Thunder 32 w/Free DSP!

529
$529
Phillips 15" Color Display with built-in Speakers

$799
Macromedia Director 4.0
The most advanced set of cross-platform authoring tools ever!

MacNews
155 Sherman Avenue
Suite 301 Evanston, IL 60201

1-800-723-7744
24hr Fax 312-871-4556 • International Orders Welcomed

Circle 172 on reader service card
Utilize the advanced SCSI features of the your PowerPC to the fullest with the Magic 1GB RAID upgrade, the ideal solution for desktop video on the PowerPC. RAID levels 0 and 1 and/or levels 0,1,4, and 5 with access times down to 4ms and transfer rates up to 10 MB/sec at RAID level 0 can be configured from software. The system is compatible with SCSI 1 and 2, SCSI Manager 4.3. RAID drives are all metal construction complete with all cables.

**Magic Memory**

1 MB 30 pin 80 ns. $35
2 MB 30 pin 80 ns. $68
4 MB 30 pin 80 ns. $124
4 MB 72 pin 60/70 ns. $129
8 MB 72 pin 60/70 ns. $259
16 MB 72 pin 60 ns, non-compost. $549

All Magic memory has a 30 day money back guarantee and a lifetime warranty.

**PowerBook Accelerators**

PowerBook RAM. 256 MB. $129
PowerBook RAM. 512 MB. $249
PowerBook RAM. 1 GB. $399

**Magic Optical**

Magic 128 MB Optical. $79
Magic 230 MB/256 MB Optical. $199
Magic 128 MB Optical. $79
Precision 128 Carts / 10 Pack. $272 / 240

**Magic SyQuest**

Magic SyQuest 1.5 GB. $299
Magic SyQuest 2.5 GB. $499
Magic SyQuest 3.5 GB. $799

**Magics Technical Support**

1.800.622.8721

**Magic Network**

Magic Network Adapter. $12
Magic 10BaseT Adapter. $49
Magic Int. Modems. $49

**Magic Modems**

Magic FaxModems...

Magic FaxModems...

**Magic Hard Drives**

Magic 1GB RAID $799
Upgrade for the PowerPC 8100

**Magic 2GB Tape $699**

The Fastest 2 GB Tape

The Magic 2GB tape drive will backup data at speeds over 68 MB/Minute. It is the only tape drive fast enough to keep up with a RAID drive. You can do a full 1GB backup in only 15 minutes and features a two year warranty. Retrospect 2.1 included.

**Magic Modems**

All FaxModems come with full feature Fax STEII, Microphone Lite®, America Online, and Compassure Startup Kit.

**Magic FaxModems**

Magic 288 V. Fax Class. $229.00
115,000bps modem. 14400bps send & receive Mac, V.42bis/V.32bis hardware & MNP-1-10 protocols. 2 year warranty, 30 day money back guarantee.

Magic 14400 Data Fax Modem. $199.00
57,600 bps data. 14400bps S/T fax, V.42bis/V.32bis, MNP-1-5 protocols. Beats the Supra Le Hands Down in Performance.

With VoiceMail. $189
High Speed Modem Cable. $15
Hardware Handslauling.

**Magic PowerBook Int. Modems**

14400bps Data Fax Modem. $169
57,600 bps Data 14400 Fax, V.32bis, V.42bis, MNP 1-5.
2460 Data/Fax Modem. $79
2400bps modem, 9600bps send & 4800bps receive, fax, V.42, MNP 1-5.

**MacProducts USA**

800 622 8721

International Sales 512-476-5295 Fax 512-499-0888


Circle 175 on reader service card
Still Faster Than Fujitsu for $719

Magic 128 Optical With a 2 Year Warranty

- Faster than the Fujitsu 128
- Twice the warranty 2 years
- Better Software than APS or FWB
- Authorized Repair Center

The 128 mechanism used in the Magic 128 Magneto-Optical was rated over 20% faster than the Fujitsu 128. The Magic 128 Optical has a max transfer rate of 3.3 MB/sec using a split head laser design.

Magic CD-ROM

Absolute CD-ROM Compatibility and Blazing Speed. The AllCache™ driver software replaces your CD-ROM drive’s original driver software, allowing drive access functions to be sped up significantly.

MacWorld December 93 as being 15% faster overall than the Fujitsu 128. The Magic 128 Optical has a max transfer rate of 3.3 MB/sec using a split head laser design.

Magic 128 Optical ** $719
Magic 256 Optical ** $999

Magic CD Pro 410/Toshiba ............... $349
Magic CD Pro 340/Toshiba ............... $499
Magic CD Pro 6 QuadSpin™ ............ $1,199

CDs

CD-ROM Multimedia Encyclopedia ....$49
W/purchase of CD Drive
6 CD Bundle ....................... $49
Call for CD-ROM Catalogue

Jetpack Inkjet Refill Twin Packs for DeskWriter
Two Pack Black .............. $15.99
BUY 3:Get 1 COLOR FREE
High Capacity Black ........ $19.99
Apple Color printer BJ800, 5500C, 5600C 310B/300C/310

Umex 630 LE $598.00
Umex 1260 $1149.00

Quark Express 3.3 $539.00

Least Costing $999.00
PLI 408/88 Syquest ........ $329/469.00
PLI105/270 Syquest .... $429/629.00
PLIDAT 4GB ........ $1,399.00

SCANNERS

Microtek IIX Scanmaker ........ $975.00
Microtek IISI Scanmaker .... $729.00
Microtek 3ST ........ $1349.00
HP ScanJet IICX ......... $1939.00
Tamara 1200 ........ $1,564.00
Nikon CoolScan Int. .... $1,920.00

SOFTWARE

Adobe Illustrator 5.0 ........ $355.00
Adobe Photoshop 2.5.1....... $499.00
Aldus Pagemaker 5.0 ....... $499.00
Canvas 3.5 ........ $249.00
Filemaker Pro 2.1 ........... $235.00
Fractal Painter ........ $239.00
Fractal x2 ........ $67.00
Freehand 3.0 ........ $369.00
Macromind Director 4.0 .... $699.00
MiniCad 4.0 ........ $499.00
Microsoft Excel 4.0 ...... $279.00
Microsoft Word 5.0 ....... $279.00
Macromind Director 4.0 .... $699.00
Macromind Director 4.0 .... $699.00

ACCELERATORS

Daystar 40 Mhz 128K ........ $999.00
FastCache Turbo ........ $165.00
Daystar 50 PowerCache .... $430.00
Daystar PowerMac ....... $375.00
Stage Two Rocket 40 .... $1449.00
Radius Rocketshare ....... $259.00

DRIVES

Magic/TW DAT 2GB ........ $899.00
Magic/TW DAT 8GB .... $1,099.00
TW DAT 16GB ........ $1,299.00
Fujitsu 1.2GB ........ $949.00
Quantum 540MB ....... $499.00

MacProducts USA THIRD WAVE

606 West 22nd Street Austin, Texas 78705 USA Tel 512 476 5295 Customer Service 512 472 8881 ext. 403 Fax 512 499 0889 Canada 512 622 8721

Circle 186 on reader service card

MacWorld July 1994 227
Below Dealer Cost!

Below Dealer Cost Clearance! All Radius products are new with full manufacturers one year warranty! All quantities are extremely limited and will be sold on a first come first serve basis. Dealer cost prices are shown below for comparison.

### Video Boards

<table>
<thead>
<tr>
<th>Board Type</th>
<th>Your Price</th>
<th>Dealer Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Color Pivot LE</td>
<td>$399</td>
<td>$600</td>
</tr>
<tr>
<td>E-Machines ColorPage 15</td>
<td>$499</td>
<td>$1307</td>
</tr>
<tr>
<td>Radius Color Grayscale</td>
<td>$499</td>
<td>$535</td>
</tr>
<tr>
<td>Radius Color Display/21</td>
<td>$1899</td>
<td>$1989</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
<td>$1248</td>
</tr>
<tr>
<td>RocketOps 20 inch Display</td>
<td>$1399</td>
<td>$1446</td>
</tr>
<tr>
<td>Apple Wavefront</td>
<td>$499</td>
<td>$459</td>
</tr>
</tbody>
</table>

### ROCKETS/ACCELERATORS

<table>
<thead>
<tr>
<th>Rocket Type</th>
<th>Your Price</th>
<th>Dealer Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
<td>$1248</td>
</tr>
<tr>
<td>Rocket 25 MHz</td>
<td>$699</td>
<td>$1248</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
<td>$830</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
<td>$1248</td>
</tr>
</tbody>
</table>

### OTHER SPECIALS!

<table>
<thead>
<tr>
<th>Special</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserWriter Parts</td>
<td>$499</td>
</tr>
<tr>
<td>Apple LaserWriter Postscript printer 8 ppm</td>
<td>$499</td>
</tr>
</tbody>
</table>

### CALL FOR MAC SYSTEMS & PARTS!

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Color Pivot LE</td>
<td>$399</td>
</tr>
<tr>
<td>E-Machines ColorPage 15</td>
<td>$499</td>
</tr>
<tr>
<td>Radius Color Grayscale</td>
<td>$499</td>
</tr>
<tr>
<td>Radius Color Display/21</td>
<td>$1899</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>RocketOps 20 inch Display</td>
<td>$1399</td>
</tr>
<tr>
<td>Apple Wavefront</td>
<td>$499</td>
</tr>
</tbody>
</table>

### CALL FUR All OTHER RADIUS VIDEO BOARDS!

### PRINTERS

<table>
<thead>
<tr>
<th>Printer Type</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Machines ColorPage 15</td>
<td>$499</td>
</tr>
<tr>
<td>Radius Color Pivot LE</td>
<td>$399</td>
</tr>
<tr>
<td>Radius Color Display/21</td>
<td>$1899</td>
</tr>
<tr>
<td>Sony 20 inch Trinitron</td>
<td>$1899</td>
</tr>
<tr>
<td>Apple 24 GS</td>
<td>$399</td>
</tr>
</tbody>
</table>

### MISCÉLLANEOUS

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
</tbody>
</table>

### CALL FOR MAC SYSTEMS & PARTS!

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
</tbody>
</table>

### CALL FOR MAC SYSTEMS & PARTS!

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
</tbody>
</table>

### CALL FOR MAC SYSTEMS & PARTS!

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
</tbody>
</table>

### CALL FOR MAC SYSTEMS & PARTS!

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
</tbody>
</table>

### CALL FOR MAC SYSTEMS & PARTS!

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Your Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
<tr>
<td>Radius Rocket 33 MHz</td>
<td>$699</td>
</tr>
<tr>
<td>Rocket 25i</td>
<td>$599</td>
</tr>
<tr>
<td>SocketShare</td>
<td>$699</td>
</tr>
</tbody>
</table>
### HARD DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fujitsu</td>
<td>1.2GB</td>
<td>$865</td>
</tr>
</tbody>
</table>

### OPTICAL DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony 5944050MB</td>
<td>5.25&quot;</td>
<td>$1199</td>
</tr>
</tbody>
</table>

### DISK ARRAY RAIDS

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 GB RAID System</td>
<td>2 x 50MB hard drives</td>
<td>$1329</td>
</tr>
<tr>
<td>2.0 GB RAID System</td>
<td>2 x 1.0GB hard drives</td>
<td>$2129</td>
</tr>
<tr>
<td>4.0 GB RAID System</td>
<td>2 x 2.0GB hard drives</td>
<td>$3499</td>
</tr>
</tbody>
</table>

### SCANNERS

<table>
<thead>
<tr>
<th>Model</th>
<th>Model</th>
<th>Description</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UMAX</td>
<td>ScanAv</td>
<td>24-bit Color</td>
<td>$999</td>
</tr>
<tr>
<td>UMAX</td>
<td>ScanAv</td>
<td>24-bit B/W</td>
<td>$1399</td>
</tr>
</tbody>
</table>

### SYSTEMS

<table>
<thead>
<tr>
<th>Model</th>
<th>Model</th>
<th>Description</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SuperMac 20T</td>
<td>Keyboard</td>
<td>$5599</td>
<td></td>
</tr>
<tr>
<td>SuperMac 17</td>
<td>Keyboard</td>
<td>$4899</td>
<td></td>
</tr>
<tr>
<td>SuperMac 20T</td>
<td>Keyboard</td>
<td>$5999</td>
<td></td>
</tr>
</tbody>
</table>

### TAPE DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony 5944050MB</td>
<td>3.5&quot;</td>
<td>$1329</td>
</tr>
</tbody>
</table>

### SYQUEST DRIVES

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Price (w/o tax)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syquest 200</td>
<td>5459</td>
<td>$5499</td>
</tr>
<tr>
<td>Syquest 300</td>
<td>4559</td>
<td>$4559</td>
</tr>
<tr>
<td>Syquest 400</td>
<td>3559</td>
<td>$3559</td>
</tr>
</tbody>
</table>

### BUNDLE SPECIAL

- Purchase $400 or more and get Adobe Photoshop 3.0 full version for $299

### SYQUEST DRIVES

- Includes external drive, 2530 SCSI Cable, Mac SW, and Terminator.
- External drive, 2530 SCSI Cable, Mac SW, and Terminator.
- Includes external drive, 2530 SCSI Cable, Mac SW, and Terminator.

### DISK ARRAY RAID SYSTEMS

- Includes external drive, 2530 SCSI Cable, Mac SW, and Terminator.
- Includes external drive, 2530 SCSI Cable, Mac SW, and Terminator.
- Includes external drive, 2530 SCSI Cable, Mac SW, and Terminator.

### POWER PC AVAILABLE

- Includes external drive, 2530 SCSI Cable, Mac SW, and Terminator.
<table>
<thead>
<tr>
<th>Feature</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precision Color 17&quot;/21&quot;</td>
<td>$999</td>
</tr>
<tr>
<td>Intel Color Display 20L</td>
<td>$1849</td>
</tr>
<tr>
<td>Le Mans GT</td>
<td>$1099</td>
</tr>
<tr>
<td>Precision Color 20V</td>
<td>$1975</td>
</tr>
<tr>
<td>Precision Color Pro 24X</td>
<td>$1245</td>
</tr>
<tr>
<td>Precision Color Pro 24XP</td>
<td>$439</td>
</tr>
<tr>
<td>VideoVision Studio</td>
<td>$329</td>
</tr>
<tr>
<td>Stage Two Rocket</td>
<td>$449</td>
</tr>
<tr>
<td>Radius</td>
<td>$269</td>
</tr>
<tr>
<td>ArtZ Bundle</td>
<td>$469</td>
</tr>
<tr>
<td>12x12 UD + Painter</td>
<td>$689</td>
</tr>
<tr>
<td>12x12 UD Electrostatic</td>
<td>$810</td>
</tr>
<tr>
<td>12x10 UD Transparent surface</td>
<td>$675</td>
</tr>
<tr>
<td>Painter v2.0 w/Tablet</td>
<td>$199</td>
</tr>
<tr>
<td>Xerox X2</td>
<td>$67</td>
</tr>
<tr>
<td>UD1212RSM Tablet</td>
<td>$499</td>
</tr>
<tr>
<td>Tamarak 1200</td>
<td>$1564</td>
</tr>
<tr>
<td>PRINTERS</td>
<td></td>
</tr>
<tr>
<td>ScannJet II ex</td>
<td>$939</td>
</tr>
<tr>
<td>DeskWriter 310</td>
<td>$299</td>
</tr>
<tr>
<td>DeskWriter 520</td>
<td>$299</td>
</tr>
<tr>
<td>DeskWriter 550c</td>
<td>$430</td>
</tr>
<tr>
<td>DeskWriter 560c</td>
<td>$579</td>
</tr>
<tr>
<td>DeskWriter C</td>
<td>$1389</td>
</tr>
<tr>
<td>LaserJet 4ML/4MP</td>
<td>$1029/1395</td>
</tr>
<tr>
<td>Transportable 90</td>
<td>$335</td>
</tr>
<tr>
<td>Transportable 150 Pro</td>
<td>$479</td>
</tr>
<tr>
<td>90MB Cartridge</td>
<td>$92</td>
</tr>
<tr>
<td>150 MB Cartridge</td>
<td>$99</td>
</tr>
<tr>
<td>150 MB Cartridge Tri-Pack</td>
<td>$313</td>
</tr>
<tr>
<td>MacOptical 21</td>
<td>$449</td>
</tr>
<tr>
<td>EtherWave Transceiver</td>
<td>$97</td>
</tr>
<tr>
<td>EtherWave adapters for NuBus/LC</td>
<td>$179</td>
</tr>
<tr>
<td>EtherWave adapter for Powerbook</td>
<td>$289</td>
</tr>
<tr>
<td>EtherWave Printer Adapter</td>
<td>$199</td>
</tr>
<tr>
<td>PhoneNet Din 8</td>
<td>$25</td>
</tr>
<tr>
<td>PhoneNet Din 8/10pack</td>
<td>$195</td>
</tr>
<tr>
<td>LEWIS HEWLETT PACKARD</td>
<td></td>
</tr>
<tr>
<td>167 Hub/12 Hub/8</td>
<td>$269/219</td>
</tr>
<tr>
<td>Mini EN/SC, EN/SC/10T</td>
<td>$289/231</td>
</tr>
<tr>
<td>MacCon+1664</td>
<td>$137</td>
</tr>
<tr>
<td>MC3 Nubes</td>
<td>$185</td>
</tr>
<tr>
<td>Asante Print Thin/Thin</td>
<td>$328</td>
</tr>
<tr>
<td>Friendly Net 1011</td>
<td>$54</td>
</tr>
<tr>
<td>Asante Life LC</td>
<td>$99</td>
</tr>
<tr>
<td>SCANERS</td>
<td></td>
</tr>
<tr>
<td>Leaf Scanner 35/45</td>
<td>$7499/Cally</td>
</tr>
<tr>
<td>Docus/PowerBooks/Newton</td>
<td>$7499/Cally</td>
</tr>
<tr>
<td>Quadra 610</td>
<td>$12349</td>
</tr>
<tr>
<td>Quadra 650</td>
<td>$1859</td>
</tr>
<tr>
<td>Quadra 660AV</td>
<td>$1599</td>
</tr>
<tr>
<td>Quadra 840AV</td>
<td>$2650</td>
</tr>
<tr>
<td>Extended Keyboard w/Purchase</td>
<td>$69</td>
</tr>
<tr>
<td>SCANNERS</td>
<td></td>
</tr>
<tr>
<td>3M Rainbow Dyesub</td>
<td>$7499/Cally</td>
</tr>
<tr>
<td>Docus/PowerBooks/Newton</td>
<td>$7499/Cally</td>
</tr>
<tr>
<td>ScanJet II ex</td>
<td>$939</td>
</tr>
<tr>
<td>DeskWriter 310</td>
<td>$299</td>
</tr>
<tr>
<td>DeskWriter 520</td>
<td>$299</td>
</tr>
<tr>
<td>DeskWriter 550c</td>
<td>$430</td>
</tr>
<tr>
<td>DeskWriter 560c</td>
<td>$579</td>
</tr>
<tr>
<td>DeskWriter C</td>
<td>$1389</td>
</tr>
<tr>
<td>LaserJet 4ML/4MP</td>
<td>$1029/1395</td>
</tr>
<tr>
<td>TRANSPORTABLE</td>
<td></td>
</tr>
<tr>
<td>90MB Cartridge</td>
<td>$92</td>
</tr>
<tr>
<td>150 MB Cartridge</td>
<td>$99</td>
</tr>
<tr>
<td>150 MB Cartridge Tri-Pack</td>
<td>$313</td>
</tr>
<tr>
<td>MacOptical 21</td>
<td>$449</td>
</tr>
<tr>
<td>LaserWriter Select 360</td>
<td>$1525</td>
</tr>
<tr>
<td>Proof/Positive</td>
<td>$6596</td>
</tr>
<tr>
<td>CMS 960 Plus</td>
<td>$3299</td>
</tr>
<tr>
<td>INPUT DEVICES</td>
<td></td>
</tr>
<tr>
<td>Grovus GamePad Mac</td>
<td>$929</td>
</tr>
<tr>
<td>MacPro Plus 105</td>
<td>$115</td>
</tr>
<tr>
<td>Other Language Keyboards</td>
<td>$99</td>
</tr>
<tr>
<td>PowerKey Remote</td>
<td>$35</td>
</tr>
<tr>
<td>Turbo Mouse ADB V4.0</td>
<td>$99</td>
</tr>
<tr>
<td>Summamasketch Fx</td>
<td>$419</td>
</tr>
<tr>
<td>NETWORKING</td>
<td></td>
</tr>
<tr>
<td>8 Port Hub 10BaseT</td>
<td>$149</td>
</tr>
<tr>
<td>Dayna Mini Hub</td>
<td>$34</td>
</tr>
<tr>
<td>Ethernet for Ilsi, NuBus, LC &amp; SE</td>
<td>$99</td>
</tr>
<tr>
<td>MacCon + IJet64</td>
<td>$148</td>
</tr>
<tr>
<td>S30 10BaseT &amp; All</td>
<td>$99</td>
</tr>
<tr>
<td>Starlit 8 108T Hub</td>
<td>$199</td>
</tr>
<tr>
<td>Thin/10Base Transceiver Adapter</td>
<td>$49</td>
</tr>
<tr>
<td>DRIVE &amp; TAPES</td>
<td></td>
</tr>
<tr>
<td>IBM 1.0GB/9mys</td>
<td>$699</td>
</tr>
<tr>
<td>IBM 2.0GB/9mys</td>
<td>$1149</td>
</tr>
<tr>
<td>Barracuda 1.9GB/8ms</td>
<td>$1539</td>
</tr>
<tr>
<td>Barracuda 2.56GB/6ms</td>
<td>$1005</td>
</tr>
<tr>
<td>Barracuda 5G</td>
<td>call</td>
</tr>
<tr>
<td>Seagate Hawk 2.4 GB</td>
<td>$1539</td>
</tr>
<tr>
<td>Granite Active Terminator</td>
<td>$3999</td>
</tr>
<tr>
<td>Quantum 340 / 1080 Empire</td>
<td>$4999/899</td>
</tr>
<tr>
<td>Seagate 1.0GB</td>
<td>$1399</td>
</tr>
<tr>
<td>Seagate Elite 3.4GB</td>
<td>$2299</td>
</tr>
<tr>
<td>Toshiba 3.40 PowerBook</td>
<td>$659</td>
</tr>
<tr>
<td>Quantum Empire 1.08 GB</td>
<td>$859</td>
</tr>
<tr>
<td>Wren 9GB</td>
<td>Call</td>
</tr>
<tr>
<td>4400PMO 1.3 GBMacExt</td>
<td>$1325</td>
</tr>
<tr>
<td>Legend Multimedia CD ROM Drive</td>
<td>$495</td>
</tr>
<tr>
<td>128 Optical</td>
<td>$920</td>
</tr>
<tr>
<td>DGR 128/256 Optical</td>
<td>Call</td>
</tr>
<tr>
<td>SOFTWARE</td>
<td></td>
</tr>
<tr>
<td>Database Development 4th Dimension v3.0</td>
<td>$559</td>
</tr>
<tr>
<td>MS FoxPro</td>
<td>$94</td>
</tr>
<tr>
<td>FireMaker Pro 2.1</td>
<td>$205</td>
</tr>
<tr>
<td>Retrospect</td>
<td>$139</td>
</tr>
<tr>
<td>Times Two v2.0</td>
<td>$85</td>
</tr>
<tr>
<td>Business Software</td>
<td>$541</td>
</tr>
<tr>
<td>Colleague v3.4</td>
<td>$44</td>
</tr>
<tr>
<td>Datebook</td>
<td>$45</td>
</tr>
<tr>
<td>In Control v2.0</td>
<td>$99</td>
</tr>
</tbody>
</table>

**SONY MONITORS**

- 17E5 CPD 1730 $1199 $1025
- 2075/4599

**SUPRA FAX MODEM**

- 14.4 MacPac/LC $203/155
- 28.8 MacPac $299

**DGR KEYBOARD**

- Extended 105 keys $69
- 14.4 bps. $139
- 28.8 bps. $229

**MAGIC MODERN 28.8**

- $1512-472-4956

24-Hour Fax 1-512-476-6399 • 1219 West 6th Street • Austin, Texas 78703 USA

Circle 63 on reader service card
DGR Technologies

Upgraded your LC, LCII, LCIII and Performa 400 with the LC MAX. Increase the single expansion slot to four, add another hard drive and supplement your LC with an additional 40 watt power supply. Conflcting cards can be easily switched on or off as needed. Enter the world of Multi-Media with the Multi MAX! Equipped with a multi-session, double spin CD-ROM, and amplified stereo speakers, you can access the vast library of CD-ROMs available or listen to your favorite music.

Multi MAX $799.00  LC MAX $299.00

DGR Power RAID Storage System

High speed RAID technology at a real world price. The DGR Power Raid Storage System is a RAID level 0 and 1 controller level 0, 1, 4, and 5 array system. Access time is 4ms with transfer rates up to 10 MB/Sec (Sync) at RAID levels 0 and 1 using a 1.0 GB array on a 840Av. The system is compatible with SCSI 1 and 2, SCSI Manager 4.3 (Asyn), and will work with all Power PC and Mac AV platforms. RAID enclosures are all metal construction complete with all cables and software. The Power Raid Storage System provides its own SCSI chain via a Nubus SCSI 2 card, allowing you to add more RAID enclosures as you need them.

4.0 GB $3,199.00  2.0 GB $2,299.00

DGR Optical Drives

DGR Technologies is committed to the excellence that has made us the industry leader. Each drive is shipped in an all-steel case with a universal 40 watt power supply. Conflicting cards can be easily switched on or off as needed. Enter the world of Multi-Media with the Multi MAX! Equipped with a double spin CD-ROM, and amplified stereo speakers, you can access the vast library of CD-ROMs available or listen to your favorite music.

JetInc. Ink Jet Refills

JetInc is the most economical way to refill your inkjet printers. It provides over 50% savings, and incorporates recycled materials to help reduce landfill waste.

JetInc $22.99  ColorJet $29.95

Colleague Business Software

Colleague Business Software has functions such as appointment calendars, client/prospect filing, invoicing, job tracking, checkbooks, general ledger, sales, expenses, and accounts receivable reports. MacWorld Editor’s Choice award and 4 1/2 mice in MacUser.

169.00

Contact Us

Reach us via Internet: Domestic sales - sales@max.dgr.com
International sales - world@max.dgr.com

DGR Technologies

4.0 GB $3,199.00  2.0 GB $2,299.00

DGR Optical Drives

Imported from DGR Technologies - High speed RAID technology at a real world price. The DGR Power Raid Storage System is a RAID level 0 and 1 controller level 0, 1, 4, and 5 array system. Access time is 4ms with transfer rates up to 10 MB/Sec (Sync) at RAID levels 0 and 1 using a 1.0 GB array on a 840Av. The system is compatible with SCSI 1 and 2, SCSI Manager 4.3 (Asyn), and will work with all Power PC and Mac AV platforms. RAID enclosures are all metal construction complete with all cables and software. The Power Raid Storage System provides its own SCSI chain via a Nubus SCSI 2 card, allowing you to add more RAID enclosures as you need them.

4.0 GB $3,199.00  2.0 GB $2,299.00

DGR Optical Drives

JetInc. Ink Jet Refills

JetInc is the most economical way to refill your inkjet printers. It provides over 50% savings, and incorporates recycled materials to help reduce landfill waste.

JetInc $22.99  ColorJet $29.95

Colleague Business Software

Colleague Business Software has functions such as appointment calendars, client/prospect filing, invoicing, job tracking, checkbooks, general ledger, sales, expenses, and accounts receivable reports. MacWorld Editor’s Choice award and 4 1/2 mice in MacUser.

169.00

Contact Us

Reach us via Internet: Domestic sales - sales@max.dgr.com
International sales - world@max.dgr.com

DGR Technologies

4.0 GB $3,199.00  2.0 GB $2,299.00

DGR Optical Drives

JetInc. Ink Jet Refills

JetInc is the most economical way to refill your inkjet printers. It provides over 50% savings, and incorporates recycled materials to help reduce landfill waste.

JetInc $22.99  ColorJet $29.95

Colleague Business Software

Colleague Business Software has functions such as appointment calendars, client/prospect filing, invoicing, job tracking, checkbooks, general ledger, sales, expenses, and accounts receivable reports. MacWorld Editor’s Choice award and 4 1/2 mice in MacUser.

169.00

Contact Us

Reach us via Internet: Domestic sales - sales@max.dgr.com
International sales - world@max.dgr.com
**Quantum**

**Best Byte for MACs!**

**New Product**

- **Capacity**
  - 42 MB: $159
  - 127 MB: $420
  - 256 MB: $625

**GO Drive Series**

- **Capacity**
  - 42 MB: 9 ms
  - 127 MB: 32 ms
  - 256 MB: 55 ms

**LPS Series**

- **Capacity**
  - 240 MB: $245
  - 270 MB: $300
  - 340 MB: $375
  - 540 MB: $485

**Empire and Pro Series**

- **Capacity**
  - 420 MB: 9.5 ms

**MICROPOLIS**

- **Capacity**
  - 1.2 GB: $270
  - 2.4 GB: $550
  - 3.6 GB: $875

- **Direct to Disk Recording AV Drives**
  - 1.2 GB: $555
  - 2.4 GB: $1155
  - 3.6 GB: $2375

**FUJITSU**

- **Capacity**
  - 240 MB: $245
  - 520 MB: $512

- **Direct MO**
  - 128 MB: $865

**HP**

- **Capacity**
  - 1.2 GB: $147
  - 2.4 GB: $240
  - 3.6 GB: $350

**QMS PRINTERS**

- **Model**
  - PS 410 4PPM, 300DPI: $1299
  - PS 860 8PPM, 600 DPI: $1599

**TAPE BACKUP DRIVES**

- **Capacity**
  - 2.0 GB: $1025
  - 3.5 GB: $1219

**ZERO FOOTPRINT**

- 40 watt shielded power supply, 110/220 VAC. Works with all 3.5" and 5.25" HH Drives.

**MICROCAP**

- Vertical Stacking
- Works with any 3.5" Drive.

**FULL HEIGHT**

- 68 watt shielded power supply, 110/220 VAC. Works with all 5.25" Drives.

**MULTIBAY CABINET**

- Two, Four, Six, and Eight Bay Cabinets available.

**EXTRANET CABINETS**

- CALL FOR QUOTE. All cabinets come with a 25-50 pin Mac system cable. One year warranty on all cabinets.

**Price**

- **Models**
  - PS 410 4PPM, 300DPI: $1299
  - PS 860 8PPM, 600 DPI: $1599

800-524-9952

Fax 24 Hrs. a Day 612-941-1109

Fax International Orders 612-929-2421 • Call: 612-941-1805

Business Hours: 8:00am to 7:00pm M-F (CST)

Prices & Specifications subject to change. All trademarks are registered trademarks of their respective companies. Freight not included.

Circle 135 on reader service card

SPRING FEVER

**Quantum 1800**

Only $995

**Micropolis 1.7 GB AV**

Only $1115

**Seagate**

- **Capacity**
  - 1.2 GB: $312
  - 2.4 GB: $625

**SyQuest**

- **Capacity**
  - 24 MB: $365
  - 48 MB: $795

**SyQuest Memory**

- **Capacity**
  - 2MB: $349
  - 4MB: $495

**Tape Backup Drives**

- **Capacity**
  - 1.2 GB: $147
  - 2.4 GB: $240

**QMS Printers**

- **Model**
  - PS 410 4PPM, 300DPI: $1299

**External Cabinets**

- **Models**
  - PS 860 8PPM, 600 DPI: $1599

**Revision**

- **Model**
  - PS 1725 17PPM, 600 DPI, **New Price!** $4399

**QMS Printers**

- **Model**
  - PS 410 4PPM, 300DPI: $1299

**Seagate**

- **Capacity**
  - 1.2 GB: $312
  - 2.4 GB: $625

**SyQuest**

- **Capacity**
  - 24 MB: $365
  - 48 MB: $795

**Memory**

- **Centris, LcIII & Quadra**
  - 4 MB -70 ns: $145
  - 8 MB -70 ns: $145

**QMS Printers**

- **Model**
  - PS 410 4PPM, 300DPI: $1299

**Seagate**

- **Capacity**
  - 1.2 GB: $312
  - 2.4 GB: $625

**SyQuest**

- **Capacity**
  - 24 MB: $365
  - 48 MB: $795

**Memory**

- **Centris, LcIII & Quadra**
  - 4 MB -70 ns: $145
  - 8 MB -70 ns: $145

**QMS Printers**

- **Model**
  - PS 410 4PPM, 300DPI: $1299
HP DeskWriter
This personal inkjet HP DeskWriter model a 2724 prints gives you superior, water-resistant, 300 dpi black printing in minutes with 15-built fonts, and 256-level grayscale for great graphics. Includes easy-to-use and install font & driver software and a spooler so you can get on with the rest of your work while you're printing!
Manager: Hewlett Packard
EnP 0518
$199
(Bars visible cables last)

Word For Word
Correct over 10,000 text & word errors with our best-selling spelling, grammar, and style checker. Version 5.0 has a new look and feel and includes support for Microsoft Word, Windows 95, and more!
Manager: MasterSoft
COM 0128
$99

Delrina Fax PRO for Macintosh
Delrina Fax PRO for Macintosh lets you conveniently send faxes directly from your Mac without running your fax machine. Advanced document management features include: Quick-Print, fax and quick-batch features.
Manager: Delrina
COM 0197
$89.95

Adobe Illustrator™ 5.5
Dreaming about a more powerful drawing tool? It's here! A major release of the world's leading illustration and design software, Adobe Illustrator™ 5.5 for Macintosh gives graphic artists and enthusiasts, technical illustrators and desktop publishers, a tool of new features that users of other drawing programs can only imagine. Includes: Adobe Editable Vector Background and Adobe Acrobat Distiller™ software, so you can import print-ready documents from your favorite applications. An expanded Flash Folder feature addresses trapping. New text features provide tab, search and replace, left, right and center, and more!
Manager: Adobe
GRA 0772
$389

Adobe Illustrator™ 5.5
Manager: Adobe
GRA 0772
$389

QuarkXPress 3.3
Unparalleled design flexibility and more color/graphics support make QuarkXPress 3.3 the choice for design-intensive page layout and graphic-rich text. Even circles and polygons. Version 3.3 adds spot color, imported from EPS files to the Colors list and incorporates. Tom and DDC spot-color links. Import JPEG and GIF graphics directly into Quark documents. Apply shading to gray elements of grayscale TIFFs. Select any active picture and text boxes by pushing a button, and much more!
Manager: Quark
DTP 0110
$589

An expanded Flash Folder feature addresses trapping. New text features provide tab, search and replace, left, right and center, and more!
Manager: Adobe
GRA 0772
$389

Delrina Fax PRO for Macintosh
Delrina Fax PRO for Macintosh lets you conveniently send faxes directly from your Mac without running your fax machine. Advanced document management features include: Quick-Print, fax and quick-batch features.
Manager: Delrina
COM 0197
$89.95

Now Contact/Now Up-to-Date Bundle
Get a full-featured contact manager AND an event scheduler at one low price!
Manager: Now Software, Inc.
BUS 0567
$99.95

Microsoft Office
With FREE EVA-18 Hornet Strike Fighter Simulation
A family of programs designed to work together allowing you to focus on your work, instead of your computer! Includes: Word 5.1, the updated version of the most popular word processor in the world; Excel 4.0, the incredibly powerful spreadsheet; PowerPoint with advanced text and sophisticated presentation capabilities; and a single work distribution license for Microsoft Mail, the high-performance, easy-to-use electronic mail program. Order today and get EVA-18 Hornet Strike Fighter Simulation FREE! EVA-18 Home printed in black. All available while supplies last. Published: Microsoft
BND 0349
$475
*No software included.

Opera 'n Bill Screen Saver
Screen savers have been known to be funny, but now there's one with new attitude. Introduces Opera 'n Bill Screen Saver from Delrina. Let Opera and Bill protect you and your monitor from boredom. Windows and Mac. Published: Delrina
UTI 0946
$29.95

Apple Personal Diagnostics
The most complete and easy-to-use Diagnostic software for your Mac. Keep your Mac trouble-free by checking and reporting on the well-being of your computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk, computer's logic board, disk. Diagnostics consists of software. Diagnostics consists of software.
Manager: Apple Computer, Inc.
UTI 0514
$99.95

1-800-255-6227
Overnight Delivery-Only $3.00
Power User Double Speed CD-ROM Drive

Order your Power User CD-ROM Drive now for only $199
and, for only $9.95 more, we'll include your choice of any ONE of these popular chart-topping CDs:

* The BodyGuard soundtrack with Whitney Houston,
  Billy Joel's River of Dreams, Sting's Ten Summoner's Tales, or Music Box by Mariah Carey!

HURRY, quantities are limited!

Get the entire 21-volume Grolier Encyclopedia on ONE CD-ROM!

PLUS... for only $9.99

Buy now and also get

3 BONUS CD-ROMS FREE!

The Mac SUPERSTORE

BUSINESS & PRESENTATION

A LASTING IMPRESSION

AscendCap (full line available)

ea. 59.

ALDUS

BRODERBUND

CAER£

CRITICISMS

DTP0098 PageMaker 5.0

579.

EDUCATIONAL & ENTERTAINMENT

BRODERBUND

GRA0347 QuickTime Starter Kit

79.

APPLE COMPUTER, INC.

GRA0528 PowerPC Pre 1.5

269.95

DAYSTAR DIGITAL

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPS & DRIVES

FIN0212 M.Y.O.B. 4.0 w/o Payroll

59.95

EDU0051 MacKids Turbo Math Facts 2.0

25.

UPG0032 PageMaker 5.0 Upgrade

149.

BAY ONE

GRA0654 FreeHand 4.0

389.95

FAX/PHONE FAX/PHONE

GRA0347 QuickTime Starter Kit

79.

GLOBAL VILLAGE (FULL LINE AVAILABLE)

PowerPublisher Call.

HAYES

MED0019 ACQUIRA 144K Fax 144

169.95

MED0019 ACQUIRA 96KFax96

159.95

INSIGHTS (FULL LINE AVAILABLE)

UI0019 Access PC 3.0

80.95

POWERBROKER

UI0019 Access PC 3.0

80.95

INPUT & OUTPUT

CAZER

INP0232 PowerPad

69.95

FARAWAY COMPUTING

IN0004 MailWriter Plus, SE & II

29.95

MUSIC

APPLE COMPUTER, INC.

GRA0528 PowerPC Pre 1.5

269.95

DAYSTAR DIGITAL

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

BUSINESS & PRESENTATION

APPLE COMPUTER, INC.

GRA0347 QuickTime Starter Kit

79.

APPLE COMPUTER, INC.

GRA0528 PowerPC Pre 1.5

269.95

DAYSTAR DIGITAL

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

OUR POWER USER CD-ROM DRIVE

Available at your local Mac software retailer or order by phone:

1-800-255-6227

Call 24 hours a day, 7 days a week.

Inquiries: 908-367-0440

Circle 150 on reader service card

POWERBOOK PRODUCTS

APPLE COMPUTER, INC.

GRA0528 PowerPC Pre 1.5

269.95

DAYSTAR DIGITAL

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

APPLE COMPUTER, INC.

GRA0528 PowerPC Pre 1.5

269.95

DAYSTAR DIGITAL

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

WWRD0059 Word 5.1

295.

BND0169 Miracle Piano Bundle

299.

XIP0010 XPress 3.3

89.

SYMANTEC CORPORATION

KENSINGTONADOBE

UPG0064 AccessPC 3.0

49.

POWERBROKER

UI0019 Access PC 3.0

80.95

B炼0034 TouchBASE Pro

49.

LOTUS DEVELOPMENT CORPORATION

POWERUS ERe INPUT & OUTPUT

CHP0013 1 Meg SIMMs 100ns

Call.

BUS0188 Lotus 1·2·3 for Macintosh

B£ST1WARE

APPLE COMPUTER, INC.

GRA0777 Illustrator

259.95

PSW0001 PowerPlugs

99.

GRA0654 FreeHand 4.0

389.95

INNOVATION" CIRCUITS

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

UPG0032 PageMaker 5.0 Upgrade

149.

POWERBROKER

UI0019 Access PC 3.0

80.95

B炼0034 TouchBASE Pro

49.

LOTUS DEVELOPMENT CORPORATION

POWERUS ERe INPUT & OUTPUT

CHP0013 1 Meg SIMMs 100ns

Call.

BUS0188 Lotus 1·2·3 for Macintosh

B£ST1WARE

APPLE COMPUTER, INC.

GRA0777 Illustrator

259.95

PSW0001 PowerPlugs

99.

GRA0654 FreeHand 4.0

389.95

INNOVATION" CIRCUITS

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

UPG0032 PageMaker 5.0 Upgrade

149.

POWERBROKER

UI0019 Access PC 3.0

80.95

B炼0034 TouchBASE Pro

49.

LOTUS DEVELOPMENT CORPORATION

POWERUS ERe INPUT & OUTPUT

CHP0013 1 Meg SIMMs 100ns

Call.

BUS0188 Lotus 1·2·3 for Macintosh

B£ST1WARE

APPLE COMPUTER, INC.

GRA0777 Illustrator

259.95

PSW0001 PowerPlugs

99.

GRA0654 FreeHand 4.0

389.95

INNOVATION" CIRCUITS

GRA0605 MacDraw Pro 1.5

199.95

Daystar Experience (Full line available)

ea. 59.

UPG0032 PageMaker 5.0 Upgrade

149.

UPG0032 PageMaker 5.0 Upgrade

149.
Jump Raven

wildlife, it's up to jump Raven to get surviving genetic samples of Earth's environment that are packed back. Cyberflix

The C.H.A.O.S. Continuum

It's the year 2577. The Titan Colony is being held captive by an orbiting supercomputer known as C.H.A.O.S. Can you save the colony? Creative Multimedia Corp. #97738

$42.98

Darkseed CD

In this intriguing multimedia saga, you control the fate of two worlds as you wander through a dark and dying civilization. Sony Imagesoft #97167

$49.98

RedShift Multimedia Astronomy

The world's most realistic space simulation software! Can accurately simulate astronomical events over 15,000 years. Maris Multimedia #97138

$52.98

7th Guest

Henry Stahl's mansion now stands rotting and empty — ever since the children started dying after the six guests came. And you are the 7th guest. Virgin Games #99236

Proceed at your own risk!

$39.98

Maniac Sports

Experience some of the most extreme, dangerous, and thrilling "sports" known to humanity... if you dare! Participate in nine exhilarating and terrifying adventures including: sky diving, surfing, skateboarding, hang gliding, extreme riding, rock climbing, mountain biking, windsurfing, and white water kayaking. The Software Toolworks #97248

Dual amplified stereo speakers

$49.98

Koss HD/4 CSS Computer Speaker Combo Pack

The Koss HD/4 CSS Computer Speaker Combo Pack features the HD/4 dual amplified stereo speakers with master volume control and 3-band stereo equalizer, the COM/10 speaker hanger and a 6 volt AC adapter. Lifetime warranty. Koss #4715

$29.98

Oceans Below

Discover the world of scuba divers in this exciting new interactive multimedia experience! It will introduce you to a variety of equipment components and underwater environmental factors. It even provides a map of exotic locations so you can choose your ideal dive sites. Learn about local sealife with photos and video clips. The Software Toolworks #99390

$48.98

The Journeyman Project

This amazing photorealistic 3D ride through time includes over 30 minutes of QuickTime video and a totally original music score. Presto Studios #06070

$48.98

Xplore 1: Peter Gabriel's Secret World

Experience the life of a rock star! Get behind-the-scenes look at how music is made as Peter Gabriel guides you through his Secret World. MacPlay #97149

$61.98

Iron Helix

Iron Helix is a science fiction thriller that immerses you in a virtual reality of neo-gothic surrealism. Includes a fast arcade game pace. Spectrum HoloByte #06852

$47.98

Microsoft Cinemania CD-ROM

From classic to contemporary films, this is the best way to see and hear reviews and biographies, faces and voices, scenes and music. Microsoft #99702

$24.98

Instant Access to Entertainment CD

This new medium for software distribution gives you everything you need to find, try and buy Macintosh software — direct from your desktop. #99695

The most versatile CD-ROM drive yet

$299.98

Reno Premium Portable CD-ROM

Until now, you've had to buy a separate CD-ROM player for every computer you own. One for the office. One for the home. And in between or on the road? Forget it. Now Media Vision has changed all that. Introducing Reno, the most versatile CD-ROM drive ever. This powerful, portable unit can keep up with you whether you're running the most demanding application from your desktop PC, or on the road miles from the nearest AC outlet. Reno delivers double-speed transfer rates, Photo CD multi-session capability, 180ms access time, audio CD playing capability, and a standard SCSI 2 interface — all in a sleek, stylish package. Reno is backed with a one-year warranty. And all Media Vision products are backed with unlimited toll-free technical support, available seven days a week. Includes headphones and battery pack. Media Vision #97987

Best Travel CD - March 1994 Macworld

$29.98

Reno Premium Portable CD-ROM

Until now, you've had to buy a separate CD-ROM player for every computer you own. One for the office. One for the home. And in between or on the road? Forget it. Now Media Vision has changed all that. Introducing Reno, the most versatile CD-ROM drive ever. This powerful, portable unit can keep up with you whether you're running the most demanding application from your desktop PC, or on the road miles from the nearest AC outlet. Reno delivers double-speed transfer rates, Photo CD multi-session capability, 180ms access time, audio CD playing capability, and a standard SCSI 2 interface — all in a sleek, stylish package. Reno is backed with a one-year warranty. And all Media Vision products are backed with unlimited toll-free technical support, available seven days a week. Includes headphones and battery pack. Media Vision #97987

Versatile, multiple-function joystick

$109.98

Flight Control System

The Flight Control System uses Thrustmaster's multiple function joystick technology, providing a versatile accessory to your game playing. This joystick utilizes four buttons and a four-way hat switch. It gives you true HOTAS™ flight (Hands On Throttle and Stick). And it can work as a two-button joystick on all games. The Flight Control System offers you durable pots — it's factory tested and certified for longevity. Supported and endorsed by leading software companies. Thrustmaster #95201

Dual amplified stereo speakers

$49.98

Koss HD/4 CSS Computer Speaker Combo Pack

The Koss HD/4 CSS Computer Speaker Combo Pack features the HD/4 dual amplified stereo speakers with master volume control and 3-band stereo equalizer, the COM/10 speaker hanger and a 6 volt AC adapter. Lifetime warranty. Koss #4715

Versatile, multiple-function joystick

$109.98

Flight Control System

The Flight Control System uses Thrustmaster's multiple function joystick technology, providing a versatile accessory to your game playing. This joystick utilizes four buttons and a four-way hat switch. It gives you true HOTAS™ flight (Hands On Throttle and Stick). And it can work as a two-button joystick on all games. The Flight Control System offers you durable pots — it's factory tested and certified for longevity. Supported and endorsed by leading software companies. Thrustmaster #95201

Dual amplified stereo speakers

$49.98

Koss HD/4 CSS Computer Speaker Combo Pack

The Koss HD/4 CSS Computer Speaker Combo Pack features the HD/4 dual amplified stereo speakers with master volume control and 3-band stereo equalizer, the COM/10 speaker hanger and a 6 volt AC adapter. Lifetime warranty. Koss #4715

$49.98

Reno Premium Portable CD-ROM

Until now, you've had to buy a separate CD-ROM player for every computer you own. One for the office. One for the home. And in between or on the road? Forget it. Now Media Vision has changed all that. Introducing Reno, the most versatile CD-ROM drive ever. This powerful, portable unit can keep up with you whether you're running the most demanding application from your desktop PC, or on the road miles from the nearest AC outlet. Reno delivers double-speed transfer rates, Photo CD multi-session capability, 180ms access time, audio CD playing capability, and a standard SCSI 2 interface — all in a sleek, stylish package. Reno is backed with a one-year warranty. And all Media Vision products are backed with unlimited toll-free technical support, available seven days a week. Includes headphones and battery pack. Media Vision #97987

$299.98

Reno Premium Portable CD-ROM

Until now, you've had to buy a separate CD-ROM player for every computer you own. One for the office. One for the home. And in between or on the road? Forget it. Now Media Vision has changed all that. Introducing Reno, the most versatile CD-ROM drive ever. This powerful, portable unit can keep up with you whether you're running the most demanding application from your desktop PC, or on the road miles from the nearest AC outlet. Reno delivers double-speed transfer rates, Photo CD multi-session capability, 180ms access time, audio CD playing capability, and a standard SCSI 2 interface — all in a sleek, stylish package. Reno is backed with a one-year warranty. And all Media Vision products are backed with unlimited toll-free technical support, available seven days a week. Includes headphones and battery pack. Media Vision #97987

$49.98

Reno Premium Portable CD-ROM

Until now, you've had to buy a separate CD-ROM player for every computer you own. One for the office. One for the home. And in between or on the road? Forget it. Now Media Vision has changed all that. Introducing Reno, the most versatile CD-ROM drive ever. This powerful, portable unit can keep up with you whether you're running the most demanding application from your desktop PC, or on the road miles from the nearest AC outlet. Reno delivers double-speed transfer rates, Photo CD multi-session capability, 180ms access time, audio CD playing capability, and a standard SCSI 2 interface — all in a sleek, stylish package. Reno is backed with a one-year warranty. And all Media Vision products are backed with unlimited toll-free technical support, available seven days a week. Includes headphones and battery pack. Media Vision #97987

$39.98

Lunicus

In an attempt to save earth, you battle mechanized aliens in fully rendered 3D environments that are packed with danger and excitement. Cyberflix

$39.98

Jump Raven

When Skin Heads hijack the only surviving genetic samples of Earth's wildlife, it's up to Jump Raven to get them back. Cyberflix #97127

$49.98

RedShift Multimedia Astronomy

The world's most realistic space simulation software! Can accurately simulate astronomical events over 15,000 years. Maris Multimedia #97138

$71.98

Guest

This amazing photorealistic 3D ride through time includes over 30 minutes of QuickTime video and a totally original music score. Presto Studios #06070

$48.98

Xplore 1: Peter Gabriel's Secret World

Experience the life of a rock star! Get behind-the-scenes look at how music is made as Peter Gabriel guides you through his Secret World. MacPlay #97149

$61.98

Iron Helix

Iron Helix is a science fiction thriller that immerses you in a virtual reality of neo-gothic surrealism. Includes a fast arcade game pace. Spectrum HoloByte #06852

$47.98

Microsoft Cinemania CD-ROM

From classic to contemporary films, this is the best way to see and hear reviews and biographies, faces and voices, scenes and music. Microsoft #99702

$24.98

Instant Access to Entertainment CD

This new medium for software distribution gives you everything you need to find, try and buy Macintosh software — direct from your desktop. #99695

$299.98

Reno Premium Portable CD-ROM

Until now, you've had to buy a separate CD-ROM player for every computer you own. One for the office. One for the home. And in between or on the road? Forget it. Now Media Vision has changed all that. Introducing Reno, the most versatile CD-ROM drive ever. This powerful, portable unit can keep up with you whether you're running the most demanding application from your desktop PC, or on the road miles from the nearest AC outlet. Reno delivers double-speed transfer rates, Photo CD multi-session capability, 180ms access time, audio CD playing capability, and a standard SCSI 2 interface — all in a sleek, stylish package. Reno is backed with a one-year warranty. And all Media Vision products are backed with unlimited toll-free technical support, available seven days a week. Includes headphones and battery pack. Media Vision #97987

$39.98

Lunicus

In an attempt to save earth, you battle mechanized aliens in fully rendered 3D environments that are packed with danger and excitement. Cyberflix #97146

$49.98

RedShift Multimedia Astronomy

The world's most realistic space simulation software! Can accurately simulate astronomical events over 15,000 years. Maris Multimedia #97138

$52.98

7th Guest

Henry Stahl's mansion now stands rotting and empty — ever since the children started dying after the six guests came. And you are the 7th guest. Virgin Games #99236
Meet the needs of today's powerful CD-ROM applications
$599.98 NEC MultiSpin 3Xe External CD-ROM Reader
- Kodak Photo CD ready
- 195ms average access time
- 450K per second performance
- 256K cache flow for smooth animation and sound

NEC's MultiSpin family of CD-ROM readers give you advanced technology that is easy to use. The 3Xe has a revolutionary design with front panel LCD display to show real-time performance and diagnostic information. And its one-touch rotating double dust door & automatic lens cleaning system provides maximum dust protection. It also plays your music CDs. NEC #97815

$947.98 Microsoft Office 3.0 CD-ROM
Use Microsoft Word to write memos, documents, and reports; Microsoft Excel to create stunning spreadsheets, crunch numbers, analyze data and predict trends; and Microsoft PowerPoint to create persuasive visual presentations with graphics that will impress and astound any audience. Also includes a single workstation license for Mail. (Requires Microsoft Mail for Networks, server version.) Microsoft Corporation #M 03233

PLUS FREE With the purchase of Microsoft Office 3.0, you get a FREE ticket to jump into the cockpit of the F/A-18 Hornet and dogfight with the enemies of freedom. Just ask for special item #96279. SRP of $79.95

$88.98 Incredible Image Pak
A treasure chest of more than 2000 all-new full color images for your publications! Comes with 40 FREE fonts! T/Maker #99555

$84.98 Microsoft Encarta 1994
Exciting multimedia learning! With FREE Photo CD from Seattle Software Group. Expires 6/90 or while supplies last. Microsoft #95750

$2.95 With any purchase from The Mac Zone
Adobe Type on Call 3.0 CD-ROM
Your choice of 1700 Adobe typefaces at special discount prices is a phone call away! Adobe Systems #98907

$29.98 Corel Professional Photo CD Sunsets & Sunrises
Includes 100 Kodak Royalty free images. Over 140 titles to choose from. Corel Corp. #15215

$35.98 The Animals!
A true multimedia experience from the experts at the world-renowned San Diego Zoo! The Software Toolworks #99388

$148.98 PhoneDiscs Resume
Conveniently track down businesses and people with over 90 million listings on five completely indexed CDs. Digital Directory #97166

$118.98 BevDiltz Think and Talk French CD-ROM
Learn French in 30 days with the world's most successful language program or your money back! Hyperglot #05438

$75.98 Total History
Everything you need for the home history reference library in one outstanding CD-ROM threesome. Bureau of Electronic Publishing #97121

$68.98 Corel/SCI Software
A toolbox of everything you need to diagnose, repair, and maintain your SCI devices—on a single workstation or AppleShare file server. Corel Corp. #06984

$58.98 Microsoft Bookshelf 1994 CD-ROM
This essential desktop reference library includes seven different source guides. Includes lightning-fast search capabilities. Microsoft #99701

$599.98 NEC MultiSpin 3Xe External CD-ROM Reader
- Kodak Photo CD ready
- 195ms average access time
- 450K per second performance
- 256K cache flow for smooth animation and sound

NEC's MultiSpin family of CD-ROM readers give you advanced technology that is easy to use. The 3Xe has a revolutionary design with front panel LCD display to show real-time performance and diagnostic information. And its one-touch rotating double dust door & automatic lens cleaning system provides maximum dust protection. It also plays your music CDs. NEC #97815

$35.98 The Animals!
A true multimedia experience from the experts at the world-renowned San Diego Zoo! The Software Toolworks #99388

$148.98 PhoneDiscs Resume
Conveniently track down businesses and people with over 90 million listings on five completely indexed CDs. Digital Directory #97166

$118.98 BevDiltz Think and Talk French CD-ROM
Learn French in 30 days with the world's most successful language program or your money back! Hyperglot #05438

$75.98 Total History
Everything you need for the home history reference library in one outstanding CD-ROM threesome. Bureau of Electronic Publishing #97121

$68.98 Corel/SCI Software
A toolbox of everything you need to diagnose, repair, and maintain your SCI devices—on a single workstation or AppleShare file server. Corel Corp. #06984

$58.98 Microsoft Bookshelf 1994 CD-ROM
This essential desktop reference library includes seven different source guides. Includes lightning-fast search capabilities. Microsoft #99701
Introduction to 60 sec. and takes less than five minutes to master — MacWorld

Label Press Tamed!

Introducing the most sophisticated, easy-to-use, bar code label printing utility ever, Label Press includes hundreds of Avery templates and industry standards such as HMart, JCPenney, UPS, Fed Ex and many more. For any Mac compatible printer. For industrial label printing, Label Press Thermal Works with all intermec, Fargo Datamax, and Zebra printers.

SYNEX (800) 447-9639

CIRCLE 450 ON READER SERVICE CARD

The Recognized Macintosh Bar Code Experts

UniScan-300 ADB Bar Code/Mag Stripe Reader
($industry's only lifetime warranty)
Complete with wand & bar code printing software
Compatible with all Macs from 128K to current models.
Innovators of keyboard interface bar code reader for Macintosh.

PDCS-300 Portable System (1 year warranty)
Includes wand, communications software, cable, battery & AC adapter.
256K storage (128K RAM & 128K Flash EPROM) upgradeable to 1 meg.
Data collection program included - Inexpensive program generator

30-Day Money-Back Guarantee on All Products
Established 1978 - Newton Scanners and Software Available Now!
Discounts for Resellers, Schools, Non-Profit & Government Agencies

2495 Old Middlefield Way, Mountain View, CA 94043
(415) 988-0141 Fax (415) 988-0289
(800) 526-5920 AppleLink: BARCODE

CIRCLE 441 ON READER SERVICE CARD

Mac Landlord $399
Upgraded version 2.2 now available.
Still the Easiest-to-use property management program for multiple properties & unlimited units.
Includes tenant and unit records, recurring income and expense, check writing, checkbook balancing, printing tenant notices, income and expense ledgers, and much more.
Free telephone support. Demo for $25, credited to purchase.
Labana Management Company
P.O. Box 2037
Dearborn, MI 48123
313/562-8247

CIRCLE 460 ON READER SERVICE CARD
Bar Code Headquarters

**Bar Code Readers**

- New RF Wand
- for all Macintosh ADB or Serial
- Attaches thru ADB as 2nd Keyboard in seconds
- UPC/EAN, Code 128, 2089, Code 39, Interleaved 2 of 5
- Wand, Magstripe, CCD, Laser, Slot Badge
- All European Keyboards Supported
- Top Rated by Independent Reviews

- Complete Reader with Cordless RF Wand – $695
- Complete Reader with CCD Scanner – $624
- Complete Reader with Corded Steel Wand – $329

**Portable Readers**

- for all Macintosh ADB or Serial
- 64K or 256K RAM, Keyboard or serial upload.
- Download Tables
- Wand, CCD or Laser Input
- UPC/EAN, 128, 2089, MSI, Code 39, etc.
- 4 x 20 LCD, 35 Keys
- 2 Built-in Inventory Programs
- Optional Voice prompts and error msgs. You record!
- Double duty as non-portable
- Very easy to program & interface with applications
- Complete 64K Unit with Wand & Voice – $799

**Ordering is Easy!**

- 30 Day Money Back Guarantee
- Qualified P.O.'s Accepted
- 2 Year Warranty on Readers
- Same Day Shipping
- Free UPS Blue in US

**WORTHINGTON DATA SOLUTIONS**

- 800-345-4220
- or call 408-458-9938 • FAX 408-458-9964
- In Europe call our Irish Office at 00 353 1 6614 566

---

**Business Tools**

- Made-2-Order™
- Inventory Management
- Purchasing
- Estimating
- Order Entry
- Bill of Material
- Custom Forms
- MRP

**Call Now for Demo**

- 800-782-5682
- 714-830-5682 • FAX 830-5691

**OnBase Technology, Inc.**

- New Hybrid Solutions • Relational Database
- AppleScript Ready • Easy-to-Use Interface

---

**Cash On Your Screen!**

**Credit Card Authorization & Electronic Deposit**

- MacAuthorize™
- POS Credit Developers since 1981
- 800-4-TELLAN • 408/274-1110 • Tellan Software, Inc.

**With POWER TRANSLATOR® PROFESSIONAL from Globalink® you can translate words, sentences, even entire documents into Spanish, French or German to/from English. All at the push of a button.**

**Specialized Subject Dictionaries are available for technical and professional uses. You can even create your own!**

**Give your Mac the power to talk global. Get POWER TRANSLATOR PROFESSIONAL, your ticket to worldwide communication.**

9503 Lee Highway, Fairfax, VA 22031-1008

INN. 1-703-727-5600 • FAX 1-703-727-3866

- 1-800-767-0035

U.S. and Canada

---

**BRING HOME AN AWARD WINNER.**

**WINNER 1993 Discover TECHNOLOGICAL INNOVATION AWARD**

**With POWER TRANSLATOR® PROFESSIONAL from Globalink® you can translate words, sentences, even entire documents into Spanish, French or German to/from English. All at the push of a button.**

**Specialized Subject Dictionaries are available for technical and professional uses. You can even create your own!**

**Give your Mac the power to talk global. Get POWER TRANSLATOR PROFESSIONAL, your ticket to worldwide communication.**

Globalink, Inc.

---

**Call for Our Catalog**

---

**BUSINESS TOOLS**
Scanning bar codes is even easier!

Creating precision bar codes is as easy as using a font!

PRINTBAR™ BAR CODE FONTS
- Compatible with virtually any Macintosh application.
- Choose from: • UPC/EAN/ISBN • Code 39 • Interleaved 2 of 5 • POSTNET/FIM.
- 90-day money back guarantee.
- "This is the best product of its kind, and it's reasonably priced too." —MacUser review.

Bundle discounts available.

4140 Mother Lode Dr., Ste. 100, Shingle Springs, CA 95682
916 672-0244 Fax 916 672-1193

CODESCAN 3000™ BAR CODE READER
- Comes complete with wand and 5 year warranty.
- Scans bar codes directly into software application.
- Available with laser gun, CCD, badge slot, magstripe options.
- No software required. Ready to use in minutes!
- Money back guarantee.

WANTED: Used Macs!

- We'll pay you cash for used Mac equipment! Call now for FREE quote.
- We also sell refurbished Macs w/1-year warranty & 10-day money-back guarantee. All models.

1-800-334-KIWI

The Experts Choice for Barcoding!

Barcode Generation
MacBARCODA
With a color option that works
All the vital features for safe, high-quality barcode production. All the popular barcode types. Compatible with all major page-making and graphics software. The highest precision barcode package available for the Mac.

Barcode Readers
Bar code data collection for the Mac or PC. Works with any software package. All major bar code types, codes, and bar code readers. Compatible with the range of Zebra reel-fed thermal printers.

Call Toll Free: 800-289-0993

Label Printing on Sheets

Separacolor International Inc.
800-779-1158 310-719-9950 FAX 310-719-7076

Circle 42 on Reader Service Card

The Ultimate Tint Book
$39.95

GOLDEN OPPORTUNITIES

4 COLOR CMYK (FOIL/CMYK)
4 PRESS PROOFS (PRINTED)
4 HIGH RESOLUTION SCAN$ 95.00

4 From Your Mac Files
4 Fully Composed/Plate Ready
4 9 Work Day Turnaround
4 COMPLETE FILM SERVICE

CIRCLE 432 ON READER SERVICE CARD

Circle 446 ON READER SERVICE CARD

Circle 51 on Reader Service Card

Circle 521 ON READER SERVICE CARD

Circle 600 ON READER SERVICE CARD

Circle 67 on Reader Service Card

Circle 700 ON READER SERVICE CARD

Circle 758 ON READER SERVICE CARD

Circle 800-508-4444

Phone: 800-850-8500
Fax: 310-653-6911
800-508-8500

Macworld Shopper

BUSINESS TOOLS
SYSTEMS & PERIPHERALS

Macworld Shopper

WANTED: Used Macs!

- We'll pay you cash for used Mac equipment! Call now for FREE quote.
- We also sell refurbished Macs w/1-year warranty & 10-day money-back guarantee. All models.

1-800-334-KIWI

90-day money back guarantee.

Choose from: • UPC/EAN/ISBN • Code 39 • Interleaved 2 of 5 • POSTNET/FIM.

Compatible with virtually any barcode types. Compatible package available for the product ion. All the popular highest precision barcoding any software package. All and graphics software. The safe, high-quality barcode Wand Reader $ 255

on Reels
The easiest solution for printing short-run multi-variation labels on reels with powerful text, graphics, and bar code facilities. Compatible with the range of Zebra reel-fed thermal printers.

Call Toll Free: 800-289-0993

270MB .......................... $95 (s)
105MB .......................... $59.99 (s)
58MB .......................... $38.99 (s)
44MB .......................... $28.99 (s)

Sony 1.3GB .................... $135
ODSMB .................... $87
Komag 1.2GB .................... $33 (s)
Primo 128MB .................... $28.99 (s)

Sony: 1.3GB .................... $125
OMSMB .................... $77
Komag 1.2GB .................... $28 (s)
Primo 128MB .................... $23.99 (s)

SuperMicro

Call 310-782-9794
Fax: 310-782-9794

SuperMicro

We also sell & lease systems

Circle 432 on Reader Service Card

Circle 446 on Reader Service Card

Circle 448 on Reader Service Card

Circle 51 on Reader Service Card

Circle 521 on Reader Service Card

Circle 600 on Reader Service Card

Circle 67 on Reader Service Card

Circle 700 on Reader Service Card

Circle 758 on Reader Service Card

Circle 800-508-4444

Phone: 800-850-8500
Fax: 310-653-6911
800-508-8500
WE CARRY EVERYTHING FOR MAC

**Quadra's**
- 940AV 0/0 $2395
- 940AV 16/500 $3150
- 940AV 64/2 $5795
- 800 8/500 CALL
- 950 8/400 $3195
- 950 6/4 $6150
- 605 8/230 $1250
- 610 16/230 $1895
- 650 16/500 $2495

**Power Books**
- 180 8/80 $2195
- 180 14/340 $3195
- 180C 14/340 $3395
- 250 12/240 $2195
- 270C 12/240M $3150
- 540C 4/320 CALL
- 540C 36/550 CALL
- 540 4/240 CALL
- 520C 8/160 CALL
- 520 8/200 CALL
- 280C 4/320 CALL
- 280 4/230 CALL

**New Items**
- QuickTake 695
- Color Pro 595
- Newton 110 589

**Apple Monitor**
- 14" HiRes $399
- 16"/17" $1025/CALL
- 14"AV/10" $599/1995

**Apple Printers**
- 320/630 950/1994
- 320/630 950/1994
- 360/810 1450/4395

**Super Mac**
- 20TXL/17T 1920/995
- Thunder 24 1575
- Thunder JGS 1360 2950
- Proof/Positive CALL

**AGFA**
- Studio Scan 995
- Studio Scan Trasnsp. 345
- Arcus Plus 2695
- Arcus + Trasnsp. 795

**UMAX**
- UC630 799
- UC840 995
- UC1260 1295
- UC1200SE 2495
- Transparency 495

**GCC**
- SelectPress 600 3697
- Selectpress 1200 5595
- Colorzone 5995

**Kodak**
- ColorEze 6495
- 450 GL 1395
- PCD Writer 200 CALL

**Hewlett Packard**
- DeskWriter 520 289
- DeskWriter 550C 395
- DeskWriter 560C 563
- DeskWriter 570C 295
- DeskWriter 1200C 1875
- LaserJet 4ML 980
- LaserJet 4MP 1330
- LaserJet 4M 1875
- HP 4SI MX 4240
- ScanJet IIICX/III 910/695
- JetStore 200e 2GB DAT 1399
- 40GB Optical Juke Box 1399
- 167GB Optical Juke Box 44900
- L3GB Optical Drive 2495

**Demo Mac's**
- 980 8/230 2395
- 800 8/230 1850
- 950 8/400 2495
- 750 5/80 895
- 160 4/80 995

**$ave on $oftware**
- Microsoft Excel 4.0 311
- Microsoft Office 3.0 456
- Microsoft Word 5.1 271
- Microsoft Power Point 3.0 289
- Claris Works 2.1 189
- Quark Express 3.2 566
- Claris File Maker Pro 2.1 253
- Aldus PageMaker 5.0 538
- Microsoft Fox Pro 2.5 432
- Microsoft Project 425
- Connectix Ram Doubler 59
- Now Utilities 4.0.2 79
- Adobe Photoshop 2.5 548
- Illustrator w/StreamLine 5.0 1370
- Fractal Design Painter 2.1 252
- Aldus FreeHand 2.0 363
- HSC/Kai Power Toll 2.0 99
- Adobe Premier 3.0 432
- Aldus SuperPaint 3.5 56
- AliSys Font Grabber 4.0 259
- Gold Disk Video Director 1.5 125
- Disney Screen Saver 29
- Kid Pix 1.2 37
- M.O.B. 4.0 w/Payroll 106
- MiniCAD 5.0 495
- PIXAR Typestry 2.0 159
- Lotus 1-2-3-3.1 295

**Call for APPLE 3rd party products**
- International Orders, Visa, MC & AmEx Welcome • Next Day Shipping for U.S.A. & International

**CIRCLE 453 ON READER SERVICE CARD**

**SYSTEMS & PERIPHERALS**

**Software**
- Microsoft Excel 4.0
- Microsoft Office 3.0
- Microsoft Word 5.1
- Microsoft Power Point 3.0
- Claris Works 2.1
- Quark Express 3.2
- Claris File Maker Pro 2.1
- Aldus PageMaker 5.0
- Microsoft Fox Pro 2.5
- Microsoft Project
- Connectix Ram Doubler
- Now Utilities 4.0.2
- Adobe Photoshop 2.5
- Illustrator w/StreamLine 5.0
- Fractal Design Painter 2.1
- Aldus FreeHand 2.0
- HSC/Kai Power Toll 2.0
- Adobe Premier 3.0
- Aldus SuperPaint 3.5
- AliSys Font Grabber 4.0
- Gold Disk Video Director 1.5
- Disney Screen Saver
- Kid Pix 1.2
- M.O.B. 4.0 w/Payroll
- MiniCAD 5.0
- PIXAR Typestry 2.0
- Lotus 1-2-3-3.1

**Exchange any OLDMAC to Power PC**

**LEASE AVAILABLE**

**CUSTOM CONFIGURATION**
- for all Audio-Video
- & Desk Top Publishing

**For APPLE 3rd party products • International Orders, Visa, MC & AmEx Welcome • Next Day Shipping for U.S.A. & International**

**Prices are subject to change w/o notice • All prices shown are C.O.D. Prices**

**TELL: (310) 470-7099 • FAX: (310) 470-8099**

**10837 SANTA MONICA BOULEVARD • LOS ANGELES, CALIFORNIA 90025**
Corporate, Dealer, and International Sales Welcome!

Next & same day shipping available! No sales tax for out of state California orders. Prices subject to change with out notice!

DATA COMPUTER
5447 Grand View Blvd, Los Angeles, CA 90066
TELEPHONE: (310) 398-3300
FAX: (310) 391-2488

Hi-End Specials!

Power PC 6100/80
13MHz, 2.1GHz HD, CD
SuperMac 21" Presierview
Thunder II +GX 1360
Extended keyboard
Sharp model JS-610X $25,285

Power PC 7100/66
40MHz, 1.2GHz CD
Extended keyboard
A Model $5,995

Power Book 1000/80
13.5MHz, 1.2GHz, CD
SuperMac 20" Trinton
Thunder II +GX 1360
Extended keyboard
With mouse pad $12,295

SuperMac 17T
Quadra 840AV
72MHz, 1.13GHz CD
Sony 20" Trinton
Radius ProGx
External keyboard
With mouse pad $3,895

Hi-End Specials!

12MB Optical cartridges $5.95 Min. 5 pcs.

Call for most recent prices!

Global Village
800-787-6710

Viwa NEW TECH CONSULTING MC
800-797-6710

Viwa AGFA
800-797-6710

McGraw SHOPPER
800-345-1234

Circle 508 on Reader Service Card

OVER 1/2 MILLION
ACTIVE BUYERS FIND WHAT THEY ARE LOOKING FOR IN THE MACWORLD SHOPPER SECTION.
### Power Mac
- 6100 8-160/500: $1,464/1,978
- 6100 8-250/500 CD: $2,075/2,279
- 6100 16-1GB, W/CD: $2,618/2,869
- 6100 8-250/500: $2,179/2,379
- 6100 16-1GB, W/CD: $3,048/3,299
- 7100 8-250/500: $2,548/2,749
- 7100 16-1GB, W/CD: $3,398/3,698
- 7100 8-250/500: $3,379/3,479
- 7100 16-1GB, W/CD: $4,242/4,494
- 8100 8-250/500: $3,769/3,969
- 8100 16-1GB, W/CD: $4,659/4,995
- 8100 8-250/500: $4,409/4,699
- 8100 16-1GB, W/CD: $5,459/5,799

### Quadra
- Work Group Servers M. 60/80/95, CALL
- 950 8-6/525: $2,999/3,149
- 950 16-8/2GB: $3,999/4,299
- 840 av 8-230/500: $2,549/2,899
- 840 av 16-500/1GB: $3,219/3,519
- 840 av 16-2GB, W/CD: $3,899/4,169
- 800 8-500 CD: $2,999
- 660 av 8-250/500: $1,599/1,949
- 660 av 16-1GB, W/CD: $2,259/2,569
- 660 16-2GB, W/CD: $3,268/3,568
- 610 16-160, W/Mod: $1,349/1,599
- 610 16-160 W/DOS CARD: $1,499
- 605 8-240: $1,199/1,399

### PowerBook
- New Black BIRD$ (Estimated Costs)
- 520 4-160: $2,199
- 520C 4-160: $2,699
- 540 4-240: $2,999
- 540C 4-320: $2,999

### Specials
- DUO 250 4-80/200: $1,395/1,499
- 68030, 33MHz, Active Matrix Display
- 4.2 Lbs. Lightest PowerBook, Upgradable to 24MB RAM

### DUO Dock
- 1.4MB Super Drive, Ext. Video out.
- NuBus Slots, 68040 Upgradable
- 3/40/160, 495/599

### LaserWriter Select 310
- 1499
- NEW BLACK BIRDd

### Apple Color Printer
- $545
- 11x17, 4Color CMYK With ColorSync, 45 Fonts

### Other Software
- Adobe Photoshop V. 2.5.1: $525
- Adobe Illustrator V. 5.0: $329
- Adobe Photoshop V. 2.0: $419
- Aldus PageMaker V.5.0.a: $549
- Aldus Freehand V. 4.0.1: $399
- Caere OmniPage Pro V. 2.1: $499
- E-Machine E-20: $1,149
- FUTURA SX/MX: $199/379

### Other
- Touchscreen Interactive CD: $95
- Other Software: CALL

---

**System & Peripherals**

**MONITORS & CD ROM Drives**
- 20" Trinitron Multi-Scan: $1,899
- 17"/14" 1280x1024: $1,045/939
- AudioVision 14" Color Plus: $239
- CD 150/150: $99
- CD 300/300: $249

**POWER PC & CUADRA**
- For Power PC & Quadra
- Factory Installed ADD: $249

**SuperMac**
- Thunder II GX 1600: CALL
- Thunder II 24V.2.0: $1,975
- Spectrum 24 PDQ+: 24 Ser. IV: $949/749
- Spectrum 24 Ser. V: CALL
- Spectrum Power 1152: $1,109
- 177 Trinitron: $969
- 20" Plus Color Dual Mode: $1,539
- 20-TXL Multimode: $1,929
- 21-TXL Multimode: $2,079
- 20" Hi Res. Trinit.: $2,399
- 21" Two-Page Cir.: $1,699
- 20" / 21" Gray Scale: $799/949
- T-16IMR/Ultura LX: $799/1,019

---

**Prices**
- Get up to $300 rebate from Supermac when you buy a monitor combined with a video card.

---

**LEASING**
- 1-800-929-9333
- Orders Only
- All prices reflect C.O.D. order only & are subject to change without notice.
Imagine how many more adventures ‘ole Huck would have had if Mark had a Mac! Call 1-800-275-9924 and let your adventures begin!

MACINTOSH & PC’s HARDWARE, SOFTWARE TRAINING, SERVICE & LEASING C.R.I. SYSTEMS 331 DANTE CT. HOLBROOK NY 11741 IN N.Y. CALL 516-737-0800 FAX 737-0923

WE SELL:
- NEW MACS
- PRE-OWNED MACS
- AND PARTS!

Ask For Our Custom Mouse Pad with Your Order! Quantities Limited

Circle 414 on Reader Service Card

LIMITED ADVERTISING BUDGET?

Macworld Shopper offers a great way to reach 550,000 active shoppers.

Circle 439 on Reader Service Card
Inventory Reduction!!

17" Multi-Res Color Monitor by Lite-On
High quality monitor display 640x480, 652x241 and 1280x768, 28 dot pitch. Includes tilt-swivel base and interconnect cable.

Blow-Out Price!!
$549.

Printers

Imagewriter I ........................................... $169.
Imagewriter I WC ...................................... 229.
Imagewriter II ......................................... 449.
Personal L’writer LS .................................... 349.
Personal L’writer NT .................................... 649.
Laserwriter II engine (NEW) .......................... 699.
Laserwriter LNT........................................... 799.
Laserwriter LNTz ......................................... 899.
Personal L’writer NTR ................................... 799.
Apple Color Printer (NEW) ............................. 549.
Apple Color Printer ..................................... 449.

Used CPU's

Mac IIE 60/68............................................ $599.
Mac Plus .................................................. 299.
Classic 4/40 ............................................. 499.
Classic II 4/40 ........................................... 599.

Monitors & Video Bds.

Apple 12" mono ........................................... $149.
Apple Basic Color ....................................... 129.
Apple 12" color ......................................... 169.
Perfoma Plus (NEW) .................................... 299.
Apple 14" trinitron ...................................... 289.
Apple Portrait .......................................... 299.
Apple 2-page mono ..................................... 799.
Seiko CM1445 (NEW) .................................. 449.
Apple 16" color .......................................... 899.
Radius ...................................................... 399.
Monochrome Pivot ...................................... 269.
Color Pivot (anti-glare) ................................. 599.
Color Display/21 ........................................ 1409.
(Prices with purchase of CPU)

Video Boards

Apple Portrait .......................................... 49.
Apple 4-bit ............................................... 99.
Apple 8-bit .............................................. 129.
Apple 4+ ................................................. 149.
Apple 4/4+ ............................................... 169.
Apple 9+24GC ........................................... 299.

Personal L’writer NTR logic upgrade!! $299.

** E-Machines **

** DoubleColor SX **

Accelerated Color Video Board


$299.

Parts

Logic Boards Floppy Drives
Hard Drives Power Supplies
Imagewriter Parts Laserwriter Parts
Cases Portable Parts PowerBook Parts
Monitor Parts

EXPRESS ORDERS ARE OUR SPECIALTY!!

Upgrades

Mac 512Kx to Plus $399.
Mac SE FDHD ROM & Drive $329.
Mac liex to liic $409.
Mac SE to SE-30 logic board $399.
Mac II to liic $1299.
Mac II FDHD (ROM only) $209.
liic to Quadra 700 $999.

Complete w/ Software!!

$329.

Home Office Starter Package:

SE 1/20, keyboard, mouse
Software: Write Now (word processor), Super Paint, Full Impact (spread sheet), Record Holder Plus (data base).

Shreve Systems

1200 Marshall St Shreveport LA 71101
FAX 318-424-9771 Tech. 318-424-7987

800-227-3971

Misc. Specials!

CD-SC w/Wayzanta "Fun House" $149.
SE Power Supply $99.
LC Power Supply & case $199.
20-Meg External Hard Drive $99.
SE-Analog B $129.
1.44 FDHD floppy mech $199.
ADK Extended Keyboard (3rd Party) $79.
40-Meg Tape Back up $159.
PowerBook 140/170 Battery $49.
12" Monochrome monitor $169.
LC Logic bd $99.
Mac IIE Power Supply & Case $149.
ADK Mouse $49.
40-Meg Internal for Mac Portable $149.
800K External Floppy $110.
5.25 External PC Drive $29.
liic/lili/Quadra/iix Power Supply $149.
Portable Battery Charger $49.
2.5 20-Meg PowerBook Drive mech $49.
1200 Baudio Personal Modem $89.
40-Meg 5.25 (Internal Mac IIE/iix/iix) $49.
Nubus Black & White Video bd $49.
LG Ethernet Board $49.
CRT & Yoke Assy. (Plus & SE) $29.
Mac Case $29.
Mac Plus Keyboard $99.
20-Meg Internal Hard Drive $49.
Portable 2400 baud Internal Modem $49.
4-Meg External Hard Drive $139.
Case & Power Supply-Mac II/iix/iix $199.
Classic Power Supply $99.
Personal NT Logic Bd $179.
Mac Portable Numeric Keypad $79.
8-bit Video Bd $79.
Express Orders Are Our Specialty!!

Mac SE FDHD (ROM only) $249.
liic to Quadra 700 $999.

We Buy Macs!
Call 318-424-9791

$149.

llvx 4/230 Brand New
(keyboard/monitor extra) $94.

Mac II 0/0 $279.
Personal L’writer LS $349.
Apple 14" Trinitron $299.

Category is used or a prior basis unless otherwise stated. Equipment carries a 130-day warranty. Returns subject to a 15% restocking fee. Price subject to change. Price represents a 5% discount off full price.

CIRCLE 425 ON READER SERVICE CARD

MACWORLD July 1994 247
SYSTEMS & PERIPHERALS

LA'S LEADING COMPUTER STORE!

LA UNIVERSITY, GOVERNMENT, AND FORTUNE
1000 P.O.S., Trained Staff,
Out of USA OK!

POWERBOOK 180c
4/80 $2249
8/80 $2599
4/160 $2999
14/160/240 $3295

POWERBOOK 180
4/80 $1899
8/80 $2299
14/80 $2699
14/160/240 $2999

POWERBOOK 165
4/80 $1499
8/80 $1799
14/80 $1999
14/160 $2199

POWERBOOK 145B
4/80 $1099
4/90 $1399

DUOS
250 4/400 $1499
250 12/200/240 $2199
250 12/240/240 $2499
Duo Dock $379
Duo Dock 200HD $399

QUADRA 950
8/100 $2799
16/160 $3699
16/160/240 $3999

QUADRA 840AV
8/80 $2799
8/230 W/CD $2999
8/230 W/CD $2999
8/500 $2999

QUADRA 800
8/230 $2299
8/230 W/CD $2599
8/500 $2799

QUADRA 660AV
8/80 $1799
8/230 $1899
8/230 W/CD $2099
8/500 $2199

QUADRA 650
8/230 $1799
8/230 W/CD $1999
8/500 $2199

QUADRA 610
8/120 $1499
8/230 $1599
8/230 W/CD $1699
8/500 $1799

QUADRA 605
4/80 $799
4/120 $899
4/120 W/CD $1099
4/500 $1299

MORE MACS
Classic 4/40 $259
Classic 4/40 $259
Classic Color 4/80 $259
LC 4/80 $259
Macintosh 512C $349
Centris 610/80/120 $799
Centris 610/80/120 $799

We beat prices! We carry only new products. Let us custom configure your system! We accept VISA, MasterCard, and AMEX.

(310) 473-2535 FAX (310) 312-9041
Ask about our 4 year on site warranty! Next day shipping!

POWER PC

APPLE'S NEW RISC BASED NOTEBOOK!
THESE HOT NEW UNITS ARE IN STOCK!

Powerbook DUO 250
• 68030 33MHz
• 8 HR Battery Life
• 4 Pounds
• 9" Active Matrix

Powerbook DUO DOCK
• 2 NUBUS slots
• Superdrive
• Expandable
• Affordable

RADIUS

Photo Booster for Stage II Rocket
$599
Photo Booster for Rocket
$599
Stage II Rocket
$1499
Stage II Rocket w/ Mac Media
$1799
Rocket III Accelerator
$999
RocketShare
$399
SCSI-2 Booster
$269
VideoBasic Vision
$1499
VideoVision Presentation
$1799
VideoVision Studio
$2299
PrecisionColor Pro 24k Interface
$1349
PrecisionColor Pro 24k
$499
PrecisionColor Rgi Interface
$499
Color Vist Pro Huber Interface
$499
PrecisionColor 20 Display
$1699
Intellivision 20 Display
$1699
TwoPage 20 Mono / Full Page
$899

FAX MODEMS

Powerloq Global Village Bronze 24/96
$199
Powerloq Global Village Silver 96/96
$199
Powerloq Global Village Gold 14.4/14.4
$199
Powerloq Global Village Mercury 14.2/19.3
$199
Teleport Global Village Gold 14.4/14.4
$199
Teleport Global Village Silver 96/96
$199
ZOOM External 24/46 FAX/Modem
$199
ZOOM External 14.4/14.4 FAX/Modem
$199
US Robotics 56K FAX/Modem External
$199
US Robotics 14.4 External
$249
APPLE EXPRESS MODEM 96/14.4
$249

KEYBOARDS

APPLE STANDARD KEYBOARD
$99
APPLE EXTENDED KEYBOARD
$99
APPLE ADJUSTABLE KEYBOARD
$99
101 EXTENDED KEYBOARD
$99
KENSINGTON TURBO MOUSE TRACKBALL
$139

SOFTWARE

Microsoft Word / Excel / Office
$329/329
$499
Aldus Page Maker / Freehand
$549/549
Quark Express
$499

SCANERS

Agfa Arcus Plus
$799
Agfa Transparency
$999
Microtek 150
$1299
Microtek 250
$1299
Scanner 150SP
$1799
UMAX 2000s
$1999
UMAX 2000s
$1999

All prices cash discounted. Prices subject to change without notice. Not responsible for typographical errors.

CIRCLE 497 ON READER SERVICE CARD

July 1994
MACWORLD
NEW Microsoft Office - $149.00
(Includes Microsoft Word, Excel, Powerpoint & Mail)
ONLY $99.00 with Purchase of CPU

NEW NEC CD-ROM DRIVE - $99.00
Includes Over $200 Software Free:
T/Maker Clickart 2000 (Over 2000 EPS Images)
FWB CD-ROM Toolkit & The Merchant

BUY THE NEC CD-ROM DRIVE & MICROSOFT OFFICE ON CD-ROM
FOR ONLY - $199.00

SYSTEM SPECIALS

Used Mac IIci 4/80 Used Standard II Keyboard Used 13" RGB Monitor
OR
Used Mac IIsi 3/40 Used Standard II Keyboard New 14" Color Plus Monitor

$1199.00
$799.00

NEW

Power Mac, PowerBook, Duo's
New LC 2/40 In Stock $399.00
New Personal LW NT $599.00
New Laserwriter Select 300 $499.00
New Laserwriter II Engine $599.00
New Apple Mouse II $59.00

New Conner 543MB $399.00
3.5" Int HD
New Apple PC 5 1/4"
Floppy Drive $15.00
New Ext. Hard Drive Enclosures $69.00
New LC Apple Ethernet Card $39.00

WE ALSO CARRY THE LATEST MODELS - CALL FOR CURRENT PRICES

USED

Mac Plus 1/0 $199.00
Mac SE (800K) 1/0 $225.00
Mac SE/30 1/0 $459.00
Mac II 1/0 $199.00
Mac IIsi 1/0 $279.00
Mac IIsi 1/40 $379.00
Mac IIsi 5/80 $529.00
Mac IIcx 1/0 $399.00
Mac IIci 1/0 $649.00
Mac IIfx 4/0 $899.00
Quadra 700 4/0 $1099.00
Quadra 900 4/0 $1399.00
PBook 170 4/40 $1099.00

Personal LW NT $499.00
Personal LW NTR $749.00
ImageWriter II $199.00
Apple Stand. II keyboard $65.00
Apple Ext. II keyboard $120.00
Apple Portrait Display $250.00
Apple 13" RGB Display $349.00
Apple Two Page Display $599.00
Apple 8 bit Video Card $85.00
Mac IIsi NuBus Adapter Card $49.00
All Apple Video Cards Sale
(4*8, 8*24, 8*24GC,...)

DEALS

EMAC SE OR SE/30 ETHERNET BD - $15.00
POWERBOOK CORDURA CARRYING CASES - $25.00
WE CARRY MAC REPAIR / SERVICE PARTS AND OFFER EXTENDED WARRANTIES!!

Software Special Bundle Includes:
Write Now, Faxmania
American Heritage Dictionary,
Grammatik Mac, Correct Quotes,
and ClickArt Holidays

Prices listed may not be current market value...

All For Only $25.00

1-800-729-7031

Call for latest updated pricing

WE WANT TO BUY YOUR NEW/USED MAC EQUIPMENT

CIRCLE 401 ON READER SERVICE CARD

MACWORLD July 1994 251
CPU's: POWER PC & POWER PC Upgrades
Quadras & Powerbooks
All models available

DISPLAYS: Apple, SuperMac, NEC, RasterOps, Radius, Sony and others.

SCANNERS: Microtek, Umax, HP, Sharp & More.

PRINTERS: Apple, HP, NewGen, GCC.

MODEMS: Global Village

DEALERS AND INTERNATIONAL SALES WELCOME!

SOMETHING FOR NOTHING

Call Anytime!

OVER 1/2 MILLION ACTIVE BUYERS FIND WHAT THEY ARE LOOKING FOR IN THE MACWORLD SHOPPER SECTION.

400-622-5557 (818) 660-6116 FAX (818) 660-6103

22541 Ventura Blvd., Suite 200 Woodland Hills, CA 91364

CIRCLE 542 ON READER SERVICE CARD

CIRCLE 421 ON READER SERVICE CARD

TOTAL MEMORY RECYCLE PATENT PENDING

SimmSaver enables you to convert your 30-pin SIMM to 72-pin SIMM to be used in most Macintosh & Power PC lines. NOW is the time to Upgrade/Double the memory capacity of your computer and save. Send us your old SIMMs and we will turn them into BIGGER & NEWER SIMMs. Call 1-800-MEMSAV!

Circle 402 on reader service card

Macworld Shopper section offers a great format to bring your ad to life.

HOT SHOPPER PRODUCT CATEGORIES
HELP BUYERS FIND THE PRODUCTS THEY NEED FAST.
Memory is a Terrible Thing to Waste!!!

With SimmStack™ you can:

🍎 Use your 30-pin SIMMs in your 72-pin Mac

🍎 Convert one 72-pin SIMM slot into two slots

SAVE Money on Memory!!!

Easy To Install
Simply plug old SIMMs into SimmStack™ and plug into 72-pin slot of your Mac.
100% Compatible.

SAVINGS
Beat the high cost of memory by utilizing existing memory in your new system. Enables you to recycle your old memory.

SimmStack™ is available for most 72-pin Macs including PowerPC Macs

Guarantee: We Stand Behind Our Products! All products carry a 30 day money back guarantee.

MEMORY TRADERS
WE BUY USED MEMORY
ANY QUANTITY - ANY SPEED
256K
128K
1MB
2MB
8MB
4MB
16MB
CHEAPER THAN "DOUBLING"
trade in for new SIMMS

WE BUY PC/WORKSTATION/ MINICOMPUTER MEMORY

Call Now To Order! (800) 209-7126

Also Available: 72 pin SIMM Slot Doubleurs

CIRCLE 598 ON READER SERVICE CARD

Corporation
New York, NY
Tel: (212) 410-1597
Fax (212) 410-0452

WE BUY PC/ WORKSTATION/ MINICOMPUTER MEMORY

HOT SHOPPER PRODUCT CATEGORIES HELP BUYERS FIND THE PRODUCTS THEY NEED FAST

Att: llfx and Iici Owners
Accelerate your Mac llfx and Iici with Fusion Data’s TOKAMAC accelerators. • 20-50% faster than a Quadra 950. • Buy at super low factory direct prices • 30 day MBG • Lifetime warranty • Toll Free tech support • 1992 MacUser Editor’s Choice “Best accelerator of the year!”
Fusion Data Systems TokaMac 8920 Business Park Drive Austin, TX 78758 (800) 265-8313 (512) 338-6326 (512) 338-1276 FAX
### POW! MEMORY UPGRADES

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x8x80</td>
<td>$40</td>
</tr>
<tr>
<td>2x8x80</td>
<td>$73</td>
</tr>
<tr>
<td>4x8x80</td>
<td>$145</td>
</tr>
<tr>
<td>4x8x80 11/1x</td>
<td>$155</td>
</tr>
<tr>
<td>16x8x70 (Low Profile)</td>
<td>$619</td>
</tr>
<tr>
<td>1x8x80fx</td>
<td>$42</td>
</tr>
<tr>
<td>4x8x80fx</td>
<td>$155</td>
</tr>
<tr>
<td>16x8x80fx</td>
<td>$629</td>
</tr>
<tr>
<td>4MB 72 pin (70NS/60NS)</td>
<td>$145/$151</td>
</tr>
<tr>
<td>8MB 72 pin (70NS/60NS)</td>
<td>$296/$300</td>
</tr>
<tr>
<td>16MB 72 pin (70NS/60NS)</td>
<td>$512/$615</td>
</tr>
<tr>
<td>32MB 72 pin (60NS)</td>
<td>$1,259</td>
</tr>
<tr>
<td>Newton-2MB</td>
<td>$289</td>
</tr>
</tbody>
</table>

### POWERBOOK MEMORY

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB 100-6MB</td>
<td>$265</td>
</tr>
<tr>
<td>PB 140/170-4MB/6MB</td>
<td>$165/$239</td>
</tr>
<tr>
<td>PB 160/180-4MB/6MB</td>
<td>$152/$225</td>
</tr>
<tr>
<td>PB 160/180-8MB/10MB</td>
<td>$299/$369</td>
</tr>
<tr>
<td>PB 165C/180C-4MB/6MB</td>
<td>$165/$269</td>
</tr>
<tr>
<td>PB 165C-8MB/10MB</td>
<td>$335/$385</td>
</tr>
<tr>
<td>PBDUO 210/230-4MB/6MB</td>
<td>$165/$215</td>
</tr>
<tr>
<td>PBDUO 210/230-8MB/12MB</td>
<td>$305/$352</td>
</tr>
<tr>
<td>PBDUO 210/230-14MB/20MB</td>
<td>$645/$379</td>
</tr>
<tr>
<td>PBDUO 210/230-28MB</td>
<td>$1,569</td>
</tr>
</tbody>
</table>

### WHAM! MODEMS

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supra V32bis Powerbook Fax</td>
<td>$299</td>
</tr>
<tr>
<td>Supra 14 4 S/R Fax</td>
<td>$225</td>
</tr>
<tr>
<td>Supra 144LC 14.4 S/R Fax</td>
<td>$165</td>
</tr>
<tr>
<td>Supra 2400</td>
<td>$59</td>
</tr>
<tr>
<td>Zoom AMX 2400 bps</td>
<td>$68</td>
</tr>
<tr>
<td>Zoom FXV 2400/9600 S/R Fax</td>
<td>$129</td>
</tr>
<tr>
<td>ZoomVFV 14.4 v.32bis S/R</td>
<td>$175</td>
</tr>
</tbody>
</table>

### POW! ACCELERATORS

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAYSTAR Universal Powercache</td>
<td>$289/$379</td>
</tr>
<tr>
<td>Turbo 040 33 w/cache</td>
<td>$829</td>
</tr>
<tr>
<td>Turbo 040 40 w/cache</td>
<td>$999</td>
</tr>
<tr>
<td>128K Cache for Turbo 040 Accelerators</td>
<td>$172</td>
</tr>
</tbody>
</table>

### POW! DRIVES

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rumi 1.2 Ext/Rumi 1.2 Int</td>
<td>$1,089</td>
</tr>
<tr>
<td>Rumi 170 Ext/Rumi 170 Int</td>
<td>$299/$279</td>
</tr>
<tr>
<td>Rumi 85 Ext/Rumi 85 Int</td>
<td>$279/$209</td>
</tr>
<tr>
<td>Rumi 240 Ext/Rumi 240 Int</td>
<td>$335/$279</td>
</tr>
<tr>
<td>Rumi 525 Ext/Rumi 525 Int</td>
<td>$679/$609</td>
</tr>
<tr>
<td>Rumi CD-ROM</td>
<td>$299</td>
</tr>
<tr>
<td>Rumi Optical 128 MB w/5 cartridges</td>
<td>$959</td>
</tr>
<tr>
<td>Rumi 44MB SyQuest w/cartridge</td>
<td>$289</td>
</tr>
<tr>
<td>Rumi 88MB SyQuest w/cartridge</td>
<td>$469</td>
</tr>
<tr>
<td>Rumi 105MB/C SyQuest w/cartridge</td>
<td>$445</td>
</tr>
<tr>
<td>Rumi 2GB DAT Drive</td>
<td>$1,069</td>
</tr>
<tr>
<td>Rumi 8GB DAT Drive</td>
<td>$1,209</td>
</tr>
</tbody>
</table>

### MISCELLANEOUS

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>256K / 512K VRAM</td>
<td>$20/$38</td>
</tr>
<tr>
<td>Tool Kit (Simms Inst. Kit)</td>
<td>$7</td>
</tr>
<tr>
<td>PowerBook Tool Kit</td>
<td>$6.50</td>
</tr>
<tr>
<td>SIMMDouble/SIMMChanger</td>
<td>$137/$98</td>
</tr>
<tr>
<td>LC/ LC II FPU</td>
<td>$55</td>
</tr>
<tr>
<td>LC III FPU</td>
<td>$65</td>
</tr>
<tr>
<td>Classic II FPU/Color Classic FPU</td>
<td>$55/$48</td>
</tr>
<tr>
<td>Duo Dock/Performa 600 FPU</td>
<td>$59</td>
</tr>
<tr>
<td>Centris FPU</td>
<td>$315</td>
</tr>
<tr>
<td>TI Microlaser Upgrade</td>
<td>$54</td>
</tr>
<tr>
<td>HP 4MB/HP 8MB</td>
<td>$175/$355</td>
</tr>
</tbody>
</table>

### SYQUEST CARTRIDGES

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest 4MB Cartridge</td>
<td>$59</td>
</tr>
<tr>
<td>SyQuest 44MB Preformatted</td>
<td>$64</td>
</tr>
<tr>
<td>SyQuest 88MB Cartridge</td>
<td>$93</td>
</tr>
<tr>
<td>SyQuest 88MB Preformatted</td>
<td>$98</td>
</tr>
<tr>
<td>SyQuest 105MB Cartridge</td>
<td>$79</td>
</tr>
</tbody>
</table>

### MEDIA

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optical Cartridges</td>
<td>$32</td>
</tr>
<tr>
<td>128 MB (Verbatim)</td>
<td>$113</td>
</tr>
<tr>
<td>650 MB (Verbatim)</td>
<td>$112</td>
</tr>
<tr>
<td>1.2GB/512K (Verbatim)</td>
<td>$112</td>
</tr>
<tr>
<td>1.3GB/1024K (Verbatim)</td>
<td>$112</td>
</tr>
<tr>
<td>Bernoulli Cartridges</td>
<td>$97</td>
</tr>
<tr>
<td>44 MB</td>
<td>$97</td>
</tr>
<tr>
<td>90 MB</td>
<td>$105</td>
</tr>
<tr>
<td>150 MB (5 Pack)</td>
<td>$459</td>
</tr>
</tbody>
</table>

### WHAM! MEDIA

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overnigh Delivery</td>
<td>$7</td>
</tr>
<tr>
<td>UPS</td>
<td>$6</td>
</tr>
<tr>
<td>Phone</td>
<td>(206) 455-0786</td>
</tr>
<tr>
<td>Fax</td>
<td>(206) 455-3448</td>
</tr>
</tbody>
</table>

### SHIPPING

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>International Orders-2 4 Hours a Day</td>
<td></td>
</tr>
</tbody>
</table>

### CALL:

**MAC Xtra**

1075 Bellevue Way N.E. Suite 114,
Bellevue, WA 98004

Phone: (206) 455-0786
Fax: (206) 455-3448

**We accept MasterCard, VISA & Discover**

*Prices subject to change*

7:00 AM to 6:00 PM M-F, 9:00 AM to 4:00 PM Sat.

**CALL: 1-800-553-4230**
## Introducing Memory

### PowerBook Memory

**As Low As $155**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price 1x64</th>
<th>Price 1x8</th>
<th>Price 1x128</th>
<th>Price 2x64</th>
<th>Price 2x8</th>
<th>Price 4x64</th>
<th>Price 4x8</th>
<th>Price 8x64</th>
</tr>
</thead>
</table>

### Accessories

- Battery Charger Conditioner...
- Long Life Battery 140-160C...
- Automobile/Adapter 100-160 / DUO...
- Newer Technology DUO Dual Port/SCSI / Color...
- Co-Star Stingray Track Ball...
- Keytoneic Keyboard / Kensington/Turbo Mouse 4.0...
- Woxcom AR7/ Acton Mouse & Button 4.0...
- HP folks Wri... / 8MB ...
- We Sell Hewlett Packard Printer Supplies...

**Ask about our Lifetime Warranty on all our memory products. Prices and availability are subject to change.**

### Scanners / Printers

- HP BCX...
- UMAX LC-20E...
- Microtek Scimaker II / INX...
- LabelWriter II PLUS...
- Citizen Notebook II Color Printer...
- LaserWriter 810 4MB / 8MB Memory...
- HP fols Writer 4MB / 8MB...

**Ask about our warranty on all our memory products. Prices and availability are subject to change.**

### Modems

- Global Village Teleport / Powerpop (Bronze) 24/48...
- Global Village Teleport / Powerpop (Gold) 14/160...
- Global Village Teleport / Powerpop (Mercury) 19.200...
- U.S. Robotics Sportster 14.4/S/R Fax...
- Zoom Pocket 14.4 w/ Voice...
- Zoom 14.4 w/ Voice...

**Ask about our warranty on all our memory products. Prices and availability are subject to change.**

### Video RAM / Math Coprocessors

- Video RAM 256k / S12k...
- 16MHz LC / Classic...
- 16MHz Color Classic...
- 25MHz LC IIs...
- 40MHz Performa 600 / Dual Dock FPU...

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### More Drives

- Fujitsu 1.209...
- Fujitsu 2.049...
- Fujitsu 3.099...
- Fujitsu 4.029...
- Fujitsu 5.049...
- Fujitsu 6.059...

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### Rumi DAT Drives

- Rumi DAT Drive w/ Retrospect...
- Rumi DAT Drive w/ Retrospect...

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### Rumi CD-ROM Drive

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### Rumi Optical Drive

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### SyQuest Drives

**As Low As $289**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price 4MB</th>
<th>Price 8MB</th>
<th>Price 10MB</th>
<th>Price 20MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest 4MB Cartridge</td>
<td>$106</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQuest 8MB Cartridge</td>
<td>$159</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQuest 10MB Cartridge</td>
<td>$214</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SyQuest 20MB Cartridge</td>
<td>$329</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### Syquest $59

- Syquest 4MB Cartridge Formatted...
- Syquest 8MB Cartridge Formatted...
- Syquest 10MB Cartridge...

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### Sonic Drive

**As Low As $92**

- Sonic Ether 107 / Thin II/ LC...
- Sony Micro Scsi Powerbook...
- Sony FriendlyNet 107 / Thin...
- Sony Starbus Ter......
- Sony Hardline 5 pc...
- Sony Powerbridge...

**Ask about our lifetime warranty on all our memory products. Prices and availability are subject to change.**

### FAX

**206-454-7302**

### Educational/Government

**1-800-848-1424**

### Fortune 1000 Companies

**1-800-848-1418**

---

**Circle 563 on Reader Service Card**

---

**MACWORLD**

---

**July 1994**

---

**256**
**AT PRICES YOU WON'T FORGET**

### TURBO 040 ACCELERATORS

<table>
<thead>
<tr>
<th>Processor Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>40MHz Turbo 040 with cache</td>
<td>$649</td>
</tr>
<tr>
<td>33MHz Turbo 040 with cache</td>
<td>$599</td>
</tr>
<tr>
<td>33MHz Turbo 040 with cache (NO FPU)</td>
<td>$599</td>
</tr>
<tr>
<td>128k Cache for Turbo 040's</td>
<td>$629</td>
</tr>
<tr>
<td>Value 040 33MHz (No FPU)</td>
<td>$649</td>
</tr>
<tr>
<td>Value 040 40MHz</td>
<td>$649</td>
</tr>
<tr>
<td>PowerPC 601 650MHz</td>
<td>$1159</td>
</tr>
<tr>
<td>PowerPC 601 830MHz</td>
<td>$1275</td>
</tr>
<tr>
<td>PowerPC 601 1MB Cache Card</td>
<td>$1519</td>
</tr>
</tbody>
</table>

### CENTRIS & QUADRA 040 ACCELERATORS

<table>
<thead>
<tr>
<th>Processor Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Image 040 40MHz</td>
<td>$1159</td>
</tr>
<tr>
<td>Quadra 040 40MHz</td>
<td>$999</td>
</tr>
</tbody>
</table>

### VERBATIM

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD-Recordable 640/74Min. (For use in Recordable CD-ROM Drives)</td>
<td>$23</td>
</tr>
</tbody>
</table>

### SONY MEDIA

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/12GB Optical</td>
<td>$135</td>
</tr>
<tr>
<td>650/600MB Optical</td>
<td>$109</td>
</tr>
<tr>
<td>128MB 3.5 Optical</td>
<td>$96</td>
</tr>
<tr>
<td>SONY 1.44 MB DATA CARTRIDGES</td>
<td>$18/20/26</td>
</tr>
<tr>
<td>1.4MB Mini D/C 120MB / 150MB / 250MB</td>
<td>$23</td>
</tr>
<tr>
<td>1.4MB QCIC 80 120MB Formatted</td>
<td>$50</td>
</tr>
<tr>
<td>1.4MB D/C 522MB</td>
<td>$63</td>
</tr>
<tr>
<td>1.4MB DVC 6.6gb</td>
<td>$79</td>
</tr>
</tbody>
</table>

### VERBATIM AS LOW AS $23

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>128MB 3.5&quot; Optical</td>
<td>$50</td>
</tr>
<tr>
<td>128MB 3.5&quot; Optical, Apple Format</td>
<td>$56</td>
</tr>
<tr>
<td>600 / 650MB 5.25&quot; Optical 012 b/s / 1024 b/s</td>
<td>$85</td>
</tr>
<tr>
<td>1.3 MB 13G Optical 512 b/s / 1024 b/s</td>
<td>$112</td>
</tr>
<tr>
<td>DC2120 w/QCRC</td>
<td>$19.50</td>
</tr>
<tr>
<td>4mm 9mm / 60mm</td>
<td>$11.50/9.90</td>
</tr>
<tr>
<td>8mm 112mm</td>
<td>$10</td>
</tr>
</tbody>
</table>

### KOMAG MEDIA

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>128MB 3.5&quot; Optical</td>
<td>$128</td>
</tr>
<tr>
<td>600MB 512 bytes/sector</td>
<td>$79</td>
</tr>
<tr>
<td>1GB 512 bytes/sector</td>
<td>$99</td>
</tr>
<tr>
<td>1GB 1024 bytes/sector</td>
<td>$99</td>
</tr>
<tr>
<td>Bernoulli 40MB Card</td>
<td>$197</td>
</tr>
<tr>
<td>Bernoulli 60MB Card</td>
<td>$199</td>
</tr>
<tr>
<td>Bernoulli 150MB Card</td>
<td>$402</td>
</tr>
</tbody>
</table>

### BERNOULLI MEDIA

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bernoulli 40MB Cartridge</td>
<td>$197</td>
</tr>
<tr>
<td>Bernoulli 60MB Cartridge</td>
<td>$199</td>
</tr>
<tr>
<td>Bernoulli 150MB Cartridge</td>
<td>$402</td>
</tr>
</tbody>
</table>

### RASEROPS MONITORS

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SONY CD-R 650MB/74 Min.</td>
<td>$269</td>
</tr>
<tr>
<td>SONY CD-R 555MB/63 Min.</td>
<td>$269</td>
</tr>
<tr>
<td>SONY 5mm DAT</td>
<td>$12</td>
</tr>
<tr>
<td>SONY 8mm DAT</td>
<td>$12</td>
</tr>
<tr>
<td>SONY 8MM 150MB</td>
<td>$14</td>
</tr>
<tr>
<td>SONY 8MM 8.4GB</td>
<td>$16</td>
</tr>
<tr>
<td>SONY 8MM 112.5GB</td>
<td>$28</td>
</tr>
<tr>
<td>SONY 8MM 120GB</td>
<td>$28</td>
</tr>
</tbody>
</table>

### THE LLB COMPANY, INC.

Call 1-800-848-8967

*With customer Service Guaranteed. Depend on LLB for Quality, Service and Value*
**PERIPHERAL OUTLET, Inc.**

**256-6581**

**NEW! INTERNATIONAL TOLL FREE NUMBERS:**
- France - 0590 1997
- UK - 0800 962 058

---

### DiMiOCache

**50MHz Accelerator $445**

- Excel Calculation
- Photoshop Unsharp Mask
- Word Scroll

**New Products**

- LaserWriter Pro 810 4 MB Upgrade board
- LaserWriter Pro 810 8 MB Upgrade board
- PowerBook Duo 20 MB/22 MB Modules
- All sizes PCMCIA cards for Newton

**Cache Cards, Etc.**

- 128K Cache Card for LC III and Performa 450
- 256K FPU Card
- 256K Cache Card
- 2-SLOT Card and 66882

**Math Coprocessors**

- 68882 16 MHz FPU
- 68882 20 MHz FPU
- 68882 25 MHz FPU
- 68882 33 MHz FPU
- 68882 50 MHz FPU
- 68881 16 MHz FPU

**Miscellaneous**

- LaserWriter Pro 810 4 MB upgrade
- LaserWriter Pro 810 8 MB upgrade
- T.I. Micro Laser 1 MB
- MacClassic 1 MB Board
- 68851 16MHz PMMU
- 68882 3 MB Card
- 4 MB Card
- 20/28 MB Card

---

**PowerBook Memory**

- 100 140/170 160/180 165x/180c Duss
- 2 MB 95.00 95.00
- 4 MB 172.00 149.00 155.00 155.00 195.00
- 8 MB 249.00 209.00 229.00 229.00 229.00
- 16 MB 289.00 299.00 299.00 299.00 319.00
- 32 MB 375.00 379.00 379.00 379.00
- 12/14 MB 379.00 379.00 379.00 379.00
- 20/28 MB 379.00 379.00 379.00 379.00

**Newton PDA Upgrade Products**

- 512K Static RAM Upgrade 125.00
- 1 Megabyte Static RAM Upgrade 169.00
- 2 Megabyte Static RAM Upgrade 289.00
- 2 Megabyte Flash Card Upgrade 259.00
- 4 Megabyte Flash Card Upgrade 425.00
- 8 Megabyte Flash Card Upgrade 749.00
- 16 Megabyte Flash Card Upgrade 1375.00

---

**Due to volatility in the market all prices and availability are subject to change without notice.**
DataCarts for Syquest Drives

Lifet ime Warranty - Money Back Guarantee - Special Offer

DataCart 45
1 Pack $58.
5 Pack $55.

DataCart 88
1 Pack $89.
5 Pack $86.

Komag Optical Disks
128MB $29.
600MB $85.
1GB $102.

Memory Merchants
Quality Removable Storage
(800) 799-DISK
(3475)
4 Shratton Ave., San Carlos, CA

ACCELERATORS/FPUs

GIVE YOUR CENTRIS 610 A 40 MHZ BOOSTER SHOT!

40MHz 040 Centris 610 INT/FPu $299/$399
Mobius Speedstar 25MHz $399/$499
33MHz w/128K cache $499/$699
25MHz 030 Mac SE $129/$178
25MHz 020/FPu/16K cacheLC $99
25MHz 030/FPu/16K cacheLCII $129
33MHz 030 Mac II $188
Apple Cache Card Mac IIi
Cache Card 256K PowerMac $249
68040 FPu LC65,LC75,LC10 $249
(With LC65/60 node-in)
68882 FPu LC (1-111, Duo, etc.) $12.49
68851 PAMU w/Mode52 Mac II $89
32-bit SIMMs 7ns 4/8MB $149/$299

SOURCE INTERNATIONAL
Silicon Valley's FIRST CHOICE for Computer Memory

(415) 323-6059
Fax (415) 326-3552

WANTED: USED SIMMS
TOP $$$ PAID
(Dealers welcome)
256K-512K-1MB-2MB PB
Same day response daily.

Heart Computer, Inc.
113 Kenway, Rockwall, TX
(214) 771-7511

MAC MEMORY, CALL FOR LOWEST PRICE

NEW POWER PC MEMORY LIFETIME GUARANTEE

HOT SHOPPER PRODUCT CATEGORIES HELP BUYERS FIND THE PRODUCTS THEY NEED FAST.

LIMITED ADVERTISING BUDGET?

Macworld Shopper offers a great way to reach 550,000 active shoppers.
Sentinel PowerBook™ Security

Stop PowerBook™ theft with the Käbit™ Sentinel

Secure peace-of-mind at the office, at home, the airport, and anywhere else you and your PowerBook travel.

Dual Security Features:
- Prevents theft by securing your PowerBook computer to desks, tables, chairs, etc.
- Secures your disk drive, preventing tampering and unauthorized data access
- Simple system for quick and easy installation.
- Portable goes with you wherever you take your PowerBook.

For more information call 800-851-7392...

Padlock Security Provided by Master Lock

Family Heritage File™ Genealogy. New Version 3.5! Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy professionals. Stand alone: Graphic Pedigree, Descendants, Family Group, Individual, Marriage, Surname
- Unlimited History
- Sorted Lists
- Export to WOPDAA base/modem
- Gedcom compatible
- Jewish LDS features
- 549 + 5 sf
- Ask about Family Heritage Bundle, Visa/MA.

Family Roots™ Genealogy. Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indexes and much more. Customize to your own preferences. Standard Mac interface.
- Call for FREE information.
- Satisfaction guaranteed.
- MC/Visa/MA.

HOT SHOPPER
PRODUCT CATEGORIES
HELP BUYERS
FIND THE PRODUCTS
THEY NEED FAST.

Music Education Software that Listens to You!

"Claire could forever change the way musicianship is taught."

$129 Order Direct 1-800-557-2633 Ext 5531

Music for Everyone!
Both programs compatible with MIDI but MIDI is not required.

Song Works
New! Your songwriting partner automatically
elates your melody, suggests chords,
suggests endless tune ideas, aligns lyrics,
plays, transposes, prints. $125.00

Practica Musica
Your personal music tutor. Provides ear training and music theory from beginning to advanced. Includes textbook. $125.00

Claire
The Personal Music Coach

Software Discounts Up to 80%! "Full Packages" (Students-Teachers-Schools) "Latest Ver.

PageMaker 5.0 $299 Photoshop 2.5.1 $269
AutoCAD Rel. 12 $199 Illustrator 5.0.1 $199
Microsoft Word 5.1 $129 Director 4.0 $598 FrameMaker 4.0 $249
WordPerfect 5.1 $129 Premiere 3.0 $249 Coda Finale 3.0 249
Microsoft Excel 4.0 $149 Claris Works 4.0 $199 Freehand 4.0 $249
Fractal Painter 2.0 $199 FileMaker Pro 149 Morph 2.0 $199
Statistica/Mac 695 Swivel 3D Pro 349 Authorware 2.0.1 995
Strata Studio Pro 1.0.495 StrataVision 3D 250 MiniCAD-4 250
Much much more.....Call for other titles.....P.O. from schools are welcome!

Resource Discounts up to 75%! "Full Package" (Students-Teachers-Schools) "Latest Ver.

PageMaker 5.0 $699 Photoshop 2.5.1 $599
AutoCAD Rel. 12 $499 Illustrator 5.0.1 $499
Microsoft Word 5.1 $199 Director 4.0 $598 FrameMaker 4.0 $249
WordPerfect 5.1 $129 Premiere 3.0 $249 Coda Finale 3.0 249
Microsoft Excel 4.0 $149 Claris Works 4.0 $199 Freehand 4.0 $249
Fractal Painter 2.0 $199 FileMaker Pro 149 Morph 2.0 $199
Statistica/Mac 695 Swivel 3D Pro 349 Authorware 2.0.1 995
Strata Studio Pro 1.0.495 StrataVision 3D 250 MiniCAD-4 250
Much much more.....Call for other titles.....P.O. from schools are welcome!
Pacific HiTech is serving you the Internet on a silver platter

Pacific HiTech has culled the finest nuggets from the Internet and placed them on high-volume, all-in-one CD-ROMs. Each one is an instantly accessible resource of tools, programs and information. There is something for everyone, from the programmer to the occasional weekend mouse jockey. These discs are a great value for people who value their time.

$49.95 each
$5.00 S/H (U.S.)
$9.00 S/H (Int'l)

- Games
- Periodicals
- Fonts
- Demos
- Graphics
- Virus Checkers
- Communications
- Applications
- Development
- Disk Utilities
- Classical Books
- Games
- Educational Stacks
- Organizational Stacks
- HyperCard® Tools
- Arcade
- Adventure
- Bolo
- Cards
- Word games
- Source Code
- Compilers
- Interpreters
- Tools
- Information

1-800-765-8369

Pacific HiTech Inc.
4530 Fortuna Way
Salt Lake City, Utah 84124

Int'l 801-278-2042
Fax 801-278-2666
Internet: orders@pht.com
AppleLink: pht
Native Application for Power Macintosh

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**HiQ-Script**

- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)

---

**Native Application for Power Macintosh**

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)

---

**Native Application for Power Macintosh**

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)

---

**Native Application for Power Macintosh**

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)

---

**Native Application for Power Macintosh**

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)

---

**Native Application for Power Macintosh**

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)

---

**Native Application for Power Macintosh**

**HiQ Real-World Math for Macintosh**

- Notebook Interface
  - Interactive analysis and graphics in a WYSIWYG notebook interface
  - Insightful 2D and 3D graphics
  - Annotation for technical reports, journals, and presentations
  - Publication-quality output

**Numerical Analysis Power**
- More than 600 math, scientific, and engineering functions
- Efficient algorithms with optimal convergence
- User-defined error tolerances

**Problem Solvers**
- Intuitive GUIs for solving sophisticated problems
- Automatic code generation

**HiQ-Script**
- A language built for scientists, engineers, and mathematicians

---

**Call for FREE demo,**

(800) 433-3488 (U.S. and Canada)
THE ONLY FAST, EASY, ECONOMICAL WAY TO CREATE LARGE-FORMAT PRINT JOBS.

• Layouts up to 10,000 square feet
• Imports EPS, TIFF, Softex CT artwork
• Drives any PostScript printer
• Fixed, custom and automatic tile sizes
• Variable gaps, margins, overlaps, bleeds
• Hundreds of professional large-format production tools
• Supported by a network of service bureaus nationwide

For info call: (617) 339-2222 or fax: (617) 339-2223

Now at MicroKnowledge 1-800-256-8277

523 Big St, New York, NY 10017

GRAPhICS

A Design Breakthrough ...
...intuitive 3D modeling
PowerPC Native or 68-K
• easy, fast, intuitive 3D CAD
• 3D direct manipulation
• sketch in live 3D perspective
• object-based shadows
• fit, flip, snap to objects
• paste into openings
• sun studies, walkthroughs
• import/export DFX, PICT, etc.

Call Artifice: 503-345-7421
or fax: 503-346-3626

In Canada: 204-453-8111

CADMOVEMENT - Release 4.0
New Formats, New Features, & More User Control
• New Formats Include: ClarisCAD, Presenter Professional
• Read MicroStation, Scheme & Pro Engineer via EPSF
• No more add-on modules - get DDES2, STL & more free
• Check your drawings with the new Pan & Zoom Feature

So many improvements...so little space...
so call for more information.

Call 703.552.0213

MAP Art
Maps for Graphic Design

"Best Collection Map Category"
ClipArt's Geographical MapWorld, January 1994
"Fine Artwork"
MacWorld, January 1992

FULLY EDITABLE WITH ILLUSTRATORS, FREEHAND & OTHER PROGRAMS!

CARTESIA
5 S. Main St., Box 757
Vicksburg, MI 49097-3441
24 hr. FAX 609-695-1714

Call 800-334-4291

Detailed Networks in Minutes with NetDraw® 2.0!
With over 330 professionally drawn images, NetDraw® 2.0 gives users immediate access to clip art symbols for LANs, WANs, computing, PCs, telephony and patching and cabling. Also included are flow charting symbols as well as mapping graphics to depict your networks geographically. Available now for just $129.95, NetDraw® 2.0's complete clip art library is easily imported into most Macintosh applications. Call 800-643-4866 to order your copy today!
James Heisig's

Remembering the Kana

Learn Japanese hiragana and katakana in 6 hours.

• Both the hiragana and the katakana presented in one package for Mac.
• Prints several types of flashcards and grid paper for review.
• Digitalized sound lets you hear the pronunciation of each kana and all examples.
• On-screen flashcard review of the hiragana and katakana.
• Background information on the history and grammatical usage of the kana.
• Lessons automatically timed. On-screen help.
• Does NOT require KanjiLife or the Japanese Language Kit.

Imaginer America Inc., 1531 7 NE 90th St., Redmond, WA 98052
Tel: 206 867 5790 Fax: 206 867 5792

CIRCLE 417 ON READER SERVICE CARD

FORTRAN on the Mac

• ANSI standard FORTRAN 77
• VAX & Cray extensions
• Advanced debugging features
• Extensive code optimizations
• User-friendly Mac interface

800-252-6479

Language Systems Corp. • 100 Carpenter Dr. • Sterling, VA 20164
(703) 478-0181 • Fax: (703) 689-9593 AppleLink: LANGSYS

CIRCLE 421 ON READER SERVICE CARD

FREE MAC & IBM SHAREWARE CATALOG

SoftShope CD $46 Only!
The Ultimate Shareware Collection
SoftShope 32 Pages! ASP Member
POB0X 4437
CERRITOS, CA 90703
TEL: (310)802-1333
FAX: (310)802-1494
1-800-851-8089

CIRCLE 419 ON READER SERVICE CARD

Medical Office Mgmt

Tess Data Systems, Inc.
14340 Tarry Chase Blvd, Ste 340
Houston, TX 77014-1021
800/218-TESS - Sales
713/440-9995, 713/440-6526 Fax

CIRCLE 422 ON READER SERVICE CARD

Care4th® PRO

An ELECTRONIC MEDICAL RECORD SYSTEM and DATA-BASE with full printout support. Imagine your entire medical record shelf & much more in a lap or desktop Mac! Utilize clinical data in ways you never have imagined. In 40 states and abroad, Care4th® Pro is the gold standard. Single & network versions available, starting well under $3000! Med4th Systems, Ltd.
716 East Carlisle Avenue
Milwaukee, WI 53217
414/963-1885 Voice and Fax

CIRCLE 423 ON READER SERVICE CARD

PKZIP Mac

The world's most popular data compression comes to the Mac!

• full PKZIP compatibility
• sophisticated encryption
• error eliminating 52-bit CRC
• compatible compression available for MacOS, Unix, VMS, OS/2, Windows

Introductory Special
$19.95
Only $54.95
multi-user discount available

Call and order today
(513) 885-2031

ASCENT SOLUTIONS, INC.

CIRCLE 420 ON READER SERVICE CARD

MACWORLD
July 1994
265
We tried all the utilities and nothing worked. Total Recall recovered 100% of our data and returned it the same day. These guys are amazing! — R.H. Dataviz, Inc.

The Data Recovery Experts
- Class B Clean Room
- 1-3 Day Service-No Extra Charge
- Better than 94% Success Rate
- Recommended by Major Manufacturers

Absolute Data Recovery!
2440 Weymouth Rd • Colorado Springs, CO 80915 • 719-380-1616 • FAX 719-380-7022

SERVICES & SUPPLIES

...
You've tried Norton™, you've tried MacTools™ & Still No Data! CPR & RS® services are recommended by most Major Hard Drive Manufacturers, System Manufacturers as well as the U.S. Dept. of Defense. We have a 98% Success Rate on all Storage Devices & Operating Systems. We will surgically remove your data, without the hassle of filling out any unnecessary forms.

We can scan your 35MM slides & negs onto Photo CD in 24 Hr Turnaround foras low as $60 an image.

COMPUTERWORLD brings humor to a mouse pad featuring a cartoon from "The 5th Wave" series by Rich Tennant. Not available in stores, this colorful foam-backed pad will keep your mouse clean and protect your desktop. Best of all, it's only $4.99*. Send your name, address and check or money order to COMPUTERWORLD, P.O.Box 9171, Framingham, MA 01701. Attn: Product Fulfillment. For credit card orders, call 1-800-343-6474.

*In U.S., for each unit ordered, add $1.25 for postage and handling; orders outside U.S. add $2.50 each. Residents of MA, CA, GA, NJ, and DC add applicable sales tax. Canada residents add G.S.T.
CD-ROMS

BROKERS

Artisan's Teacher Trouble .......... 34.95
Carmen World Deluxe .............. 49.95
Just Grandma & Me .................. 34.95
Myth ......... 47.95
New Kid on the Block ............... 34.95
Tortoise and the Hare .............. 34.95

DISC BOOKS - CLASSROOM VERSIONS

Aesop's Fables .................. 24.95
Cinderella ...................... 24.95
Mud Puddle .................. 24.95
Scary Poems for Reitn Kids ......... 24.95
Tale of Benjamin Bunny ............... 24.95
Tale of Peter Rabbit ............... 24.95
Thomas' Steventime ............... 24.95

SOFTWARE TOOLWORKS

Orange creamy New Media ........ 26 000 Leagues Under the Sea .......... 39.95
Adventures of Pinocchio ............ 39.95
Beauty and the Beast .............. 39.95
Talking Classic Tales .............. 39.95
Talking Jungle Safari ............... 39.95
Time Traveler .................. 59.95
Wind in the Willows ............... 39.95

SOFTWARE

Bravebird

Carmen America's Past ............... 29.95
Carmen Time .................. 29.95
Carmen World .............. 19.95
Kid Pix ...................... 34.95
Kid Pix Companion ............... 24.95
Print Shop Deluxe ............... 47.95

LEARNING COMPANY

Bilingual Writing Center .......... 169.95
Math Rabbit 1 .................. 34.95
Math Rabbit 2 .................. 34.95
Reader Rabbit 1 .................. 34.95
Reader Rabbit 2 .................. 34.95
Reader Rabbit's Ready for Letters .... 34.95
Super Solvers Midnight Rescue ...... 34.95
Super Solvers Outnumbered ........ 34.95
Super Solvers Spellbound .......... 34.95
The Writing Center ............... 49.95
Treasure Math Storm ............... 34.95

MADCAT

SimCity 2000 .......... 29.95
SimEarth .................. 29.95
SimLife .................. 29.95

MECC

Amazon Trail .................. 39.95
DinePark Tycoon ............... 34.95
My Own Stories ............... 29.95
Ostel Down Under ............... 34.95
Oregon Trail ............... 79.95
Super Munchers/Number Munchers Bundle .... 29.95
USA Geography ............... 79.95

QUALITY COMPUTERS

SmartSavant .................. 49.95
SmartSavant Pro Version ........... 79.95
SmartVoice .................. 49.95

RUGER MACHINER

HyperStudio 2.0 .................. 109.95

SYMANTEC

 Norton Utilities 2.0 Academic ...... 59.95
SAM 3.5 Academic ............... 39.95

TIMEWORKS

Publish It Easy 3.0 ............... 49.95

WEIGHTY READER

Stickybear's Early Learning Activities .... 34.95
Stickybear's Math Town ............ 34.95
Stickybear's Reading Room ........ 34.95

HARDWARE

DIGITALVISION

ComputerEyes (BW) .............. 199.95
ComputerEyes (Color) ............. 299.95
ComputerEyes RT ............... 399.95

HEWLETT PACKARD

ScanSoft Fax 949.95
ScanSoft Fax 959.95

LAPIS TECHNOLOGIES

LTV LV .................. 289.95
LTV Portable ............... 316.95

LOGITECH

Foto/Mike Plus ............... 549.95
Scanman Model 32 w/CatchWord Pro .... 249.95

QUALITY COMPUTERS

Q Drive 60 MB .............. 199.95
Q Drive 170 MB ............... 349.95
Q Drive 340 MB (Corner Mechanism) ... 399.95

SUPRA

SupraFAX Modem 144LC ........... 169.95

SOFTWARE

Creative Writer Academic ........... 39.95
Fine Artist Academic ............. 39.95
Microsoft Word Academic ........ 84.95
Microsoft Works Academic ....... 99.95

SMARTSTART

Stickybear Early Learning Activities .... 34.95
Stickybear Math Town ............ 34.95
Stickybear's Reading Room ........ 34.95

SUPER MUNCHERS/NUMBER MUNCHERS BUNDLE

$29.95

WHO WE ARE: Quality Computers has been a leader in the educational technology market for 10 years. When we started, everyone used Apple II's. Today, schools are using more Macs and PCs. But no matter what kind of computers schools use, we will be there to provide the needs. Call for your free catalog and issue of our educational newsletter.

1-800-777-3642
THE BEST DEAL IN CLIP ART

CLIP ART CD

- Over 1200 high quality curriculum-oriented images, borders, and more!
- 20 different categories
- Pictorial Index & Catalog included
- PICT & EPS formats
- Easy-to-use
- 30 Day Money Back Guarantee
- Preferred choice of educators

ONLY $49.95

Also available on 3.5" diskettes. Ask for details!

FREE EDUCATIONAL CATALOG

Find out why Enhance is America's favorite journal & catalog of educational technology. Every year, over a million educators look to Enhance for grant writing tips, technical advice, product reviews, and now, to read how they can best meet the challenges of Goals 2000.

Enhance is free! Call today, or clip and mail this order form.

ORDER NOW AND GET

BONUS CD WITH EVERY ORDER

The Q-ROM

Software Demos • Educational Games
Entertainment Games • Fonts
QuickTime Movies • Clip Art • Much more!

Find out what makes Quality Computers the leader in Educational Technology across America!
Give your Mac a clear, natural voice with SmartVoice

- Reads any text in any program
- Add speech to your favorite word processor
- Great for proofreading—find out how your writing REALLY sounds
- Works in the background so you can work while your Mac reads
- Comes with 14 unique voices, a talking computer psychiatrist, talking text editor, talking clock, talking calculator, and more fun extras
- Uses Apple's new PlainTalk™ technology
- Comes bundled with Apple's SpeechManager™, MacinTalk 2™, and MacinTalkPro 2™
- High-quality synthesized speech with realistic inflection and tone
- Speaks notification boxes from the Finder

SmartVoice ..................... 49.95

Crank It Up with Labtec Speakers .................. 24.95
Labtec Shielded Mini-Speakers for full-range voice reproduction. Batteries or adapter required.

Talking Software ................. 39.95 ea
Early Learning made fun through the power of speech synthesis! Three colorful packages available: Math, Phonics, and Music.

1-800-777-3642
The Only Guide You Need to Master the Mac Universe!

Macworld Complete Mac Handbook
PLUS CD, 2ND EDITION IS LOADED WITH
EXPERT ADVICE, PRODUCT PROFILES AND
100S OF TIPS AND TECHNIQUES

Here it is: the 800 page all-in-one handbook for all Mac users — beginners to experts, by Jim Heid, one of Macworld magazine's most popular columnists. From word processing and desktop video, to printers and surge suppressors, this completely updated and expanded guide is your key to mastering the Mac universe. Features a Bonus CD-ROM with over 300MB of dazzling software.

"Required reading for the power user — and anyone who wants to be one." — Frank Casanova, PowerPC Product Manager, Apple Computer, Inc.

ISBN: 1-56884-033-0
Price: $39.95 USA/$52.95 Canada
800 pages

The Ultimate Mac Reference is Here!

FIND OUT 1000 THINGS APPLE NEVER TOLD YOU IN MACWORLD MACINTOSH SECRETS™

Here — complete with over 8MB of software — is the fact-rich book you need to get the most out of your Mac. Written by Macworld's own columnists David Pogue and Joseph Schorr, it features 1000 things Apple never told you, including hundreds of tricks and expert tips. With up-to-date coverage on all the latest Mac models, including the new Performas and Quadras. Also includes over 8MB of the hottest commercial software and shareware — over 40+ programs from Apple, Claris, Bitstream, and more!

"(Macworld) Macintosh SECRETS appears to be the newly definitive Macintosh reference work, replacing the venerable 'Macintosh Bible' and Danny Goodman's graphically stunning but somewhat shallow 'Macintosh Handbook'" — Washington Post.

Price: $39.95 USA/$52.95 Canada
752 pages

Order Risk-Free: 1-800-762-2974
For fastest service, fax your order to (415) 358-1260. Phone 8am to 8pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me: I Wish to Pay by:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Price</th>
<th>Card No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Include all numbers)</td>
<td>(necessary to be valid)</td>
</tr>
</tbody>
</table>

Yes! Please send me: I Wish to Pay by:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Price</th>
<th>Card No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Include all numbers)</td>
<td>(necessary to be valid)</td>
</tr>
</tbody>
</table>

For fastest service, fax your order to (415) 358-1260. Phone 8am to 8pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me: I Wish to Pay by:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Price</th>
<th>Card No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Include all numbers)</td>
<td>(necessary to be valid)</td>
</tr>
</tbody>
</table>

For fastest service, fax your order to (415) 358-1260. Phone 8am to 8pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me: I Wish to Pay by:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Price</th>
<th>Card No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Include all numbers)</td>
<td>(necessary to be valid)</td>
</tr>
</tbody>
</table>

For fastest service, fax your order to (415) 358-1260. Phone 8am to 8pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me: I Wish to Pay by:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Price</th>
<th>Card No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Include all numbers)</td>
<td>(necessary to be valid)</td>
</tr>
</tbody>
</table>

For fastest service, fax your order to (415) 358-1260. Phone 8am to 8pm, PT, or complete and mail the order form. Also available wherever computer books are sold.

Yes! Please send me: I Wish to Pay by:

<table>
<thead>
<tr>
<th>Qty</th>
<th>Price</th>
<th>Card No.</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(Include all numbers)</td>
<td>(necessary to be valid)</td>
</tr>
</tbody>
</table>
Join the CD-ROM Revolution!

All drives are ready to run and are Kodak multisession compatible. Driver software and cable included. Specify NEC MAC to SCSI or #92 SCSI to SCSI cable (except NEC).

CD-ROM Drives

Buy a CD-ROM drive from us, and add a bundle up to 90 days after purchase!

- Pioneer DRM601X $1299
- NEC 3Xp $469 (portable)
- Plexor DM5028 $499
- NEC 3Xc $597 (external)

3 FREE CDs

FREE Luminus, Mister X & the EDUCORP CD Sampler with a CD-ROM drive or drive bundle purchase from EDUCORP. May not be valid when matching titles.

Luminus

**1/2 "The King of CD-ROM Adventure." MacUser (MSRP $99.95)

Mister X

An animation-enhanced version of the Mister X comic book series. (MSRP $19.95)

EDUCORP CD Sampler

Over 100 demos of the newest and best-selling titles. (MSRP $99.95)

CD Bundles

Includes drive, Labtec speakers with A/C adapter, stereo headphones, choice of SCSI cable, driver software and power supply.

- Grolier's Encyclopedia...Retail $99.80
- World Atlas .............. $69.95
- U. S. Atlas ................ $69.95
- The Big Green Disc .... $69.00
- Think for Yourself .... $240.00
- The View from Earth ... $79.95
- Dictionary/Living World 3.0 ... $149.00
- Mayo Clinic Family Health Bk ... $49.95
- Shakespeare ............ $29.99
- Sherlock Holmes ......... $29.99
- Audubon's Birds of America $49.99
- Audubon's Mammals .... $49.99
- A5028 Plexor DM5028 $649
- A5100 CD Tech-4100A $599
- A1824 CD Tech-T3401 $699
- 1 FREE multimedia title with CD Tech.
- A945 NEC 3Xc ............ $829
- A944 NEC 3Xp ............ $679

Optional Bundles

Super Saver Bundle

Save A Bundle!

- 3 CDs for $39.95
- 5 CDs $59.95 #SB8
- Save $259.80 Total retail value $399.75
- 1. Desert Storm ......... $99.95
- 2. The Orchestra ........ $79.95
- 3. Funny: the movie in QuickTime $69.95
- 4. Sports Illustrated Sports Almanac $69.95
- 5. Word Tales .......... $69.95

Reference Bundle

- 3 CDs $79.95 #SB1
- Save $454.95 Total retail value $549.90
- 1. Grolier's MM Encyclopedia .......... $395.00
- 2. World Atlas ........ $69.95
- 3. Mayo Clinic Family Health Bk ... $69.95
- 4. Animal Alphabet .......... $69.95

Call for a complete list.

*Excluded from the 90-day offer.

Over 600 CD's

Educational Multimedia

- 1280 Encyclopedia of Life $64.95
- ZooGuides Series ...a series of beautiful interactive zoo discs.
- 50110 Encyclopedia of Dinosaurs $49.95
- 2078 Animal Alphabet $29.95
- 2094 Comic Bk Confidential $34.95
- 2095 A Hard Day's Night $27.95

ZooGuides Series

- A series of beautiful interactive zoo discs.
- Each ZooGuide is filled with interactive video, photos, narration, animation, distribution maps and a guide to families and species.
- 2081 Butterflies/World $39.95
- 1210 Whales & Dolphins $39.95
- 1275 Mammals of Africa $39.95
- 50300 The Rainforest $39.95
- 50141 Font Frontier $39.95

Softcover Union 115. Hundreds of illustrations, animated diagrams and video.

- Select an animation, or QuickTime video.
- One for each letter of a narrated sentence.

Entertaining Multimedia

- 50319 Freak Show $49.95
- 2094 Comic Bk Confidential $34.95
- 2095 A Hard Day's Night $27.95

Rated MacUser Magazine

- Span Theater: It's All Relative $39.95

Desktop Publishing

- 1680 Graphic Design $499.95
- Over 800 color & bw professional EPS images you can edit, animals, birds, business, flags, holiday, people and more.

- 50073 Design Toolkit Pro $99.95
- Over 3500 color & bw EPS design elements for desktop publishing, multimedia, and presentations: textures, patterns, titles, fonts, creative caps, borders, backgrounds and more.

- 50141 Font Frontier $39.95
- A collection of 117 high quality Type 1 and TrueType fonts.

Stock Photography

- 1444 Pro Photo Collection $54.95
- 1297 Creative Backs $79.95
- 50048 Best of People/Bus $79.95
- 50150 Essential Beakmarks $49.95

The titles below have at least 100 royalty-free photographs and are in Kodak Photo CD format.

We'll BEAT any advertised price on CD-ROM products (some restrictions apply).

FREE Express Shipping!

Free Express (2-day) Shipping on products in this ad marked with a star.

You must purchase a drive or drive bundle from EDUCORP.

CALL FOR A COMPLETE LIST!

Ad Background created using Best of Nature's Way #5083, $64.95
50376 Virtual Galaxy........$15.95  
Tony Quinn's Virtual Galaxy offers an easy to use operator interface, hundreds of digitally created full color illustrations and animated sequences. View 3-D images, virtual landscapes, QuickTime movies and visit the robot planet.

1564 Wayzata World Factbook  
1994 Edition. Journey around the globe! You'll find detailed high quality photos, in-depth information from the State Department, CIA, or travel advisories. Published by Wayzata.

2090 Small Blue Planet...$59.95  
Rated 4 1/2 MacUser Magazine  
This interactive exploration is a global geographic voyage so fun and engaging you'll be surprised how much you learn along the way. The Maps that Move interface is your conduit to our Small Blue Planet. Cruise and zoom over The Real Picture Atlas' spectacular imagery—These are real pictures! Published by Now What Software!!

1385 Right Images......$159.95  
Stars • Planets • Astronauts • Nebulae • Shuttles • "The best and most comprehensive commercial collection..." Published by MacUser Magazine
People naturally react to these dramatic images. Unlimited reproduction rights on over 100 photographs. Published by Tsunami Press.

50225 CD AllCache.......$44.95  
High performance CD-ROM drive acceleration software. Make your CD-ROM drive unbelievably fast with CD AllCache. Optimizes drive performance—searches, reads and opening of files and folders. Manually adjusts cache sizes or clicks on the button, and the data cache settings will be optimized automatically. Enjoy CD AllCache's Audio DA and listen to your favorite music while you work. Corporate and site licenses available. Published by ClarisMac Engineering.

50420 Cooking to Seduce $27.95  
Enjoy a brand new multimedia experience in cooking and entertaining. Eight evening themes to choose from with tantalizing menus & complete recipes. Print menus, recipes & shopping lists. Before dinner, set the mood by selecting any of the 8 video clips and 40 voice comments on music, movie & gift ideas and listening to a musical background distinctive to each theme. Published by Proconad Inc.

50316 Midnight Stranger* The first CD-ROM to employ Virtual Intimacy  
#50316, $59.95  
Published by Gazelle Technologies

“Meet the stranger of your dreams...You control the plot through first person interaction Over 12 hours of play time 100's of variations Midnight Stranger is an interactive urban experience that features over 60 minutes of digital video, full color photographic environments, original music soundtracks and virtually endless interactivity.

Free Catalog! The Multimedia PioneerSM  
If you don't see the CD-ROM title you want, chances are, we have it! Call for your free color catalog. (Foreign customers send $4 postage & handling)

EDUcorp 1-800-843-9497  
W27

Prices subject to change without notice. Dealer Inquiries Welcome.  
7434 Trade Street • San Diego, CA 92121 • Info 619-536-9999 • FAX 619-536-2345

Circle 157 on readers' service card
Potholes along the Information Superhighway

If this is the highway, I’d rather hitchhike along a country road

FOR ONCE, THE REPUBLICANS have done the right thing. For a few months, because of the Whitewater controversy, we do not have to listen to Bill Clinton and Al Gore talk about the information superhighway. Say what you like about Bob Dole, he does know how to deflect national attention. While Whitewater occupies center stage, I would like to point out several potholes in the information superhighway.

Building What You Want to Use

Pothole #1: The wrong kind of people are trying to build the highway. The inventions that changed the world—such as the telephone, computer, and airplane—were created in the garages and labs of nerdy scientists and engineers, not in investment banks or boardrooms.

Making history and going where no one has gone before were the motivations—not fattening corporate coffers or stroking the (mostly male) egos of businessmen. I once asked Steve Wozniak, the co-founder of Apple, what motivated him to design the Apple I and Apple II. His response: “I tried to build the computer that I wanted to use.” If Apple had begun Macintosh development by merging with Xerox PARC, Microsoft wouldn’t have had anything to copy when MS-DOS ran out of gas.

Pothole #2: Even if the business types were to succeed, do you really want them to? It’s debatable whether there’s enough good programming for today’s 30 or so channels of video—much less for 500. Also, part of the beauty of 30 or so channels is that 30 is a surfeitable number. You can, through serendipity, find something that looks interesting.

How will we do this with 500 channels? It is like trying to find something in 500 files on the desktop by opening them one at a time. Keyword searches won’t work because you’d have to determine in advance the subjects that interest you. How many times have you flipped channels and stopped to watch something you didn’t know you’d be interested in?

Shop until You Drop

Pothole #3: Who says everybody wants to shop at home? A handful of businessmen have decided how Americans—particularly American women—want to shop. The theory is that many consumers are so harried, busy, and yet bored with their lives that they want to flick on the shopping channel and watch Dianne Von Furstenberg show us the latest in gold-plated synthetic garnet earrings.

These businessmen don’t get it, so as a stay-at-home Macintosh househusband, allow me to explain: Shopping is fun. It’s sport. It’s entertainment. People want to get dressed up, jump in a car, go to the mall, push strollers around, eat fast food and ice cream, and shop until they or their baby drops. They want to get out of the house and see other people—not be glued to the lobotomy box watching infomercials.

Big, Cheap, and Slow

Pothole #4: Books won’t die. Part of the information superhighway vision is that books will die, and on-demand video or multimedia CD-ROMs will replace them. Books will never die because they have certain advantages: you can drop them; you can read them in low light; and you don’t need to recharge their batteries or plug them in. Books also have a tactility and heft that a disc, cable, or satellite will not equal.

I’ve yet to see a CD-ROM worth buying—I don’t even have my CD-ROM drive hooked up most of the time, because I need the electrical outlet for important things like a lava lamp. I’ll concede that there are some cool educational CD-ROMs for children, and that CD-ROMs are acceptable for holding large quantities of information like collections of quotations for me to steal from. But in most cases CD-ROMs are nothing more than big, cheap, and slow mass-storage discs.

Also, the information superhighway vision of the dissemination of information is inherently elitist. Let us rue the day that people are forced to rely solely on TV’s or computers to get information. And let us not be stupid enough to think that private enterprise will provide televisions or computers to everyone at the request of the government.

No Shoes

Pothole #5: Long after the mergers, alliances, and acquisitions (and the failures of said mergers, alliances, and acquisitions) are announced, it still comes down to implementation. Here’s a little factoid for you: many parts of Washington, D.C., don’t have cable television, circa 1994, because the various government agencies can’t decide who should get the franchise. Pardon me? The billmaker’s children have no shoes?

GUY KAWASAKI’S views are his own and only sporadically represent those of Macworld. His last book is Hindsight (Beyond Words Publishing, 1994). He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at Kawasaki@radionow.net.
Don't lie to me.
how much is it going to cost me; and, will it look good on my desk? The answers are: Yes; around the same that it will cost you for a 2X; and you’d better believe it.

Our new MultiSpin CD-ROM readers are not only fast but interactive and intuitive to your needs, with control and display features on the front panel that tell you exactly what’s going on (or not going on) at all times. They also have stand-alone audio controls so you can play music CDs without a computer. And there’s a complete line of NEC interfaces, which include easy-to-use installation software. So you won’t spend half your life trying to hook your reader up.

They’re compatible with Macs and PCs, as well as Kodak Multisession Photo CDs. And they come with the longest commitment in the industry – a 2-year limited warranty.

For more information on our new MultiSpin 3X CD-ROM readers, call 1-800-NEC-INFO now. Or, for immediate details via fax, call NEC FastFacts* at 1-800-366-0476, request document #23768.

We’ll answer any questions you may still have about CD-ROM. And (this is the best part) you’ll actually get to have an honest conversation for a change.

NEC

Circle 16 on reader service card
You want the truth? Here it is. NEC's new MultiSpin® 3X CD-ROM readers are the best-performing readers on the market.

Notice, there is no asterisk to qualify that statement. No special connections are required to make our readers run at triple speed. And, you don’t have to have an NEC computer or monitor. (Although it would be nice if you did.)

We were the first to introduce double speed. And now we improved our data transfer rate to 450 Kbytes/sec and made a triple-speed reader. (Because that’s what you wanted.) We also cut our access time to less than 200 milliseconds, added a 256-Kbyte continuous-flow cache, a SCSI 2 interface, and a full 16-bit SCSI card.

OK, so now we’ve done what every true computer ad must do. We’ve filled your head with a long list of numbers and specs. But, what does it all mean?

Well, it means you can get your information three times faster than you can with standard readers, see smoother animation and video.

And then there are the really important questions. Like is our CD-ROM reader easy to use;
Turbo Mouse® 4.0

Program one button as a double-click to open files and programs instantly.

Program another button to avoid holding down the button when dragging objects. Or program a button to slow the cursor down, lock on an axis or send keyboard macros. Our new Brilliant Cursor® technology even allows you to jump to predefined HotSpots onscreen, like the icons in a toolbar or palette.

And Turbo Mouse automatically remembers which application you’re in. So you can program different command combinations for each application.

It all adds up to less repetitive motion. Less wasted energy. Less stress.

Kensington Satisfaction Guarantee
Turbo Mouse 4.0 comes with on screen help, two ADB ports for chaining and is fully System 7 compatible. Our unique Satisfaction Guarantee includes a 5-year warranty, toll-free technical support, and a no risk 60-day trial. For information, call 800-535-4242. Outside the US, 415-572-2700. For information by fax, call and enter 82 and request document #323.

MacUser gave it the coveted Five Mice. The readers of Macworld voted it “Best Input Device” five times. It has won more awards than any Macintosh input device in history.

What makes Turbo Mouse the number one choice in input devices?

Move the ball. Click the buttons. Feel the difference.
Turbo Mouse is more comfortable than an ordinary mouse. Its superior trackball design means less hand and arm movement; you move only the ball, not the entire device.
And it’s more comfortable than an ordinary trackball. A unique combination of hardware and software make the difference.
Turbo Mouse has a large comfortable ball that rests on high-quality stainless steel bearings. The movement is ultrasmooth. Precise.
The buttons are also more comfortable. They are oversized, well-positioned and easy to click. Your fingers don’t have to stretch as much. There is less fatigue after a day’s work.

Program the buttons. Jump to HotSpots. Save unnecessary movements.
The other part of the comfort story is our unique, programmable software. It allows you to automate the functions you use most often.