To get the most out of this box,

Now that you've had the good sense to put a Macintosh in, may we suggest something sensible to put in your Mac: The Microsoft Office. The essential tool set designed to work the way you do.

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

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

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

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

*The Microsoft Office contains software for a single Macintosh or PC workstation version of Mail. Microsoft Mail server software must be purchased separately and installed on a Macintosh workstation on the network. © 1992 Microsoft Corporation. All rights reserved. Mac are registered trademarks of Apple Computer, Inc.*
And Microsoft Mail, the friendly, efficient route for office communications. All four have been thoughtfully designed, with features like outlining in Microsoft Excel and Word, style sheets, shared user dictionaries, mail integration and templates.

Which may explain why each of these applications is a leader in its category. And what’s more, the price for The Microsoft Office has never been better. So now that you have the computer that has everything going for it, get it everything it needs to get going.

For more information, call (800) 541-1261, Department B29. Or stop by your Microsoft reseller today.

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

NEC and Radius have designed a display

Presenting display systems that will be the apple of Macintosh users' eyes. NEC's 15", 17" and 21" MultiSync FG display systems.*

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

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

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

There's also a 72 DPI mode which gives you a WYSIWYG view of your final output. And expanded modes that let you enlarge images and get a closer look at your work.

*C15", C17" and C21" CRTs and 15", 17" and 19" active matrix displays.
*MultiSync is a registered trademark of NEC Technologies, Inc. Apple is a registered trademark of Apple Computer, Inc. Radius is a trademark of Radius Technologies, Inc. NEC is a trademark of NEC Technologies, Inc.
But the best part is, as you change applications, you can switch to any of these modes on the fly. Right from the control panel. You don’t even have to restart the computer.

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

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

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

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

Because ↑ is the way you want to go.
Contents

MACWORLD THE MACINTOSH® MAGAZINE JULY 1992

FEATURES

The Quadra 950 .................................................................................................................................. 148
BY LON POOLE Apple upgrades the Quadra 900 and gives you more for your money.

When Words Aren’t Enough ............................................................................................................. 154
BY DEKE McCLELLAND From slide shows to interactive movies, what you produce with today’s top presentation software is limited only by your imagination.

Black-and-White Monitors ............................................................................................................... 160
BY GALEN GRUMAN Macworld Lab tests 22 portrait and two-page display systems to point you toward the best value in monochrome monitors.

Spreadsheets That Count .................................................................................................................. 168
BY CHARLES SEITER With two new formidable rivals in the Mac spreadsheet arena, can Microsoft Excel still maintain its edge? We put Excel, Lotus 1-2-3, and Claris Resolve through their paces to find out.

From Page to Pixel ............................................................................................................................... 174
BY JIM HEID Macworld Lab evaluates 11 OCR packages to find out which are the fastest and most accurate at text recognition.

Home-Office How-To ......................................................................................................................... 182
BY SAUL D. FELDMAN Wondering how to set up a successful office from your home? We target the many legal, tax, insurance, and personal issues you must face—as well as some useful business products—in order to get your home-based business off and running.
DEPARTMENTS

18 How to Contact Macworld
21 MacBulletin
27 Commentary/Jerry Borrell
   Computer magazines and labs
39 Letters
59 Art Beat
   BY CATHY ABES
63 The Iconoclast
   BY STEVEN LEVY
   Out of memory, out of luck
71 Conspicuous Consumer
   BY DEBORAH BRANSCUM
   Apple’s puzzling PowerBook policy
85 Updates
95 Lab Notes
   BY TIM WARNER
99 Verbatim
   Jim Rea, president of ProVue Development
123 News
   BY DAN LITTMAN AND TOM MORAN
223 The Desktop Critic
   BY DAVID POGUE
227 New Products
241 How To/Quick Tips
   BY LON POOLE
247 How To/Getting Started
   BY JIM HEID
   Spreadsheet techniques
259 How To/Insights
   BY ROBERT C. ECKHARDT
   Word 5.0
265 Where to Buy
328 Best-Sellers

July 1992, Volume 9 Number 7. Macworld (ISSN 0894-9590) is published monthly by Macworld Communications, Inc., 1401 Second St., San Francisco, CA 94122. Subscription rates are $35 per year; $60 for 24 months; and $90 for life. Foreign subscribers must pay in U.S. dollars with additional postage. Add $10 per year for postage to Canada and Mexico subscribers. Add $40 per year for foreign postage to all other countries. Second-class postage paid at San Francisco, California, and at additional mailing offices. Postmaster: Send address changes to Macworld, P.O. Box 14929, Boulder, CO 80301-4929. Editorial and business offices: 1401 Second St., San Francisco, CA 94122. +1/415/293-9900.
In the office or on the road, Dynodex is the premier contacts database for your Macintosh. Whether you're a novice or a power user, Dynodex is the fastest way to manage your contacts. You can keep telephone numbers, addresses, and even up to two pages of notes per entry. Dynodex will also print your double-sided address books, envelopes, labels and Rolodex® cards.

Dyndex works with any organizer. Select a list of key suppliers or anybody in seconds. And you won't need your Mac to get the information you need. Whether you have Day Runner®, Day Timer®, Filofax® or any other personal organizer, Dynodex prints them all, quickly and easily.

Trade up to Dynodex now. If you're using any other program, Dynodex is now only $49. Try it for 30 days and if you don't agree it's the best electronic address book you've ever used, send it back for a full refund. To take advantage of this limited time offer, call (800) 729-DYNO now.

Macintosh editors agree:
"...Dynodex is our clear choice...
"—MacWeek

"Easy to use. Fast. Recommended."
"—Tom Negrino,
MacWorld Magazine

"We give Dynodex the highest score."
"—Steve Bobker, MacUser Magazine

When you go on the road, go with Dynodex.
Fast cars. Bungee jumping. Triple chocolate cheesecake. Seems like all of life's really satisfying stuff comes faced with danger. Or at least cholesterol. • Our drawing program on the other hand, is an exception to the rule. • A peak experience that's actually good for you. • Good how? • Good by coupling up your productivity. With Canvas, you won't need to hop around as you work, passing your piece from program to program to get things done. And you won't find yourself face to face with significant built in compromises, either. Because Canvas puts every tool and effect you'll need for just about any design job together in a single coherent package. It's all there. And it's all good. • How good? • Good enough to generate a slew of rave reviews and positive comparisons with programs costing much more. • And good enough to capture virtually every significant industry award there is - from a MacUser Eddy for Best Drawing Program to a MacWeek Target for Best Business Graphics Program to the Infoloworld Buyers Assurance Seal. • Canvas 3. No fat. No side effects. No shin splints. Just supreme drawing satisfaction.
Introducing 5 New Choices At

**PlusDrive $449**
Add SuperDrive compatibility to your Mac Plus, SE and II with our 3.5" external floppy drive. Reads and writes 400K, 800K, and 1.44Mb disks. Works with DOS Mounter and Apple File Exchange to provide compatibility for 720K and 1.44Mb MS-DOS disks. This top-of-the-line drive is part of our full family of floppy drives for all Macintosh models.

**TransWarp CI $1999**
Blast your IIci past IIx speeds with a TransWarp CI board. Our combination of an ultra-fast 50 MHz 68030 processor and 64K of cache will let your IIci boldly go where no IIci has gone before. Optional 30 MHz floating point math coprocessor gives your IIci high-speed number crunching power. One of many fine accelerator and cache products from Apple's oldest and largest developer.

**QuadraLink DMA $499**
Break through the serial port bottleneck with QuadraLink! Add four serial ports to any Mac II with the QuadraLink and QuadraLink DMA NuBus boards. More ports means no more reaching behind your Mac to unplug one serial device and plug in the next. And maximize QuadraLink performance with ShadowLAN Networking software. ShadowLAN makes your connected serial devices available to any user on the AppleTalk network.
Prices That Are Hard To Lick.

TransWarp 040 $2699
Turbocharge any configuration of your Mac II with our TransWarp 040 NuBus board, the fastest accelerator card anywhere. Powered by an out-of-sight 68040 processor at 25 or 33 MHz, the TransWarp 040 will boost your Mac II to Quadra speeds! Built-in floating point math coprocessor pushes your Mac's calculations up to 10 times faster than before.

DataLink II Express $459
When you need great data and FAX modem products for your Mac, our line of DataLink modems fills the missing link. From external boxes to internal cards, all of our modems are fully Hayes-compatible and operate at 300, 1200 and 2400 baud. The V.42bis Option offers communication rates as high as 9600 baud.

Applied Engineering®
The Apple enhancement experts since 1979
1-800-554-MACS Ext. 211 (6227)
Call for a free product guide
Made
in the USA

Circle 167 on reader service card
"We left some things out of WriteNow 3.0"

—Heidi Roizen, CEO, TNSaker Company

And you'll be happy we did.

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

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

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

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

WriteNow 3.0

NEW VERSION—FEATURES INCLUDE:

Easy & Powerful Paragraphs and Character Styles

System 7 Savvy (32-Bit Addressing, Virtual Memory, etc.),

Microsoft® Word Compatibility (Fast & Full-Saved).

Also PC WordPerfect® & MacWrite II Compatibility.

Robust Print Preview:

- Color Text & Graphics • Column Breaks • Tripple-click Selections

- Variety of New Underline Styles

- Lightning-fast Scrolling Option

- One-button Setting of Document Defaults • Auto-Finding & Auto-Guessing in Spell Checker

- Horizontal Line Graphics

- Unlimited Paragraph Sizes • Largest Dictionary/Thesaurus Combination Available Online Help • Virus Detection • New Documentation

...and much more!

100% MONEY-BACK GUARANTEE!

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

If you are a WriteNow user, upgrade to WriteNow 3.0 for $49.95 ($69.95 after Aug. 30, 1992) - To upgrade, call 1-800/668-2850 Call for special $59.95 upgrade from MS Word, MS Works, MacWrite, or WordPerfect.

MACWORLD

EDITOR-IN-CHIEF

Jerry Borrell

EXECUTIVE EDITOR

Adrian Mello

EDITORIAL

Deborah Branscum

Cheryl England

Senior Editor/Departments

Carol Person

Chippy Carvan

Senior Associate Editor/Features

James A. Martin

Senior Associate Editor/Features

Lisa Weinman

Associate Editor/Departments

Cathy E. Abes

Associate Editor/Features

Galen Grauman

Associate Editor/LA

Mark Hurlow

Associate Editors/News

Dan Littman, Tom Moran

ASSOCIATE EDITOR/FEATURES

Charles Piller

Assistant Editors/News

Marjorie Baer

Assistant Editors/Features

Evan Cooper

Suzanne Courtois

Tim Warner

ASSISTANT TO THE EDITOR-IN-CHIEF

Susan P. Grant-Marsh

CONTRIBUTING EDITORS

Robert C. Eckhardt, Erford Fenton, Rob Hahn, Jim Heid, Dave Kosar, Steven Levy, Joe Mattaunoni, Dale McClelland, Tom Negrinos, David Pogue, Lan Poole, Steve Routh, Charles Seiter, Franklin N. Tessler, Bruce F. Webster

INTERNATIONAL EDITORS

Alan Jones, Australia, 011 61 2 439-5133; Carsten Levin, Denmark, 011 45 36-44-28-00; Jean Cassigne, France, 00113 1904 79 09; Stefan Frevel, Germany, 011 49 803 63 66869; Giulio Ferrari, Italy, 011 39 38011660; Oscar Herra, Japan, 011 81 35-5206-0451; Shin Choo, Korea, 082 2 579-0831; Paul Molenar, Netherlands, 011 31 31 354955; Bristow Stanford, Norway, 011 47 2 647 729; Miro Brozar, Spain, 011 34 1 319-8041; Fredrick Landergren, Sweden, 011 46 8667-9180; Roger Reaillard, Switzerland, 011 91 1 11107; Celal Rezic, Turkey, 0212 508 790; Peter Worlock, United Kingdom, 011 447-831-9522

COPY EDIT AND

EDITORIAL PRODUCTION

Charles Barrett

COPY EDIT OR MANAGING EDITOR

Lori Ann Lewis

ASSISTANT MANAGING EDITOR

Sanford L. Ulrich

ASSISTANT PRODUCTION EDITOR

Jo Ann Villalobos

ASSISTANT TO THE EXECUTIVE "RUIDENT

Terri Edelman

SENIOR EDITOR/LA

Cheryl England

SENIOR ASSOCIATE EDITOR/LA

Heidi Roizen, TNSaker Company

SENIOR CO-EDITOR/FEATURES

Carol Person

SENIOR ASSOCIATE CO-EDITOR/FEATURES

Chippy Carvan

SENIOR ASSOCIATE ASSISTANT TO THE "RUIDENT

Terri Edelman

SENIOR ASSOCIATE ASSISTANT TO THE "RUIDENT

Kim Rae

ASSISTANT TO THE "RUIDENT

Bob Hoffman, Dan McCullough

ASSISTANT TO THE "RUIDENT

Shane McCullough

ASSISTANT TO THE "RUIDENT

Steven LeVay

ASSISTANT TO THE "RUIDENT

Jeffrey A. Stuart

ASSISTANT TO THE "RUIDENT

Tim Warner

ASSISTANT TO THE "RUIDENT

Carolyn Bickford

ASSISTANT TO THE "RUIDENT

Lise Urquhart

ASSISTANT TO THE "RUIDENT "RUIDENT

Liz Dodge

SENIOR COPY EDITOR

Karen Helms

ASSISTANT COPY EDITOR

Marjorie Baer

ASSISTANT COPY EDITOR

Evan Cooper

ASSISTANT COPY EDITOR

Suzanne Courtois

ART AND DESIGN

Dennis McLand

DESIGN DIRECTOR

Joanne Hoffman

ART DIRECTOR

Leslie Barton

SENIOR DESIGNER

Anne Hurry

DESIGNER

Karen Tanaka

ASSOCIATE DESIGNER

Hae Yoon Kim

SENIOR DESIGN ASSOCIATE

Matthew C. Nischen

DESIGN ASSOCIATE

Tim Johnson

MARTHA KATT

EVENTS AND CONFERENCES

Sandy Butler

EVENTS MANAGER

Donna Deschel

EVENTS ADMINISTRATIVE ASSISTANT

JULY 1992 MACWORLD

10 Circle 174 on reader service card
When we introduced our first desktop scanner, we set a standard by which all others are judged. Now, with the Nikon LS-3510AF, we've managed to set an even higher standard by bringing you a better, faster 35mm scanner. For less.

**Better control.** First we improved color scanning capability. The LS-3510AF offers you the option of either standard 8-bit or true 12-bit scanning for even greater color resolution.

Next, we added Autofocus which automatically provides the sharpest image for each scan regardless of the type of mount used. The scanner also adapts to a wider range of film processing variables and "learns" about each manufacturer's film as it's first scanned. Then it automatically corrects for gamma and color balance and stores all that information in its memory. A feature available only from Nikon.

**Faster scans.** With the LS-3510AF, you can complete an 8.3MB (2048 x 1365 pixels) scan suitable for full page, 133 line screen reproduction including Autofocus and other corrections in under 110 seconds.

**New SCSI Interface.** A SCSI interface is now available for direct connection to a variety of desktop computers and workstations.

**Automatic Operation.** For high volume scanning requiring unattended operation, an optional Auto-feeder is available. It can scan up to 300 slides unattended.

---

**Lower price.** Faster scanning. Optional 12-bit operation. Your choice of GPIB or SCSI interfaces. A complete selection of film holders including ones for free-rotation and strip film. At a lower price, Nikon. Our standards are hard to beat.

For more information, write or call: Nikon Electronic Imaging, Dept. B2, 101 Cleveland Avenue, Bayshore, NY 11706. (516) 547-4355. Or call 1-800-52-NIKON for the nearest dealer.

**THE LS-3510AF SCANNER.**

**A HIGHER STANDARD OF QUALITY, SPEED AND ECONOMY.**

---

**Nikon**

**ELECTRONIC IMAGING**

---

PhotoStyler, Windows, Photoshop, ColorStudio, Macintosh are trademarks of their respective companies ©1991 Nikon, Inc.
Presenting New CA-Cricket Draw III.

Friends, artists, Mac users...lend me your ears.
The world's hottest, most affordable drawing software has arrived: New CA-Cricket*® Draw III.*
*MacWorld* called it "the reincarnation of the year." And for good reason.
We've packed CA-Cricket Draw III with today's most powerful features. Eleven Bezier-based, object-oriented drawing tools. Floating color windows that allow you to select from RGB, HLS, CMYB & grayscale color models. A dazzling new fountain fill tool. Masking and hole-cutting capabilities. A ruler-based text processor. Plus the ability to import PICT, EPSF, Scrapbook and MacPaint files.

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

Dial 1-800 CALL CAI today for your free CA-Cricket Draw III Demo Disk.

But you'd better hurry. Because they're gogging like crazy.

© Computer Associates International, Inc., One Computer Associates Plaza, Islandia, NY 11788-7000. All product names referenced herein are trademarks of their respective companies.

Circle 10 on reader service card
A BREAK FOR INDEX FINGERS EVERYWHERE.

Even while running System 7, your forefinger gets a real workout.

OnCueill™ lets you manage the work you do on a Macintosh® running System 6 or System 7 the way you want to rather than the way you’ve had to.

You’ll click less and do more.

Find, duplicate, delete, and search for files without returning to the Finder. Launch groups of applications and files with a single click or keystroke. Open files created by applications not installed on your system. Track and launch up to 100 recently opened files. Group and order all your system extensions. Retrieve, display, and launch files from any drive by name, type, date, size, creator, or any set of search criteria.

We call OnCueill the personal file and application manager for the Macintosh.

You’ll think of it as a major jolt of productivity to help you get things done better quicker.

Get your cursor on it. Call us now at 1-800-234-4750 extension 400.
How are you organized? How does it work? How is it done? Flowcharts provide the best answers to important questions like these. And the highest-rated solution (5 Mice - MacUser) for fast, clear flowcharts is MacFlow.

Use MacFlow to produce top-quality charts and diagrams without tedious drawing. Why waste hours drawing a chart with a draw program when you can develop your chart up to ten times faster with MacFlow? Graphically organize complex programs, projects, and structures—fast...

Simply drag predrawn symbols onto a page and connect with lines. Place text in symbols and lines, and even include your own custom symbols. Change the chart as desired; lines stretch and stay attached. Create stand-alone flowcharts that can be freely distributed. MacFlow is also System 7-savvy, letting you publish your charts. Translate to/from text, Acta, and MORE outliners.

Get MacFlow today for better charts tomorrow.

When will it happen? When is break-even? How much will it cost? Gantt chart schedules with integrated financial data provide the best answers to important questions like these. And the best solution for fast, clear project schedules is MacSchedule.

Use MacSchedule to plan projects and keep them on track and within budget. MacSchedule automatically creates and manages a project calendar. Just specify tasks and indicate task timing with the mouse. Status tracking is also as easy as a click of the mouse.

Integrated spreadsheet and graphing capability ties data to schedule tasks. Include budget and manpower requirements and project trends. Automatically develop calendarized cost estimates and cost/schedule variance with the Earned Value Analysis feature in MacSchedule PLUS. Place schedules in documents for proposals and reports or create slides, overheads, and wallcharts.

Get MacSchedule today for better schedules tomorrow.

For a free demo disk and catalog, phone, write, or fax Mainstay today.
Now you can get out of trouble before you get into it.
Owning most utility software packages is like belonging to the Auto Club.
If your system crashes, or if you have an accident with your data, they can come to your rescue.

It doesn't take an MIS type to appreciate what Public Utilities can mean in higher productivity and lower support costs. But if you are an MIS type, you'll be delighted to know that, in addition to protecting your people from disaster, Public Utilities reminds them to do prudent things like perform regular backups, update their passwords and optimize their hard disks.

But before you get back up and running, you have to spend a lot of time waiting by the side of the road. Which is why Public Utilities, the ingenious new package from the creators of Suitcase, is the utility every Macintosh owner has been waiting for.

Instead of getting you back up and running, Public Utilities concentrates on keeping you up and running, How?

By automatically finding and fixing potential disk and data corruption problems before they leave you stranded.

Every half hour (more often if you're cautious, less often if you're a daredevil) Public Utilities performs a detailed diagnostic scan of your disk.

If anything is amiss, it politely lets you know and prompts you to run the appropriate repair program.

All you have to do is point, click and carry on with whatever you were doing.

(You may also gasp, sigh, and pat yourself on the back for ordering Public Utilities as soon as you heard about it.)

It even launches the requisite software for them, at a stroke.

(If the requisite software doesn't happen to be a Fifth Generation product, Public Utilities will launch it anyway.)

Of course, even Public Utilities can't prevent people from deleting their files or reformatting their hard disks. But it can bail them out of more difficult situations than any other utility software.

And unlike other programs, it won't let them get into difficult situations.

That's because we left out Sector Editors and other such high end, high risk things. And put in plenty of on-line HELP.

Naturally, we made it System 7 savvy, so you can utilize such helpful features as virtual memory and Apple Events.

There's more. So pick up the phone, Call 1-800-477-8212. We'll tell you about our vaunted 24-hour toll-free customer support.

Which is what you use to get out of trouble after you get into it.
Introducing MINICAD+ 4

4 Major Areas of CAD Power

2D CAD: With MiniCad+, the original award-winning CAD program, you’ve drafted the price/performance leader in Macintosh CAD. Hundreds of advanced, easy-to-use tools make superior-quality drawing a snap.

3D CAD: Create stunning, high-precision models directly in true 3D or auto-create from your 2D drawings. A tightly linked 2D/3D interface makes MiniCad+ a modeller of choice. Export 3D files for high-end rendering in Stratavision™.

Programmable CAD: Why be limited by parameters? Over 300 powerful graphics and database routines extend MiniCad+ for the advanced user.

Database CAD: Let MiniCad+ become your specialized cost estimator by using it to price out projects, create area tables, track manufacturers, create a bill of materials etc., without leaving the drawing area.

New Features in MiniCad+ 4: Interactive 2D/3D, intelligent wall, floor and roof tools, walkthroughs, flyovers. Display objects in multiple views simultaneously. 3D SmartCursor™, auto-creation of 3D models from 2D (hot-linked!), tolerancing, definable dash types, full front plane clipping, “cut” tool, cavalier and cabinet projections, automatic section generation and hybrid symbols. New mode/message bar plus other enhancements make this the easiest-to-use MiniCad+ ever.

Graphsoft
8370 Court Ave.
Ellicott City Md. 21043
410-461-9345 Fax 410-461-9345

$795
Demo $19
30 Day Money Back Guarantee

Buy MiniCad+ 3 NOW........Receive a FREE Upgrade to MiniCad+ 4
The trouble with most 24-bit color products is that they do the job exactly as their name implies, bit by bit by bit.

Fortunately, Radius has introduced the PrecisionColor 24X™ and Rocket 25i™ combination. Together they blow away existing standards. Individually they stand apart as well. For instance, the Rocket 25i eliminates your system's performance bottleneck. Its 040 CPU allows you to whip along at speeds up to six times faster than your current Mac II.* Which means overall performance increases on all your applications — not just graphics.

But when the job does call for graphics performance, the PrecisionColor 24X delivers. 16.7 million colors, on-board QuickDraw acceleration and multiple resolutions including WYSIWYG and two page mode.

Put the two together and start flying through your graphics applications — all for a special bundled price of $2,999.

Please call 1-800-227-2795. Or 1-800-966-7360 for immediate faxed information. We'll get your performance up to speed. At prices that are down to earth.
DI
NO 1 Year (12 issues) for $24.
That's a savings of 49% off the annual newsstand price of $47.40.
With this coupon I'll save a total of $23.40.

□ 2 Years (24 issues) for $39.97.

□ Bill Me later!

NAME

COMPANY

ADDRESS

CITY, STATE, ZIP

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

MACWORLD

DISCOUNT COUPON

Save 49%
BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 1167 BOULDER, CO
POSTAGE WILL BE PAID BY ADDRESSEE

MACWORLD
Subscription Department
P.O. Box 51666
Boulder, CO 80321-1666
Disappearing Folders Found: A problem with System 7 that sometimes causes folders to disappear is fixed in System 7 Tune-Up version 1.1, according to Apple.

Apple dropped prices by about 25 percent for the PowerBook 100 2/20 (with 2MB of RAM and a 20MB hard drive), to $1499, and by about 8 percent for the PowerBook 100 4/40, to $2199. Apple also cut the prices of the PowerBook 140 2/40 and PowerBook 140 4/40 by $500, to $2699 and $2999, respectively. The company added these new models: the $2999 PowerBook 140 2/80, the $3299 PowerBook 140 4/80, the $4299 PowerBook 170 2/80, the $4299 PowerBook 170 4/40, and the $4599 PowerBook 170 4/80.

Problems with early CorrectPrints caused RasterOps to send out PROM board upgrades to the color-calibrating printer. The first 100 or so CorrectPrint models lacked the promised JPEG compression, the company confirmed. RasterOps (408/562-4200) said the version 1.1 PROM fixes that and several other problems.

The Color Pivot/LE from Radius (408/434-1010) is a lower-cost version of the company's Color Pivot monitor, which swivels from portrait mode to landscape display. The Color Pivot/LE lists for $1199 versus $1549 for the Color Pivot, but the LE requires an adapter board while the original works with the built-in video on some Macs.

New tires and Macintoshes are now both available from some Sears stores. In a major move into consumer retail channels, Apple has authorized The Office Center at Sears to sell the Macintosh Classic II, LC II, Ilisi, and PowerBook 140, all bundled with an Apple modem and ClarisWorks.

Olduvai Revs OCR, MultiClip: Olduvai (305/665-4665) is upgrading Read-It Pro to 4.0, with batch processing capability, a multilingual spelling checker, and a window for suspected mistakes. It lists for $595, including one spelling dictionary. An upgrade to the $149 Clipboard enhancement MultiClip supports more applications (including Illustrator) and file formats (including EPS) and can add comments to clips and sort them.

Excel Analyzes Stocks: Spreadware (619/347-2365) is shipping Push-Button Market Analysis (PBMA). PBMA provides securities-analysis tools inside Excel 3.0 or 4.0, including stochastics, relative-strength charts, and candlestick charts. PBMA lists for $99 and will increase to $189 in July.

Bargain Word Processor: The second product in Softsync's (305/444-0080) sub-$50 line is ExpertWriter ($49.95), a RAM-conservative word processor that includes an address book and an envelope-printer utility that can do bar codes.

MacDraw Pro 1.5 from Claris (408/727-8227) adds support for tabs in text blocks; Apple events to control MacDraw from other applications; embedded QuickTime movies; and faster screen redraw. Its price remains $399.

MapInfo's Data Access: MapInfo's (518/274-6000) ArcLink is a $595 add-on to MapInfo that permits users to access data from Environmental Systems Research Institute's Arc/Info, use the data in MapInfo, and return modified data to the Arc/Info host.
It'll remind you bought a Macintosh

When you take one look at this Lotus® spreadsheet, it will all come back to you.

All those feelings of power and control that surfaced when you first sat down in front of a Mac.® You were feeling rather impressed with yourself because now you could operate something as complicated and mysterious as a computer.

With 1-2-3® for Macintosh®, you'll experience this same feeling of accomplishment. That's because 1-2-3 for Macintosh takes full advantage of the friendly Macintosh environment. And all those funny looking icons that go with it.

For example, you'll find our graphing tools embarrassingly easy to use. With just a point and a click of your mouse, you can preview, create and change all graphs. And the icon palette offers you every type of graph imaginable—3-D pie charts, bar charts, area and scatter graphs—literally hundreds of variations are available to you in an array of colors.

You probably first bought your Macintosh because it would make life easier for you. You'll buy this spreadsheet for the same reason. You see, 1-2-3 for
Macintosh is the only Mac spreadsheet to provide true 3-D technology so you can link files and consolidate data or create multi-page reports all in a single worksheet file. You can view and work with up to 256 worksheets simultaneously. In short, 3-D makes the job of analyzing and organizing your work fast and easy.

1-2-3 for Macintosh also offers in-cell editing, a feature that lets you edit text, formulas and data directly in the cell. So you can focus on the worksheet, instead of the formula bar above. Makes sense, doesn't it?

Because the program captures the true spirit of Macintosh, it has recently earned the Editor's Choice Award from Computer Reseller News as well as praise from Apple Chairman and CEO John Sculley, who has called it, "a spectacular product." (He doesn't throw comments like that around every day.)

So pick up a copy of 1-2-3 for Macintosh from your favorite dealer. Or call 1-800-TRADEUP, ext. 6886 for a free working model. (Excel users, be sure to ask about our special upgrade price.)

1-2-3 for Macintosh. It'll bring back fond memories.

Lotus 1-2-3 for Macintosh

For information on registering for LotusWorld '92, please call 1-800-524-1857.
You haven’t had this much back and forth since...

cc:Mail for Macintosh, Version 2.0 is out. Pass it on.

Whether you use the new cc:Mail™ to deliver praise or disapproval, sales reports or sandwich orders for that big luncheon, you’ll find it as enjoyable and fun to use as the Macintosh itself. cc:Mail for Macintosh Version 2.0 looks, feels and performs like a Macintosh.
So it's easy and, yes, fun to learn. Everything you need is right before your eyes. You just click on mail icons to check your in box, prepare messages, store messages, or fire off that memo to the powers that be. And you can send and receive text, files, faxes, QuickTime videos and voice annotations. It also supports System 7 and all its capabilities, including Balloon Help, QuickTime, and AppleEvents.

Of course, all this simplicity doesn't mean cc:Mail for Macintosh isn't powerful. On the contrary, it lets you exchange messages with nearly every electronic mail system in the world. You can send messages effortlessly across all major platforms—Windows™, UNIX®, DOS, and 0S/2®. And if your company were to grow from 5 people to 500,000 people overnight, cc:Mail's scalable architecture could accommodate such growth.

Like to save time preparing messages? With cc:Mail, simply type in a person's name. There's no need to know their address. What's more, with one click, you can instantly open an attached file, even if it was created in a DOS application.*

Setting up and maintaining e-mail systems is often a chore. But not with cc:Mail. It offers an impressive set of administration tools, such as Automatic Directory Exchange, a product that automatically collects any changes in the directory and updates the entire network. cc:Mail also expedites the not-so-fun task of finding messages, thanks to a new Message Finder utility. And it lets you search for messages according to subject, text, address, date, size, priority or item.

So for a free demo disk of the cc:Mail for Macintosh Platform Pack, call 1-800-448-2500.

cc:Mail. It makes passing a note to someone as much fun now as it was back then.
You Can’t Buy A Better Surge Protector Than Curtis
 Guaranteed Protection—Proven Performance

When it comes to protecting their valuable data and electronic equipment, more computer users rely on Curtis surge suppressors than any other brand. Here’s why:

UL 1449 TVSS Lowest Voltage Ratings—Every Curtis surge protector has achieved a rating of 400 volts peak or less—the lowest ratings available—in tests by Underwriters Laboratories for maximum let-through voltage.

Greater Selection—
Single or multiple outlets, switched or unswitched, remote control, EMI-RFI filtering, phone line.

UL Standard 1449 TVSS tests the maximum voltage that can pass through a surge suppressor after clamping has occurred.

<table>
<thead>
<tr>
<th>Lowest Ratings</th>
<th>330</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>800</th>
<th>1000</th>
<th>1200</th>
<th>1500</th>
<th>2000</th>
<th>2500</th>
<th>3000</th>
<th>4000</th>
<th>5000</th>
</tr>
</thead>
</table>
| Curtis Surge Protectors are rated at 330 or 400 Volts Peak the lowest ratings available.

Curtis products are available worldwide.
For your FREE “Surge and the new UL 1449 Standard” brochure, call (800) 548-4900 Ext. 42

© Curtis Manufacturing Company, Inc.
30 Fitzgerald Drive, Jaffrey, NH 03452-1931

*Surge protectors are not lightning arrestors and cannot be guaranteed to protect against direct hits.
Product Testing and Late Nights at the Lab: Part 1

BY JERRY BORRELL

It's a scene from Casablanca. We're in San Francisco. It's late. Mist is swirling outside the windows. All the guys wandering about the hallways need a shave. The corridors are dimly lit. Stacks of boxes and crates extend upward to the ceiling. The power just went out in part of our building, so racks of products are being moved elsewhere. On second thought, it's a little like a science fiction film. The workers are muttering aboutamps, and densitometers, and luminance. Did I mention it's late?

Mark Harlow, Tim Warner, and Danny Lee of the lab are all looking the worse for wear. When I ask about the thick power cables snaking around the corridors, they respond to the effect that the circuit breakers, which are inaccessible after hours, were automatically thrown off when they plugged in something too many in addition to the 20-plus color monitors that they're in the process of testing. This in a building where we spent over $50,000 for power-conditioning equipment. Huge racks of 19-inch displays are being wheeled around the offices toward power outlets. It's getting real late.

Third-World Wharves and Late Nights

Welcome to the world of product testing at a modern-day computer magazine. In 1991 we tested more than 850 products in the laboratory here at Macworld. Last year we averaged one feature article that included lab testing per issue. This year we're averaging two, but some issues have three because of Apple product announcements. In 1992 we're likely to test more than 1200 products.

We believe in the testing that we do, that it's valuable to you in a market with thousands of products. (The numbers I am referring to here are the products covered in our feature articles. We also write single-product reviews, more single-product reviews than any other Mac publication. We're now beginning to add lab tests to those reviews.)

We produce two different lab-test-based features in each issue because we want to provide all of our readers with something of interest in each issue. To accomplish that goal, we must cover a broader mix of features and reviews than one category would allow. And in the process of this coverage, the issues we confront are multiple and complex. Because Macworld is at a turning point in its lab testing, I am soliciting your viewpoint. In an upcoming issue we'll print a special section of your letters on the topic to reflect your opinions. Please read on, and then write in.

Why Do We Test Products?
The primary question is why Macworld should test products. Macworld was the first Mac magazine to run benchmarks on Mac products, beginning with the October 1985 article on hard drives. While we have consistently worked to better our product testing, we don't tend to market our results. Instead, we work behind the scenes to build our knowledge and to identify the best products for readers. And that is the reason why we have felt for the last seven years that we should be testing products: to help you by providing objective, timely information on what products you should buy.

Computer magazines have hardly broken any ground on this issue; car magazines have been testing products for what, four decades? Stereo magazines and photography magazines also have a history of product testing. But what is the role of computer magazines in product testing? This is a question I hope you'll help us answer.

What Products Do We Test?
The first issue in testing is the decision about what products to test, and the scope of the products selected for testing. Software applications are most often evaluated outside the lab by our editors and authors, but that may change in the future. Hardware products are the primary focus of Macworld Lab, and they tend to fall naturally into several product categories, with the Macintosh itself being the most obvious one. When a new computer is announced by Apple, you want to know whether it's in some way faster or better than its predecessor and whether it has revolutionary new features or is simply an evolutionary development.

And especially whether a new Macintosh can run the software that you own without crashing.

Next on the list of products, in terms of reader interest, are the most-often-purchased peripherals for the Macintosh: hard drives, monitors, video boards, and printers. Other categories of hardware products have grown in importance over the years, including accelerators, networking products, fax modems, film recorders, and scanners.

As the Mac has matured, the originally narrow product areas have broadened and developed into subcategories that we believe are worth testing. Printers, for example, can be divided in several ways: by price (personal versus office/high-speed devices); by technology (laser, color thermal, ink-jet, and dye sublimation); and by performance categories (such as imagesetters).

The primary benefit of testing subcategories is that it allows Macworld to explore technology in greater depth. For example, we can focus on how new products in the color printer category (such as printers that use dye sublimation) or in optical media (such as CD ROM players or erasable optical drives) work. Subdivisions are useful to both the product-testing staff in the lab and to readers, who learn about technology, performance, and value.

How Do We Decide When to Test?
To cover the latest product announcements, we sometimes schedule feature stories to coincide with major trade shows where many new products are announced. The editors also work with manuscripts.
facturers to test the latest products for every lab feature. Typically we schedule lab testing for a feature six months to one year in advance.

Occasionally we push ahead or delay an article to coincide with the announcement of a new version of an important product or a technology several developers are implementing. We do it rarely, and then only in an attempt to serve the readers. But sometimes product developers attempt to use this to their best advantage. The worst problem with this is the delayed-product-shipment syndrome. Some developers prematurely announce a product to editors intentionally, in the hope of buying time until they can come up with a better product than a competitor. Others preannouncer unintentionally; that is, their product development staffs have scheduled unrealistic shipment deadlines. In either case our staff, other developers, and readers suffer whenever products fail to ship on time.

In some product categories it makes sense to schedule an article when a new technology becomes available from several vendors. Hard drives are a good example. At roughly the same time, new generations of technology (higher-capacity mechanisms in smaller form factors) are made available to Macintosh developers who then release new product families based on the new technology. So it is sometimes sensible to wait for such a category to arrive so we can test a full range of products.

**Who Should Do the Testing?**

Ideally there would be third parties out there who would test computer products, and computer magazines could focus on issues other than processing hundreds of products through quality testing. Several years ago both Apple and Macworld worked with another independent testing group, the National Software Testing Lab, in an effort to push NSTL toward producing regular product tests. Over the past two years NSTL has, in fact, produced more tests of Macintosh products than in the past, but still far too few. And its results, because of the high cost of testing, are typically sold to corporations rather than published in magazines.

Over the last five years Macworld has slowly built a staff and facilities for testing products, following in the footsteps of many other magazines on the DOS side. But the conundrum remains. What should a computer magazine be responsible for? How much testing should be done? What products should be tested? What kinds of tests should be performed? How should the results of tests be represented? What tests yield results that are valid or useful to the reader?

**Are Car Magazines a Role Model?**

The examples that we most often hear about from developers are the car magazines. An estimated 200 new car models are introduced into the U.S. market every year (not counting trucks or specialized vehicles). Compare that with the 850-odd products we tested last year. We often wonder aloud how to perform the kind of long-term testing that seems so valuable in car magazines. You know—drive an automobile for a year, keep a record of all service and repair, resettle it after running it for 20,000 miles and see how it stands up. For cars costing $10,000 to $20,000, that's really worthwhile. But how does that relate to a product category such as hard drives—a category in which $1500 is a high price and in which there are hundreds of products to test. A category in which the products tested now are replaced by a new generation of products in 12 to 18 months.

Moreover, car tests are relatively straightforward and unchanging, made up of acceleration, braking distance, fuel continues
Mirror's Got A Large Menu
For Those Who Are
Watching Their Figures.

COLOR DISPLAYS

14-inch Color Display $399*
16-inch Color Display $599*
16-inch Trinitron® Display $1,199*
20-inch ProView V $1,799
20-inch ProView (Trinitron) $2,499
6-inch Trinitron® Display $1,199*

MONOCHROME DISPLAYS

From our value priced 15-inch portrait displays to our stunning 21-inch two-page display, every Mirror monochrome display offers superb sharpness, ergonomic design and excellent performance. Matching Mirror video cards are available for most Macintosh models.

15-inch Analog Portrait Display $449* $99
15-inch Standard Portrait Display $599
19-inch Two-page Display $799
21-inch Two-page Display $799* $999

STORAGE

All Mirror drives feature rugged steel enclosures, high-grade power supplies, external push-button SCSI address switch, switched convenience outlets, and external termination.

<table>
<thead>
<tr>
<th>Size</th>
<th>Int.</th>
<th>Ext.</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 MB</td>
<td>$269</td>
<td>$299</td>
</tr>
<tr>
<td>50 MB (Q)</td>
<td>$279</td>
<td>$339</td>
</tr>
<tr>
<td>120 MB (Q)</td>
<td>$419</td>
<td>$479</td>
</tr>
<tr>
<td>120 MB (Q)</td>
<td>$469</td>
<td>$529</td>
</tr>
<tr>
<td>210 MB (Q)</td>
<td>$589</td>
<td>$739</td>
</tr>
<tr>
<td>240 MB (Q)</td>
<td>$739</td>
<td>$799</td>
</tr>
<tr>
<td>330 MB</td>
<td>$1,139</td>
<td>$1,199</td>
</tr>
<tr>
<td>425 MB</td>
<td>$1,339</td>
<td>$1,399</td>
</tr>
<tr>
<td>495 MB</td>
<td>$1,399</td>
<td>$1,399</td>
</tr>
<tr>
<td>1 GB</td>
<td>N/A</td>
<td>$2,099</td>
</tr>
<tr>
<td>45 MB Portable</td>
<td>$299</td>
<td></td>
</tr>
<tr>
<td>128 MB Optical Drive</td>
<td>$449</td>
<td></td>
</tr>
<tr>
<td>128 MB Cartridge</td>
<td>$599</td>
<td></td>
</tr>
<tr>
<td>600 MB Optical Drive</td>
<td>$2,299</td>
<td></td>
</tr>
<tr>
<td>64 MB SyQuest Drive</td>
<td>$479</td>
<td></td>
</tr>
<tr>
<td>88 MB SyQuest Drive</td>
<td>$629</td>
<td></td>
</tr>
<tr>
<td>DAT Drive</td>
<td>$1,499</td>
<td>$1,499</td>
</tr>
<tr>
<td>CD-ROM Drive</td>
<td>$599</td>
<td></td>
</tr>
<tr>
<td>Mirror CD Information Library (with drive purchase)</td>
<td>$189</td>
<td></td>
</tr>
</tbody>
</table>

COLOR SCANNER

Mirror's top-rated 600 Color Scanner offers true 600 dpi scanning resolution, 24-bit color and a great price. Comes complete with Adobe Photoshop 2.0.

MB $1,199

LASER PRINTERS

MirrorImage Laser Printers feature PostScript Level 2, RISC processors, 35 built-in Adobe fonts, three interface ports, a SCSI port for adding a font drive, and an installation videotape.

The MirrorImage 309 is a 300 dpi, 9 page-per-minute printer for letter or legal size paper. Includes 2 MB of RAM (upgradable to 10 MB).

$1,699

The MirrorImage 415 is the smallest tabloid size laser printer available. It offers true 400 dpi printing and a heavy duty 15 page-per-minute print engine. Includes both an 11"x17" and an 8.5"x11" paper tray, and 4 MB of RAM (upgradable to 16MB).

$4,499

NEW Product

1-800-654-5294
ORDER DIRECT
MIDIA1015

MIRROR

Technical Support Hotline: (612) 633-2105 Telephone: (612) 633-4450 Fax: (612) 633-3136 Address: 2644 Patton Road, Roseville, MN 55113

All prices subject to change. Prices are quoted F.O.B. origin. *For built-in video ports. ® Trinitron is a registered trademark of Sony Corporation.

Circle 234 on reader service card
economy, and heaps of statistics. OK, we can add the list of testing done by Consumer Reports: starting/running, transmission, routine handling, emergency braking, ride, noise, driving position, and so on. Maybe it’s not so simple. But these tests apply year after year, and all the cars have brakes, engines, and other features that don’t vary in terms of their technology—at least not relative to the breadth of technology that Macworld must understand and test. We may jump from covering complex networking technology to hard drive heads to print mechanisms over a one-month period.

Then there are the practical problems. How could we keep the several hundred drives we tested last year running throughout the year? We would have to build a separate facility. We would have to implement test suites to simulate normal use over a long period of time. Information already provided by most drive manufacturers in their MTBF (mean time between failure) statistics. Drive technology is changing so quickly that by the time we published the results of our year-long tests, some products would no longer be on the market. And you probably wouldn’t want to buy them anyway because newer drives with better performance for less money would be available.

As much as we would like to do long-term testing, we simply can’t justify it for our market of fast-changing hard drives, most of which cost under $1000. And that’s only one product category. How about long-term testing of, say, scanners? Opening and closing a lid, running a scan. Or printing to test duty cycles. And of course we would have to purchase all these products so we could keep them for long periods of time, something not even vaguely possible in the economic model of publishing that we operate under. So we don’t run long-term tests.

Why Do We Collect Feature Information?
WE COLLECT AND PUBLISH SPECIFICATION information about products. In the past, we, like other computer magazines, have sometimes been guilty of overemphasizing less-important aspects of hardware and software. Describing the sizes of hard drives cases, for example. On the one hand, some corporate buyers use the feature charts that we publish to determine whether a product meets with their purchase requirements. On the other hand, producing charts tends to force developers with no tick mark in certain categories to add those features—expending precious resources developing features they may not believe are useful to their customers. Still, some of you would be angry if you could not find a succinct table of desktop publishing software features so you could compare two products you are considering for purchase. At the same time, we recognize that more features do not necessarily equate with better products.

We are attempting to de-emphasize the measurement/feature charts and to more heavily emphasize issues such as warranty, technical support, and price for value, in an effort to reward developers who stick with their products once they leave dealers’ or mail-order vendors’ shelves. So we have dropped the case measurements from hard drive feature charts, but have kept sound measurements and performance tests. And we’ve begun to more assiduously collect information about tech support, upgrades, and warranties. We’re attempting to replace the vast feature charts with narrative summaries of products’ strengths, and with recommendations for what products are appropriate for which applications or users.

So What Do You Think? WRITE IN. ARE WE HEADED IN THE right direction? Let us know your thoughts. And please tune in next month for Part 2.

Small business accounting for those who don’t plan to stay that way.

MultiLedger is the small business accounting package for those who think on a slightly grander scale. Yes, it contains all of the major accounting functions (General Ledger, A/R, A/P, and Inventory) plus many management reports in one integrated program. And as one major magazine wrote, "It’s the most elegant, usable, and Mac-like of all the packages."

But that, as they say, is only the beginning. You may want to manage multiple departments. Or add a Payroll.

With MultiLedger, growth is built directly into the plans.

One more thing. MultiLedger is also the only package of its kind with a multiuser version available, for that moment when business goes so well that you actually need more than one person doing the books.

Call us now at (800) 444-9922 for a free demo disk.
We’re proud of our reputation.

"...I’m now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie...”
MacWeek, February 1991

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

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

The La Cie tradition of pride.

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

To order or for more information, call toll-free 800-999-0143
6 a.m.-6 p.m. PST Mon.-Fri.
International 503-520-9000 Fax 503-520-9100
When size really counts.
As a Quantum Company, La Cie offers customers the advantages of $489 million in assets. Deep-pockets R&D. State-of-the-art technology. Superior value. And, the assurance of long-term support. Yet for all our size, La Cie's smallest achievements still make our biggest headlines.

Introducing the PocketDrive™
Portability in the palm of your hand.
Pack it in your pocket, purse or briefcase. La Cie's new 40MB and 80MB power-packed PocketDrives offer ounces of convenience, not pounds. Using Quantum's new 2 1/2" drive, the PocketDrive offers 19ms seek time, whisper-quiet operation and La Cie's exclusive switchable termination and SCSI ID.

Introducing La Cie's new 120MB PocketDrive!

Desktop docking.
La Cie's PocketDrive eliminates the hassle of fumbling with cables at the back of your Macintosh every time you connect or disconnect the drive. Instead, the PocketDrive comes with a unique PocketDock™ desktop docking cable that lets you plug in the PocketDrive in seconds. With a second PocketDock (only $99), you can have fast and easy connection at work and at home. There's even a miniature T-connector (only $39) for connecting to other Macintosh systems.

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

La Cie 40MB PocketDrive
$499

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. La Cie Ltd., all rights reserved, printed in U.S.A. © Copyright 1992, 8700 SW creekside Place, Beaverton, OR 97006. Phone: (503) 370-9000, Fax: (503) 370-9109.
of our size.

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

Space consciousness.
Smaller, faster and less expensive than conventional optical drives, La Cie's Cirrus Optical uses cartridges that are the same size as 3.5" floppy disks, but store eighty-eight times more data than high-density floppy disks. Engineered to fit within our space-saving, award-winning Cirrus case, the Cirrus Optical offers the reliability of optical media, 45ms seek times and the economy of removable cartridges.

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

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

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

La Cie Cirrus Optical Drive

$1699 with cartridge

To order or for more information, call toll-free 800-999-0143
6 a.m.-6 p.m. PST Mon.-Fri.
International 503-520-9000 Fax 503-520-9100
The drive to satisfy.

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

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

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

Internals. Space savers. Portables.

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

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

Drive the La Cie Express.™

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

ExpressDrive from

$Call

La Cie hard drives from

$239

Price does not include shipping. Add 5% exchange for American Express. Add sales tax where applicable. La Cie is a trade mark of La Cie Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All specifications, terms, descriptions, products and services herein are subject to change without notice or review. La Cie Ltd., all rights reserved, printed in U.S.A. © Copyright 1991. 6700 SW Creekside Place, Beaverton, OR 97005. Phone (503) 520-9000, Fax (503) 520-9130.
of our drive.

Economical, versatile, ideal for archival backup, La Cie's comprehensive line of removable media options includes:
- Removable cartridge drives
- ExpressDrive
- 3 1/2" & 5 1/4" magneto opticals
- CD ROM

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

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

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

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

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

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

Tape drives from $649

To order or for more information, call toll-free
800-999-0143
6 a.m.-6 p.m. PST Mon.-Fri.
International 503-520-9000 Fax 503-520-9100
Image is everything.
We believe quality is a priority. Our image as a company that produces quality products is well known. We’re so confident in the quality of our scanner image that we are willing to compare it to other scanners right here. Compare for yourself.

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

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

Lay it on the line.
When comparing line art, the Silverscanner really shines! At 1200 dpi you get what amounts to an electronic stat. The comparison is incomplete, however, because some scanners don’t have hi-res capability (too bad). But even if you compare at 400 or 600 dpi, it’s clear how much better the Silverscanner is, especially bundled with Color It!
Software to die for!
We're proud of our image when it comes to quality software, too. La Cie has always had a reputation for powerful, well-written software. La Cie's exclusive plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance, ImageStudio and RagTime have been hailed as some of the best software ever written for flat-bed scanners. Enjoy features like fast dynamic color previews, independent color/brightness controls, nine scan modes, savable scan settings, color dropout, magnified previews, proof scans, 25% to 400% scaling in 1% steps, and 25 dpi to 1200 dpi in 1 dpi steps.

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

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

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

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

$1899

All scans were done at default settings with no corrections. The color images were separated using Adobe Photoshop. The logo was scanned as grayscale and as line art. This entire ad was done on the Macintosh using Silverscanner, Photoshop, QuarkXPress and a PostScript imagesetter. The entire production cost was $145.
You'll be delighted at La Cie's competitive prices. Especially when you consider what you get absolutely free. Like our acclaimed Silverslining software. Five megabytes of public domain software. A 2-Year Limited Warranty on Quantum mechanisms (extendible to 5 years). 72-hour turn-around on warranty service. Prompt, courteous, competent service.

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

### Pricing

<table>
<thead>
<tr>
<th>Product</th>
<th>Price 1</th>
<th>Price 2</th>
<th>Price 3</th>
<th>Price 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>50MB (Quantum)</td>
<td>$239</td>
<td>$299</td>
<td>$319</td>
<td>$339</td>
</tr>
<tr>
<td>100MB</td>
<td>$399</td>
<td>$429</td>
<td>$479</td>
<td>$489</td>
</tr>
<tr>
<td>120MB</td>
<td>$479</td>
<td>$529</td>
<td>$559</td>
<td>$579</td>
</tr>
<tr>
<td>155MB Tape Drive</td>
<td></td>
<td></td>
<td></td>
<td>$649</td>
</tr>
<tr>
<td>600MB Tape Drive</td>
<td></td>
<td></td>
<td></td>
<td>$999</td>
</tr>
<tr>
<td>1.2-2.0GB DAT Drive</td>
<td></td>
<td></td>
<td></td>
<td>$1499</td>
</tr>
<tr>
<td>128MB Cirrus Optical</td>
<td></td>
<td></td>
<td></td>
<td>$1699</td>
</tr>
<tr>
<td>ExpressDrive</td>
<td></td>
<td></td>
<td></td>
<td>$Call</td>
</tr>
<tr>
<td>Silverscanner</td>
<td></td>
<td></td>
<td></td>
<td>$1399</td>
</tr>
<tr>
<td>Silverlining</td>
<td></td>
<td></td>
<td></td>
<td>$149</td>
</tr>
<tr>
<td>PocketDrive</td>
<td></td>
<td></td>
<td>$649</td>
<td></td>
</tr>
</tbody>
</table>

**Call for products not listed.**

To order or for more information, call toll-free **800-999-0143**

6 a.m.-6 p.m. PST Mon-Fri.

International 503-520-9000 Fax 503-520-9100

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

NEW AGE SOFTWARE SOUNDS GREAT (The Iconoclast, April 1992). One of the biggest problems with the personal computer is that, generally, only one person at a time can use a terminal. Now, with the right program, you can gather a group of friends and use the mouse with an on-screen Ouija board. Great fun at parties.

Can you channel your spirit guide with a modem? Be sure to wear the right crystal to reduce ELF emissions, and just think of the revolutionary virus-protection software.

Turner Babcock
Berkeley, California

I HAVE ENJOYED READING MANY COLUMNs, particularly The Iconoclast. I enjoy Steven Levy’s humor, cogency, and the information he imparts. Alas, in his latest piece, I also detect an extended sneer. Yes, the software is of variable quality, and I would concede that it is easy to mock anyone involved in a spiritual quest. Also, since we are talking about small businesses, run by entrepreneurs taking great risks, I think a more creative response would be to encourage more development, not the opposite.

Tim Turner
Portland, Oregon

I’TS TOO BAD “SENSITIVE NEW AGE Software” was written by such an insensitive critic. Mr. Levy’s primary interest seems to be in unburdening himself of his personal prejudices regarding astrology and other self-help information.

Julia Lipton Skalka
Springfield, Virginia

Sightly Column

I ENJOYED YOUR ARTICLE ON VISION problems with computer use (Conspicuous Consumer, April 1992). I am in my forties and have bifocals, which aren't so humiliating if you want to see very close or far away. My constant head-bobbing when looking at computer screens drove me nuts. I was getting eyestrain and using the top vision part of the glasses far more than I should have been.

My eye doctor suggested having a pair

My eye doctor suggested having a pair

Crossing Bridges

A S A PC USER AND RESELLER, I was prompted by your article “Bridging Two Worlds” (March 1992) to bring in a copy of Mac-In-DOS, only to find that it didn’t have anything to do with Mac-to-PC file transfer. This prompted further research with these results.

Pacific Micro’s Mac-In-DOS is strictly a DOS shell program that gives the user a Mac-like environment.

PLI’s Mac-to-DOS does allow a PC user to read and write to a Macintosh floppy via the PC’s 1.44MB floppy drive.

MacLinkPlus/PC allows a PC user to read and transfer Mac files via a direct-connect cable method or via a modem. It does not allow a PC to read and/or write to a Mac floppy in the PC’s 1.44MB drive. It will, however, allow the Mac to read and write to DOS floppies via a DOS mounter.

Central Point Deluxe Option Board, which you didn’t mention, is an add-in board that allows a PC to read and/or write to 800K floppies in a Toshiba or Teac floppy drive. It will also act as a jumperless 1MB controller board for a tape backup unit. My informal tests, however, indicated a 50 percent failure rate on file transfers and 100 percent failure on complete Mac-to-Mac disk copy.

For the PC user who is looking for an inexpensive way to transfer files from a Mac to a PC via floppy disk, Mac-to-DOS appears to be the product of choice.

Dennis Stayniak
Lorain, Ohio

Ask about

SCSI II DART ultra-high-speed RAM Drive.
Complete line of 4MB, 8MB and 16MB SIMMs.
F/F Overdrive and Quadra/Overdrive accelerators.
Ask about our 16MB SIMMs for other Macs.

Only Newer Technology offers this System 7 application memory solution. MacSWELL modifies the standard GET INFO box. Bundled exclusively with all of our 16MB SIMMs.

Central Point Deluxe Option Board

FPU-882 Card

NEW Macintosh Classic II

NEW Low-Profile 16MB SIMMs for the Macintosh Quadra™ 700 & 900

Newer's specially designed low-profile 16MB SIMMs offer up to 68MB in the Quadra 700 and up to 256MB in the Quadra 900.

Use up to 1024MB of application memory with MacSWELL™ INIT

Only Newer Technology offers this System 7 application memory solution. MacSWELL modifies the standard GET INFO box. Bundled exclusively with all of our 16MB SIMMs.

MacSWELL died exclusively with Macs.

Asking for 16MB SIMMs brings in a copy of Mac-In-DOS, only to find that it didn’t have anything to do with Mac-to-PC file transfer. This prompted further research with these results.

Pacific Micro’s Mac-In-DOS is strictly a DOS shell program that gives the user a Mac-like environment.

PLI’s Mac-to-DOS does allow a PC user to read and write to a Macintosh floppy via the PC’s 1.44MB floppy drive.

MacLinkPlus/PC allows a PC user to read and transfer Mac files via a direct-connect cable method or via a modem. It does not allow a PC to read and/or write to a Mac floppy in the PC’s 1.44MB drive. It will, however, allow the Mac to read and write to DOS floppies via a DOS mounter.

Central Point Deluxe Option Board, which you didn’t mention, is an add-in board that allows a PC to read and/or write to 800K floppies in a Toshiba or Teac floppy drive. It will also act as a jumperless 1MB controller board for a tape backup unit. My informal tests, however, indicated a 50 percent failure rate on file transfers and 100 percent failure on complete Mac-to-Mac disk copy.

For the PC user who is looking for an inexpensive way to transfer files from a Mac to a PC via floppy disk, Mac-to-DOS appears to be the product of choice.

Dennis Stayniak
Lorain, Ohio
AudioShop

AudioShop™ is the hot new software for playing, recording and editing your Macintosh audio. Change Mac System sounds, add audio to HyperCard, record your voice and add special effects so your voice sounds like an alien! Color graphics and powerful editing tools make sound a blast (or an elephant, or any sound).

– 2 Free Disks of Sounds –

You get 2 free disks of sound effects and music to start exploring sound right away. Also, you don’t need a CD ROM drive to use AudioShop but it’s even more fun if you have one. Songs from your audio CD collection and digitized sounds can be assembled into a “playlist.” Change the order they’re played by simply clicking and dragging.

- Create fun messages for your answering machine
- Cut and paste sound waves like text in a word processor
- Edit voice annotations for QuickTime supported applications and email
- Add soundtracks to your QuickTime movies, and Director presentations
- Record songs and greetings to send to friends

Audio formats supported include QuickTime, AIFF, HyperCard, Director, and SND. Record audio using the microphone included with your Mac or any compatible input device, a perfect choice for Mac II LC and PowerBook users.

of glasses made with one lens that focuses at arm's length, the proper distance from the screen. My computer glasses have stabilized my vision problems.

Thomas Gasparro
Capitola, California

THERE IS NO EVIDENCE THAT COMPUTER USE CAN ACCELERATE THE DEVELOPMENT OF EYE-FOCUSING PROBLEMS. Computer use cannot make you nearsighted, eye exercises cannot improve your visual skills, and the notion that “some vision specialists don’t understand or accept the impact long-term computer use can have on eyesight” cannot substitute for the lack of scientific proof of the assertions made in the article. Had the author consulted the American Academy of Ophthalmology, she would have found out that there is no evidence of any harm to the human eye from computer use.

Jeffrey Temman
Alsip, Illinois

Not a Whiner

THE WORLD OF MACINTOSH USERS is a bunch of whining wimps, to the point where I’m almost ashamed to say that I am a devout Macintosh user.

Apple continues to upgrade its wares, far beyond the technology of other computer companies in the same area. So users whine that their previously purchased Macs are becoming obsolete. Would they rather Apple do what other computer companies do—not try to go where no computer user has gone before?

Whine, whine, whine. David Bin­nion’s whine in the April issue (Letters) is petty. Whether the switch on a piece of computer equipment is easy or difficult to reach, the equipment should be plugged into a remote switch, and the remote switch used to turn it on and off. Switches are electromechanical devices and eventually wear out. It does cost a hunk of money to replace a switch in a piece of computer equipment—but only another eight bucks to replace the remote switch. If David wants the super-duper whizbang surge-suppressing device, he should complain about his cravings, not about Apple.

Loy Spurlock
La Mirada, California

Finding the Right 7.0 Book

WHY THE COMPARISON TABLE uses the authors rather than the titles to identify the books is beyond my ken (The Desktop Critic, April 1992). Throughout the body of the article, the various titles are highlighted in boldface type and easily spotted. In the concluding paragraph, David Pogue sums up his comments with reference to the books’ titles, then asks you to use the table as a quick guide. When you go to the table, you have to scramble through the article to discover which author wrote which book. And he is criticizing the reference manuals’ clarity? Yikes!

continues
Which Comes First...

The Display Card or the Display?

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

Juan Martinez
Oak Park, Illinois

Artists’ Effects

DEKE MCCLELLAND’S ASSESSMENT of Aldus Gallery Effects demonstrated to me what the lack of imagination in a reviewer can result in (Reviews, April 1992). The basic tools are presented in the program. Their use is dependent on the creativity of the artist using the medium. I rarely treat an entire image with a single effect. I mask parts of images and use the appropriate filter on the parts of the image that I feel can be best enhanced by it. It is a very creative tool if used with some degree of artistic license.

Ed Foster
Cedarhurst, New York

WHAT’S IMPROVED IN WORD

CONTRARY TO THE ADS AND THE reviews—yours included (Reviews, April 1992)—Microsoft Word 5.0 is not a major upgrade. The only real improvements are the better spelling checker, with its customizing options and double-word finder, and drag-and-drop editing. In fact, I’m surprised that drag-and-drop took so long. All applications should do this. How about some real features like a better way to generate indexes other than those hidden codes; the ability to auto-number paragraphs, figures, and tables, as opposed to the unsatisfactory way Word does it now; and a way to dynamically refer to autonumbered paragraphs, figures, and tables.

Paul Lucas
Urbana, Illinois

Video Vision

THE SIDEBAR “UNDERSTANDING Video” begins with the number of horizontal scan lines in NTSC television, then jumps into a discussion of the number of vertical lines that can be resolved, without making that distinction clear (“Frame by Frame,” March 1992). In summary, a computer’s 15-inch shadow-mask monitor with holes on a .28mm pitch can display nearly four times more vertical lines than can an NTSC TV screen. That’s why the vertical fans on the captured NTSC TV frames in the “Video-Capture Comparison” sidebar look so bad. Good tests that want better explanations, in my opinion. The rest of the article was very good.

George Myers
Hicksville, New York

Thank you. As an additional clarification, although the RadiusTV board does not have a one-step feature for saving a frame directly to disk, the board does let users freeze a frame with the option of editing the frame before saving it as a PICT file. With QuickTime, the RadiusTV now can capture a sequence of frames. Radius also offers a $599 option for upgrading its PrecisionColor 8X board to 16 bits.—Ed.
Go For A RELIABLE DRIVE

HEWLETT-PACKARD

High Quality Disk Drives For Over 20 Years!

5 YEAR WARRANTY

You'll have no worries with a warranty like this!

Bring your Mac up to speed with a super reliable drive!

Made With PRIDE

• 5 Year Warranty • SCSI-2 Controller
• Avg. Seek Time 12.6ms • 3600 RPM
• 150,000 Hours Mean Time Between Failure
• Transfer Rate up to 10 MB/Second w/Fast SCSI!

*Hard drive does not include:
Wheels
Headlights
Windshield
Windshield Wipers or Macky

234 MB $888
422 MB $1488

Complete external hard drive package includes:
SCSI cable, power cord, formatting software... everything you need!

STOP!
Don't forget to ask about the best extended service available

Call Toll Free Today!

331-1322

Mac Friends

Get on the road to great savings. Call MacFriends today!

24 HOUR QUICKFAX: (503) 286-8710 LOCAL: (503) 286-9390

Circle 58 on reader service card
Quick Work with QuicKeys

I liked Tom Negriño's QuicKeys article (Insights, April 1992). I've been working in desktop publishing for three years, and I can honestly say that I practically doubled my work speed when I started using QuicKeys. There are many operations I find routine and repetitive, such as pulling down menus, handling dialog boxes, and so on. QuicKeys has relieved me from the doldrums of these constant chores and allowed me to concentrate on more important aspects of my work. It lets the Macintosh do what it does best: repetitive chores. I'm glad this article further touts the advantages of this macro utility. In fact, it taught me a few things, too!

Tze-Chiu Lei
Berkeley, California

Definitive Low-Cost

I saw the words "low-cost monitors" on the cover and immediately turned to the article ("Color Display Bargains," March 1992). I was disappointed to find the cheapest monitor being reviewed cost $600, and that's not including the $400 color board. My idea of low-cost monitors are the 14-inch displays from Mirror Technologies, Magnavox, Orion Technologies, GoldStar, and Generation Systems, all of which cost less than $500.

Richard Frisky
Tabernacle, New Jersey

As the feature pointed out, several mail-order firms offer low-cost monitors, usually adapted from low-cost VGA monitors sold for DOS PCs. However, none of the companies had products to send us for testing, since the suppliers of these monitors (GoldStar and Hitachi) were changing their product lines. Be aware that the components used in lower-cost products can change at any time as suppliers change, which means that results published in magazines may not apply a few months later. Magnavox is a brand name for monitors from Philips Consumer Electronics; Magnavox monitors were covered in the article.—Ed.

Don't Worry; Play Games

Maxis commits a severe crime every day. Look at SimCity. How clever: you lay out a design for a city, and hope that the Sims like it. But alas, Maxis has given you a small inconspicuous red sheet containing the answers for literally thousands of possible copy-protection questions. In a busy household, one tiny little red sheet can get trashed so easily! Avoid this rather overly copy-protective company, or your $50 game may lose every cent of its value.

Neil Irwin
Spartanburg, South Carolina

Maxis has said that as of May 1 it will publish an unprotected SimCity, and it has no plans to include copy protection on future games.—Ed.

IRS Eyes Software

I purchased my Macintosh in April 1989 along with some software. I was aware that in all cases the software came with a license agreement that says I do not own the software; in essence, what I was buying was a license that permitted me only to use the software. Given that, I have taken the position that if I do not own the software, I have no proprietary interest in or title to a tangible asset. So I expense the cost of the license fee.

Now for the kicker. My 1989 tax return was selected for an audit. The examiner has arbitrarily decided that all my software licenses are capitalizable software licenses with an amortizable life of five years. Needless to say, I'm not about to continue...
New MacTools® 2.0.
The First Data Protection That's Automatic.

PROTECT AND REPAIR DATA WITHOUT EVER HAVING TO THINK TWICE.

MacTools® 2.0 is the first automatic data protection program with integrated virus protection, backup and data recovery.

And to make sure that today's minor disk problems don't turn into tomorrow's disasters, MacTools is the only data protection package that offers scheduled disk analysis and repair.

New MacTools automatically detects and removes known viruses and protects your computer from unknown viruses.

When it's time for you to backup, MacTools can use tape or network drives at the times you schedule. And it will even remind you to back up to disks.

MACTOOLS 2.0 HELPS MAKE EVERY MANAGER'S JOB A LITTLE EASIER.

Just configure MacTools once for your entire group, then customize it for individual users. And only MacTools can recover data from damaged Excel files. It also recovers deleted files.

Upgrade to MacTools 2.0 from MacTools Deluxe for only $49, a savings of $100. Just call us at the number below. If you own any other Macintosh utility, upgrade for $59 by calling the same number or visiting your local dealer.

The rest is automatic.

1-800-947-9445

Central Point Software®

MacTools is a registered trademark of Central Point Software. Names of other companies' products used for identification purposes only.

©1992 Central Point Software.

Circle 275 on reader service card
stand still for what I consider to be no more than a heavy-handed attempt to extort additional taxes from me.

John Amos
South San Francisco, California

The tax courts have not ruled on software per se, and the IRS is treating software as the equivalent of a computer peripheral in the meantime. Amos had already reached the $10,000 limit on one-year amortization with his computer equipment, so by current IRS law, the software needs to be amortized over five years. Amos is still appealing his case. See “Home-Office How-To,” in this issue, for more information on taxes and home businesses.—Ed.

Matchprint as Trade Name

Danny Lee writes in LAB NOTES (April 1992) that “a match print is a color proof that’s produced from four sheets of film—one each for cyan, magenta, yellow, and black.” Matchprint is a trade name of 3M, representing a color-proofing system made with a single sheet (and therefore called a single-sheet color proof), using color dyes. It is similar to Du Pont’s Cromalin system.

Thad McIlroy
San Francisco, California

Other Side of the BBS

I believe you were out of line to approach Jerry Saperstein with a “she said” line (The Iconoclast, March 1992). Not only did you not print all the facts, JerryType now looks like some sort of hero. Thank you sarcastically to everyone who has ever tried to deal with this type of person. Did you ask other members of any online services what they think of a person who does the type of things JerryType does?

Your article did not discuss the issues of online lynching. You merely stated some inconveniences and then sloughed them off by saying, oh, freedom of speech, I guess it’s OK after all.

Page Gilley
Wilmington, North Carolina

More Macs in the Cold

After reading about the difficulties in obtaining supplies for a Mac in Western Samoa (population 160,000), where the inhabitants own some 30 Macs, I decided to drop you a line (Letters, March 1992).

It must be better to run a Mac in an igloo than in a straw hut, as there are 10,000 Macs in Iceland (population 250,000). This means that every fourth igloo has a Macintosh, and the number of the unmentionables (IBM PCs and clones) is probably double this at least, so approximately every other igloo in Iceland has a computer. This is probably a world record per capita and definitely a record per igloo.

Fridrik Hjartarson
Reykjavík, Iceland

The MIDI School

The April issue contained a brief article on Thomas Dolby’s use of computers and highly sophisticated software to produce his latest album (Profile). Also mentioned was the possibility of Dolby starting a school that would train people to use that type of software. Do you know where I could get more information regarding this school?

David Nace
Greensboro, North Carolina

Thomas Dolby may teach at a school that may be founded this year. For more information, write to Coller Management, 3960 Laurel Canyon Blvd., #304, Studio City, CA 91614. Engineers and musicians may also be interested in Cogswell Polytechnical College’s Music Engineering Technology Program, which encompasses MIDI, sound design, and audio recording technology (408/252-5550; fax 408/253-2413).—Ed.

Future Art Master?

If you are planning for a fifth Macintosh Masters Showcase, I wish to enter (“1991 Macintosh Masters Showcase,” April 1992).

Could you send any information on enrollment forms, requirements, deadlines, and locations for this contest or any similar events in the future?

Geri Loudenstager
Trevose, Pennsylvania

The 1991 Macintosh Masters contest was announced in the June and July 1991 issues, with entry forms and guidelines, as are similar contests announced. We have not set a date for the 1992 contest.—Ed.
It can take any color you throw at it.

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

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

Ten MB RAM and a 24 MHz RISC chip make it the fastest printer controller around. And with Adobe's PostScript™ Language Level 2, your stuff will look great. So go ahead. Throw out the wildest idea you can think of. The Phaser III can take it. Call 1-800-835-6100, Dept. 18C for a free output sample.
1991 Macworld World Class Award Nominee for Best Customer Support-Software. Since 1984, the original Mac mail-order source.

Our System 7 Video featuring Macworld Contributing Editor Lon Poole is just $9 (224x) or free when you order Apple's System 7 for $99 (174x). We also have Lon's Macworld Guide to System 7 for $10 (223x).

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

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

We have over 3,500 items to choose from, and we've indicated the expected availability dates unless indicated otherwise.

*ASD Software ... 30 day MBG

**MDS Drives ... 60 day MBG**

MDS Removable SyQuest Drives come complete with one cartridge and all the software you need for low-level formatting of cartridges, selecting interleaves for fastest data access, defining partitions, and initializing partitions in either Mac or AIX formats. There's also disk caching and volume password protection. Plus, get a free copy of Salient's AutoDouble or Symanette's New Utilities for the Mac with each drive purchased.

Open a package, and backed by a 2-year warranty.

**MDS 44 SyQuest w/AutoDouble 1.0 6 $499.**

5533 MDS 44 SyQuest w/AutoDouble 1.0 6 $499.

5534 MDS 44 SyQuest w/New Utilities 2.0 499.

5535 MDS 44 SyQuest w/New Utilities 2.0 499.

14 MB. 28 8 MB SyQuest Drives ... see line listing.

**T/Maker ... 30 day MBG**

5316 The PowerBundle Carry Case (only) ... 75.

5308 The PowerBundle w/Carrying Case ... 199.

**COMPUTERS**

Outbound Systems, Inc.

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

**2030 Series** (25 MHz 68000)

2105 462: 4 MB, 60 MB HD ....... 3199.

2106 462: 4 MB, 60 MB HD (incl. math copro.) 3499.

2109 462: 4 MB, 60 MB HD (incl. math copro.) 2999.

2660 860: 8 MB, 60 MB HD 3199.

2669 882: 8 MB, 60 MB HD (incl. math copro.) 3249.

2673 880: 8 MB, 60 MB HD .... 3499.

2653 880: 8 MB, 80 MB HD (incl. math copro.) 3499.

2665 860: 8 MB, 60 MB HD .... 3639.

2108 440: 4 MB, 40 MB HD .... 2799.

2147 442: 4 MB, 40 MB HD (incl. math copro.) 2699.

2110 460: 4 MB, 60 MB HD .... 2699.

2107 440: 4 MB, 40 MB HD (incl. math copro.) 3299.

2106 460: 4 MB, 60 MB HD (incl. math copro.) 3499.

2711 860: 8 MB, 60 MB HD ..... 3499.

2712 860: 16 MB, 60 MB HD .... 3699.

2730 1660: 16 MB, 60 MB HD .... 3699.

2745 1660: 16 MB, 80 MB HD (incl. math copro.) 3599.

2750 1660: 16 MB, 80 MB HD (incl. math copro.) 2999.

2668 882: 8 MB, 60 MB HD (incl. math copro.) 3699.

2668 882: 8 MB, 60 MB HD (incl. math copro.) 3699.

2666 880: 8 MB, 80 MB HD .... 3859.

2660 880: 8 MB, 80 MB HD .... 3859.

2667 880: 8 MB, 80 MB HD .... 3859.

2668 880: 8 MB, 80 MB HD 3859.

2668 880: 8 MB, 80 MB HD 3859.

2695 1662: 16 MB, 50 MB HD (incl. math copro.) 4299.

2694 1660: 16 MB, 80 MB HD (incl. math copro.) 4399.

2691 1662: 16 MB, 80 MB HD (incl. math copro.) 4499.
summer are here

★ Expert Software ... 30 day MBG
5324 ★ Expert Writer 1.0—Quick, easy, efficient word processor plus address book, spell checker and envelope printer (with postal bar codes). Always available, uses less than 50K of RAM! Professional looking letters, faxes, memos $29.

★ ASD Software ... 30 day MBG
5313 ★ Active Memory 2.0 (*user) ........ 125.
7446 ★ MacLabel Pro 1.5 ................. 48.
4358 ★ Banner Blue ... 30 day MBG .... 125.
3548 ★ Org Plus Advanced 1.0 .......... 55.
8861 ★ Thunder 1.0.5 ...................... 19.
★ Beagle Bros. ... 30 day MBG ......... 95.
3119 ★ BeagleWorks ... 184, 3565 Upgrade .... 95.
6928 ★ Checkfree Mac 1.5 ................. 19.
★ CheckMark Software ... 60 day MBG 
5862 ★ Payroll 4.6 ......................... 169.
5003 ★ MultiLedger 2.0 225, 3787 MultiUser 359.
★ Chena Software ... 30 day MBG .... 1594 ★ Fair Witness 1.1 .......... 315.
★ Claris ... 30 day MBG ................. 1129 ★ MacWrite II 1.112 ..... 89.
3503 ★ ClarisWorks 1.0 199, 3743 Upgrade 95.
3531 ★ Claris Resolve 169, 3745 Upgrade 95.

8216 ★ FileMaker Pro 1.0V2 .............. $199
1125 ★ MacProject II 2.5V1 ............ 345.
★ Essential Software ... 30 day MBG
4086 ★ Easy Alarms 2.0 (May '92) .... 61.
★ Expert Software ... 30 day MBG .... 29.
5234 ★ Expert Writer 1.0 ................. 29.
★ Fox Software ... 60 day MBG ......... 339.
5572 ★ FoxBASE - Mac 2.0 .......... 45.
★ Franklin Software ... 30 day MBG 
7070 ★ Language Master 2.0 ............. 45.
★ Good Software ... 30 day MBG ... 399.
2572 ★ REMO Property Manager 3.01 .... 399.
★ Intuit ... 30 day MBG ................. 42.
2507 ★ Quicken 3.0 ........................ 42.
★ JAM Software USA ... 30 day MBG 
6099 ★ Smart Alarms Plus ............... 63.
★ Kenyon Software ... 30 day MBG ...
1091 ★ Flow Chart Express 1.0 ........ 93.
8941 ★ TopDown 3.1 199, 6137 Upgrade 129.
★ Lotus Development ... 60 day MBG
3696 ★ Lotus 1-2-3 for Mac 329, 6137 Upgrade .... 89.
★ Mainstey ... 30 day MBG ............. 219.
7118 ★ MacFlow 3.7 ....................... 219.
★ MECA ... 60 day MBG ................. 49.
2796 ★ Managing Your Money 4.0 .... 49.
★ Microlytics ... 30 day MBG ........... 9729 ★ Strunk & White's Elements of Style ... 34.
7820 ★ Random House Enyclopedia 1.0 .. 88.
★ MicroPerl ... 30 day MBG ............ 2884 ★ Works 2.00E1 ....................... 155.
3699 ★ Excel 4.0 (May '92) 295, 5237 Upgrade 99.
4902 ★ Word 5.0, 295, 1503 Upgrade .... 125.
5454 ★ The Microsoft Office 2.5 (May '92) .... 475.
★ Niles & Associates ... 30 day MBG 
4602 ★ EndNote 3.1.5 85, 8010 Plus 1.2 .. 145.
★ Nolo Press ... 30 day MBG ........... 3422 ★ For the Record 2.0 .............. 30.
2281 ★ Willmaker 4.0 (not valid in LA) .... 35.
1204 ★ Living Trust 1.0 ................. 45.
★ OCCAM Research Corp. ... 60 day MBG
3697 ★ MUSE 1.0.1 ......................... 499.
★ OneNote ... 30 day MBG ............. 5683 ★ Nisus 3.06, 239, 1612 Compact 3.3 ... 92.
★ Pastel Development ... 30 day MBG 
1785 ★ DayMaker 1.01 ................. 61.
7070 ★ Language Master 2.0 ............. 45.
3609 ★ MacUSA 35, 3356 MacGlobe 46.
★ Portfolio Systems ... 30 day MBG 
7992 ★ DynoPage 1.7 or 6916 Dynodex ea. 75.
★ PowerUp ... 30 day MBG ............ 4562 ★ Panorama II 2.0.5 ................. 239.
7696 ★ Calendar Creator 1.01 .......... 44.
7694 ★ Address Book Plus 2.01 .. 83.
★ ProVUE ... 60 day MBG ............... 7482 ★ RightWriter for the Mac 3.1 ...... 54.
1292 ★ WealthBuilder 1.02 .............. 95.
★ QuarkXPress ... 30 day MBG ........ 6266 ★ GrammarMac 2.0 .................. 50.
★ Reality Technologies ... 30 day MBG 
6929 ★ WealthBuilder 1.02.............. 95.
★ Reference Software ... 30 day MBG 
5473 ★ Professional LetterWorks ........ 51.
★ Shana ... 30 day MBG ............... 8810 ★ Information Manager 99, 7692 ★ Designer 159.
7129 ★ Accountant, Inc. 335, 9538 MultiUser 659.
★ Software Toolworks ............. 8336 ★ Dollar's & Sense 5.0 ............ 59.
★ Spyglass ... 60 day MBG .......... 2027 ★ Transform 2.1 or 2028 £Dicer 1.1 ea. 399.

★ SoftSync, Inc. ... 30 day MBG 
7129 ★ Accountant, Inc. 3.0—1991 MacUser Editors' Choice Award for Best Accounting Package.
3828 ★ Accountant, Inc./MultiUser 1.0 ... 569.

★ Survivor Software ... 30 day MBG 
3285 ★ MacMoneym 3.52 ................ 58.
2237 ★ GreatWorks 2.0 .................. 199.
2278 ★ GreatWorks Upgrade .......... 99.
3422 ★ More 3.1 ......................... 265.
★ Symphony ... 30 day MBG ......... 3131 ★ Acta 7.1 ......................... 75.
6877 ★ CalendataGraph 2.1.3 ........... 150.
7616 ★ M.Y.O.B. 3.0 (May '92) .... 138.
★ TIMESLIPS ... 30 day MBG ...... 2396 ★ Timeslips III 2.1 .............. 194.
6939 ★ Accounting Link 1.0B .......... 52.
★ T/Maker ... 30 day MBG ............ 3639 ★ WriteNow 3.0 (May '92) .... 149.
5259 ★ WriteNow 3.0 Upgrade (May '92) .... 49.
5253 ★ WriteNow 3.0 Competitive Upgrade .... 69.
★ Vertical Solutions ............... 5886 ★ Fastlabel 3.1 .................... 45.

★ T/Maker ... 30 day MBG 
3639 ★ WriteNow 3.0—The fastest Mac word processor. Includes Grammatic Mac, a lightning-fast 135,000 word spell checker, a thesaurus, DA, powerful style sheets, and Microsoft Word compatibility ...... $149.

MacConnection®
1-800/800-3333
14 Mill Street, Marlboro, NH 03456 603/446-3333 FAX 603/446-7791

3333C

MMC

MacConnection®
When car seats and
sunburns will sear.

After Hours Software
1532 TouchBASE 2.0 — Multi-user database designed to keep track of personal and business contacts. It's a handy desk accessory that can print envelopes, address books, fax cover sheets, reports, and much more .......... $79.

PROGRAMMING

UTILITIES, HYPERCARD, SECURITY

* Abbott Systems ... 30 day MBG
2515  Calc 1.0 .39. 5236 CameraOpener 2.0 .62.
2651  Advanced Software ... 30 day MBG
2831  Intouch 1.1 .9986 Network (3-Pak) .112.
2687  After Hours Software
1352  TouchBASE 2.0 .1 .79.
3314  DateBook (May '92) .79.
* Aladdin Systems ... 30 day MBG
6740  StuffIt Deluxe 2.01 .55.
* Aldus ... 30 day MBG
5100  Aldus SuperCard 1.6 .195.
* ALSoft ... 30 day MBG
9808  MasterJuggler 1.57B .25.
9807  DiskDrill A (M.A.D. Bundle) .63.
5201  ALSoft Power Utilities 1.01 .64.
* Alysia Software ... 30 day MBG
2697  SuperDisk! ... 49.
1083  More Disk Space (May) .55.
Apple Computer
1074  System 7 (with free PCTV video) .99.
* ASD Software ... 30 day MBG
5  & 10 users packs available.
7095  FileGuard 2.7 (1 user) .138.
2552  WindoWatch (1 user) .91.
* Baseline Publishing ... 30 day MBG
7783  INIT Manager 1.1 .33.
3114  INIT Info Pro 1.0 .39.
* Berkeley Systems ... 30 day MBG
5737  After Dark 2.0V .28.
2198  More After Dark (M.A.D.) .23.
2196  After Dark A (M.A.D. Bundle) .38.
* Casa Blanca Works ... 30 day MBG
1593  Drive 7 .2.0 .49.
1573  DriveShare (May '92) .89.
* Casady & Greene ... 30 day MBG
2269  QuickDEX 2.3 ... 22. 2598 (6 Pak) .99.
* CE Software ... 60 day MBG
1727  CalendarMaker 3.0.1 .31.
6678  Top Cop 2.0 (Multi-M.A.D.) .71.
7518  Allarming Events 1.03 .64.
8024  QuickKeys 2.12 (May) 93. 1565 (10) 749.

* ASD Software ... 30 day MBG
Maccard Reader combined with FileGuard 2.7
secrets your Mac against unauthorized users.
7085  FileGuard 2.7 (1 user) .138.
9440  Maccard Reader (Macs) .299.
9439  Maccard/FILEGUARD I (Bundle) .399.

* Insight Development ... 30 day MBG
6171  MacPrint 1.3 .92.
* Kensingtom ... 30 day MBG
7542  PassProt (night, day, Classic, U.S.) ea. 65.
* Kent Marsh Ltd. ... 30 day MBG
9513  FolderBolt 1.02 .73.
1803  The NightWatch II (May '92) .89.
6267  kiwi Software ... 60 day MBG
6998  kiwi SGRID .94.
3518  kiwi POWER WINDOWS .50.
* Magic Software ... 30 day MBG
7297  AutoSave II ... 47. 7290 (Backspace) 50.
* Microcom ... 30 day MBG
4803  Virex/Mac .57. 5885 (10 user) .399.
8561  Virex 111ite or 2482. 111ade w/Shredder .89.
* MicroMat Computer Systems
7332  MacEKG II (May '92) .110.
* Microseeds Pub. ... 60 day MBG
7088  INITPatcher 2.02 .34.
2913  INFUSION for Mac (10 Pak) .49.
* Microsoft ... 30 day MBG
4471  QuickBasic 1.0 .64.

* Centriax Point ... 30 day MBG
5041  Mac Tools Deluxe 2.0 (June '92) .92.
* Claris ... 30 day MBG
8734  HyperCard Development Kit 2.1 .139.
* Connectix ... 30 day MBG
7630  Maxima .45. 6647 (HandOff II) .55.
* Dantz Development ... 30 day MBG
3393  DiskFit Pro 1.0 .72.
5255  Retrospect 147. 7945 (Remote 1.3) .264.
7946  Remote (10 Pak) 147. 3112 (50 Pak) 649.
* DUBI-Click Software
6653  MenuFonts 44. 974A (ClickChange) .55.
* ElseWare Corp. ... 30 day MBG
4871  Checkit 2.02 .89.
* Fifth Generation ... 30 day MBG
4287  PYROII 4.01 .27.
3655  Suitecase II .50.
5178  FastBack Plus or 5725 (DiskLock ea.) 125.
* FWE, Inc. ... 30 day MBG
2999  Hard Disk Clipper 1.1 .125.
* ICOM Simulations ... 30 day MBG
6296  Intermission 1.0 .38.
3731  OnCue II .2.0 .55.

Salient Software ... 30 day MBG
4835  AutoDouble I.D.6 — Automatically double the space on your drive ......... $45.
4801  DocDouble 3.75 — Award winner. Compres clothes for telecommunication, backups, or transfer to floppies. Can use w/AutoDouble 45.

* Nine to Five Software ... 30 day MBG
9767  Reports 2.1 .94.
2832  Attributes 2.0 .50. 2835  Search 2.0 .62.
* Now Software ... 30 day MBG
1793  Now Up-To-Date 1.0 (1 User) .65.
2371  Now Update 2.25. 2386 (10 User) .385.
4925  Now Utilities 3.01 .83.
* ON Technology ... 1 year MBG
6835  On Location 2.0 .75.
1566  STATUS+Mac 2.0.2 (unlimited) .749.
Paloma Software
8210  PLOTTEReset 2.0 .249.
* Salient Software ... 30 day MBG
7404  DiskDouble 3.7.5 .45.
4838  AutoDouble 45. 6982 (10 Pak) .295.
* Symantec ... 60 day MBG
5176  Symantec AntiVirus for Mac (SAM) .64.
5724  Symantec Utilities for Mac (SUM II) .96.
6748  Norton Utilities for Mac (2.0) (May '92) .85.
3421  THINK Pascal 146. 2669 (THINK C) 199.
9957  THINK Reference 1.0 .68.

Microcom ... 30 day MBG
Complete disk and file recovery and protection.
5856  911 Utilities 1.0 .89.
4803  Virex/Mac .57.
2462  CASUAL with Shredder 1.0 .89.
8562  Complete Undelete 1.1 .48.
But inside with Mac

UserLand Software
4753 0 Frontier—Power user's scripting system for System 7. Write & run your own utilities to customize the Mac file system, networks & applications. "Mac users have wanted something like this since 1984." (MacUser 12/91) $189.

UserLand Software
5805 0 Sprout!—The complete planning tool for vegetable gardeners produces a graphic, scalable garden plan with correct plant and tool for vegetable gardeners produces a graphic, row spacing. Prints garden layouts, calendars, shopping lists, and reports $47.

†Abracadabra, Ltd. ... 30 day MBG
5805 0 Sprout! 1.0 (veggie gardens, May '92) ... 47.
†Accolade
1423 0 Hard Ball II 31. 8220 0 Jack Nicklaus Golf 34.
†Alidus ... 30 day MBG
3503 0 Dark Castle 1.2 ...
3502 0 Beyond Dark Castle 1.0 ...
†BaseLine Publishing ... 30 day MBG
7785 0 Talking Moose 4.0 ...
†Beacon Technology ... 30 day MBG
4967 0 HyperBible (KJV) or 4968 (NIV) ... ea. 125.

†Abracadabra, Ltd. ... 30 day MBG
5805 0 Sprout! 1.0—The complete planning tool for vegetable gardeners produces a graphic, scalable garden plan with correct plant and row spacing. Prints garden layouts, calendars, shopping lists, and reports $47.

Broderbund Software
4314 0 Typel 1.0 ... 16.
6516 0 The Playroom 2.0 (CP) (color)... 29.
†Carmen Sandiego Series (CP) ... ea. 29.
5317 0 Spanish and the Cave of Mr. Sueldo ... 29.
9804 0 RoboSport or 8915 0 BannerMania ... ea. 35.
5318 0 Nigel's World ... 35.
3559 0 SimAnt, 35. 8266 0 SimEarth 1.1 ... 40.
4966 0 SimCity (CP) ... 29. 5871 0 Supreme ... 47.
†Carine Software ... 30 day MBG
5726 0 Voyager 1.2 ... 87.
†Casady & Greene ... 30 day MBG
3343 0 Aqua Bloopers Piper or 3342 0 Goller ... 29.
4960 0 Fun Bundle (includes Crystal Quest w/CE, Sky Shadow & Mission Starlight) ... 59.
†Centron Software ... 30 day MBG
2707 0 PuzzlerMaster ... 26.
8525 0 CasinoMaster ... 39. 8524 (Color) ... 45.
†Cyan ... 30 day MBG
6320 0 Manhole 1.6 ... 19.
†Davidson & Associates ... 30 day MBG
3922 0 Talking Spell It Plus ... 29.
6126 0 Math Blaster Mystery ... 28.
2574 0 New Math Blaster Plus ... 34.
8278 0 Algebra Master ... 34.
3923 0 Personal Trainer SAT ... 34.

Graphic Simulations
4756 0 Hellcats Over the Pacific 1.0—Fast and fluid graphics, 256 colors and high-quality sound, transport you into the cockpit of an F6F Hellcat. Experience the excitement of an intense dog fight and a well-placed 500 pounder! $39.

†Deadly Games ... 30 day MBG
2611 0 Bomber2 or 3460 0 Battle of Britain II ea. 31.
8050 0 EARTHQUEST III ... 34.
5294 0 Time Treks 1.0 ... 34.
Electronic Arts
1303 0 Loch ... 29.
8194 0 Armor Alley 1.1 or 5702 4D Boxing ... ea. 32.
1907 0 PGA Golf or 3385 0 Secret Silver Blades ... 39.
8643 0 Harpoon ... ea. 29. 2962 0 Challenger Pak ... 59.
†Expert Software ... 30 day MBG
6219 0 Expert Astronomer 1.0 ... 29.
FTL/Software Heaven
1555 0 QIDS 1.2 ... 24.
†Graphic Simulations
4756 0 Hellcats Over the Pacific 1.0 ... 39.
†Great Wave ... 30 day MBG
2276 0 Kid's Time 1.2 or 5842 0 Kid's Math 1.1 ... 25.
1517 0 ReadingMaze 25. 1913 0 (Color) ... 35.
4334 0 NumberMaze 25. 8527 (Color) ... 35.
8044 0 NM Decimals & Fractions (Color) ... 35.
†HyperGlot Software ... 30 day MBG
4334 0 Word Torture 4.0—Beginner to Advanced (Span., Fren., Germ., Ital. & Rus.) ... ea. 34.
† Pronunciation Tutor—Beginner (Span., Fren., Germ., Ital.) ... 38.
†Tensa Tutor 2.0 (Spanish, French, German, Italian) ... ea. 38.

†Expert Software ... 30 day MBG
6219 0 Expert Astronomer 1.0—Learn astronomy by displaying & printing the stars & planets from your location. View 9000+ celestial objects, track eclipses or comets. Perfect for novices or experts. Ind. Instruction to Astronomy guide. $29.

†McGraw-Hill Software
1517 0 LightScribe ... 50.
†Microsoft ... 30 day MBG
2868 0 Flight Simulator 4.0 (CP) ... 42.

†Media Vision
7126 0 Reunion 3.0 ... 115.
†Mallard Software
2868 0 Turbo Math Facts 1.0 ... 24.
2858 0 WordSearch ... 24.
2850 0 WordQuest 2.1 ... 30.
2857 0 PreSchool Pack—Color 1.0 ... 34.
2716 0 Word Search Deluxe 1.0 ... 34.

†Person Overseas ... 30 day MBG
9733 0 Hoyle's Book of Games II ... 20.
2412 0 Rise of the Dragon ... 34.
7367 0 SpaceQuest II ... 34.
3345 0 SpaceQuest IV ... 34.
2523 0 King's Quest V ... 39.
3549 0 Police Quest II (July '92) ... 39.
3552 0 Leisure Suit Larry V ... 34.
8229 0 Barn of Cosmic Forge ... 35.

†Personal Training Systems ... 60 day MBG
2707 0 PuzzlerMaster ... 26.
8525 0 CasinoMaster ... 39. 8524 (Color) ... 45.
†Cyan ... 30 day MBG
6320 0 Manhole 1.6 ... 19.
†Davidson & Associates ... 30 day MBG
3922 0 Talking Spell It Plus ... 29.
6126 0 Math Blaster Mystery ... 28.
2574 0 New Math Blaster Plus ... 34.
8278 0 Algebra Master ... 34.
3923 0 Personal Trainer SAT ... 34.

†Qtirion Design ... 30 day MBG
1562 0 3 in Three or 1944 Swamp Gas ... 31.
8809 0 Tessere ... 31.
3414 0 Mutant Beach ... 43.
7622 0 Darwin's Dilemma 2.0 (May '92) ... 31.
†Interplay Productions
1894 0 BattleChess (3D animation) ... 29.
3520 0 Dvorak on Tiptoe (June '92) ... 29.
1893 0 CheckMate (Infinite play levels) ... 31.
3524 0 Castles 1.0 (June '92) ... 34.
†Learning Company ... 30 day MBG
2670 0 Reader Rabbit 3.0 (CP) (ages 4-7) ... 34.
3572 0 Super Solvers: OutNumbered 1.0 ... 34.
3657 0 Super Solvers: Midnight Rescue ... 34.
3510 0 The Writing Center 1.0 ... 51.
†Lester Productions ... 30 day MBG
7126 0 Reunion 3.0 ... 115.
†Mallard Software
2868 0 Turbo Math Facts 1.0 ... 24.
2858 0 WordSearch ... 24.
2850 0 WordQuest 2.1 ... 30.
2857 0 PreSchool Pack—Color 1.0 ... 34.
2716 0 Word Search Deluxe 1.0 ... 34.

†Penton Overseas ... 30 day MBG
9733 0 Hoyle's Book of Games II ... 20.
2412 0 Rise of the Dragon ... 34.
7367 0 SpaceQuest II ... 34.
3345 0 SpaceQuest IV ... 34.
2523 0 King's Quest V ... 39.
3549 0 Police Quest II (July '92) ... 39.
3552 0 Leisure Suit Larry V ... 34.
8229 0 Barn of Cosmic Forge ... 35.

†Personal Training Systems ... 60 day MBG
2707 0 PuzzlerMaster ... 26.
8525 0 CasinoMaster ... 39. 8524 (Color) ... 45.
†Cyan ... 30 day MBG
6320 0 Manhole 1.6 ... 19.
†Davidson & Associates ... 30 day MBG
3922 0 Talking Spell It Plus ... 29.
6126 0 Math Blaster Mystery ... 28.
2574 0 New Math Blaster Plus ... 34.
8278 0 Algebra Master ... 34.
3923 0 Personal Trainer SAT ... 34.
your Connection’s back

**ALSoft ... 30 day MBG**
5023 | $3472
---|---
*SoftStream ... 30 day MBG*
4489 | $3287
*Galactic Frontiers* | $3472
*Classic Trilogy (Cribbage, Whist, Hearts)* | $49.00
*Family Cards (Solitaire, Rummy, War)* | $49.00
*Software Toolworks*
4618 | $1908
*Maxis Beacon Typing 1.3 (CP)* | $27.00
*World Atlas 1.0* | $52.00
*StarTrek ... 30 day MBG*
2328 | $2244
*Spectrum Holobyle ... 30 day MBG*
4288 | $2592
*Spectrum/8* | $536.00
*Spectrum/8·24 PDQ or 2231 PDOsi* | $899.00
*VideoSpigot LC or 4114 llsi* | $2595.00
*VideoSpigot* | $2533.00
*RasterOps 24SX* | $649.00
*Image Pro* | $894.00
*PCTV* | $629.00
*Star Trek: The Final Frontier* | $29.00
*Canon Color Copier* | $999.00
*20" Color System: SE/30, 11, lssi* | $2595.00
*20" Gray-Scale/Mono Display* | $999.00

**VIDEO & SOUND**

**MUSIC, MULTIMEDIA**

*Music Pro* | $189.00
*Final 2 .6.1* | $549.00
*MacRecorder Sound System PRO* | $239.00
*Sound Ext PRO 2.03* | $207.00
*MacroMind Accelerator 3.0* | $135.00
*MacroMind Director 3.1 (May ’92)* | $799.00
*MacroMind Three-D 9.1* | $999.00
*MicroMass Systems* | $369.00
*Quickimage 24* | $369.00
*Rival Monochrome Systems* | $1199.00

**CODE MUSIC SYSTEMS**

*MacMusic 8-bit Card 799.* | $1699.00
*Multisync 6FG* | $2899.00
*Nutmeg Systems ... 30 day MBG*
*10" SE, SE/30, II, llsi* | $995.00
*20" Color System: SE/30, II, llsi* | $2595.00
*Passport Designs* | $339.00
*Gallavler Track PRO+ 5.5* | $339.00

**STUDYWARE**

*ACT, GMAT, GRE, or SAT Prep* | $29.00
*Studyware* | $29.00
*USAT Prep* | $35.00
*Terrace Software* | $107.00
*UMM’S The Word Plus 1.10 (color)* | $107.00

**Dantz Development ... 30 day MBG**
5255 | $7946
*Retrospat—Provides automatic, unattended backup for any single Macintosh to tape, cartridge or optical. You set it up once, and a calendar backs you up again and again... $147.00.*
7946 | $147.00

**INSIGNIA SOLUTIONS**

*Access PC 2.0—With Access PC, MS-DOS files look and act like Mac files inside Mac applications. System 6 and 7 savvy. Includes MultiDriver and Media Formatter utilities $60.*
7537 | $3717
*Simulator* | $3717
*ICOM Simulations ... 30 day MBG*
7473 | $3918
*Terapac* | $3918
*AmerDataStories CD* | $3918
*Baseball’s Greatest Hits CD* | $3918

**YOUR CONNECTION’S BACK**

**CD-ROM**

*Broderbund* | $3730
*Just Grandma and Me (CD-ROM)* | $34.00
*CD Technology* | $2321
*CD-ROM Creator* | $11.00, 2533 (5 Pack) $49.00
*Porta Drive CD-ROM* | $599.00
*Multimedia HANDic* | $75.00
*Cyan ... 30 day MBG*
2117 | $9967
*Zcromic 3.0 (CD-ROM)* | $37.00
*Discovery Systems ... 60 day MBG*
9967 | $20.00

**Synergy Software ... 30 day MBG**
6619 | $6619
*Vera term 4.6—Now SLIP support, Multiple sessions, TCP/IP Telnet, and FTP (client/server) services are included with our award winning terminal emulation apps $90.*
6619 | $177.00

**ACCESSPC**

1-800/800-3333

MacConnection®

© Copyright 1992 PC Connection, Inc. MacConnection is a division and registered trademark of PC Connection, Inc., Marlow, NH. All other trademarks remain the property of their respective companies.
With cool pricing and...
Need a break from fast food and pull-down menus? Find out about the free home-cooked meal waiting for you here in Marlow, NH.
800/800-3333.

PERIPHERALS

1866 Quick SCSI Card (requires cable) .......... 319.
8335 PLI TurboFloppy 1.4 .......................... 295.
8327 PLI Infinity 40 Turbo (removable) .......... 599.
9752 PLI Infinity 88 Turbo (removable) ......... 779.
2325 PLI Infinity Optical Drive .................... 3199.
4545 PLI Infinity MO 3.5 Optical Drive ......... 1699.
2884 PLI Infinity Floptical Drive (21 MB) ....... 559.
2865 Floptical Cartridge (21 MB) 35 2069 (10 pack) 299.
2944 Quantum 52 MB External Hard Drive ....... 479.
3692 Quantum 240 MB External Hard Drive ....... 999.
8330 PLI 105 MB .......................... 619.
2327 PLI 2GB DAT Drive .......................... 1939.
3135 PSI MultiColor 99 3137 Crunch-It LC 113.
1501 SIGMA Designs DoubleUp 36 DiskDoubler 3.7 179.
* TOTAL SYSTEMS 30 day MBG
7817 16 MHz Mercury 680 for Mac SE .......................... 359.
7816 20 MHz Gemini 680 .................. 799.
68882 Math Coprocessor .......................... call

MEDIA

* Fuji 60 day MBG
2214 31/2" DS Disks (10) 9 2242 (50) 32.
2215 31/2" HD Disks (10) 15 2241 (50) 59.
4863 31/2" HD Disks (20) w/tlilage case ......... 26.

ACCESORIES

TONERS, CASES, DUST COVERS

Apple Computer
9773 StyleWriter Ink Cartridge .......................... 22.
7746 Personal LaserWriter Toner Cartridge ......... 87.
1115 LaserWriter II Toner Cartridge .............. 105.

** Expert Software 30 day MBG
4970 Expert Color Paint 1.0 — New! The latest in painting tools at an incredible price. You get hot 32-bit color and tools that may be customized, multiple undo’s, virtual memory and System 7 support .......................... $29.

** Avery 60 day MBG
7050 Avery 5660 (1" x 2"") Clear Adhesive-Laser 32.
4811 Avery 5180 (8 1/2" x 11" Trans-Laser) .... 22.
4807 Avery 5190 (1" x 2"") Address-Laser ........ 24.

** Basic Needs 60 day MBG
Full line of Dust Covers, etc. call

** Curtis Manufacturing 30 day MBG
8973 Apple Security Kit (SL-2) .............. 22.

** Ergotron, Inc.
Mac Tilt (Classic, SE or SE/30) ea 68.

** I/O Design 30 day MBG
Full line of Dust Covers (total green or navy) call

** Kensington 30 day MBG
Full line available, Partial Issuing.
4973 Power Tree 20 .......................... 27.
2550 Apple Security Kit .......................... 33.
9303 Keyboard Shelf .......................... 39.
6763 Mac SE Anti-Glare Filter .............. 49.
3623 Apple Color 12" Anti-Glare Filter .... 63.
5064 Apple Color 13" Anti-Glare Filter .... 63.

** MacConnection 60 day MBG
1505 Solid Oak Desk Case (520) 21 4823 (90) 32.

** MouseTrak 60 day MBG
2694 MouseTrak Pad (7" x 9") B 2692 (9" x 11") 9.
2693 MouseTrak Pad Low Friction (9" x 7") .... 10.

** Time Slips 30 day MBG
2996 @&par Timeslips III 2.1 — New version! Fast, easy, accurate time and billing for service professionals $194.
8959 @&par Accounting Line 1.2B — New links with general ledger accounting programs .... 52.

SHIPPING

Continental US: Barring events beyond our control, all credit card orders are shipped same day. COD max $1000. Cash or certified check.

120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.

Our order lines are open continuously from 8:00 a.m. Monday until 5:30 p.m. Sunday Eastern Time. You can call our business offices at 603/446-7711 Monday through Friday 9:00 a.m. to 5:30 p.m. Eastern Time.
products all year.

ACME/Safe Power
$300VA Power Backup ................ $175.

Advanced Gravis ........................... 30 day MBG
Gravis Mouse Stick ................... 62.

AMERICAN POWER
UPS 1100E ................................ 209. 6666 UPS 3700c .......................... 339.
Surge Arrest Plus ................... 39.

APPLE
Thumbellina (mini 3 button mouse) ...... 65.
MousePen Pro Mac .................. 65.

CAEER
OmniPage 459. 4930 Professional 649.

Curtis Manufacturing ........................... 30 day MBG
MVP Mouse (MyP 1) .................. 89.

Dadastek ................................ 30 day MBG
MAC1161E 126. 2384 w/Quick Keys ...... 149.
Switchboard (modular keyboard) ........ 159.

Exrex ................................ 30 day MBG
Silhouette Trackball 1.0 (ADB Macs) .... 78.

GDT Softworks ............................ 30 day MBG
BetterWriters 1.0 (software drivers) .. 39.

Power Print ................................ 99.

Hewlett-Packard
HP B&W DeskWriter (w/cartridge) .... 479.
HP Color DeskWriter G (w/color cart.) .. 440.
HP ScanJet IIc (color) .................. 1599.
HP LaserJet III (requires kit) ........ 1599.

Koala ................................ 30 day MBG
MacVision (Serial) G-102 Digitizer 419. 269.

Kraft Systems .............................. 30 day MBG
Trackball (footswitch) ................ 39.

KM30 Trackball ............................ 42.

Logitech ................................ 30 day MBG
MouseMan 77. 1672 TrackMan 89. 800.
ScanMan Model 32 G-Scale Scanner 299.
ScanMan & Catchword ................ 369.

MicroSpeed ................................ 30 day MBG
MicroTRAC for SE & II family ........ 75.

Motor Systems ............................. 30 day MBG
Little Mouse or 8001 Little Mouse Plus 74.

NEC
SiemensWriter Model 95 .................. 1599.
Orange Micro ................................ 30 day MBG
Grappler 2.0 .......................... 92. 3692 Cislsp ......... 115.

Simpkins ................................ 30 day MBG
Applied Engineering .................. 269.
Festh McIntosh LC ...................... 100.
M1 44 MB High Density Drive ....... 229.
Plus Drive (FDHD for Plus & SE) ..... 309.
TransWarp SE (25 MHz) ............. 799.
TransWarp SE (33 MHz) ............. 1479.
TransWarp LC (33 MHz) ............. 1199.
TransWarp Classic (15 MHz) ....... 479.
Flurry Drive to Mac III Cable ...... 15.

SIMMs ................................ 30 day MBG
1 MB SIMMs (80ns. set of 2) ...... 69.
2 MB SIMMs for II or IIc ........... 65.
4 MB SIMMs (80ns) 125. 7600 (set of 4) 479.

Applied Engineering .................. 30 day MBG
QuickSaver Accelerator for the IIi ... 269.
Festh McIntosh LC ...................... 100.
MicroSpeed ............................. 1599.

UPGRADES & DRIVES
SIMMs ................................ 30 day MBG
1 MB SIMMs (80ns, set of 2) ...... 69.
2 MB SIMMs for II or IIc ........... 65.
4 MB SIMMs (80ns) 125. 7600 (set of 4) 479.

Applied Engineering .................. 30 day MBG
QuickSaver Accelerator for the IIi ... 269.
Festh McIntosh LC ...................... 100.

SUNDAY ................................ 30 day MBG
Simpkins ................................ 30 day MBG
Applied Engineering .................. 269.

SUN Microsystems
Dove Computer ............................ 30 day MBG
Raccer 030 Plus, SE, or SE/30 ....... 399.
Raccer 030 for Mac II ................. 739.

FWD. Inc. ................................. 30 day MBG
HammerDisk4k (removable) .......... 739.
HammerDisk8k (removable) .......... 949.
PocketHammer 50 ....................... 569.

PH ......... 749. 2314 PH 200 ....... 1199.
HammerInternal 100is 599. 2334 200is 999.

HammerDisk4k (40 MHz) ............ 69.
HammerDisk8k (60 MHz) .......... 429.
HammerInternal 100is 599. 2334 200is 999.

IONEMEG
2224 90 MB Transportable (req. interface) ..... 799.
Mac Interface (w/Center Point Back-up) ..... 39.
Mac 2B Interface (w/Retrospect) .... 99.

MASS Microsystems
Data Pak A 5. 849. 5599 Data Pak 88 849.
Data Pak MO/12B 1699.
Diamond Drives
2973 120 MB HD .................. 399. 2972 120 MB HD 1049.
2369 320 MB HD 6859. 2351 510 MB HD 2149.
9503 Internal disk 1289. 5010 Internal . 389.
9509 Internal disk 1289. 5010 Internal . 389.
9508 70 120 MB Portable .... 449.
9589 70 120 MB Portable .......... 559.
3677 2 Diamond 60 MB Portable Drive ...... 469.
3678 120 MB Port., 599. 3663 210 MB Port. .... 979.
3682 120 MB Port. 1649. 3659 510 MB Port. .... 1999.
3657 HitchHiker Portable (40 MB) .... 479.
3656 HitchHiker Portable (80 MB) ...... 699.

MDS Drives .............................. 60 day MBG
5533 MDS 44 SyQuest w/AutoDoubler 1.0 469.
5982 MDS 44 SyQuest w/Norton Utilities 2.0 599.
5534 MDS 88 SyQuest w/AutoDoubler 1.0 .... 469.
5535 MDS 88 SyQuest w/Norton Utilities 2.0 599.
5529 44 Mb Cart. (3 pack) 199. 5528/5 (pack) .... 329.
5531 44 Mb Cart. (3 pack) 186. 5530/3 (pack) .... 329.

Micron ................................. 30 day MBG
1749 Xceed Ici-128K Cache Card ...... 239.
2262 Xceed Color 30 Card (SE/30) ..... 279.
2263 Xceed Gray Scale 30 Adapter Card .... 75.
3688 Xceed Macro Color 30 24-bit Video Card 499.

Applied Engineering
6519 TransWarp Classic=16 MHz 68030 accelerator upgrade for the Mac Classic. Quadruples the performance of a standard Classic. Available w/optional 68882 math chip (FPU) & optional support of up to 16 MB of memory .... $479.

SIMMs ................................ free video & manual
RAM your Mac to System 7 specs and beyond. At the lowest prices around. All SIMMs come with a full 2-year warranty, plus free installation manual and video. We also carry SIMMs for the Quadra, and 2 MB, 4 MB, and 6 MB modules for Apple’s PowerBooks. So kick your Mac into overdrive and create huge spreadsheets & complex graphics with power to spare.
1107 1 MB SIMMs (80ns) ........ 36.
8316 1 MB SIMMs (80ns, set of 2) .... 69.
9437 2 MB SIMMs for Ill or LC ...... 65.
7437 4 MB SIMMs (80ns) ........ 125.
7600 4 MB SIMMs (80ns, set of 4) .... 479.
4 MB SIMMs for Quadra 700/80/60, set of 4) call PowerBook 2.4, and 6 MB modules available

Dayna ................................ 60 day MBG
DaynaFile II 1.4 51/4 Drive .......... 429.

Software Ventures ........................... 30 day MBG
3455 MicroPlane II 4.0-The only System 7 savvy telecommunications software with Publish & Subscribe, Apple Events, Connection Manager & IAC. Winner of several Macworld Class Awards ............................ limited special $179.

Software Ventures ........................... 30 day MBG
Software Ventures ........................... 30 day MBG
Software Ventures ........................... 30 day MBG
Software Ventures ........................... 30 day MBG
The experts agree: Thunder/24 is the industry's fastest color graphics card.

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

MACUSER

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

MACWORLD

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

MACWEEK

"Thunder offers the best Macintosh\u2122 graphics performance, and that's essential to serious color-publishing customers."

TYPEWORLD

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

BYTE

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

Circle 132 on reader service card
Behind Macworld's Graphics

BY CATHY ABES

Artist: Along with his two partners, Jesse Doquilo and Randy Lim, Glenn Mitsui runs Seattle-based Studio MD, specializing in digital design and illustration. Mitsui's introduction to the Mac began when he designed presentation templates for Aldus Persuasion. "Our geographical location between Aldus and Microsoft prompted our firm to go online," says Mitsui. "Since then, our main target market has been the high-tech field."

Hardware: Mac IIx with 20MB of RAM (on a Radius Rocket) with 340MB internal hard drive; 24-bit Radius DirectColor/GX accelerated color graphics board; 13-inch AppleColor High-Resolution RGB Monitor; Micronet 44MB removable-cartridge drive; Microtek 600ZS color ScanMaker.

Software: Aldus FreeHand 3.1; Adobe Photoshop 2.1; Fractal Design Painter 1.2.

How It Was Done: The illustration that opens our feature wanted; after skewing each one, he redrew it with the pen tool to get the exact shape and form he wanted. The 2 and the 4 he drew from scratch. After creating the numbers, he skewed them slightly downward with the right side slightly lower than the left so that when he rotated them to fit into the grid, the baseline would be flush with the grid lines (for example, to make the base of the large 4 align with the road). To give each number an illusion of height, Mitsui duplicated it several times and moved each duplicate straight up—simulating the extrusion technique of 3-D modeling programs. For more dimension, he added other details such as doorways, windows, smokestacks, and different floor levels.

Next Mitsui created the random numbers traveling the roads to Spreadsheet City. For these he used various fonts, scaling and skewing the numbers to fit the perspective of the drawing.

After drawing the other individual elements (the truck, the policeman, and the sign) Mitsui copied them into the existing file and resized them until they were in correct proportion to the rest of the elements. Before bringing the drawing into Photoshop, he refined it as much as possible in FreeHand because that program enabled him to quickly and easily do revisions, such as moving and scaling objects, that would be difficult or impossible to do in Photoshop.

Once he had finished these revisions, he saved each element (the large numbers, the policeman, the truck, the sign, and the...
Mitsui's original pencil sketches of the various elements of the drawing, scanned in as gray-scale TIFF images and composited into one FreeHand file for use as a template.

background) first as a separate FreeHand file and then as a separate PICT2 file for import into Photoshop. Mitsui saved each file in FreeHand format as well as PICT2 so that if he needed to make any changes, he could do them in the FreeHand file and then just replace the PICT2 file. (Since the default resolution for PICT2 files is 72 dpi, he also had to change that to 300 dpi for his final output.)

In Photoshop, Mitsui's first step was to render the background, adding gradations and textures (he used similar techniques for the large 3-D numbers). After masking the green areas with the Pen tool he chose Save Path (from the Select menu) so that he could reselect the green areas later. Next he chose a greenish tan for the foreground and a dark green for the background and specified a linear gradation of the spreadsheet area. Because he knew that the RGB colors he was using would eventually have to be converted to CMYK colors for printing, during the color-selection process, he checked the Color Picker dialog box to make sure the colors he chose were within the CMYK gamut. Colors without CMYK counterparts would almost certainly look dramatically different in the final output.

Now Mitsui was ready to add the spreadsheet grid with text and numbers to the background. First he scanned an actual spreadsheet and skewed it to fit the perspective of the illustration. Then—to select just the grid lines, text, and numbers—he used the magic-wand tool to select one word and then chose Similar (from the Select menu) to select everything similar, in this case, everything black. After pasting the worksheet into the gradated area, he marqued this area, then copied and pasted it into a new Photoshop file and saved it as an RGB TIFF file. Next he opened this file in Painter 1.2, where he applied a paper texture with 40 percent opacity to the spreadsheet. After saving this as an RGB TIFF file in Painter, he opened it from within Photoshop and copied and pasted the area into the original RGB TIFF file he'd created in Photoshop. Here he added a slight gradation for the road (from dark gray to black) and added the yellow dividing lines. The clouds were taken from a scanned photo. The yellow wall was drawn in FreeHand, gradations were added in Photoshop, and texture was added in Painter.

The small black sphere was created as a square in Photoshop, into which Mitsui typed various math operators at different sizes and thicknesses—in white on a black background. Then he used Photoshop's Spherize filter to transform the square into a sphere with a 3-D appearance. The sphere's highlights were added with the airbrush tool.

Mitsui spent about 10 hours designing and drawing the basic illustration in FreeHand and about 40 hours rendering it in Photoshop and Painter. The illustration's finished size (as an RGB TIFF file) was 23MB; after conversion to CMYK it became 30MB.
WIN A FREE INFINITY FLOPTICAL® 21 MB DRIVE

The floppy has finally grown up! The Infinity Floptical® 21 MB Drive is the most exciting removable technology for the 90's. It reads and writes 1.44MB Macintosh formatted floppies, as well as 21MB floptical diskettes. To enter the drawing to win an Infinity Floptical® 21 MB Drive, and to get more information about the Infinity Floptical® 21 MB Drive, fill out and mail this card. You may also choose to get a special discount on an Infinity Floptical® 21 MB Drive by ordering one with this card.

CHECK ONE:

☐ YES! I would like to receive a discount by buying an Infinity Floptical drive immediately. Please have a PLI representative call me to arrange the purchase. I understand that I will still be entered in the drawing to win an additional drive.

☐ NO! I don’t want to order a drive today, but please enter me in the drawing anyway.

IMPORTANT: YOU MUST PROVIDE ALL REQUESTED INFORMATION TO BE ELIGIBLE FOR THE DRAWING. NO PURCHASE NECESSARY.

Name ___________________________ Title ___________________________

Company ___________________________ Address ___________________________

City, ST, Zip, Country ___________________________ Daytime Phone Number ___________________________
Peripheral Land Incorporated
47421 Bayside Parkway
Fremont, CA 94538
The floppy turns 21

The floppy has finally grown up with the arrival of the Floptical disk drive. Floptical drives provide a combination of the best qualities of both magnetic and optical technology.

Each Floptical disk holds 21MB of text (or graphics, or spreadsheets, or anything). And because the Floptical disk drive reads and writes ordinary 720K and 1.44MB floppy disks, you can renew your system instead of redoing it.

Though the outside looks like an ordinary 3.5" floppy, the inside is a highly refined super floppy. Unique stamped optical servo tracks give the Floptical drive very accurate positioning of the read/write head, allowing track densities of 1245 tracks per inch, almost ten times the track densities of ordinary floppies. Even better, these embossed servo tracks can't be erased or damaged, making Floptical disks safer than any other servo-based media.

But the Floptical drive is more than just a better floppy; it's a whole new standard. The media are from Hitachi Maxell and 3M, two world-class companies providing a world-class product. Their commitment to excellence is your assurance that Floptical disks are safe enough for your most valuable data.

Floptical's high density storage and low cost, ultra-high reliability and convenience are features you'll never outgrow.

PLI Floptical storage products are also available for the PC, Atari & NeXT platforms.

®Floptical is a registered trademark of Insite Peripherals. All products are trademarks or registered trademarks of their respective companies.

800-288-8754
Peripheral Land Incorporated
47421 Bayside Parkway • Fremont, CA 94538
510-657-2211 or Fax 510-683-9713

Circle 236 on reader service card

In just minutes with new GreatWorks 2.0, you'll be outlining, writing, calculating, charting, communicating, drawing, painting, and sorting files.

With eight powerful, integrated applications, GreatWorks 2.0 is all you need to become productive immediately. In fact, anything you need to do on your Classic, LC, or portable, you can do with GreatWorks.

No other integrated software does so much, so easily. And for only $299.*

One easy set of commands.

GreatWork's unique CORE Technologies let you use the same commands in every module. Outline or write a document, then bring in spreadsheet data and build a chart.

Add your own colorful artwork or logo. Then e-mail it to someone in your database. In minutes. All using the same seamless interface.

Because it's System 7.0 savvy, you can make changes in your spreadsheet or artwork and have GreatWorks automatically update every document.

So complete, you can't beat it.

So, why waste another moment with your new Mac? A few minutes with GreatWorks, and you'll be ready for anything. Call 1-800-554-4403 for an instant FAX Data Sheet (enter 150) or 1-800-228-4122, x 818F for the name of your nearest dealer.
James Joyce was one heck of a writer, and Word is one doozy of a word processor. But with one life to lead and one Mac on the desktop, sooner or later you have to scream "Enough!" So I'm screaming—Enough already!

The problems begin with installation. In the old days—the eighties—installing a program on the Macintosh entailed but a few simple steps. You would insert the disk that held the program into your 1MB Mac SE, find the program icon, and drag it onto your hard drive. And the program would be installed. Today a megabyte is the penny you ante up with. To suggest that a program like Microsoft Word 5.0 should fit in less than 1MB of memory would be like saying that Donald Trump should squire Marla Maples about in a Geo. It is just not done.

The total storage requirement for Microsoft Word 5.0—including the program dictionaries, help, and other assorted paraphernalia—is about 6MB. Installing a program of this size is no picnic. Like many programs of its ilk, Word is too complicated to install using the trusty Macintosh protocols, so you have to hand everything over to a separate installation program that becomes, for a time, your personal exercise trainer, strengthening those key wrist muscles by coaching you to endlessly swap disks in and out of the machine. When you're finished, you have a folder that takes up space that might otherwise be occupied by the complete works of Ambrose Bierce.

**Performance Anxiety**

**FINALLY, I WAS READY TO open the program. I reached for the mouse and double-clicked. Instead of the perky response to this event to which I have become accustomed, I got the dread cursor-watch. Without a stopwatch of my own, I cannot give you the precise amount of time that elapsed before the Mac was ready to work. But it seemed very long. Too long.**

The next shock came when I tried to open up a second application. A dialog box informed me I was out of memory. Checking the About This Macintosh box, I discovered that this new, improved Word occupied well over 2MB of memory. Combined with the even bigger chunk of RAM gobbled up by System 7 (see my previous ravings in the May issue about the size of that monster), this just about filled up what I had once assumed to be an extravagant expanse of memory.

I do not mean to condemn Word 5.0. Indeed, the new version includes many improvements. For instance, I like the ability to search by type style, and there is a neat feature that lets you instantly call up recently closed files. There are many other great features that I have not had the time to discover. Obviously a lot of work went into this upgrade, in anticipation, no doubt, of tithing Microsoft Word 4.0 users for the $129 upgrade fee. Perhaps it was a desire to justify that fee that led Microsoft to assume that better had to mean bigger. As a result, on the majority of Macintosh computers now in use, we have a program that has every feature imaginable, is loaded with well-conceived shortcuts, can handle Russian novels as easily as memos—and is continually irritating because it's slow and hoggish.

It's not just Microsoft. (And to be fair, I must note that the company does tell users with memory-deficient Macs how to delete components of the program—which they paid for—to shoehorn Word into a smaller space and allow it to run faster.) Most of the applications I see these days are livin' large monsters. A recent HyperCard stack came on five disks, and the swapping took more wrist action than a game of racquetball. Even some games these days take up 4MB or 5MB of code. By the time you install them, you are too tired to play.
Microsoft Words  When the delivery truck drops off the package of 80 floppies containing the new Words, you will be delighted with a whole new set of features, including a point-and-click etymology feature that tells the derivation of any word, along with its Indo-Chinese root. You won't believe you ever got along without it.

Mail merge now comes with a built-in franking privilege. The popular Translate module first included in version 49.1 now handles Serbo-Croatian, Hobbit, and Pig Latin.

In fact, over 7000 new commands have been added, any or all of which can be included or excised from the menu bars. Some of the newer ones include Change Word to Euphemism, Search by Nuance, Remove Pun, Make Up New Style, and Create Rebus.

Installing the full program will fill two magneto-optical drives, but you can save space by not loading large modules like Poetry Generator, Etiquette Checker, and Film at 11.

Lotus 10-20-30  The new, improved spreadsheet from Lotus can accommodate more cells than electrons in the known universe. Also of note is the animated charting function that can display exploding pie charts, dynamic wire graphs, and a line graph with Nintendo's Super Mario tracing the ups and downs.

Of special interest is the Fudge Formula command on the menu bar. When Fudge Formula is chosen as the default, 10-20-30 automatically skews the numbers toward hopelessly optimistic projections, especially useful for seeking venture capital. Warning: 10-20-30 runs a little slow. Instead of the cursor changing to a wristwatch, you get a calendar.

40th Dimension  The team that produced this version of the famous database code-named it Fields of Dreams. It was beta-tested by Mormons, who used it to catalog the genealogies of every human in North America. With a single keystroke, it's possible to find out all the second cousins of everyone in Chicago! And the program is still hardy enough to handle voluminous information on each person, along with scanned photos!

This version includes an extensive scripting language (unfortunately incompatible with the approximately 300 scripting schemes for various other Mac programs) that makes it possible for MIS wizards to dazzle their bosses by automating the most mundane tasks.

As befits a serious database, speed is secondary to power, but each copy of 40th Dimension comes with a free Nintendo Game Boy to while away the time as the Mac is fulfilling queries.

MacDrawnOut  Claris's absolute breakthrough in image creation. The tear-off toolbox has 721 icons representing different brushes, shapes, and effects, including some never seen and a few that never work. When you draw a box in MacDrawnOut, a simple keystroke can change the color of the box, fill it with one of thousands of different patterns (including your own family tartan), and generate an infinite fractal pattern.

You can save your images in 41 different formats, including PICT, TIFF, JIF, ASCII, NASA, ASCAP, and FUBAR. The program also comes with templates for easy creation of forms, blueprints, storyboards, and domestic and foreign currency.

MacDrawnOut runs on all Macs, but users with pre-1996 Quadras should allow 40 minutes each time the screen redraws. For best results, Claris recommends a two-teraflop machine.

continues
STATISTICA/Mac™ A complete statistical data analysis system with hundreds of presentation-quality graphs integrated with all procedures.

- In-depth, comprehensive implementations of: Exploratory techniques; Descriptive statistics; Frequency tables; Large selection of nonparametric tests; Stepwise multiple regression methods with extended diagnostics; General nonlinear estimation (with predefined or user-specified models); Logit/Probit analysis; General linear model implementation of ANOVA/MANOVA/ANCOVA/MAANOVA (designs of practically unlimited complexity, repeated, nested, incomplete, random, changing covariates, contrast analyses, post-hoc tests, custom designs); Discriminant function analysis statistics; Canonical analysis statistics; Time series modeling techniques with forecasting; Factor analysis with rotations; Cluster analysis (incl. hierarchical, k-means, and 2-way joining); General survival/failure time analysis (incl. life tables, group comparisons, and regression models); Distribution fitting (a large selection of continuous and discrete distributions); Curve and surface fitting and smoothing (incl. spline, LOWESS, NEX; and others); and much more.

- Manual with comprehensive introductions to each method and step-by-step examples (Quick Start booklet explains all major conventions); balloon help.

- Extensive data management facilities: a super-fast spreadsheet of unlimited capacity with formulas (and Publish and Subscribe); menu-driven files, “double identity” of values (numeric/text); BASIC-like data transformations programming language; Import/Export data and graphs from/to Excel, MacSS, CSS and other formats.

- Graphs integrated with all procedures (e.g., click on a correlation coefficient to produce the corresponding scatterplot and other graphics; click on a variable in the descriptive statistics table to produce a histogram and other graphs; click on an interaction effect in the ANOVA table to see a plot of interaction) (Large selection of 2-dimensional graphs: Histograms (incl. multiple, clustered breakdown, overlaid functions), Scatterplots (incl. multiple, weighted frequency, smooth, fraction fitting), Multiple line and Range plots, Trend plots, Standard deviation plots, Data sequence diagrams, Contour plots, Box-and-whisker plots, Column plots, Bar graphs, Double pie charts, Scrollable dendrograms, Two-way joining plots, Curve fitting plots, Distribution comparison plots, Range plots, Probability plots, Amalgamation plots, Factor space plots, Gene set outlier and residual diagnostics, ANOVA interaction plots, Multivariate (multiple) matrix plots, exploratory timeforms plots with histograms, and many specialized plots).

- Large selection of 3-dimensional graphs: 3D surface plots (with data smoothing procedures, color or gray-scale shading, and projected contours), 3D scatterplots, 3D block scatterplots, 3D axes (space) plots, 3D spectral plots with adjustable planes, 3D isometric plots, 3D histograms, 3D surface-smoothed frequency plots, and 3D range plots (“flying boxes”).

- All 3D plots displayed in true perspective, feature interactive real-time rotation facilities (incl. continuous rotation) (Extensive graph customization options: all structural aspects of graphs (axes, scaling, patterns, colors, styles, regions, perspective, rotation, line/area/colored, etc.); MacDraw-style tools with specialized “objects”; hi-res graph and artwork embedding; page layout/preview; dynamic rulers; Publish and Subscribe graph links) (All output displayed in Scrollsheets™ (dynamic, internally scrollable tables: all numbers can be instantly converted into a variety of on-screen customizable, presentation-quality graphs) (All Scrollsheets can be saved into data files and used for input, or exported) Flexible facilities to perform analyses on specific subsets of data (Extremely large data analysis designs) (Unlimited size of files) (Extended precision) (Unmatched speed) (e.g., on a Mac life, arbitrary rotation of a surface with 1,000 points takes 1 second; correlation matrix 50x50 with 100 cases—less than 3 seconds; transposing a 5,000 data points file—less than 2 seconds) (Full support for System 7 (“savvy”) incl. “Publish and Subscribe,” Apple events, balloon help, “drag and drop,” 32-bit, Quadra; etc.)

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

DOS versions also available (can exchange data with Macintosh versions): STATISTICA/DOS™ $795; Quick STATISTICA/DOS™ $285.

Domestic $99 per product; please specify type of computer with order; 14-day money-back guarantee.

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

Overseas Offices: Statsoft of Europe (Hamburg, FRG), tel: 040/42020347; fax: 040/4201311; Statsoft UK (London, UK), tel: 0402/420222; fax: 0402/420255; Statsoft Pacific (Melbourne, Australia), tel: (03) 663 0580; fax: (03) 663 6117; Statsoft Canada-CCC (Canada), tel: 416-949-0737; fax: 416-949-0918; Available from: CORPORATE SOFTWARE and other Authorized Representatives Worldwide: Holland, Spain, France, Version US (1) 40509813; Sweden: Akademiska Data 018-240335; Hungary: Pardosoft KFT 186-666; Belgium: TKRM 10 61 16 29; South Africa: Olivos 17 663-4500; Japan: SOFEL Co. 03-3251 1195.

CSS, Statsoft, STATISTICA/Mac, STATISTICA/DOS, and Scrollsheet are trademarks of Statsoft, Inc. • Macintosh, Mac, Excel and MacDraw are trademarks of their respective companies.

Circle 99 on reader service card.
Find More Customers

Guaranteed

There's simply no easier, faster, or more cost-effective way to find more business-to-business prospects than with MarketPlace Business. MarketPlace is so effective that we guarantee it. In fact, now you can try MarketPlace FREE for 30 days. Use it to build lists, run test campaigns, increase your sales. If, after 30 days, you aren't convinced that MarketPlace is a revolutionary money-maker, simply return the product. It's that easy.

Using MarketPlace is like being your own list broker. You can instantly build lists for direct mail, telemarketing, market analysis, and more. You select the best prospects from among 7 million U.S. businesses, using criteria you set yourself—like geographic area, annual sales, number of employees, and type of business. You save money on smaller, more precisely targeted lists that you build using the most detailed industry classifications available—8-digit SIC codes. (Even the U.S. government can't give you more specific business definitions.)

Because MarketPlace lets you be the list broker, you can preview your list, change your criteria, analyze your list's characteristics—all without charge. And best of all, you can reuse any MarketPlace list as often as you want for one year—at no extra charge.

You get the lists you want when you want them. With information like business name, key contact name and title, mailing address and telephone number, annual sales and number of employees—the kind of information that helps you turn perfect strangers into perfect customers.

There's more: Quarterly information updates. Unlimited market analysis. Instant list counts. One-step data exporting. But don't just take our word for it. Call us now at 617-894-4100 (x3034) and ask for a FREE MarketPlace demo diskette.

If you've been looking to increase your sales, your search is over. Guaranteed.

Call today: 617-894-4100 (x3034) or fax: 617-894-1656

Circle 273 on reader service card

STEVEN LEVY's latest book is Artificial Life (Pantheon, 1992).
DiagnoSTIC softWare foR macintosh

The next time you see a 'sad Mac' on your screen or your Mac's performance isn't up to par, DIAGNOSE FROM YOUR DESK with SNOOPER, the revolutionary new standard for Mac diagnostic and testing tools.

SNOOPER performs a comprehensive suite of tests, checks all your hardware and identifies any problems. And the same SNOOPER software runs on all Macs.

SNOOPER is easy to use and saves time and money. If you already own Norton Utilities, complete your Mac utilities with SNOOPER, the hardware diagnostic.

MAXA and SNOOPER are trademarks of MAXA Corporation. Other product and company names are trademarks of their respective owners. © 1992 MAXA Corporation. All rights reserved.
7 REASONS WHY YOU NEED A NEW WORD PROCESSOR.

1. SYSTEM 7
Because you're ready to see what System 7 can do.

Apple calls System 7 the biggest improvement in Macintosh since Macintosh. And WordPerfect is now System 7 savvy.

So now (among lots of other new things), WordPerfect will automatically keep track of changes that you (or someone else) might make to imported files (charts, graphics, whatever), and update your WP documents accordingly. Now, a change made in one place can be a change made in many places. Apple calls it "Publish and Subscribe," and it works between programs on your hard drive, as well as among people on your network. Publish and Subscribe assures you that your documents will always reflect the latest information available.

And it's just one of the new System 7 tricks that WordPerfect 2.1 has mastered.

2. COLUMNS
Because WordPerfect does columns better than the Greeks.

Pick a starting point, click on the ruler, and see your text in two columns. Or in three columns. Or five columns. With vertical rules beside or between them, if you like. Drag a guide on the ruler and try unequal columns. Highlight text in a box that jumps across columns.

Go crazy with the design, or stick with the tried-and-true.

The point is, WordPerfect gives you formatting options that other word processors don't. And exploring them couldn't be much easier.

3. GRAPHICS
Because you'd use more graphics if using them were easy.

WordPerfect not only gives you full control over the placement of graphics in your text, it also gives you a color drawing program for modifying imported artwork (or starting over from scratch) without ever leaving the program.

You can print graphics under your text (as "watermarks") or on top (as overlays). You can use the drawing tools to rotate text to any angle that strikes your fancy (something many page-layout programs still can't do).

And WordPerfect gives you 36 border styles and 64 fill patterns—which you can use in any of 256 colors—for highlighting graphics, paragraphs, columns, pages, even blocks of text.

4. QUICKTIME
Because a movie is worth who-knows-how-many words.

If a picture is worth a thousand words, what's a movie worth? With WordPerfect and QuickTime, you can calculate it for yourself.
Apple's QuickTime is a new technology that lets you work with digital video and sound as easily as you now work with text and graphics files.

Imagine being able to place (and size) a QuickTime movie anywhere in a document. You could add urgency to a memo with a few well-chosen words delivered "live." Or help an audience visualize your latest brainstorm with a 3-D simulation they can start, stop and replay.

We have a feeling that words can't begin to describe all the ways you'll think of to use it.

Because you get tired of repeating yourself, yourself, yourself.

Perhaps because they've heard it's a powerful programming language, WordPerfect's macro editor intimidates some people at first. It shouldn't.

It's no more complicated than a tape recorder. Click "record" and it memorizes your keystrokes. Click "play" and it repeats them.

With no more knowledge than that, you can create a WordPerfect macro. And can spare yourself the effort of formatting M-E-M-O-R-A-N-D-U-M, T-o-F-r-o-m (and so on) across the top of the page every time you want to fire off a memo, for example.

But simple as recording your own macros can be, we also ship a number of them with the program. For formatting addresses to print on envelopes. Placing "drop caps" at the start of paragraphs. And other jobs you'd rather not do twice.

WordPerfect's compatibility can save you a lot of aggravation. Not to mention a lot of reformatting.

Because some people work on DOS computers.

You want the word processor that's right for you. If your choice happens also to be the choice of millions of others — with other computers — so much the better.

That's why WordPerfect is such a good choice. Lots of DOS users use WordPerfect. As well as UNIX, VMS and other users. If you ever find your Mac on a network with other computers,

WordPerfect's compatibility can save you a lot of aggravation. Not to mention a lot of reformatting.

Because even if you never call us, it's nice to know we're here.

Like any good Mac program, WordPerfect 2.1 is easy to use. But unlike many Mac programs, you're not on your own with it. You get toll-free help from one of the largest support staffs in the industry.

For more reasons to try WordPerfect, call for our free video.
1-800-526-7820

WordPerfect

WordPerfect is a registered trademark of WordPerfect Corporation within the United States and other countries. All other brands and product names are trademarks or registered trademarks of their respective companies. Copyright © 1992 WordPerfect Corporation.
Full Page Power at Its Best.

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

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

Call (800) 845-8086 EXT 100 for details. You're just a plug away from full-page power!
Paul Muehlman agrees. Looking at a 170 display with a voided pixel is like “looking at a Renoir painting with a hole in the canvas, he says.”

Apple claims it doesn’t have to replace PowerBook displays that have voided pixels. Not so fast, says one attorney.

Legally Speaking
Mark Anderson has a more-than-passing acquaintance with consumer law as a partner in the San Francisco law firm of Kemnitzer, Dickison, Anderson & Barron. Last year he successfully represented a client who bought a defective PC clone system from a Los Angeles manufacturer that made three attempts to repair the system over the course of several months and failed miserably every time.

Eventually, the company refused to provide any additional warranty service. But the computer was still broken. Under California’s Song-Beverly Consumer Warranty Act and the federal Magnuson Moss Warranty Act, Anderson demanded the company completely replace the system or reimburse his client for the purchase price, loss of use, and so on.

Smart Company, Foolish Choices
BY DEBORAH BRANSCUM

Paul Crouch, Jr., owns a video production company in Tustin, California. Mac Muehlman is a Macintosh user in Fairfield, Iowa. Both of them bought PowerBook 170s and both of them are angry about defective displays.

Apple, you see, doesn’t call them defective.

The active matrix technology used in PowerBook 170 displays is beautiful. It’s also new, expensive, and imperfect. As a result, some displays have broken pixels. If a broken pixel is permanently black, Apple calls it a defect and repairs or replaces the display. If a broken pixel is permanently white, Apple calls it a voided pixel and says customers have to live with it—except under very narrow circumstances.

A consumer-law attorney I consulted disputes Apple’s claim that it doesn’t have to repair displays that have voided pixels. But before we get to that, let’s consider the company’s argument for its policy as outlined by Michelle Perata of Apple Executive Relations in a letter to one unhappy owner.

“Thank you for your recent letter to John Sculley regarding your new PowerBook 170 computer,” she writes. “I understand that there are two pixel voids in the display of your PowerBook 170 computer, and that you are dissatisfied with Apple’s decision not to replace this display.

“Some of the features that make active matrix display technology so superior are its fast refresh rate, sharp contrast, bright backlighting, and side-angle viewing ability. However, one less-appealing characteristic inherent in this technology is the appearance of pixel voids (pixels that stay white all the time).

“Apple’s current manufacturing specifications for the Active Matrix Display allow the following: a) up to five voids that cannot appear within 1 inch of each other; b) zero defects (pixels that stay black all the time).

“Apple arrived at this specification because the manufacturing costs to eliminate all pixel voids would be prohibitive and would prevent Apple from making active matrix display technology available in the PowerBook 170 at an affordable price. At this time, Apple has no plans to announce a service program for PowerBook 170 owners.”

Apple’s argument that the benefits of active matrix technology outweigh its flaws makes perfect sense—as long as customers are aware of Apple’s policy before they buy and have a chance to decide for themselves if voided pixels are acceptable. But that’s not what is happening.

Unhappy Customers
Paul Crouch, Jr., for example, has spent about $50,000 over the years on Macintosh equipment for his business. In March he unpacked a PowerBook 170 that had a trackball problem and three damaged pixels. His authorized Apple dealer was happy to fix the trackball, but unwilling to replace the display, since it wasn’t broken in Apple’s eyes. Crouch says a polite person on the Apple PowerBook repair hotline listened sympathetically but pointed out that the bad pixels represented a tiny failure rate in the overall scheme of things. That didn’t comfort Crouch.

“It’s like buying a Mercedes and having a big old ding in the door and having Mercedes say, Sorry, it’s within factory specifications,” he says. “If I had known about this situation, I would have fired up the machine and checked it on the spot.... I had no reason to expect the machine would be anything less than perfect.” Although Apple sent a notice to its dealers about the policy, no one at the local computer dealership mentioned it to Crouch.

Mac Muehlman had a similar experience in April when he bought a PowerBook 170 that had one voided pixel. Muehlman purchased his 170 from an unauthorized dealer, a large mail-order company that initially refused to accept his PowerBook for a refund, then relented.

When Muehlman called Apple to discuss the issue, he was assured that Apple asks all its authorized dealers to tell customers about the pixel policy. So he called the local authorized Apple dealer to inquire about the matter. According to Muehlman, a salesperson there said that he had never heard of a pixel policy until that moment. (An informal Macworld survey of eight dealers found that only two salespeople had heard of problems with active matrix technology.)

Are these guys a couple of whiners? Maybe, but I don’t think so. Apple agrees that dead black pixels are defects. Voided pixels may be less obvious and aren’t much of a problem at the edge of the screen, but a white pixel in the wrong place can be enormously irritating to some customers.

“One [bad] pixel is right dead center, so it doesn’t matter if I’m working on text or a graphic, it’s very annoying,” explains Crouch. “It’s like trying to read with a spot on your glasses. My eye goes right to it, so I usually have to reposition the windows so I don’t see it. It drives me crazy—it’s like having a fly on your nose.”

Muehlman agrees. Looking at a 170 display with a voided pixel is like “looking at a Renoir painting with a hole in the canvas, he says.”
SONS OF "ACIOUS CONSUMER

Sensible attorneys’ fees, and some incidental expenses. The manufacturer said no. But the court said yes, and Anderson’s client got her money back.

The PowerBook warranty states, in part, that Apple “warrants this hardware product against defects in materials and workmanship for a period of one year from the date of the original retail purchase. If you discover a defect, Apple will, at its option, repair, replace, or refund the purchase price of this product. . . .” I asked Anderson to review copies of the PowerBook warranty and Michelle Perata’s letter about the company’s policy. Can Apple stand fast?

Probably not, according to Anderson. The company’s policy that voided pixels do not require warranty repair “is probably not valid because no one has had notice before buying,” says Anderson. “The question then is if it is a substantial defect. Would the average user care? Will it affect the use or value of the product? It seems to me that a reasonable person shouldn’t have to live with that defect.”

The more expensive the product, the higher the consumer’s reasonable expectations, says Anderson. “I think a small-claims court would say, Apple, give ‘em their money back.”

It’s not entirely that simple. Anderson points out that dealers and manufacturers are equally liable under the so-called lemon laws above, so consumers must attempt to negotiate with both parties before heading into court. But if that fails, look for an attorney. Or small-claims court may be an option, particularly in states like California, which sets a $5000 limit on claims.

Smooth Moves

IT SEEMS SILLY, THOUGH, FOR THE few PowerBook owners disgruntled by the display issue to be forced into court when Apple has been so great in related areas.

Some PowerBook floppy drives have had real problems in reading 800K disks, for example. That’s been solved with a Rev B mechanism, according to Apple. Customers with floppy drive problems can call the repair hotline (800/767-2775) and arrange for an Apple warranty repair or return the PowerBook to an authorized dealer for service.

Apple jumped to solve another problem as well. Spare nickel-cadmium batteries for PowerBook 140s and 170s may short-circuit if metal contacts both terminals. (It is an industry-wide problem, not an Apple problem.) That makes the batteries a potential fire hazard. Once Apple learned of the danger, it notified all its dealers, sent out a mailing to all registered PowerBook users, and established a toll-free number (800/377-4127) that users can call for a free protective battery case.

The very existence of the repair hotline has been a godsend for many users, who praise the pickup and delivery service for sick PowerBooks and Apple’s fast repair turnaround. (These services will be available, for a price, after the warranty period as well.)

Winning Loyalty

IT SEEMS CLEAR THAT APPLE KNOWS how to do the right thing, it just doesn’t want to—at least when it comes to the voided-pixel policy. The company has no plans for a service program, and no way to ensure that dealers publicize the active matrix trade-off to potential customers.

But that’s not good enough. Active matrix technology is a step forward for users, and it’s great that Apple is pushing to improve the technology and make it more widely available. But the company...

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

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

The ultimate in data protection.

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

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

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

All this and fast backup, too.

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

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

Not just the best product, the best value.

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


© 1992 Symantec Corporation. *Offer expires 6/30/92; valid only in the U.S. and Canada. Price in U.S. dollars. International phone: Canada, 1-800-465-2296; Europe, 38-71-958111; Australia, 3-879-6577; others, 1-408-352-3570. All trademarks or registered trademarks are those of their respective holders.
must do a better job of informing consumers about the limitations of that technology before they get to the cash register. That may be tough with PowerBooks in such short supply that some dealers don’t even display the machines, but it’s not impossible.

Clothing manufacturers have an approach that might work for most Apple dealers. Fabrics made of natural fibers often have flaws. It’s so common that some manufacturers hang tags on raw silk and linen clothing pointing out the irregularities. Tags are an inexpensive way of informing customers about the nature of the fabric to avoid costly returns. Apple should insist that its dealers label display 170s in a similar fashion.

And once it does, Apple will discover that people are much more accepting of the limits of the technology—as long as they know about them upfront. As it is, Tim Hayes, director of service business for Apple USA, estimates that less than 3 percent of PowerBook calls involve display questions or complaints. That’s out of 200,000 PowerBooks sold in the first two quarters of this year, and not all of those were 170s. Given that, Apple can certainly afford to satisfy those few people unhappy with their 170 displays. After all, as Apple spokespeople keep telling me, nothing is more important to Apple than customer satisfaction.

Good thing, too, because I’m not sure Apple can afford to ignore disgruntled customers. Remember big spender Paul Crouch, Jr.? He tells everyone he meets about his pixel problem and tries to discourage them from buying a PowerBook.

Regardless of the law, practically and morally, Apple has an obligation to repair PowerBook 170 displays for the few people who will demand it. As attorney Anderson puts it, “They’ve got plenty of money for billboards, but they don’t want to replace screens. That’s not fair.”

Research assistance by CAROLYN BICKFORD.

Send nominees for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld) or America Online (Branscum). Conversely, drop Conspicuous Consumer a line if a company is ignoring you.
When it comes to printing in the background there are plenty of spoolers to choose from.

So why have over 150,000 Mac users chosen SuperLaserSpool? Because it supports more printers than any other spooler?

Or because it's the only one that supports Apple Image Writers and HP Laserjets, Deskjets and DeskWriters?

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

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

Because only SuperLaserSpool can spool color PostScript files?

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

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

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

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

How about picking up the phone? Dial 1-800-477-8212. It's the right thing to do.

FIFTH GENERATION SYSTEMS, INC

Circle 151 on reader service card
Microsoft Works 3.0 w/Quicken

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Works 3.0</td>
<td>$158</td>
</tr>
</tbody>
</table>

Microsoft Excel 4.0

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Excel 4.0</td>
<td>$294</td>
</tr>
</tbody>
</table>

Microsoft Word 5.0

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Word 5.0</td>
<td>$294</td>
</tr>
</tbody>
</table>

Nolo's Personal RecordKeeper

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nolo's Personal RecordKeeper</td>
<td>$28</td>
</tr>
</tbody>
</table>

Accountant Inc. 3.0

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accountant Inc. 3.0</td>
<td>$329</td>
</tr>
</tbody>
</table>
Expand Your Storage Potential
Quality Storage and Memory for Your Valuable Data

DPI DRIVES: QUALITY DRIVES... AT AMAZING PRICES

The Mac Zone proudly presents a new line of high-quality, low-priced hard drives, the DPI series. Our DPI removable was given top honors by BMUG (Berkeley Macintosh User’s Group). All DPI drives are built using only the finest components and drive mechanisms. Each drive is carefully tested for over 24 hours to assure your complete satisfaction. You will not find a better buy for the money.

52 Mb Quantum External $358

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

GET CONNECTED WITH MACTURBO MODEMS

MacTurbo 24/96 Mini Fax/Modem $149

Send faxes without leaving your desk! Our MacTurbo 24/96 Group III Fax modem gives you both fax and modem for the price of most data-only modems. The 24/96 features 9600bps send and receive rate, full-featured 2400bps data modem, full Hayes compatibility and compact design. Includes all the necessary communications and fax software. MacTurbo #00977

MacTurbo 2400 Mini Modem $89

Our MacTurbo modem has all the features you would expect to find on modems twice the price—and at 6" by 4" it's compact enough to easily tuck away in a briefcase. An eight-light status panel keeps you informed as to the status, nonvolatile memory stores phone numbers even when the modem is turned off. MacTurbo #00408

CALL NOW FOR OUR LATEST COMPETITIVE PRICING!

• Overnight Delivery
• Top Quality SIMMs
• 30-Day Money-Back Guarantee

Macintosh Ifx Owners
Need more power for graphics? Power up to 20Mb by ordering 4X4Mb FX SIMMs.

Quadra Owners
Feel the power! Take your 4Mb Quadra into the next dimension with 36Mb. Order 8Mb SIMMs (must be installed in sets of 4).

Ilsi Owners
Upgrade Your 1Mb Ilsi to 9Mb. Order 2Mb (QTY 4) Ilsi SIMMs module.

LaserWriter NTX Owners
Need more memory for your fonts? Upgrade now by ordering SIMMs 1Mb NTX (must be sold in sets of 4).

MEMORY

00801 2 1MB Simms (2Chip solution)...
00848 8MB Simms..................................58
00849 16MB Simms................................499
00342 2 1MB Simms (80ns) Samsung ....66
00357 Simm 4X1MB Ifx 80Ns ...............169
00358 Simm 4X4MB SE,30,Ifx,Ifc,Ifx Quadra 548
00354 Simms 4X4 for Ifx/If Only ............799
00355 Simms 4X4MB fx ..........................759
00356 Simms 1MB NTX ..........................49
00336 llsi Simm Module 2MB (QTY 4) ....399
00376 Simms LC (Twout 4MB Simms) ....257
04608 LC Video Ram-512K ....................89
04943 258K Vis Ram-Quadra 2 Chips ....59

NewLife Computer Corporation
04914 16MHz no FPU Plus $312E .........499
04915 16MHz with FPU Plus $512E ..........573
04917 SC5 for 128K,512K,512Ke .............95
04918 16MHz with FPU (SE) ....... 479
04919 16MHz no FPU (SE) .............. 199
04920 25MHz with FPU (SE) .............319
04922 33MHz with FPU (SE) .............1739
04923 25MHz with FPU Plus (512/2E) ......830
04947 16MHz with FPU-Classic ..........595
04952 16MHz with out FPU-Classic ..........493

Radius
821 Radius Rocket 2si ................................348
1004 Rocket 25si/44 Card Bundle ............2490
04207 Radius Rocket (SE) .....................1796

Technology Works
04905 1 MB Memory Upgrade Ti-Ps-17 ....69
04906 PowerBook 100 4MB SRAM .........499
04907 PB 2MB SRAM 100,140,170 ..........299
04908 PowerBook 600 6MB SRAM ............649
04907 PB140, 170 6MB SRAM ...............649
04908 PB140, 170 6MB SRAM ...............499

CALL NOW FOR OUR LATEST COMPETITIVE PRICING!

• Overnight Delivery
• Top Quality SIMMs
• 30-Day Money-Back Guarantee

Mac Plus and SE Owners
Upgrade your Mac Plus and SE. Order 1Mb SIMMs (80NS) Lifetime warranty.

#03428 2Mb upgrade kit .............34 per Mb (sold in pairs)

LC Owners
Upgrade Your 2Mb LC to 10Mb. Order hvo 4Mb SIMMs.

#03976 8Mb upgrade kit .............257 per pr.

#04608 Upgrade kit ..........................89

Classic Owners
Attention Classic owners! Upgrade from 1Mb to 4Mb. Order Applied Engineering MacRAM Classic 1Mb Upgrade to reach 2Mb.

#03824 Expansion board with 1Mb .....78

#03428 2Mb upgrade kit .............34 per Mb (sold in pairs)
Double Your Disk Space!
Save On Memory Management And Desktop Utilities

DiskExpress II
$49

Help!
System configuration can be infuriating. But don’t fret. Help is on the way. In fact, it’s here. Help! the handy system problem solver from Teknosys, Inc. #00867

Wallpaper
$36

Are you tired of staring day after day at the same old desktop? Redecorate with Wallpaper, the software that allows you to display, create, edit and save any number of large desktop patterns using artwork made in Wallpaper or artwork imported from your favorite paint or draw program. Thought I Could #04762

Autodoubler

The most powerful disk optimizers available. DiskExpress II monitors your file usage to determine the optimal location for files on your hard disk. It works in the background, keeping your hard disk running at maximum speed and efficiency. Alsoft Power Utilities #00618

DiskDoubler 3.7

Make your disk drive more efficient. DiskDoubler effectively doubles or triples your storage capacity. Salient Software #04955

Utilites

BetterWriters 1.01

BetterWriters gives your printer LaserWriter-like features and more. LaserWriter-like features and more: flexibility for graphics, speed, label-forms printing, user interface and communications options. Some of its specific amenities: scaling from 20 to 400 percent, custom paper sizes, two sided printing, smooth grayscale patterns, WYSIWYG access to internal printer fonts, text sorting for faster labels and forms, and much more. Works with Apple’s ImageWriter (I, II, and LQ) and StyleWriter serial printers and HP’s DeskWriter. GDT Softworks, Inc. #00901
All major credit cards accepted. No surcharge. Credit card is not charged until your order is shipped. If we must ship a partial order, freight is not charged on back order. C.O.D. orders are accepted. Add $5.00 per C.O.D. order. Educational, government and corporate purchase orders are accepted. All U.S. shipments insured at no extra charge. No sales tax, except for Washington State residents (add 8.2%). Prices and product availability subject to change without notice. All products covered by a 30 day limited warranty. Orders placed by 9pm ET shipped free in USA via Airborne Express Overnight service. Orders placed by 5pm PT by 2nd day Air, 7pm PT by 3rd day Air. International orders shipped by air only. Orders placed by 2pm PT (7pm ET) weekdays and by 1pm PT (6pm ET) weekends shipped same day. Orders placed by 2pm PT (7pm ET) weekends shipped 2nd day. Orders placed by 1pm PT (6pm ET) weekends shipped 3rd day. Orders placed by 1pm PT (6pm ET) weekends shipped 4th day. Orders placed by 11am ET will ship the same day. Orders placed by 11am ET will arrive on Monday. We will not be held responsible for typographical errors. Support and Product Upgrade Orders must be obtained prior to ordering any item. Please call Customer Service Hotline, 1-800-248-9948, weekdays from 8am to 6pm PT, 9am to 9pm ET.

MAC Zone 18085 NE 68th St, Suite A110 • Redmond, WA 98052-6716
International: 206-883-3088 • FAX: 206-881-3421

**DIAGNOSTIC SOFTWARE FOR MACINTOSH**

The next time you see a 'sad Mac' on your screen or your Mac's performance isn't up to par, Diagnose From Your Desk with SnooPER, the revolutionary new standard for Mac diagnostic and testing tools. SnooPER performs a comprehensive suite of tests, Checks ALL YOUR HARDWARE and identifies any problems. And the same SNOOPER software runs on all Macs.

SNOOPER is easy to use and saves time and money. If you already own Norton Utilities, complete your Mac utilities with the hardware diagnostic.

**Features**
- Video Tests
- Benchmark Tests
- Loopback Connectors
- RAM Test
- System Testing
- SCSI Tests
- I/O Testing
- Audio Tests
- Error Logging
### Design It On Your Desktop!
Cut Costs—Do Your Design & Layout In House

#### Aldus Personal Press
- **Price**: $98
- Aldus Personal Press is an easy and effective desktop publishing program that has the features you need, including page layout, full-featured word processor, powerful graphics capabilities, everything you need to produce simple flyers to slick newsletters and brochures. Helpful visual previews, on-line help and automated key tasks streamline your layout process and make learning ultra-easy. Aldus #04799

#### Aldus Gallery Effects
- **Price**: $128
- Aldus Gallery Effects automatically turns grayscale and color bitmapped images into spectacular, breathtaking art. 16 master effects including Graphic Pen, Watercolor, Charcoal, and Emboss, with thousands of variations from each. Works directly with programs like SuperPaint, Photoshop, and Painter, or as an application DA. Aldus #04121

#### VideoShop
- **Price**: $398
- VideoShop, the new QuickTime movie creation and presentation tool from Diva, combines powerful digital video technology with a friendly drag-and-drop interface. If you know how to use a Mac, VideoShop will instantly transform you into a QuickTime movie maker. Diva #00602

#### ofoto
- **Price**: $279
- Now professional-quality gray scale scanning is as easy as a click of a button. With Autocan, ofoto reduces the time-consuming process of scanning, rescanning and editing into one simple step, giving you a crisp, accurate reproduction of your original image on the very first scan. And leaving you more time to exercise your creativity. Light Source #00657

#### Aldus FreeHand 3.1
- **Price**: $394
- Aldus FreeHand is the easy-to-use professional quality graphics tool that combines an elegant user interface with exceptional depth of function and flexibility. With it you can draw, do page layout, use vivid Pantone colors and import and export graphics files in a wide variety of popular file formats. Aldus #00333

#### Aldus PageMaker
- **Price**: $494
- This is it. The one and only desk top publishing powerhouse from Aldus. The new System 7 Savvy version 4.2 is full of enhancements and features. Some enhancements include: a control palette, a user-interpretable screen redraw, leading and much more. Aldus #04573

#### Ofoto
- **Price**: $279
- Now professional-quality gray scale scanning is as easy as a click of a button. With Autocan, ofoto reduces the time-consuming process of scanning, rescanning and editing into one simple step, giving you a crisp, accurate reproduction of your original image on the very first scan. And leaving you more time to exercise your creativity. Light Source #00657

### Graphics

- **Abracadala**
  - Design Your Own Home-(each) .... 62

- **Adobe Systems**
  - Adobe Illustrator 3.2 with ATM .... 364
  - Adobe PhotoShop 2.0 .......... 548
  - Adobe Streamline 2.0 .......... 121
  - Adobe Type Manager 2.0 ....... 58

- **Aldus Corp.**
  - Aldus Gallery Effects ............ 128
  - Aldus Pagemaker V4.2 ........... 494
  - Personal Press .................... 98
  - Aldus FreeHand 3.1 .............. 394
  - Aldus SuperPaint 3.0 ............ 132

- **Blistream**
  - Type Essentials-Headlines ....... 78
  - Type Essentials-Spreadsheets & Graphics 98
  - Type Essentials-Newsletters & Broch. 98
  - Type Essentials-Letters, Memos, & etc. 98

- **Claris**
  - MacPaint 2.0 ...................... 84
  - MacDraw Pro ....................... 274

- **Computer Associates**
  - Cricket Draw II ................. 199
  - Canvas 3.0 ....................... 248

- **Design/Scene**
  - Design/Scene DesignCad 2D/3D 159

- **Electronic Arts**
  - Studio 32 .......................... 448

- **Fractal Design**
  - Fractal Design Painter V 2.0 ..... 248

- **Frame Technology**
  - FrameMaker 3.0 ................... 594

- **Light Source**
  - Ofoto ............................. 279

- **Quark**
  - Quark Express 3.1 ................. 579

- **Softsync, Inc.**
  - Expert Color Paint ....... 28

- **Supermac Technology**
  - Infini-D 3D Animator ............ 646

### Multimedia

- **Adobe Systems**
  - Adobe Photoshop 3.0 .... 364
  - Adobe Premiere .......... 304

- **CoSa**
  - PaCo Producer for Windows .... 148
  - PaCo Producer for the Mac .... 148

- **DIVA**
  - VideoShop ..................... 398

- **Gold Disk Software**
  - Animation Works ............. 119

- **Motion Works, Inc.**
  - Motion II ....................... 94
  - ProMotion with Primetime CD 248

- **Macromedia**
  - Director V3.0 .................... 688
  - Professor QuickTime Authoring Kit 985
  - Getting Started QuickTime Kit 598
  - Macromind Media Maker .... 495
  - Suvellelman 3D Pro 2.0 .... 520
  - Magic ......................... 248
  - Filmmaker 2.0 .................. 439

- **NewTek**
  - Showplace/Macromaker .... 548

- **Raydream**
  - RayDream Designer 2.0 ........ 619

- **Special叔cular International**
  - InfitiD 3D Animator ........ 646

- **Strata**
  - Stratavision 3D 2.5 ............ 628

### Pricing

- **Getting Started QuickTime Kit**
  - Price: $598

- **1-800-248-0808 • CALL US • OR ORDER BY COMPUSERVE "GO MZ"**
Call Now for your FREE Catalog
Over 2400 Products at Super Low Prices!

Personal Scanner with Recognize OCR Software $685

UMAX UC630 Scanner w/ PhotoShop $1389

UMAX UC630

Optional Slide Scanner pictured $314

Powerbook Display Adaptor $548

Eddy Award-winning Envisio Display Adaptor allows you to hook up your PowerBook to an external monitor. It supports all Apple and many VGA displays via a lightweight, internally mounted video interface. Envisio, Inc. #05165 $638

Radius Precision Color 20" Display $2968

The Radius Precision Color Display 20 is a sophisticated, 20" Trinitron® color display for Macintosh and PC computers. The multi-frequency Precision Color Display 20 is microprocessor-controlled, connects to a wide array of video interface cards and gives users an unprecedented amount of control over image parameters. PrecisionColor's built-in microprocessor establishes sync with the image card, provides the best image for the resolution and memorizes any user fine tuning. Radius #04899

Video Spigot $458

The VideoSpigot Digital Video Frame Grabber is a revolutionary new digital video hardware/software system for making QuickTime movies with all NuBus-equipped Mac systems. This amazing system captures and digitizes NTSC/PAL video camera input at rates up to 30 frames per second with 24-bit color SuperMac Video Spigot for NuBus #00613
Quicktel Xeba
2400bps Data Modem

With the Quicktel Xeba 2400bps Modem you get unique styling and rock-solid engineering at a great price. It features multiple positions and icons and comes with everything you need to get up and running. The package includes data communications software and cable. Works with Mac plus and up machines. Logicode #00852

\section*{Microphone II 4.0}

Microphone II V.4.0 delivers communications without the hassle. Ideal for international telecommunications. Praised for ease of use and advanced scripting language, Microphone II 4.0 now contains faster script execution, screen speed, file transfers and new interface design tools. Supports ZMODEM transfer protocol and can operate modems at any speed from 50 to 57,600 baud. It includes predesigned front-ends that put you in touch with MCI Mail, CompuServe, Dow Jones, and other info services. Software Ventures #04893

\section*{Communications Software Solutions}

White Knight 11

White Knight 11 (previously known as Red Ryder) has been called the best all-around telecommunications program available. Written by programming prodigy Scott Watson, White Knight 11 gives you technical sophistication, flexibility and user-friendliness... at a great price. Its features include: afull-featured BBS package, a text log, security and access restriction, file transfers, message sections, a powerful scripting language, gateway functions, technical support and more. Freesoft #02881

\section*{Modems & Faxes}

Xeba 24/96 S/R Fax Modem With V.42bis

You will not find a 9600 send/receive Fax Modem at a better price. The V.42bis offers multiple transfer speeds and is available in black or gray. Includes Mac cable. Comes with QuickLink II data communications software and STF fax software. Logicode Technology, Inc. #04644 black, platinum #04664

$209

$84

$199

$99

\section*{Access The Information You Need}

We Carry A Complete Line Of Quality Faxes And Modems

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

1-206-881-3421

ORDER BY FAX ANYTIME
Mac Zone Means Business

Call Us Today And Establish A Corporate Account

Overnight Delivery Via Airborne Only $3.1-248-8000

Asante
Dayna Communications Inc
Fara/Ion

NEW ETHERNET PRODUCTS
A complete line of Ethernet Cards for anymac slot. And any media including new 3-way adapters with thick, thin and 10 BASE-T ports.

Cards starting at $158

See Farallon line listings for complete selection.

AE Plus Drive 1.44/800K FD $308

The new 1.44Mb floppy “plus drive” is one of the finest drives available for the Mac. Some of its many features include: SuperDrive capability with the Mac Plus, SE and Mac II family; MS-DOS compatibility; two color read/write activity light; auto, touch & paper clip eject; die cast Apple “platinum” case; and the manufacturer’s full one-year warranty. Applied Engineering #04956

ACCELERATORS

w = FPU Included  ➤ also available w/ FPU

Universal PowerCache Accelerators
The award-winning PowerCache gives you the best combination of blazing-fast speeds (up to three times faster) and cost-effective prices. More importantly, the PowerCache is guaranteed 100% compatible with ALL your software and hardware. The same board fits seven different Macs (adapter required for non-IIci installations).

DaynaSTAR MiniHub
The DaynaSTAR MiniHub is a non-intelligent hub for connecting network devices using twisted-pair (10BASE-T) Ethernet wiring and allowing communication between various types of computers, printers and servers. Dayna Communications, Inc. #04911

$242

$798

The TransWarp SE 300 gives you up to 10 times the speed of the standard SE. The board comes standard with a 68892 Floating Point Unit (FPU) math chip which greatly enhances the speed of any math functions, so your spreadsheets and CAD programs run faster than ever before. Applied Engineering #04325

The DaynaSTAR MiniHub is a non-intelligent hub for connecting network devices using twisted-pair (10BASE-T) Ethernet wiring and allowing communication between various types of computers, printers and servers. Dayna Communications, Inc. #04911
Video Training Becoming Most Popular, Least Expensive Way to Learn Macintosh Programs

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

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

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

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

Hard Earned Money Wasted

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

An Excellent, Low Cost Training Answer

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

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

MacAcademy training is successful for one reason - it works!

The Video Answer

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

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

Guaranteed Results

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

To Order

Here is a partial list of over 80 MacAcademy Video training tapes now available. To order, simply send check, credit card information, or purchase order to MacAcademy Videos Dept. MW792 477 S. Nova Rd. Ormond Beach, FL 32174 or call the numbers listed below. Now is the time to start training. Thank you for allowing MacAcademy to help you in that effort.

To Order: Call Toll Free
1-800-527-1914
FAX Orders Call
1-904-677-6717
48 Hour Shipments


Circle 106 on reader service card
### Updates

**July 1992**

**Organize your PowerBook. Organize Yourself.**

Introducing the DayMaker™ Travel Case Bundle.

- **The DayMaker Travel Case:** Custom designed for the PowerBook™. Lets you use your PowerBook without having to take it out of the case. Form-fitted. No slack, straps, or sliding. Ports accessible. Open front for easy trackball use. Tough Dupont Nylon Cordura™.

- **DayMaker personal organizer software:** Gives you the power to organize your work and life. Control over information and time. Exclusive "tag" system lets you define your own categories, then view and print customized lists and calendars that perfectly match your needs.

"DayMaker is the premier personal information manager on the Mac." MacWeek

**Special Bundle Price $149.99**

plus $8.50 shipping and handling. See your dealer or call toll-free 1-800-756-8553

---

**Product List**

<table>
<thead>
<tr>
<th>Product</th>
<th>V.</th>
<th>Req.</th>
<th>$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4TH DIMENSION</td>
<td>2.2</td>
<td>1MB/6.0</td>
<td>$99</td>
</tr>
<tr>
<td>A4</td>
<td>3.0</td>
<td>2MB/6.0</td>
<td>$395</td>
</tr>
<tr>
<td>ACCOUNTANT, INC. PROFESSIONAL</td>
<td>3.0</td>
<td>1MB/6.0</td>
<td>$3</td>
</tr>
<tr>
<td>ACCUTXYT</td>
<td>3.0</td>
<td>4MB/6.0</td>
<td>$160</td>
</tr>
<tr>
<td>ACTA 7</td>
<td>7.0</td>
<td>512K/6.0</td>
<td>$495</td>
</tr>
<tr>
<td>ADDNTOITION</td>
<td>2.0</td>
<td>2MB/6.0</td>
<td>$35</td>
</tr>
<tr>
<td>ADDRESS BOOK PLUS</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$2.25</td>
</tr>
<tr>
<td>ADORO ILLUSTRATOR</td>
<td>3.2</td>
<td>2MB/6.0</td>
<td>$3</td>
</tr>
<tr>
<td>ADORO PHOTOSHOP</td>
<td>2.0</td>
<td>2MB/6.0</td>
<td>$199</td>
</tr>
<tr>
<td>ADORO TYPE MANAGER</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$2</td>
</tr>
<tr>
<td>AFTER DARK</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$30</td>
</tr>
<tr>
<td>AGATYPE</td>
<td>2.0</td>
<td>2MB/6.0</td>
<td>$30</td>
</tr>
<tr>
<td>AGA TYPECHART</td>
<td>1.5</td>
<td>1MB/6.0</td>
<td>$30</td>
</tr>
<tr>
<td>ALARMING EVENTS</td>
<td>1.03</td>
<td>1MB/6.0</td>
<td>$30</td>
</tr>
<tr>
<td>ALDUS DIGITAL DARKROOM</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALDUS FIREHAND</td>
<td>1.1</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALDUS PAGE MAKER</td>
<td>4.2</td>
<td>4MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALDUS PERSUASION</td>
<td>2.1</td>
<td>4MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALDUS SUPER 3D</td>
<td>2.5</td>
<td>4MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALDUS SUPERCARD</td>
<td>1.6</td>
<td>2MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALDUS SUPERSNAP</td>
<td>3.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ALLIANCE POWER TOOLS</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AMAZING PAINT</td>
<td>1.03</td>
<td>2MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AME</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ANTITOXIN</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>APPLSHARE FILE SERVER</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ARCHICAD</td>
<td>4.03</td>
<td>5MB/6.0</td>
<td>$495</td>
</tr>
<tr>
<td>ASHAR YELLUM</td>
<td>2.10</td>
<td>4MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ASHAR YELLUM 3D</td>
<td>2.10</td>
<td>4MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>ATONE</td>
<td>1.2</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AUDIO MEDIA</td>
<td>2.02</td>
<td>2MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AURACAD</td>
<td>3.01</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AUTHORWARE PRO</td>
<td>1.7</td>
<td>2MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AUTOSAVE II</td>
<td>2.0</td>
<td>512K/4.2</td>
<td>$3.95</td>
</tr>
<tr>
<td>AUTOX</td>
<td>2.0</td>
<td>4MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>AZIMUTH</td>
<td>2.1</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
<tr>
<td>BACKFAX</td>
<td>2.0</td>
<td>1MB/6.0</td>
<td>$3.95</td>
</tr>
</tbody>
</table>

**V.** = version #: **Req.** = min. RAM and system software required. **$** = cost of update to registered owners. **NA** = first version, not applicable. ***$** = contact your dealer for update policy. **Blue** = new version. **Yellow** = reviewed product.

---

“organize your PowerBook. organize yourself.”

**MacWorld** July 1992 85
## Updates

<table>
<thead>
<tr>
<th>Product</th>
<th>V. Req.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display AdBuilder</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Dollars &amp; Sense</td>
<td>5.0</td>
<td>512KX/3.2</td>
</tr>
<tr>
<td>Double Helix</td>
<td>3.5</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Dreams</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Dynaperspective</td>
<td>2.3</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>DynodeX</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Easy Color Paint</td>
<td>2.02</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Ehelp</td>
<td>2.0</td>
<td>1MB/4.1</td>
</tr>
<tr>
<td>Empower II</td>
<td>4.07</td>
<td>2MB/4.2</td>
</tr>
<tr>
<td>Encore</td>
<td>2.5</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Enhance</td>
<td>2.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Evolve</td>
<td>1.1</td>
<td>2MB/5.3</td>
</tr>
<tr>
<td>Exodus</td>
<td>3.02</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Ez Vision</td>
<td>1.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Fastback Plus</td>
<td>2.6</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Fast Forms</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Fastlabel</td>
<td>3.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Fasttrack</td>
<td>1.5</td>
<td>512KX/5.5</td>
</tr>
<tr>
<td>Fileguard</td>
<td>2.7</td>
<td>1MB/6.2</td>
</tr>
<tr>
<td>FileMaker Pro</td>
<td>1.02</td>
<td>1MB/4.2</td>
</tr>
<tr>
<td>FileVision V</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>FilmMaker</td>
<td>2.5</td>
<td>512KX/0.3</td>
</tr>
<tr>
<td>Finale</td>
<td>2.6</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Flexicad</td>
<td>2.20</td>
<td>512KX/0.4</td>
</tr>
<tr>
<td>Fontographer</td>
<td>1.01</td>
<td>5MB/6.0</td>
</tr>
<tr>
<td>Fontographer</td>
<td>3.5</td>
<td>1MB/4.2</td>
</tr>
<tr>
<td>FontShare</td>
<td>2.2</td>
<td>1MB/4.0</td>
</tr>
<tr>
<td>FontStudio</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Form A</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Formbase + MAC</td>
<td>2.01</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Framemaker</td>
<td>3.0</td>
<td>1MB/6.0</td>
</tr>
</tbody>
</table>

## Updates

<table>
<thead>
<tr>
<th>Product</th>
<th>V. Req.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freedom of Press Light</td>
<td>3.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Freedom of Press</td>
<td>3.02</td>
<td>4MB/6.0</td>
</tr>
<tr>
<td>Full Impact</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>FullWrite Professional</td>
<td>1.5</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Generic Case</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Gepylog</td>
<td>3.6</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Gofer</td>
<td>2.0</td>
<td>1MB/4.1</td>
</tr>
<tr>
<td>GraceCam</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>GraceCam Update Manager</td>
<td>1.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Grammatica Mac</td>
<td>2.05</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Great Gatsby</td>
<td>1.4</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Great Plans Accounting Series</td>
<td>6.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>GreatWorks</td>
<td>1.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Guide</td>
<td>2.0</td>
<td>512KX/4.1</td>
</tr>
<tr>
<td>Hand-Off II</td>
<td>2.5</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Help</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>HyperCard</td>
<td>1.01</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>HyperDesk</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Icon-It</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>IPI Forms Designer</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>IGOR</td>
<td>1.2</td>
<td>2MB/6.1</td>
</tr>
<tr>
<td>Image Grabber</td>
<td>3.9</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Imagistudio</td>
<td>1.7</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Infini-D</td>
<td>1.1</td>
<td>4MB/6.0</td>
</tr>
<tr>
<td>Infologic Envelope</td>
<td>1.1</td>
<td>512KX/6.0</td>
</tr>
<tr>
<td>Infoticker</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Inside Out</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Insight Expert Accounts Payable</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
</tbody>
</table>

## Updates

<table>
<thead>
<tr>
<th>Product</th>
<th>V. Req.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insight Expert Accounts Receivable</td>
<td>2.2</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Inspiration</td>
<td>3.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Instant Expert Plus</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Interface Rave</td>
<td>2.05</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Intouch</td>
<td>1.1</td>
<td>512KX/4.2</td>
</tr>
<tr>
<td>Think</td>
<td>2.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Kaleidoscope</td>
<td>2.1</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Kilnvelopes</td>
<td>3.1</td>
<td>512KX/4.1</td>
</tr>
<tr>
<td>LabView</td>
<td>2.2</td>
<td>4MB/6.0</td>
</tr>
<tr>
<td>Language Systems portray</td>
<td>3.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Laplink Mac III</td>
<td>3.0</td>
<td>512KX/2.0</td>
</tr>
<tr>
<td>Laplink Mac Plus III</td>
<td>3.0</td>
<td>512KX/2.0</td>
</tr>
<tr>
<td>Laserpaint Color II</td>
<td>1.02</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>LeutraStudio</td>
<td>2.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Lightspeed Color Layout System</td>
<td>2.5</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macanaist</td>
<td>3.1</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Macarchetron</td>
<td>5.5</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>Macbrain</td>
<td>3.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macdraft</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macdraw II</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macdraw Pro</td>
<td>1.01</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macenvelope</td>
<td>5.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macenvelope Plus</td>
<td>5.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macflow</td>
<td>3.7</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>Macfortrans II</td>
<td>3.1</td>
<td>4MB/6.0</td>
</tr>
<tr>
<td>Macglobe</td>
<td>1.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MaclabelPro</td>
<td>1.5</td>
<td>1MB/6.0</td>
</tr>
</tbody>
</table>

## Updates

**Visibly Superior.**

Double the space on any Mac disk by shrinking any Mac file or folder an average of 50%.
<table>
<thead>
<tr>
<th>PRODUCT V.</th>
<th>REQ.</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACLINKPLUS/PC</td>
<td>6.0</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MACMONET</td>
<td>3.5</td>
<td>512K/4.0</td>
</tr>
<tr>
<td>MACPAINT</td>
<td>2.0</td>
<td>512K/6.3</td>
</tr>
<tr>
<td>MACPALETTE II</td>
<td>2.2</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MACPHONEROOK</td>
<td>3.0</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MACPILOT PROFESSIONAL</td>
<td>4.0</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MACPILOT STANDARD</td>
<td>4.0</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MACPROJECT II</td>
<td>2.5</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MACRECORDER</td>
<td>2.0</td>
<td>512K/3.3</td>
</tr>
<tr>
<td>MACTENDERMAN</td>
<td>1.1</td>
<td>512K/6.0.5</td>
</tr>
<tr>
<td>MACROMIND DIRECTOR</td>
<td>3.0</td>
<td>2MB/6.0.5</td>
</tr>
<tr>
<td>MACSCHEDULE</td>
<td>2.5</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MACSCHEDULE PLUS</td>
<td>1.0</td>
<td>51MB/6.0</td>
</tr>
<tr>
<td>MACSPIN</td>
<td>3.0</td>
<td>512K/4.3</td>
</tr>
<tr>
<td>MACTERMINAL</td>
<td>3.0</td>
<td>512K/3.2</td>
</tr>
<tr>
<td>MACSTOOLS DELUXE</td>
<td>1.2</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MACTOPS</td>
<td>3.1</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MACTWRITE II</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MANAGING YOUR MONEY</td>
<td>4.0</td>
<td>1MB/6.0.8</td>
</tr>
<tr>
<td>MANAPRO GENERAL LEDGER</td>
<td>3.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MAPLE V</td>
<td>2MB/6.0.7</td>
<td>5/92</td>
</tr>
<tr>
<td>MARCOPOLO</td>
<td>1.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MARKET ANALYZER PLUS</td>
<td>2.0</td>
<td>2MB/6.0.2</td>
</tr>
<tr>
<td>MARKETSHARE</td>
<td>3.5</td>
<td>1MB/6.0.3</td>
</tr>
<tr>
<td>MARKUP</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MARKSHIELD</td>
<td>1.1</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MASTERCOMMERGER</td>
<td>1.57</td>
<td>512K/6.0</td>
</tr>
<tr>
<td>MASTERPLAN</td>
<td>1.0</td>
<td>512K/6.0.5</td>
</tr>
<tr>
<td>MASTER TRACKS PRO</td>
<td>6.0</td>
<td>1MB/6.4</td>
</tr>
<tr>
<td>MATHEMAC</td>
<td>2.06</td>
<td>1MB/6.0.2</td>
</tr>
<tr>
<td>MATHEMATICA</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MATHTYPE</td>
<td>2.1</td>
<td>512K/6.0.2</td>
</tr>
<tr>
<td>MATHWRITER</td>
<td>2.0</td>
<td>2MB/6.0.5</td>
</tr>
<tr>
<td>MATLAB</td>
<td>4.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MEDIATRACKS</td>
<td>1.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MENUPOINTS</td>
<td>4.0</td>
<td>512K/4.3</td>
</tr>
<tr>
<td>METAPICT</td>
<td>2.0</td>
<td>512K/4.3</td>
</tr>
<tr>
<td>META PRO</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MICHAEL'S DRAW</td>
<td>1.0</td>
<td>1MB/6.0.5</td>
</tr>
<tr>
<td>MICROPHONE II</td>
<td>2.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>MICROPLANNER MANAGER</td>
<td>1.0</td>
<td>2MB/6.0</td>
</tr>
<tr>
<td>MICROSOFT EXCEL</td>
<td>3.0</td>
<td>512K/6.0.2</td>
</tr>
<tr>
<td>MICROSOFT MAIL</td>
<td>2.0</td>
<td>512K/3.2</td>
</tr>
<tr>
<td>MICROSOFT OFFICE</td>
<td>1.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MICROSOFT POWERPOINT</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MICROSOFT PROJECT</td>
<td>1.0</td>
<td>1MB/6.0.4</td>
</tr>
<tr>
<td>MICROSOFT WORD</td>
<td>5.0</td>
<td>512K/6.0.5</td>
</tr>
<tr>
<td>MICROSOFT WORKS</td>
<td>2.0</td>
<td>512K/6.0</td>
</tr>
<tr>
<td>MINDLINK</td>
<td>2.0</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MINDWRITE</td>
<td>2.1</td>
<td>512K/4.2</td>
</tr>
<tr>
<td>MINDREAD</td>
<td>3.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MINDCAT+</td>
<td>4.4</td>
<td>512K/3.2</td>
</tr>
<tr>
<td>MOOFOCKAGE PLUS UTILITIES</td>
<td>1.1</td>
<td>1MB/6.0.3</td>
</tr>
<tr>
<td>MODELSHIP II</td>
<td>3.1</td>
<td>1MB/6.1</td>
</tr>
<tr>
<td>MR. FILE</td>
<td>1.1</td>
<td>1MB/6.2</td>
</tr>
<tr>
<td>MULTI-AD-CREATOR</td>
<td>3.0</td>
<td>2MB/6.0.3</td>
</tr>
<tr>
<td>MULTI-EDGER</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MUSICFLORE</td>
<td>2.1</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MUSIC PUBLISHER</td>
<td>2.5</td>
<td>1MB/6.0</td>
</tr>
<tr>
<td>MYADVANCEDDIALLIST</td>
<td>3.0</td>
<td>512K/6.1</td>
</tr>
<tr>
<td>MYDISKLABELE III</td>
<td>3.0</td>
<td>1MB/6.0</td>
</tr>
</tbody>
</table>

**PRODUCT V. | REQ. | S**
| M.Y.O.B. | 2.0 | 1MB/6.0 | 10/91 |
| AUTOKEYMANAGER | 4.0 | 1MB/6.0.3 | * |
| NETMAILER ETHERNET | 2.1 | 2MB/6.0 | * |
| NETWORK BUNDLE FOR THE MAC | 3.0 | 512K/3.2 |
| NETWORK SUPERVISOR | 2.0 | 2MB/6.0.3 | * |
| NILSUS | 3.06 | 1MB/6.2 | * |
| THE NETOMUT UTILITIES FOR THE MACINTOSH | 1.1 | 1MB/6.4 | $19 |
| NOW UTILITIES | 3.0 | 1MB/6.0.4 | 3/92 |
| NURSE FOR THE MAC | 1.3 | 1MB/4.1 | 12/92 |
| OMPAGE | 3.0 | 4MB/6.0 | $25 |
| OMPAGE PROFESSIONAL | 1.0 | 5MB/6.0 | * |
| ORINSSEN | 2MB/6.0 | * |
| ORCUE II | 2.0 | 512K/6.0.2 | $14.95 |
| ON LOCATION | 2.0 | 1MB/6.0.5 | 6/92 |
| ON SCHEDULE | 2.0 | 1MB/6.0 | * |
| PANORAMA | 2.0 | 1MB/6.0 | 3/92 |
| PAYROLL | 4.0 | 2MB/6.0.5 | $89 |
| PERFORMER | 3.6 | 2MB/6.0.2 | * |
| PERSONAL PRESS | 1.0 | 1MB/6.0.2 | FREE |
| PHONEYET LIAISON | 3.0 | 1MB/6.2 | $75 |
| PHOTOMAC | 1.5 | 2MB/6.0.3 | $75 |
| PICTURE | 1.0 | 512K/6.0 | NA |
| PICTUREBOO+ | 1.0 | 1MB/6.0 | 9/92 |
| PICTUREPRESS | 2.0 | 2MB/6.0.4 | * |
| PIXELPAINT | 2.0 | 2MB/6.4 | * |
| PIXELPAINT PLUS | 2.0 | 2MB/6.4 | * |
| PLANS & SIMPLE | 1.06 | 1MB/3.2 | * |
| PLANS McC | 1.3 | 512K/4.2 | $48 |

## Salient Software
**Invisibly Superior.**
Salient Software, developer of best-selling DiskDoubler, now brings you a clear choice for automatically saving disk space. Introducing AutoDoubler™ the data compression program that's so fast, so safe, so automatic—it's virtually invisible. AutoDoubler's patent-pending technology can increase your disk space up to 100% or more. For 0% effort. And it's so fast, you'll hardly even notice your files are compressed! Put AutoDoubler in your Macintosh, and watch your disk space problems disappear.

Both available at leading software stores.

**Salient Software Inc.**
(415) 321-5375
Salient Software, Inc., 124 University Avenue, Palo Alto, CA 94301.
DiskDoubler and AutoDoubler are trademarks of Salient Software, Inc. © 1992.

Circle 39 on reader service card
“One of the best-designed products of the year.”
- *Time*

“One of the best products of the year.”
- *Fortune*

“Hardware product of the year.”
- *InfoWorld*

“One of the best new products of the year.”
- *Business Week*

The power to be your best.
The new PowerBook® computer from Apple is more than the lightest, smallest Macintosh® computer ever. It’s a whole new standard of mobile computing.

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

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

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

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

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

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

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

The power to be your best.
microphone input (PowerBook 140/170 only)
SCSI port for up to 6 external peripherals
speaker/headphone jack
external data/fax modem port (140/170 only)
internal data/fax modem (optional)
AUX port for mouse or keypad
printer/network port

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

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

<table>
<thead>
<tr>
<th>PowerBook</th>
<th>Weight</th>
<th>Memory</th>
<th>Hard Disk</th>
<th>SuperDrive</th>
<th>Processor</th>
<th>Internal Modem</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>5.1 lb</td>
<td>2/4MB</td>
<td>20/40MB</td>
<td>Optional ext.</td>
<td>16 MHz 68000</td>
<td>Optional</td>
</tr>
<tr>
<td>140</td>
<td>6.8 lb</td>
<td>2/4MB</td>
<td>40/80MB</td>
<td>Internal</td>
<td>16 MHz 68020</td>
<td>Optional</td>
</tr>
<tr>
<td>170</td>
<td>6.8 lb</td>
<td>4MB</td>
<td>40/80MB</td>
<td>Internal</td>
<td>25 MHz 68030</td>
<td>Optional</td>
</tr>
</tbody>
</table>

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

The extremely affordable PowerBook 100 offers twice the performance of a Macintosh Classic.
Perform engineering and scientific calculations faster...and with fewer errors.

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

Call 800-MATHCAD to request a free demo disk!

Yes! Tell me more about Mathcad 2.0!

Name ________________________
Title ________________________
Company ________________________
Address ________________________
City ____________________________ State __________ Zip __________

MathSoft, Inc. 201 Broadway Cambridge, MA 02139 USA

MC TECH 2.0

To have your products considered for this section, send a press release to Updates, Macworld, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766.
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, auto-correlations, 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
Meet the new Outbound Notebook Systems. Smaller, lighter and faster than their Apple counterparts, the Outbound Notebook System sport an ingenious modular design that lets you "mix and match" the CPU, hard drive, and memory you want, before and after you buy. You get the performance you need right from the start. Then, as your hunger for power grows, you can upgrade your Notebook simply and easily with standard low-cost modules.

Don't give up anything
Outbound's "mix and match" system lets you choose from two to 14 MB of RAM, a hard disk from 20 to 120 MB, and lighting speeds of 20 to 33 MHz. With any combination, you'll have all the power and memory you need for your demanding applications. Naturally, the Outbounds are as compact as they are powerful. Just call toll-free and use your credit card. And, when you call, be sure to ask about our 10 day money back guarantee of satisfaction, one year warranty, and toll-free customer support.

ORDER DIRECT TODAY AT:
1-800-444-4607
ORDER DIRECT TODAY AT:
1-800-444-4607

Enjoy Mac compatibility
Your Outbound Notebook System is ready for action the minute you unpack it, because the Macintosh ROM is already installed for compatibility with the thousands of Macintosh applications. Systems come with the memory conscious System 6.0.7 installed, and are completely compatible with System 7. And of course, all models include an internal SuperDrive® equivalent 3½" floppy disk drive for working with high and low density Mac and MS-DOS diskettes.

Perform big business in small places
Small enough to fit in most briefcases, all models measure 8.5 x 11 x 2.1 inches, weigh only 6.25 pounds, and boast a full-size, silent keyboard. In tight quarters, use the keyboard mounted Trackbar® to point and click. Or add a mouse or other ADB pointing device. The backlit LCD screen is large and easy to read, and provides 17% more displayable area than the Apple PowerBook™ screens.

What the experts say:
"Outbound offers top-notch portable Macs." MacWEEK Magazine
"Outbound's Outboards are solid machines and deserve serious consideration by anyone contemplating buying a Mac notebook." MacUser Magazine
"Outbound's new Notebook System has the unique ability to grow along with your requirements — and your budget."
MacUser Magazine
"Innovative touch, a high degree of compatibility, and moderate pricing make the Outbound Notebooks strong competitors with Apple's portable Macs." PC Magazine
"For me, the Outbound Notebook is the better choice." BYTE Magazine

Integrated Floppy Standard
Upgradeable CPU and Hard Disk
Processor Speed
Maximum Hard Drive Available
Full Size Silent Keyboard and True Notebook Size
Maximum RAM Available
Motherboard
Maximum Silicon Disk Memory (RAM) Available
Price

<table>
<thead>
<tr>
<th>MODEL</th>
<th>THE OUTBOUND NOTEBOOK</th>
<th>MACINTOSH POWERBOOK</th>
</tr>
</thead>
<tbody>
<tr>
<td>3000</td>
<td>200MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3001</td>
<td>25MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3002</td>
<td>33MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3003</td>
<td>16MHz</td>
<td>No</td>
</tr>
<tr>
<td>3004</td>
<td>20MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3005</td>
<td>40MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3006</td>
<td>50MHz</td>
<td>No</td>
</tr>
<tr>
<td>3007</td>
<td>60MHz</td>
<td>Optional</td>
</tr>
<tr>
<td>3008</td>
<td>80MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3009</td>
<td>100MHz</td>
<td>No</td>
</tr>
<tr>
<td>3010</td>
<td>120MHz</td>
<td>Yes</td>
</tr>
<tr>
<td>3011</td>
<td>128MB</td>
<td>No</td>
</tr>
<tr>
<td>3012</td>
<td>50MB</td>
<td>Optional</td>
</tr>
<tr>
<td>3013</td>
<td>6MB</td>
<td>Yes</td>
</tr>
<tr>
<td>3014</td>
<td>6MB</td>
<td>No</td>
</tr>
<tr>
<td>3015</td>
<td>6MB</td>
<td>Yes</td>
</tr>
</tbody>
</table>

$1999 $2499 $3899
$2999 $3499

ORDER DIRECT AND SAVE—PRICES START AS LOW AS $1999
You can order your Outbound Notebook System right from the folks who make it. Just call toll-free and use your credit card. And, when you call, be sure to ask about our low-cost financing.

Smaller, lighter, faster and available now!
There's no reason to wait. Start enjoying the Macintosh environment you know and love on the road now. Let us customize an Outbound Notebook for you today. There's no risk when you buy, because every Outbound Notebook System purchased direct comes with a FULL 10 DAY MONEY BACK GUARANTEE OF SATISFACTION, one year warranty, and toll-free customer support.

Circle 30 on reader service card

Notebook prices based on direct sales. MacBook prices reflect published Apple retail pricing. Technical specifications and specifications to change without notice. Outbound name, logo and Trackbar are trademarks of Outbound Systems, Inc. Apple, Macintosh and Mac are registered trademarks of Apple Computer Inc. Notebook and Apple SuperDrive are trademarks of Apple Computer Inc. All other brands and product names mentioned herein are trademarks or registered trademarks of their respective holders.
FEW PEOPLE ENJOY TYPING; THAT’S why OCR is so exciting. Optical character recognition is faster than retyping, and it removes the labor of data entry involved in archiving or building databases. Theoretically, that is. As our tests of 11 OCR packages for this month’s OCR roundup, “From Page to Pixel,” show, reality is something else again.

The fact is, a document that’s been input with an OCR application is frequently riddled with errors, and the quality of the original document or the scan may be to blame. But you want to avoid not only retyping, but also rescanning. While different OCR applications are better at recognizing different types of documents, some problems are common to all.

Avoiding OCR Pitfalls
WE DISCOVERED a few techniques for getting a good scan the first time, and a few pitfalls that you should avoid. First, don’t expect the resulting document to look just like the original you scanned. A few OCR vendors claim their applications are able to preserve formatting, such as indents, fonts, type size, boldface, italics, underlining, and even occasionally superscripts and subscripts. Don’t believe them—assume that you will have to reformat a good portion of what you scan.

We used Apple’s OneScanner in combination with each OCR application running on a Mac IIfi (except Xerox Imaging Systems’ AccuText, which did not support the OneScanner at the time we tested the programs). Using each application with tens of pages of text showed that format recognition is inconsistent at best. Here are some of the many problems we observed: boldfaced words that mysteriously appeared in the middle of plain text; bold italic text recognized as plain text; 5-point type in all capitals where 12-point bold small caps should have been; text in which some of the lines ended with hard carriage returns and others didn’t; 10-point text that was recognized in various sizes from 6-point to 12-point; underlines where none should have been; extra spaces between words or letters.

The worst offenders were Callera’s WordScan and WordScan Plus, but Callera’s OmniPage Professional had problems as well. Granted, recognizing formatting is difficult, and not all packages claim this capability. Logitec...
Out of Control?

Get IN

CONTROL To-Do List Manager

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

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

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

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

NEW from the creators of FileMaker®

considerable amount of labor, but not all.

Columns present a particularly difficult problem. We found that only a few OCR packages could recognize columns correctly, so we were forced to scan multiple-column text using each program's manual blocking feature (which allows you to select the portions of a page to be scanned). Because most applications read text line by line across the page and put in the number of tabs necessary to set off the new columns, the number of tabs separating the columns may vary from line to line or column to column. This inconsistency requires reformatting of tabular material. However, a word processor that's adept at handling formatting (for instance, Word lets you cut and paste contiguous blocks of text with an option-key sequence) or a program with macro capabilities can make reformatting easier. Which type of word processor is best for tables depends largely on the recognition method your OCR package uses.

Another problem for OCR is highly stylized text with tightly or loosely kerned characters. Tight spacing causes substitution errors (for example, ni or iii or re might be recognized as m) and can produce large blocks of unrecognized text. Loosely kerned text often results in extra spaces between letters, because OCR programs recognize only individual characters, they're unable to judge which letters should be linked together to create words.

One difficult challenge is recognizing text on a dark or color background. Two of the documents to be scanned were newspaper print with gray-brown backgrounds. Along with the greater complexity of the newspaper document, the low contrast between the characters and the background lowered the recognition speeds by as much as 69 percent and the accuracy by nearly 30 percent.

Before scanning documents that have color backgrounds or are on newsprint, try photocopying them on a copier using a lighter setting to remove the gray or whiten the background. Then you can scan the copy with a slightly higher darkness setting to make the text darker and more continuous. Don't be extreme about this; a scanner works the same way that a copier does, and errors are introduced not only when features step away from the original but especially when they step substantially darker the image—eventually the text smears and becomes unrecognizable.

A photocopy of a low-resolution dot matrix printout can be read more easily by an OCR program than the original, because smearing fills the spaces between the dots. High-gloss originals are also difficult for most packages to read. We had a glossy thermal paper fax in our original test suite, but had to drop it because the fax faded considerably in just a few days. However, early scans were poor; all the OCR packages had extreme difficulty, some taking as much as 30 times as long to recognize a fax as they did to read the same text on a laser printout—and with much poorer accuracy.

Adjusting Your Expectations

WHEN WE BEGAN THE OCR TESTING, we assumed that each program would be configured to its ideal settings. However, as testing progressed, we learned not to trust the defaults.

To their credit, nearly all the programs in this review save (or prompt you to save) defaults to a file so that your modifications will be immediately available the next time you scan. Dest Recognize, Read-It Pro 3.0, and all the Caere and Calera packages display the scanner settings before each scan, enabling you to set the brightness appropriately.

With one document, we found that WordScan's brightness setting was inadequate because it perceived part of the page as darker than the rest, as if a shadow had been cast over one side of the page. The version we tested (an early copy of 1.0.0) limits the OneScanner to changing brightness settings in 6 percent increments, so all the settings were either too dark or too light. Calera has since modified version 1.0.0 to allow finer control (1 percent increments).

Hewlett-Packard's AccuPage technology, supported by Caere's OmniPage Professional and by Calera's soon-to-be-released WordScan version 1.1, overcomes this obstacle by varying the scanning intensity in different zones to optimize contrast over the entire page. Packages using AccuPage can read documents with variable backgrounds—those with different shades or colors—or documents that, according to Calera, have been stained or weathered by age.

If you don't have an HP or Microtek scanner, try using Light Source's Ofoto gray-scale scanning software to scan originals. Ofoto can straighten a scan as well as optimize its contrast. Saved scans can be queued for unmonitored recognition by OCR programs like Xerox's AccuText. For best results, use OCR for large sets of homogeneous documents; use the best originals possible; stick to documents with light-colored backgrounds and dark text; and avoid highly stylized or heavily formatted originals. Someday, OCR technology will be sophisticated enough to handle such tough challenges, but until then, be realistic, and be prepared for some OCR cleanup.
With a 1.25 MB per second transfer rate and a 35 ms average seek time, the 1 GB CY-2000 optical disk drive saves and restores files at hard disk speed. All on a removable media that protects your data from unpredictable head crashes. Once you lose your hard disk files, they’re gone forever. But data stored on the CY-2000 remains secure—and quickly accessible.

We call it nearline storage, and it's perfect for data-intensive applications like desktop publishing, multimedia, digital video, CAD/CAM, medical imaging and more. It's also ideal for private databases and security-sensitive files because the disks can be removed and stored to prevent unauthorized access.

What's more, it's fully "plug and play" compatible with your personal computer, mini-computer, workstation or server.

With the CY-2000, each disk stores 1 GB, making it twice the capacity of competitive optical disk drives. The media are erasable, rewritable, and extremely durable. One platter can last over 40 years. And because the disks are small and lightweight, you'll enjoy reduced storage and shipping costs.

The CY-2000 is part of our family of data storage products that includes QIC streamers, magneto-optical disk drives, and 8mm tape drives and tape libraries.

If you want gigabyte capacity, fast file access, and the security of a removable media, the CY-2000 is a perfect fit. Call today for more information at (804) 873-9000.
FINALLY.
AN OCR SOFTWARE PRODUCT THAT DOES WHAT IT SAYS.

INTRODUCING TYPEREADER® FOR MACINTOSH®

We'll save you the time of checking out the comparison charts. There simply is no better OCR software program for the Mac.

It's TypeReader from ExperVision®. The first OCR (optical character recognition) software that can read any page of type. And any type of page.

Because TypeReader utilizes a revolutionary new OCR technology, Macintosh users will be able to read documents more accurately and automatically than ever before. Not just the crisp and clear documents, but the real documents that cross your desk every day. Even the hard to read faxes. You'll save both time and money by no longer having to re-type your existing documents.

Because we Macintosh users expect and demand graphics that give us what we see on screen, TypeReader has a WYSIWYG editor which preserves all the formatting of your original document, including margins, tabs, columns, and tables. And, proofing is made simple with TypeReader's exclusive On-Screen Verifier which allows you to view suspect characters from the original document.

No other OCR software product can make these claims.

TypeReader goes even further. By integrating Hewlett-Packard's AccuPage technology, complex colored or stained documents can also be recognized accurately.

And, TypeReader is completely System 7 and 6 savvy.

You might think that all of this was enough to motivate anyone to buy the new TypeReader. But wait, there's more!

GET YOURS FOR ONLY $149

If you've been using the current outdated OCR products, we don't need to tell you how frustrating your experiences have been. That's why, for a limited time, you can purchase TypeReader for only $149 when you trade-in your current OCR software product.

If you're not currently using OCR software, we've got some good news for you too. When you purchase TypeReader at the best price possible from one of your local TypeReader dealers (suggested retail is $695), you'll receive a $100 rebate. It's that simple. Not a bad deal for a product that finally allows you to utilize the real performance of OCR.

To see TypeReader in action, contact CompUSA, Egghead, Computer City, MacConnection, MacWarehouse or your local dealer. Or, give us a call for the name of the TypeReader dealer nearest you at: 1-800-READ-TYDE (1-800-732-3897).

TypeReader for Windows® is also available. *When you SCAN is what you see. +Offer applies only to users of WordScan, WordScan Plus, OmniPage, OmniPage Professional, CorelDirect, ReadRight, Read It, and Perceive. ExperVision, the ExperVision logo, TypeReader and "Any page of type. And any type of page" are trademarks of ExperVision, Inc. AccuPage is a trademark of Hewlett-Packard. All other names are trademarks of their respective holders. ©1992 ExperVision, Inc. All rights reserved. ExperVision, 3500 N. First Street, San Jose, CA 95134, (408) 428-0660.

Circle 183 on reader service card
IM REA HAS BEEN WORKING WITH MICROCOMPUTERS FOR 15 YEARS. A NATIVE CALIFORNIAN, HE FOUNDED PROVue DEVELOPMENT, A HUNTINGTON BEACH-BASED COMPANY THAT SELLS PANORAMA, ONE OF THE MOST ENDURING AND BEST-SELLING DATABASES FOR THE MACINTOSH. HE BECAME INTERESTED IN MICROCOMPUTERS AFTER READING AN ARTICLE ABOUT THE ALTAIR COMPUTER KIT IN 1975. BUT AFTER RECEIVING PLANS FOR THE ALTAIR,REA DECIDED IT WASN'T ANY GOOD—AND BUILT HIS OWN COMPUTER FROM SCRATCH.

MW When did you see your first Mac? Rea At SoftCon in 1984. That conference was held a week after the Mac came out, in New Orleans. I was actually excited. I had just seen the ads. And I was working on [Motorola's] 68000 microprocessor earlier. I pretty much bought into what was happening on the Mac. By then I had been working on computers for seven years. I used to tell people who asked me, don't buy a personal computer, because before the Mac I thought computers were too hard for most people I knew.

MW Why were you working with the 68000 microprocessor? Rea I went to work for Alpha Micro Systems in Irvine; they had a multiuser operating system—an S-100-based machine, which they switched to a 68000 CPU. I worked on the OS for two years.

MW How did you get your first Mac? Rea I bought it from a dealer in New Jersey. I had a friend who knew a dealer who had two Macs on allocation. I was not part of the developer program. I was not someone Apple approached to develop for the Mac. [My friend] told me that if I had the money I could have a Mac, so I did it. And I ordered Inside the Macintosh, then a collection of loose-leaf stuff from Apple. I read the book and applied to be a developer. I lived with it for two months. I must have read most of it three times.

MW What about Alpha Micro? Rea I was still doing that. By May 1984 I was ready to start programming [on the Mac], but I was still not a registered developer. Apple said I would have to wait one more month to be registered, and then another six weeks for a Lisa to do the programming. I wasn't about to wait three months, so I went to a dealer and bought a Lisa. The catch was you had to have Apple's software for the Lisa, and that only came from Apple. Fortunately, I knew someone who gave me an essentially pirated version of the software.

MW So finally you were on your way to being a Mac developer? Rea In May I got started. My plan was to write the [database] program on an Alpha Micro and transfer it to the Mac. I got the Lisa and spent two weeks writing a program to transfer data on the Mac's serial port. [After moving the program to the Mac] I connected these programs to the floppy drive of the Mac. I could then take machine code, binary code, from the Alpha Micro to the floppy drive of the Mac. I could try to run that machine code on the Mac and see if it would work.

MW How long before you had a product? Rea After one month I had a product that could sort, write; it had a little data in it. I could demo it. I had a friend at Alpha Micro who had a C compiler. He ported it to the Mac like I did. He showed it to the Apple developer group, and they invited him to the Apple booth at the National Computer Conference. He told me about the evangelists and he gave me someone's number. I called and said I have this program. They said send us the program. I said no way, but I'll fly up and show it to you myself. So I flew up to Cupertino. The first person I saw was Alain [Rossmann]. It was a fun day. Alain got really excited. He was jumping up and down. They asked where I came from and how did I write this program. At that time they knew most of what was happening on the Mac.

MW When was the program finished? Rea It shipped in September. It was called OverVue. Eventually it sold about 30,000 copies.

MW You are one of the only remaining Macintosh-only developers. Rea I think so, yes. It's possible. Better to do a few things well rather than a lot of things halfway. ProVue Development is small enough so that if we did Windows, the Mac product would suffer.

MW What has happened in the Mac database market? Rea Developers come and go a lot. There are only three large products—FileMaker, 4th Dimension, and us.

MW What about the others? Rea PfsFile for the Mac was the first. It was a piece of junk ported from the PC. PfsFile had no features. It died in 1985. Then there was Microsoft File. Then Odesta's Helix. Microsoft File came out in 1985 and was popular for a while. It was the Buick of databases. Standard data, no graphics, utilitarian. Across the board. At one time [Microsoft] had an idea of the grand database, the be-all and end-all, and it never got finished. Helix is still sold.

MW What database came next? Rea There was FileMaker in '85. The original version didn't do too much, but FileMaker Plus took off. It had graphics tools. At that time we were selling OverVue, which did not support graphics.

MW dBase didn't make it on the Mac. Rea That goes to prove that just pouring money down a hole doesn't make a successful product. Ashton-Tate bought dBase Mac and didn't port their PC product. [That was] the right strategy. Mac owners wanted their own software, not some PC stuff.

continues
They think databases are easy to use. A oversold it. [But] the HyperCard phe-
omenon emerges again and again—every-
one will be a programmer. Every few
years there is a new product like that.

People's reach exceeds their grasp.
They think databases are easy to use. A parallel—word processor buyers don't think
that they can write a spell checker.
People buy Photoshop, and they don't
think that it will make them paint like
Rembrandt. But if they buy a database,
they want to do complicated things or
think that we should teach them to.

MW What divides you from Bill Gates?
Why aren't you worth several billion?
Rea Bill Gates. There's only one. Part
of what rankles everyone is what Bill has
done with his luck. I'm not a Microsoft
fan, though. I don't like the Microsoft
idea. I do like Bill Gates a lot because I
think that he is really the only person in
this industry with vision, technology
knowledge. Plus he sees beyond that, to
the other side—marketing. Most people
in the industry are in marketing, like
Sculley. Knowledge Navigator just isn't a
realistic dream, [But] when Gates talks, he
knows what can happen.

Microsoft [goes from] success to suc-
cess because at the top is a technical per-
sion. Most software companies have one
success and that's it. Years ago all the rage
was one-product companies. [You] don't
hear so much about them anymore. Ash-
ton-Tate, WordStar. Turned themselves
into [multiproduct] companies.

MW Let's talk about Panorama.
Rea Panorama is different from other
databases. It's RAM based. It loads all of
your data into RAM when you operate.

MW That sounds tough in a System 7
world. Doesn't 7 use most of the system's
memory?
Rea We hear that objection less and less.
Now it's easy to get 8MB on a CPU, File-
Maker and 4D pull data from disk. To
find data they use an index, not the whole
disk file. There is a problem with indexing; it consumes disk space. One
megabyte of data may have 4MB to
5MB of indexes, four to ten times more
disk space for the index than for the
database. So when you compare file
sizes of 5MB for a FileMaker file, you're
only talking about 1MB in a Panorama
file. People forget that.

The other problem with an index is
that it can only look at data in a certain
way. As in 4D, where you can only pick
certain fields to be indexed. Pick all you
want, but that slows it down. If you don't
index in advance, you can't search the
data. And in 4D you can't search for a
partial match—say, something within a word,
or a mathematical relationship—only en-
tire entities. Say you want to find every-
one on a certain street. Generally you
can't do that with an index system. You
can with FileMaker, but it has a different
set of limits. What's stored in the database
is the numbers of street addresses, but not
the entire street because it's not indexed
that way.

MW And you can't add to such indexes?
Rea No. It's a structural thing of setting
up the database. Generally not. Certain
fields are not indexed at all.

MW In FileMaker?
Rea It indexes every word. On the other
hand, there are some problems. No punc-
tuation. A and A+ look the same. You
cannot do things [you can] do in Panorama.
Like "find all of the checks in a checkbook
database that are more than 10 percent
of the balance." You could do that in 4D by
writing a program, but the program takes
a while to run because the program must
look at each check, that is, each record.

MW So the truth is that Panorama is
not for large users.
Rea You wouldn't automate General
Motors' accounts receivables with it. My
biggest [list of] records is 90,000. It takes
6MB. Ninety thousand names, addresses,
phone numbers. You probably couldn't
put 90,000 invoices in 6MB.

MW Does the original dBase on the PC
have any role on the Mac?
Rea Yes. But it has no future other than
what FoxBase+/Mac manages to carve
out. FoxBase+/Mac gives DOS dBase us-
ers a way to port their applications to the
Mac. Probably few will start new ap-
lication[s]. It's not a growth industry. On
the other hand, anytime a language has a
billion lines of code written in it, it will
not go away.

MW Another distinction that people
make about databases is whether they're
programmable or end-user oriented. Is
that useful?
Rea It can be. Products like dBase or
4th Dimension—generally [end users]
can't use those products without program-
ing. Say you want to put an application
together that allows you to sort data. Pan-
orama has a feature called cross tabs that
allows that. 4D could do the same if some-
one wanted to write a program, which
would take hours or days.

MW Do you see Claris as a competitor?
Rea They sure are.

MW How do you reflect on that?
Rea Life isn't fair. I don't think it's fair.
I don't think people know that Claris is
wholly owned by Apple. It's interesting
that Apple doesn't seem to care about
third-party developers. First Claris was to
be spun out. Apple would not compete
with its developers. [But] that's just what
they've done. Recently they have taken
the guts out of the developer program.
They've lowered [developer] discounts for
hardware. They just banned the developer
credit card purchase program. Looks to
me like they're headed toward disbanding
the developer program altogether.

MW Apple has provided a lot of support
to the database market. To Ashton-Tate.
To ACIUS.
Rea That was a long time ago. 4D was
in-house for a while. Jazz was not in-
house but it got a lot of support.

I don't think I would want Apple di-
recting industrial policy for the nation.
When we did work with them they were
always calling at the last minute, wanting
$10,000 [for a project], and we had to de-
cide [whether to participate] overnight,
but if we could decide before they hung
up, even better.

MW Do you plan to remain an Apple
developer?
Rea Yeah. I like the computer. I think
that the people who designed the original
Mac did a great job. As a programmer,
[with] almost every system I've worked on
I've always come up against things that
people who designed the system didn't
anticipate. You end up duplicating part of
the operating system to make it do what
you want. On the Mac that almost never
happens. Apple anticipated that people
would want to do things that they them-
selves didn't anticipate.
The Critics Love Our Movies.

One of the critics, Macworld, recently said, “As a group, the RasterOps boards made the best video captures—with truer colors, better resolution, and fewer artifacts than all of the other boards.”

MacWeek honored our 24STV video adapter with its Target Award. And Presentation Products handed us its Readers Choice Award. We could go on, but you get the point: RasterOps makes the most highly acclaimed multimedia/video products you can buy.

It’s no wonder. Apple® developed QuickTime with RasterOps products. And today, the RasterOps QuickTime Presentation Theater is the only complete multimedia family available.

In its price range, it's the only one offering video output to an NTSC source or a video recorder. The only one with a full screen video window that can display and capture at 30 frames per second. And the only one that includes CD quality sound and video digitizing on one board. All these functions are enhanced by each product's easy interactivity.

We've prepared a video about the RasterOps QuickTime Presentation Theater. To order your $5.00 video, find out about our special VideoSpigot Trade-In Program, or get more information, please call us at 1-800-SAY COLOR.

And let RasterOps take you to the movies.

RasterOps QuickTime Presentation Theater.

In its price range, it’s the only one offering video output to an NTSC source or a video recorder. The only one with a full screen video window that can display and capture at 30 frames per second. And the only one that includes CD quality sound and video digitizing on one board. All these functions are enhanced by each product's easy interactivity.

We've prepared a video about the RasterOps QuickTime Presentation Theater. To order your $5.00 video, find out about our special VideoSpigot Trade-In Program, or get more information, please call us at 1-800-SAY COLOR.

And let RasterOps take you to the movies.
Five Claris Titles. One Sleek Container.
Introducing ClarisWorks, The Only Software Package You'll Ever Need.

ClarisWorks has redefined the concept of integration. In the past, other products have been assembled under a menu system and labeled "integrated." They were in the same box, but they didn't really work together. These packages were often fat, requiring too much memory; and slow, because moving between them meant closing one and opening another. Why Bother? ClarisWorks has developed the ultimate integrated environment, wherein all six programs live and work together. Create great-looking newsletters, brochures, reports and more. Just click the tool you need and the menus and commands change automatically. You get a WYSIWYG display, so you can see what your document will look like when it's printed — and an on-line spell checker and 660,000-synonym thesaurus. This sleek integration means students and novice users can experience new uses for their computers.

Engineered elegantly into just 580K, ClarisWorks is a must for PowerBook users, and the perfect package for new users. Creating a document with text, graphics and charts is truly simple, and you'll do it as if you were working in one program. The ingenious integration makes it very comfortable. And of course, there's context sensitive and balloon help for just about everything.

The programs themselves are not trimmed down, either; they are from Claris, a leader in the Macintosh market. These programs feature the same proven interface you'll see in dedicated applications like MacWrite II, MacDraw Pro, Claris Resolve and FileMaker Pro.

Word Processing. The Heart Of ClarisWorks.
The heart and soul of your system. Your word processor. ClarisWorks features one of the best in the business. Bring it up and format a page in no time flat — set up custom tabs, margins, indents, line spacing and justification. Use your choice of fonts just for the right look. Quickly create professional mail merged letters, using the database, and send them to everyone on your mailing list.

Ready to get fancy? It's easy with ClarisWorks' multiple columns, headers and footers, link frames so type flows smooth as silk between columns, around graphics and more. Hey — you can also rotate type nows smooth as silk between columns, around graphics and more. Hey — you can also rotate type... you can isolate the data you need by quickly specifying the combination of calculations locally and globally.

Chilling: It's A Snap! Pictures speak louder than numbers, and your spreadsheets will sing with great looking charts. Just highlight the data you want to chart — then a couple of clicks and you've created a sleek, visual display of the information. And you can choose from seven different chart types — with 280 possible combinations of colors, grids and legends. Whenever you change the data, your chart will be automatically updated. Plus other powerful features.

Database Magic! ClarisWorks features a full-blown database with pro-quality reports and management features. Searching and sorting functions are world-class. You can isolate the data you need by quickly specifying the search parameters. Quickly organize information with automatic sorting. If you've never used a database before, you'll love how easy ClarisWorks makes organizing your data. If you're a seasoned database veteran, there's plenty of power under the hood to satisfy even the most demanding tasks.

You can easily create mailing labels, using any one of the standard layouts that included in the package, or customize them as needed.

Create Grand-totals and sub-totals quickly and summarize your information, highlight key results to present an accurate analysis with plenty of impact. The visual record selection enables you to select specific records without using formal search criteria — just point and click.

Graphics Tools For Everyone. Speed and flexibility — that's what it takes to make your documents look good on paper. And that's what you get with ClarisWorks. Select from a great design palette, create lines, circles, ovals, polygons and more. Resize, rotate and redesign to produce precise, polished graphics. Then position text and graphics any way you want to achieve the perfect effect. Align objects with snap-to grids and insert your graphic masterpieces anywhere.

FREE

Desk Reference, Word Finder Plus and CheckFree when you buy ClarisWorks.

YOU GET ALL OF THIS

PLUS New RightWriter 3.2
Good writing is a key element in successful business and RightWriter can help you make your writing strong, clear and to the point. Not just a spell checker, RightWriter is a sophisticated expert system that applies the rules of good writing directly to your documents. It's designed to flag errors in your writing from a rule base of over 4,500 — including rules of grammar, style, usage, punctuation, sentence structure, and more.

HOW TO PLACE AN ORDER

Ordering: Just call 1-800-666-2562 Monday Friday 8:00 A.M. - 9:00 P.M. Eastern time, Saturday 11:00 AM - 5:00 PM (eastern) and one of our representatives will be happy to take your order. Your order will be promptly processed.

Fax orders: For faster service, FAX your order form or FAX to us on our TigerSoftware Express FAX Service Line — (305) 529-2990.

How to Pay: Pay for your purchases with VISA, MasterCard, American Express, Discover Card, or by check. Personal check held 10 days or money order. We DO NOT charge your account until WE SHIP THE SOFTWARE! We accept purchase orders from Fortune 500 companies, educational and government institutions (in 15 days).

Risk-Free Return Guarantee: We proudly stand behind every product we sell with our ironclad, 30-day return guarantee. If for any reason you're not 100% delighted with the product, just return it within 30 days. We only ask that you return ALL material in new, resalable condition (packing materials, registration cards, etc.) and the original invoice. We will then immediately exchange the product for a TigerSoftware credit, less shipping costs, for any future TigerSoftware purchase.

Customer Service: If you order your new software product by 3:00 p.m., we'll have it on its way to you within one business day. If you place your order by 11:00 AM (EST), your order will be processed and shipped out same day for immediate shipment to you. If for any reason you are unhappy with your new software, simply call our Customer Service Department for a Return Authorization Number, and return it to us freight prepaid. We will gladly exchange it for any other product in our huge inventory.

LOWEST PRICES GUARANTEED!

We will match current, published prices on identical offers. ALL PRICES ARE SUBJECT TO CHANGE. TigerSoftware is registered trademark of TigerSoftware, Inc. This Entire catalog, copy and images method of displaying products is copyright (c) 1991-1995 TigerSoftware, Inc. All trademarks appearing herein are acknowledged.
**Draw, Paint, Retouch. Make Digital Movies!**

**Reviewer's Notebook: In addition to the two industry standards reviewed on this page, Adobe Illustrator and Adobe Photoshop, Tigersoft is proud to be among the first to offer Adobe Premiere, an incredible new title that allows you to combine video footage, audio, animation, still images and graphics to produce digital movies on your Mac.**

Adobe Premiere is fast and yields high-quality results. Interactive presentations, television ad concepts and roughs, video databases, merchandising sequences and training sessions are just a few of the wide ranging uses for this new title.

**Adobe Illustrator: A slew of impressive industry awards grace the Illustrator box, a clue to the amazing capabilities you'll discover inside. Indeed, Adobe Illustrator is the most powerful desktop design and production tool in the world today, ideal for designers with a desire to elevate their work to a new vista of speed and creativity. It's the only system capable of precise illustrations, extensive text handling, fully automatic graphing and color separations. You can work from existing images if you like — just scan it and you're ready to begin. Or draw from scratch using Illustrator's magnificent set of drawing tools, the envy of the industry. It's as simple as moving the mouse.**

Professional pages depend on the ability to handle text in a variety of ways. This package includes free Adobe Type Manager and 13 type faces. Nothing allows more creative opportunities than Adobe Illustrator when it comes to integrating text with your designs, illustrations, line art, images and photos. Just enter your text on screen, or quickly import it from your word processor with control of the kerning, tracking, word and letter spacing.

Create tight wraps around shapes (or any path, like circular type) and images, viewing your alterations on your screen as you work. Flow text between columns, add unlimited numbers of characters and styles from any PostScript Type 1 font (including the entire Adobe Type Library). You can even convert the type to outline images, and then create images from them.

Creating charts is a snap with Illustrator, just type in your data, select a chart type and it's done. Customize your charts with your palette of creativity and review them in just a few seconds. You'll create top-notch ads, brochures and more, from concept to final production and color separations. In fact, the Adobe Illustrator box was completely created using the product. Color capabilities include unlimited 24-bit screen reproduction (8-bit is supported for B&W).

**Adobe Photoshop:**

The ultimate color-retouching/image processing system for the Mac. A great pre-press and production tool, Adobe Photoshop has garnered loyal users in all areas of graphic design and color reproduction. Using its extensive features, it's always able to create anything you can imagine. Full 32-bit color artwork with full control and flexibility to manipulate and combine photographic images, and the ability to create stunning video effects. Color separations are precise, meeting or exceeding even the strictest standards for repro. You can produce bitmapped, grayscale or continuous-tone color, add color, change it or remove it completely. Produce intriguing duotones, tritones and quadriones. And you can use your existing Adobe Illustrator files in your Photoshop images. You've got a great selection of creative tools right at your fingertips. Call for details for Adobe latest hit...

**ALL NEW ADOBE PREMIERE...**

Become a movie maker — with the help of your Mac — and new Adobe Premiere. It's the newest creative tool from the leaders in precision graphics and photo manipulation.

---

**Fully-Editable, Full-Page Photo-Images for Print, Multimedia**

**Reviewer's Notebook: It was love at first sight — on a professional level, of course. These professional-photograph-scanned images, designed for print and multimedia applications, are simply the highest quality work we've ever seen. We thumbed through the sample guide and were instantly awed-struck with the immense character and depth of artistic creativity. Each and every image is a fascinating work of art dedicated to a lifetime of unlimited use.**

Picture this: a library of 100 photographic images for your Mac. FOLIO I features full-page photographic backgrounds and textures for print, multimedia, and presentation graphics.

With FOLIO I, you can add a splash of color to a page...fill a logo with a texture...create a patterned illustration...build unique templates for slide presentations...make backdrops for product shots...touch up attractive advertisements and brochures with graphic elements...add decorative trim to multimedia menus...produce broadcast-quality chroma keys...and even map textures to 3-D renderings!

Why Settle For Clip-Art? Why Pay For Stock?

There's no need to settle for the amateur look of clip-art of the high costs of one-time-use stock photography. With FOLIO I, you get professional photography without royalties or restrictive use rights. Every image includes a lifetime of unlimited use.

FOLIO I is the perfect companion for your page-layout or multimedia software. If you can open, place or copy a TIFF or PICT image, you can use FOLIO I!

**Unmatched In Quality.**

At D'pix we understand the #1 rule of scanning: garbage in, garbage out. That's why we've emphasized quality every step of the way, using the finest studio equipment, film, and transparency scanners. From thousands of shots, only the best make it to the scanning stage. Images are scanned at up to 5,000 dpi, to capture the finest details, at 48 bits, for the most accurate colors on the market. Images are resampled to 24-bit and two resolutions: one for magazine-quality printing, the other for multimedia and business-quality print.

The FOLIO I Image Library is available in two different packages: FOLIO I Print Pro and FOLIO I Media Kit.

**FOLIO 1 Print Pro.**

Available only on CD-ROM, the FOLIO 1 Print Pro is for the serious color professional who requires full-page images for magazine-quality reproduction.


These images are perfect for multimedia, presentation graphics, and business-quality print. Each image is 9" x 12", 25-bit, 8000 dpi, 32-bit, and 24-bit. The quality is unmatched!

In addition, the package includes your choice of one free category of 10 magazine-quality images unlocked from the CD-ROM. The remaining 90 images can be purchased as either unlocks or 4" x 5" transparencies for only $75 each.

**FOLIO I Media Kit.**

Available only on CD-ROM, the FOLIO I Print Pro is for the serious color professional who requires full-page images for magazine-quality reproduction.


These images are perfect for multimedia, presentation graphics, and business-quality print. Each image is 9" x 12", 25-bit, 8000 dpi, 32-bit, and 24-bit. The quality is unmatched!

In addition, the package includes your choice of one free category of 10 magazine-quality images unlocked from the CD-ROM. The remaining 90 images can be purchased as either unlocks or 4" x 5" transparencies for only $75 each.
There's a comprehensive world atlas — presented in scientific accomplishments from the beginning of time, and speedy CD-ROMs! They include an amazing, full-color encyclopedia, complete with enhanced sound. 

Everything's included. One price. Complete in one! It's a remarkable package that contains the most extensive collection of full color maps you'll find anywhere.

**The Software Library Includes:** The Toolworks Illustrated Encyclopedia. Critically acclaimed and widely used, The Toolworks Illustrated Encyclopedia features the entire text of a 21-volume encyclopedia — stored on a single compact disc!

**Desert Storm:** The War In The Persian Gulf. The acclaimed CD that lets you experience Operation Desert Storm in full sight and sound. Chronicling the war and the events that precipitated it, it provides new reports, eyewitness accounts, and more.

**Sherlock Holmes:** An absolute for electronic game fans. Sherlock Afficionados and deductive reasoners! You get to interact with the on-screen characters, embarking on three cases with the super-sleuth himself.

**Ludwig van Beethoven Symphony No. 9:** A fascinating way to experience Ludwig van Beethoven's classic Ninth symphony, exploring and understanding the entire work, as well as its historical setting, all while listening to the music itself.

**Birds of America:** This disc is perfect for bird watchers, history buffs, fine art students, and libraries.

**Cosmic Osmo:** The world's greatest playwright, proven to be the most enduring English language author of all time, is now available on compact disc.

**CIA Fact Book:** The CIA has been busy — collecting facts, stats, maps, sound clips and more! They've assembled megabytes of inside information on one CD and made it available to you.

**The Time Table of History:** Science & Innovation. More than 6,000 entries show the chronology of historical, scientific, and technological events from the beginning of time to the present.

**U.S. History:** U.S. History on CD-ROM provides detailed coverage from a variety of historical perspectives on political, aerospace, geographic, social, military and economic history.
WHY SETTLE FOR SECOND-RATE EQUIPMENT?

These are state-of-the-art multimedia sets. Nothing else to buy!

Full motion video! Digital sound! 11 free CD titles!

Reviewers' Notebook: The dizzying impact of sight, sound and motion is not easily forgotten. Our first experience with multimedia CD-ROM felt like entering a new world—it grabbed our senses! If you make presentations or conduct training, adding sound and motion will yield incredible results: it's fun watching an audience with their mouths hanging open—completely entranced by what they're witnessing! This hot new technology enhances communication, there's nothing quite like full motion video. We've included 11 smash CD software hits to get you going—that's thousands of diskettes worth of information. These discs are packed with mesmerizing sound, magnificent animation and video, language lessons with spoken pronunciations, gripping games, color-drenched maps and plenty of information—with the added dimension of stereo sound. The world of multimedia CD-ROM is here.

Tiger has two complete multimedia packages to choose from. The first features the CDR-37M, the ultralight portable reader with zippy response times and rugged NEC quality. You also get the complete interface kit, including all the cables you'll need, a pair of high quality persona Micro speakers (that pump out bone-crushing sound), and a CD-ROM caddy that holds 30 titles. The CDR-74M is the fastest reader in the world! Breathtaking 280 millisecond response speed and a brand new design incorporating state-of-the-art optical technology. Of course you get all the goodies: Full NEC interface kit, persona Deluxe speakers, all the cables, 11 CD-ROM current-release titles, and the sleek CD caddy!

Here's everything you get

<table>
<thead>
<tr>
<th>CDR-37 TIGER BUNDLE</th>
<th>Retail Value</th>
<th>CDR-74 TIGER BUNDLE</th>
<th>Retail Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDR-37M CD-ROM Reader</td>
<td>$449.00</td>
<td>CDR-74M CD-ROM Reader</td>
<td>$675.00</td>
</tr>
<tr>
<td>Complete Interface Kit</td>
<td>99.00</td>
<td>Complete Interface Kit</td>
<td>99.00</td>
</tr>
<tr>
<td>persona Micro Speakers</td>
<td>80.00</td>
<td>persona Deluxe Speakers</td>
<td>229.00</td>
</tr>
<tr>
<td>30 CD-ROM Holder</td>
<td>29.95</td>
<td>30 CD-ROM Holder</td>
<td>29.95</td>
</tr>
<tr>
<td>CIA Fact Book</td>
<td>99.95</td>
<td>CIA Fact Book</td>
<td>99.95</td>
</tr>
<tr>
<td>Desert Storm</td>
<td>99.95</td>
<td>Desert Storm</td>
<td>99.95</td>
</tr>
<tr>
<td>Orient</td>
<td>99.95</td>
<td>Orient</td>
<td>99.95</td>
</tr>
<tr>
<td>Toolworks Illustrated Encyclopedia</td>
<td>395.00</td>
<td>Toolworks Illustrated Encyclopedia</td>
<td>395.00</td>
</tr>
<tr>
<td>World Atlas</td>
<td>79.95</td>
<td>World Atlas</td>
<td>79.95</td>
</tr>
<tr>
<td>sherlock Holmes</td>
<td>99.00</td>
<td>sherlock Holmes</td>
<td>99.00</td>
</tr>
<tr>
<td>Shakespeare</td>
<td>99.00</td>
<td>Shakespeare</td>
<td>99.00</td>
</tr>
<tr>
<td>Birds Of America</td>
<td>99.00</td>
<td>Birds Of America</td>
<td>99.00</td>
</tr>
<tr>
<td>Family Doctor</td>
<td>149.95</td>
<td>Family Doctor</td>
<td>149.95</td>
</tr>
<tr>
<td>Time Table: Science &amp; Innovation</td>
<td>99.95</td>
<td>Time Table: Science &amp; Innovation</td>
<td>99.95</td>
</tr>
<tr>
<td>U.S. History</td>
<td>395.00</td>
<td>U.S. History</td>
<td>395.00</td>
</tr>
<tr>
<td>Total Value</td>
<td>$2374.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AN INCREDIBLE VALUE</td>
<td>ALL THIS—$699</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Value</td>
<td>$2748.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AN INCREDIBLE VALUE</td>
<td>ALL THIS—JUST $999</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tiger Multimedia Accessories:

Tiger multimedia accessories! All the extras for sound and motion CD-ROM. The Persoona speakers, available in two sizes, are designed to complement the look of your Mac. The Persona Micros are compact, dynamic, churning out rich, vivid sound. The Persona Micros match your Mac perfectly, and take up a lot of space on your desktop. They're small enough and powerful enough to put on a shelf—or out of the way completely behind a plant!

We've also got the persona Deluxe Speakers—for premium sound! These unique speakers can be mounted on your PC, for "stereo desktop" games, presentations, sound effects and interactive titles.

CD Flipper. Your CD software titles (along with your audio discs) stay neat and organized on your desktop with an ultra-modern designed CD flipper. The rugged, single-piece aluminum construction and clean, low-profile design allows compact storage, and instant "flip-view" display.

The Black, oven-baked finish stands up to heavy use.
The Wall Comes Down! DOS And Mac Unite!

REVIEWER’S NOTEBOOK: At last! The great barrier between Mac and DOS compatibility has been removed — for good. As a user of both Mac and DOS computers, I know the pros and cons. Macs are friendly and advanced, but the DOS world has more people creating more software. Specialized software that might fill your particular needs. Plus today’s office environment uses a mix of DOS and Mac computers, which can cause a spreadsheet and data files needing to flow smoothly between Mac and DOS PCs. That’s why we at Tiger are proud to offer the world’s best-selling answer from Insignia Solutions, a dedicated company who has had a five-year mission: To bridge the compatibility problem between different worlds of software.

AccessPC. Slip a DOS floppy into your Mac and it looks just like a Mac floppy! An icon appears, you double-click it and DOS files and sub-directories appear just like the were Mac files and folders. Double-click on the DOS files and immediately run Mac applications like Word, 1-2-3 Mac and Excel. AccessPC is still the fastest — fully 4 to 10 times faster than the competition!

Now with Cartridge and Magneto-Optical Drive Support! AccessPC is instantly compatible with your external cartridge and magneto-optical drives. No other utility software is needed! Unlike the others that make you call your drive manufacturer for software they haven’t even finished yet). Your DOS files are ready, willing and able with the finest DOS file access application made — AccessPC.

Added bonus! Intelligent disk cache for your cartridge and magneto-optical drives can increase performance by 30% or more — and it’s free!

SoftPC Family. Turn any Mac into an advanced DOS computer. Put DOS files and applications from within a Mac window, complete with all the extras. SoftPC will turn any Mac into a 286 AT computer, complete with a full 640 K of memory and DOS 3.3. Run a DOS program and print directly to any Mac printer — just like it was an industry-standard Epson LQ2500 (which virtually all DOS programs support). Or if the DOS program supports PostScript printers, you can print directly to any LaserWriter or other Mac PostScript printer. TrueType fonts are even included for the Epson LQ2500 so you get crisp, clean printouts every time.

Getting your data between DOS and Mac has never been easier. Cut & Paste with the Mac Clipboard between all DOS and Mac windows. Put DOS files and applications on any Mac drive — any folder or volume that appears on your desktop can be used, even remote hard disks on networked Macs.

Entry Level SoftPC. This member of the SoftPC family was designed for low-cost Macs including the Mac Plus, SE, LC, Classic and Portable. You get everything mentioned above including IBM AT 286 emulation, DOS 3.3 and CGA graphics.

Universal SoftPC. Step up to Universal SoftPC and you add several new capabilities to the Entry Level SoftPC package. CD-ROM support lets your Mac CD reader play DOS CDs. And if you purchase the optional SoftNode add-on, you can access Novell Netware networked. It’s the perfect solution for offices with specialized Novell software.

SoftAT. Fasten your seatbelt and hang on as SoftAT takes DOS software to new levels of high-performance. You need a Mac LC, SE30, Mac II, IIci, LC, Ici, Quadra or PowerBook 140 or 170 to run it, but it’s all speed.

You get lightning fast benefits like a math coprocessor, EGA graphics for more demanding graphics applications and expanded memory for big, hungry programs.

SoftNode. Another Insignia Solutions breakthrough is SoftNode — the perfect solution for running Novell Netware PC client software on any Mac. With the addition of the SoftNode add-on, both Universal SoftPC and SoftAT can run off the shelf and customized MIS-DOS programs on any Mac.

Buy SoftAT or SoftPC And Get FormTool & Personal Law Firm Free

INsignia

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AccessPC</td>
<td>$65.95</td>
</tr>
<tr>
<td>AccessPC Entry Level</td>
<td>$139.95</td>
</tr>
<tr>
<td>Universal SoftPC</td>
<td>$209.95</td>
</tr>
<tr>
<td>Universal SoftPC 2.5</td>
<td>$139.95</td>
</tr>
<tr>
<td>SoftNode</td>
<td>$115.95</td>
</tr>
<tr>
<td>SoftNode 1.0</td>
<td>$99.95</td>
</tr>
</tbody>
</table>

GraceLAN Network Manager. Provides a complete profile of each person’s system details and applications in a single screen. Identify users with specific needs (those who may require System 7 or external drives) and you’ll see how they become problems. With the ability to track these details, you can eliminate any down time for your users — in just a few minutes. You’ll quickly spot incompatibilities (such as a system conflict and build a complete software and hardware inventory. You’ll verify software license agreements and synchronize all system clocks on the network (perfect for shared backups) and keep a complete, detailed log of printer use and activity. Print reports of all GraceLAN Network Manager’s findings.

Honorited with MacWeek’s Target Award for “Best Network Management,” GraceLAN Network Manager is a must for smooth network operation.

GraceLAN Update Manager. The new software is here! You want to update every user on your network as soon as possible. A simple but very time-consuming process, GraceLAN Update Manager takes the pain out of 10, 20 or 30 machines can take hours and hours. A better way? It’s called GraceLAN Update Manager.

GraceLAN Asset Manager. This unique program automatically provides a central database for hardware and software inventory details on every device on your network. Asset Manager is actually a powerful relational database with custom data fields to handle network inventory — including serial numbers, locations, purchase dates, depreciation schedules, maintenance logs, history notes and more.

Network Management Headaches?

GraceLAN Network Manager is actually a powerful relational database that can help you manage your network more efficiently. You can use it as you normally would, just double-click on a compressed file to open it. Any application can open a compressed file, just as if it wasn’t compressed. DiskDoubler even remembers which files have been opened and re-compresses them automatically when you’re done.

AutoDoubler. If you’re looking for more disk space, you’re looking at the right product. Because AutoDoubler gives your drive twice the capacity — automatically! Its patent-pending technology fills and applies to half your original disk space. Just double-click to install and AutoDoubler does the rest. It’s that fast and that easy. Just in fact, AutoDoubler lets your Mac use files and applications while they’re still compressed!

Disk Doubler. DiskDoubler is a powerful file compression utility that makes disk drivers more efficient. It increases a disk’s storage capacity by 20% or more! DiskDoubler is easy to use. Let’s you select any file or folder on your disk and compress it in seconds. The immediate result is more free disk space. Once a file is compressed, you can use it as you normally would, just double-click on a compressed file to open it. Any application can open a compressed file, just as if it wasn’t compressed. DiskDoubler even remembers which files have been opened and re-compresses them automatically when you’re done.

Disk Doubler

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DiskDoubler</td>
<td>$45.95</td>
</tr>
<tr>
<td>DiskDoubler 50</td>
<td>$45.95</td>
</tr>
<tr>
<td>DiskDoubler 10</td>
<td>$29.95</td>
</tr>
</tbody>
</table>
Sweet Sur-Render!

REVIEWER’S NOTEBOOK: This page is devoted entirely to the art of animation, 3D modeling and photo realistic rendering. It’s a new frontier for the Macintosh spearheaded by the incredible Swivel 3D Professional and ModelShop II, which includes Modeler and SwivelMan, which has been awarded some heavy industry awards, including MACWORLD Worldwide "World Class Award", MacUser’s "Editor’s Choice", and INFOWorld’s "Buyer’s Assurance Award" to name a few. We were amazed at how capable these products are, and after speaking to some devoted users — along with having some fun ourselves — we understand why they are the premier design and animation software in the industry today.

Swivel 3D Professional is the most complete modeling and design environment: move and handle objects with power and simplicity. Animate 3D models by setting keyframes. Swivel will automatically create the frames in between. SwivelMan enables you to create 3D models and render them by applying photorealistic textures and shaders.

ModelShop II is also reviewed here, enabling architects, interior and landscape designers and civil engineers to quickly create desktop models for presentation and unique visualizations. Converts popular 2D CAD product (including Claris CAD, AutoCAD, Graphisoft Microcad plus and more) to stunning, life-like 3D. Lines become walls, solids extrude. ModelShop II enables you to draw and design freely, with premium flexibility, before and in lieu of committing ideas to hard-rendered drawings. You can actually walk through or fly by cities, interiors, buildings and landscapes in real time.

We’ll also take a close look at MacroMedia’s SwivelArt Collections of ready-made 3D models for use in Swivel 3D and other Multimedia and desktop programs. Choose from North and South American maps, Europe, Asian, Australian and African maps, Cars and Air and Sea models. There’s also a collection of anatomical and human forms. You are in control. Resize, shade, rotate, scale and color these 3D clip images any way you like. And just released — LifeForms, a collection of detailed human motion animations. Now you can add moving human shapes to your models, renderings and animated sequences.

ModelShop II, Why not present your spatial design ideas in amazing 3D?! Architects and designers are pouring it on with this amazing sketch and rendering tool that produces realistic models with incredible speed, pinpoint-precise and remarkable flexibility. Even the most complex models can be constructed using ModelShop II’s 2-D and 3-D objects (including cubes, cylinders, walls, arcs, polygons and more). Light and shadows are completely at your command: adjust intensity, color and add an unlimited number of point and spotlights. Drawing and re-drawing is faster with ModelShop II’s Layering — organize your project into an unlimited number of layers to simplify the construction and manipulation of objects. Lock text into place in your models for final presentations.

Incredible colors, unbelievable resolution and striking output. This example uses rendered and rendered type as part of the design. Images so lifelike, they are real — amazing capabilities.

RENDERING and output capabilities include last, incredibly smooth shading, 24-bit color output capabilities, 24-bit image mapping, 8 independent light sources, environmental mapping, specular highlighting, RenderMan RIB output, along with AutoCad DFX output. Produce PostScript halftones for color separations.

A unique "Linking" feature enables you to design models with constrained mechanical properties. For example, design a ball joint link which permits a component to pivot but not separate. Objects can also be constrained in their range of motion and rotation in order to build hinges, wheels or sliding panels. Create an automobile design with working doors and trunk.

"...I liked using Swivel 3D Professional so much, and found it so straightforward and intuitive, that I almost wished I was a graphics designer and got to do this stuff all day long."

Don Crabbe, BYTE

Make It Move... Create animated sequences containing a variety of different views, including walk-throughs and fly-bys of your models. Choose straight or curved paths, edit frames, move at varying rates of speed — to explore your models in ways never before possible. Create amazing visual rides through interiors, over walls and around exteriors.

FREE Multimedia Info Kit
Mini Speakers
Trax MIDI Software

Information & Orders: 1-800-666-2562
Int'l Orders: 305-443-8212
Fax: 305-529-2990

Swivel 3D Professional 2.0. Rendering, sex and rock’n’roll! Enter another world with Swivel 3D Professional, the 3-D design and SwivelMan, which includes Swivel 3D Professional and MacRend and SwivelMan, the award winning 3-D photorealistic rendering sensation.

Macintosh graphic designers, animators and illustrators are producing computer images, video presentations and even print media with stunning realism and loving every minute of it. But perhaps the greatest advantage is the ability to quickly VISUALIZE ideas and designs with the impact of the third dimension. Swivel 3D Professional 2.0 is superbly designed, with an interface that enables you to move with blistering speed. Build amazing 3-D scenes with uncanny realism and almost effortless object handling. In fact, NASA relies on Swivel 3D Professional for scientific visualization, concept modeling and idea development. Operational methods are conceived using Swivel 3D for robotics and planetary exploration. The ability to quickly create models and put them into action before building prototype mechanical devices saves time and money. For print applications, Swivel 3D Professional exports Adobe Illustrator format, so views of models can be edited directly in Illustrator Joe Lertola of TIME magazine uses this method to create many of his infographics.

Rendering and output capabilities include last, incredibly smooth shading, 24-bit color output capabilities, 24-bit image mapping, 8 independent light sources, environmental mapping, specular highlighting, RenderMan RIB output, along with AutoCAD DFX output. Produce PostScript halftones for color separations.

A unique ‘Linking’ feature enables you to design models with constrained mechanical properties. For example, design a ball joint link which permits a component to pivot but not separate. Objects can also be constrained in their range of motion and rotation in order to build hinges, wheels or sliding panels. Create an automobile design with working doors and trunk.

"...I liked using Swivel 3D Professional so much, and found it so straightforward and intuitive, that I almost wished I was a graphics designer and got to do this stuff all day long."

Don Crabbe, BYTE

ModelShop II. Why not present your spatial design ideas in amazing 3D?! Architects and designers are pouring it on with this amazing sketch and rendering tool that produces realistic models with incredible speed, pinpoint-precise and remarkable flexibility. Even the most complex models can be constructed using ModelShop II’s 2-D and 3-D objects (including cubes, cylinders, walls, arcs, polygons and more). Light and shadows are completely at your command: adjust intensity, color and add an unlimited number of point and spotlights. Drawing and re-drawing is faster with ModelShop II’s Layering — organize your project into an unlimited number of layers to simplify the construction and manipulation of objects. Lock text into place in your models for final presentations.

Design in any perspective or view, with Bezier walls, objects of revolution, linked walls and punched holes. Use unlimited colored light sources, hellodonic cast shadows and more.

Create detailed interior drawings in full color.
Universal PowerCache. Combine the blistering speed of a high performance processor (33-, 40-, or 50MHz) with an incredibly fast RAM cache and you’ve got the industry’s most respected time saving beast out all alternatives. And keep in mind, it’s guaranteed 100% compatible with all your software and hardware. On any other board make that claim? One card fits seven different Macs (adapter not required for Illc). Let’s take a closer look: The 33MHz PowerCache offers near-Ilfx performance, while the 40MHz delivers full llfx class speed. But hold on — the 50MHz monster sends your Mac to the limit with the hot 50MHz board with Adobe Photoshop, Aldus Freehand, Infini-D and Quark Xpress with results ranging from 225% faster to over 330% faster! Simple to install, just plug it in and hold onto something!

The PowerCache is a second generation CPU accelerator that provides unparalleled performance, 100% compatibility, and easy installation. It’s backed by a 3 year warranty and DayStar’s 100% Compatibility Guarantee.

Whatever the application, the PowerCache provides huge gains in productivity. It speeds up virtually all functions, plus, it works with everything. So choose the speed you need — all at a price you can afford.

• Super performance for ALL applications.
• Completely universal/transposable. One card fits them all.
• Available in multiple speeds. You choose the speed you need. Swap-Up on your needs change.

Equalizer LC. For the first time run Apple’s System 7 virtual memory. Have all the memory you want... 10, 20, 100 MB or more, all for one economical price! DayStar puts a 16 MHz 68030 processor in your 68020 based Mac LC. The optional math chip is great for complex spreadsheet recals and math/science programs. Special PowerMath software adds even more of a boost to many math functions. Buy today, and you can always upgrade to the blazing fast 50 MHz PowerCache accelerator.

The 68030’s built-in memory manager, along with DayStar’s proprietary technology, allows the LC to run Apple’s virtual memory. Have as much memory as you want, when you want it. Inexpensively upgrade your Mac LC to a Mac II class computer.

DayStar’s Swap-Up Program. DayStar offers one of the most comprehensive upgrade programs in the industry. Their program provides cost effective pathways which allow users to upgrade their DayStar’s acceleration line as their needs change. Owners of the Equalizer LC and PowerMath LC can, at anytime, upgrade to DayStar’s award winning PowerCache family of accelerators.

ACCELERATOR BOARDS

BBT2831A PowerCache 33 MHz $785.95
BBT2831B PowerCache 40 MHz $995.95
BBT2831C PowerCache 50 MHz $1495.95
BBT2831D PowerCache 33 MHz w/math processor $995.95
BBT2831E PowerCache 40 MHz w/math processor $1195.95
BBT2831F PowerCache 50 MHz w/math processor $1779.95
BBT2832A Equalizer LC/Virtual Memory $235.95
BBT2834B Equalizer LC w/math processor $345.95
BBT2835 PowerMath LC $149.95

PACKED with tips on making your Mac faster; best explanation of 32-bit addressing mysteries. Includes HyperCard stack on diskette for easy reference.

FREE Pick up where your Apple Users Guide left off.

For example: Did you know that RAM is actually a temporary store for your data and applications? When you turn off the power — they’re gone. Your hard drive or diskette is where you permanently store your files. That’s what happens when you boot your Mac. Some programs need more memory. Add ing memory to a LaserWriter increases the space so you can print with more fonts, bigger graphic images, and faster printing in many cases.

FREE BOOK & DISKETTE!

What is memory and why do you want more of it? Order now and get “The Macintosh Memory Guide” from Connectix absolutely free. A simple explanation of memory and how to get the most out of your Macintosh.

Z-COM

BBT2815 1MB for SE/30, IIx, IIc, Ile, Ii $59.00
BBT2816 2MB for Plus, SE, LC $95.00
BBT2837 4MB for Ii, Ile, IIc $185.00
BBT2838 4MB for III, Ilcx, Iixe $265.00
BBT2839 4MB for Ilfx $180.00
BBT2840 4MB for LC $65.00
BBT2841 4MB for LC $80.00
BBT2842 8MB for LC $339.00
BBT2843 2MB for PowerBook 100, 140, 170 $135.00
BBT2844 2MB for PowerBook 140, 160 $250.00
BBT2845 4MB for PowerBook 140, 170 $350.00
BBT2846 4MB for PowerBook 140, 160, 170 $575.00
BBT2847 8MB for SIMM Modules 80 ns $39.00
BBT2848 8MB for SIMM Modules 80 ns $75.00
BBT2849 16MB for SIMM Modules 80 ns $120.00

SIMM Modules have a 3 year warranty, furthermore memory half (8MBx2) memory 64ns and 8ns RAM also available.
THE INCREDIBLE NEC SILENTWRITER 95
PostScript Power Made Perfect!

The Silentwriter 95 is PostScript Level 2, with full
PostScript technology. It offers features of the Silentwriter 95,
but they proved to be no match.

The Silentwriter 95 is PostScript Level 2, with full PostScript
technology. It offers features of the Silentwriter 95, but they
proved to be no match.

Our tests matched features of the Silentwriter 95, the QMS 410
and the HP LaserJet III: PostScript standard, HP LaserJet
emulation, Apple interface availability, number of hot ports,
edge enhancement, fast upgradation of software features. The
result? Surprising. The NEC Silentwriter 95 is over $500
less than the LaserJet III, $700 less than the Apple LaserWriter.

The Silentwriter 95 gives you more advanced technology,
higher quality materials and workmanship — for up to
$1000 less than the competition. We even cranked it in
an HP III for Mac, a Texas Instruments Turbo and an
Epson 750 to battle feature for feature with the Silentwriter.

The Silentwriter 95 is PostScript Level 2, with full HP
PostScript standard. Imagine, you can print PostScript and PCL
— the Silentwriter 95 automatically switches emulations for you. One printer can handle
your PCs and Macs. It's all here, built right in to the Silentwriter 95. We weren't
able to find this combination of features anywhere else at
any price. Full-featured PostScript laser technology at an
affordable price! The print quality is absolutely perfect.

Documents look great with the Silentwriter's Sharp Edge
technology and Microfine toner.

Print Explosive Color Pages!
The NEC Colormate PS. It's color PostScript at its best.
You will never be satisfied
with anything less after you print your first full-color page.
Your competitor's presentation will pale by com-
parison next to your color work. Fast, timely color
sheet and promotional materials can be produced in
just a few minutes with a Colormate PS.

The Silentwriter 95 is PostScript Level 2, with full
PostScript technology. It offers features of the Silentwriter 95,
but they proved to be no match.

The Silentwriter 95 is PostScript Level 2, with full PostScript
technology. It offers features of the Silentwriter 95, but they
proved to be no match.

Our tests matched features of the Silentwriter 95, the QMS 410
and the HP LaserJet III: PostScript standard, HP LaserJet
emulation, Apple interface availability, number of hot ports,
edge enhancement, fast upgradation of software features. The
result? Surprising. The NEC Silentwriter 95 is over $500
less than the LaserJet III, $700 less than the Apple LaserWriter.

The Silentwriter 95 gives you more advanced technology,
higher quality materials and workmanship — for up to
$1000 less than the competition. We even cranked it in
an HP III for Mac, a Texas Instruments Turbo and an
Epson 7500 to battle feature for feature with the Silentwriter.

The Silentwriter 95 is PostScript Level 2, with full PostScript
technology. It offers features of the Silentwriter 95, but they
proved to be no match.

Our tests matched features of the Silentwriter 95, the QMS 410
and the HP LaserJet III: PostScript standard, HP LaserJet
emulation, Apple interface availability, number of hot ports,
edge enhancement, fast upgradation of software features. The
result? Surprising. The NEC Silentwriter 95 is over $500
less than the LaserJet III, $700 less than the Apple LaserWriter.

The Silentwriter 95 gives you more advanced technology,
higher quality materials and workmanship — for up to
$1000 less than the competition. We even cranked it in
an HP III for Mac, a Texas Instruments Turbo and an
Epson 7500 to battle feature for feature with the Silentwriter.

The Silentwriter 95 is PostScript Level 2, with full PostScript
technology. It offers features of the Silentwriter 95, but they
proved to be no match.

Our tests matched features of the Silentwriter 95, the QMS 410
and the HP LaserJet III: PostScript standard, HP LaserJet
emulation, Apple interface availability, number of hot ports,
edge enhancement, fast upgradation of software features. The
result? Surprising. The NEC Silentwriter 95 is over $500
less than the LaserJet III, $700 less than the Apple LaserWriter.

The Silentwriter 95 gives you more advanced technology,
higher quality materials and workmanship — for up to
$1000 less than the competition. We even cranked it in
an HP III for Mac, a Texas Instruments Turbo and an
Epson 7500 to battle feature for feature with the Silentwriter.

The Silentwriter 95 is PostScript Level 2, with full PostScript
technology. It offers features of the Silentwriter 95, but they
proved to be no match.

Our tests matched features of the Silentwriter 95, the QMS 410
and the HP LaserJet III: PostScript standard, HP LaserJet
emulation, Apple interface availability, number of hot ports,
edge enhancement, fast upgradation of software features. The
result? Surprising. The NEC Silentwriter 95 is over $500
less than the LaserJet III, $700 less than the Apple LaserWriter.

The Silentwriter 95 gives you more advanced technology,
higher quality materials and workmanship — for up to
$1000 less than the competition. We even cranked it in
an HP III for Mac, a Texas Instruments Turbo and an
Epson 7500 to battle feature for feature with the Silentwriter.
The Piano That Teaches You How To Play!

Remember being forced into taking piano lessons as a kid? My piano teacher, Mrs. Reymer, was sort of a crabby woman who'd smack my hands with a ruler when I missed a note. During my lessons, fun was the furthest thing from my mind. The repetition, the drills -- I eventually quit and I've regretted it ever since. If she had injected a little fun into those lessons, I'd be on tour with The Rolling Stones today!

Now it's my turn to decide on piano lessons for my own kid. My nine-year-old, a self-proclaimed Nintendo master and Junior Mac hacker, has asked me to bring him to the Miracle Piano Teaching System about four months ago. His first question was “How do I fire the weapons?” Wise guy.

I left him alone with the Miracle and waited to hear something. Ten minutes later I heard “Mary Had A Little Lamb,” then Chopsticks and then the theme song from The Jetsons. I rushed back to his room and found him with that look on his face -- the same look he gets when he reaches level 17 in Zelda.

I saw that this thing really works. Today, he's writing his own tunes and getting better each day. He's enjoying music, he doesn't get hit with a ruler and all I have to do is encourage him.

The Only Self-Teaching Piano. The Miracle Piano Teaching System can teach anyone -- children and adults -- to play the piano with a series of progressive, customized lessons. The Miracle quickly connects to a Macintosh or PC and includes software cartridge that combines an advanced MIDI keyboard with full stereo sound and brilliant on-screen graphics. In no time at all, students of all ages will learn and perform left and right handed melodies -- while having a lot of fun!

The Miracle provides the ability to create over 100 instrumental sounds. Classical: Clarinet, Oboe, Strings, Sfz Brass I, Xylophone; Rock: Fuzz Guitar, Stop Guitar, Puck Synth, Stick Bass, Percussion; Jazz: Saxophone, Vibraphone, Jazz Guitar, Fretless Bass, Percussion; Blues: Harmonica, Organ, Steel Guitar, Electric Bass, Percussion; Rap: Kalimba, Mod Synth, Clean Guitar, Moog Latin; Pan Flute, Marimba, Guitar, Upright Bass, Percussion; Country: Banjo, Violin, 12-String Guitar, Detuned Piano, Percussion.

Here's What You Get Free With The Miracle -- Only From TigerSoftware. When you buy a Miracle from TigerSoftware, we'll throw in everything you need to create your own recording studio. We'll start with the Miracle Song Collections, Volumes 1 and 2 containing dozens of popular songs from the Beatles, to Michael Jackson. Play along with your favorite songs, or break out into your own solo. These song collections are a great value and are yours free only from Tiger.

Then we add a copy of TRAX, the MIDI recording software that allows you to create your own smash hits. Change the tempo, mix different instruments, add your own vocals, sound effects and more -- controlling it all from your keyboard. TRAX Interface is simple and fast, enabling you to lay down tracks using your Miracle to create your own arrangements.

But That's Not All. You also get the Miracle keyboard stand you see pictured at the top of this page. With all this, you'll be ready to create your own live performance or cut your own record.

With The Miracle, you or your child can learn to play without the boring drills and monotonous practice that music usually requires.

Now There Are 40 More Ways of Playing To Learn Instead of Learning To Play! With The Miracle Song Collections, you can add dozens of popular titles to The Miracle Piano Teaching System. All the features that are quickly making The Miracle the most popular keyboard learning method available are fully functional when you use the songs in this collection.

Endorsed By Educators, Kids And Parents. Everyone loves the new Miracle system. Musical educators love the way it encourages children to practice, making a fascinating game of the piano. And, of course, kids love it because it’s not like learning; it’s a challenge. Parents love it because...well, what parent doesn’t enjoy the sounds of their children enjoying a musical instrument?

The Piano That Teaches You How To Play! The Miracle allows boring, repetitive routines. The super creation, critically intelligent software quickly teaches the basics and builds on them in very entertaining ways. And that makes all the difference.

The Keyboard. Dazzling music Spectacular effects! Booming orchestras -- all created by you -- the Miracle keyboard and one NES. As a stand alone instrument, the Miracle is music industry's most sophisticated MIDI consoles. The 49 full size keys are velocity sensitive, so you can learn to play utilizing true piano expression. You also get a foot pedal, which controls the length of time each note is sustained and step time moves.

The Miracle can produce sounds from its library of over 100 instruments, sounds and effects programmed by a leading motion picture sound designer. To produce its superior acoustics, the Miracle uses sampled sounds, it can be connected to a home stereo system for rich, full sound.

It's Not Just For Kids! The Miracle is a lot of fun and kids all over the world are entering the world of music because of it. But it's not just for kids. The Miracle is a breakthrough step in piano self-teaching. If you're an adult and would love to play piano (but think you're too old to learn), The Miracle can teach you with as little effort as it teaches the youngsters. And you'll enjoy it just as much.

It's Not Too Late To Learn... The Miracle is not a toy (but don't tell your kids). It's so ingenious, it can teach anyone -- at any age -- how to play piano. The Macintosh and PC software contain exercises specifically designed for adults, too. You don't have to know anything about the piano, you don't have to read music, and you can have a lot of fun! Normally, adults have a tough time learning something like the piano, but with The Miracle, it's easier because it moves at whatever pace you're comfortable with. If you want to start out learning just one song or melody, you can just work on that, and The Miracle follows you. As you become more comfortable, The Miracle can adjust to whatever method and speed you like.

The Miracle is a lot of fun and kids all over the world are entering the world of music because of it. But it's not just for kids. The Miracle is a breakthrough step in piano self-teaching. If you're an adult and would love to play piano (but think you're too old to learn), The Miracle can teach you with as little effort as it teaches the youngsters. And you'll enjoy it just as much.

FREE WITH THE MirACLe Everything you see below: Miracle Song Collection Volumes 1 and New Volume 2, TRAX MIDI Recording Studio and Miracle Stand pictured on the top of this page.

As Seen On "Good Morning America," "Today Show" and Arsenio Hall!
Create Full 3-D, Photorealistic Images!

REVIEWER'S NOTEBOOK: MacRenderMan represents the finest software available for 3-D image creation. It is perfect for those who are new to 3-D and for those who have experience with modeling software. Showplace-MacRenderMan gives you an easy way to improve images created with RenderMan compatible modeling applications or to create a dazzling 3-D image using the pre-designed shapes that come with Showplace. With Showplace you just arrange your scene, select realistic appearances for your objects, set your lights and watch the powerful MacRenderMan create your image. Pixar's RenderMan technology was used in the academy award winning film Tin Toy and to create special effects in films such as The Abyss and Terminator 2. Showplace-MacRenderMan gives you access to this amazing technology and you can see impressive results in a short time. But if you get the urge, you can get crazy with these products and never be seen or heard from again...

MacRenderMan. Fascinating photorealistic design made easy (and fun). Three distinct dimensions in full color, with a variety of surface textures and designs. In our first session, we created several billiard balls with a variety of whacked-out designs and colors in under an hour. That hour passed quickly; the real work was handled by MacRenderMan transparently.

We began the modeling process by describing the objects (geometry and appearance), the characteristics of the lighting (the light sources) and the view we wanted of the object (the camera, if you will). We then had a scene! We could change the texture of the surface (and how the light reflects off of it) and easily control the various shading techniques. The more you work on your images, exploring the powerful capabilities of MacRenderMan, the more detailed your images become. This is a great tool for CAD projects, product design, animation, merchandising, architecture and presentation graphics. Nothing else can compare to the images you'll create with MacRenderMan, the most visually accurate picture making product available for the Mac today.

MacRenderMan is used with 3-D design applications that produce RenderMan Interface Bytestream (RIB®) files. Use your favorite 3-D system to model objects. The design software will record these geometric descriptions into a RIB file and spool the file. MacRenderMan reads the spooled RIB file and produces a color rendition, computing it in the back under MultiFinder.

Showplace. Showplace is the forum for your objects. Give images 3-D beauty and realism. You'll see vivid colors and rich detail.

The Only Way to Get Full-Motion Video on Your Macintosh

The VideoSpigot™ Digital-Video Frame Grabber is a revolutionary new digital-video system for making QuickTime movies with the Macintosh LC, IIsi, and all NuBus Macintosh II systems.

The VideoSpigot makes it easy and very affordable to capture full-motion video to disk — up to 30 frames per second with 24 bit color in a 640 x 128 pixel window when used with a Macintosh IIfx and 800 x 600 pixel window with a Macintosh IIsi, or embedded digital video in interactive electronic publications, product training materials, interoffice presentations, and mail sent over office LANs, among other projects.

Unlike other video products, the VideoSpigot turns video into fully digital data so you can store it on an ordinary hard disk or removable cartridge. Part of a complete family of digital video products from SuperMac, the VideoSpigot makes working with full-motion images as easy and intuitive as cutting and pasting text and graphics.

The VideoSpigot integrates all the basic capabilities needed for capturing external video and making QuickTime movies. And its ScreenPlay™ QuickTime Movie Player Interface provides easy controls for capturing video source material, trimming video, previewing your footage, storing your footage, playing your QuickTime movies to disk, and playing them back in real time.

Capture Live Video Input. When you connect a VCR, laserdisc, or video camera to your Macintosh, the VideoSpigot captures and digitizes NTSC/PAL input at native video resolution using the high-end video capture card and CPU...

Once in digital form, your video source material is as easy to work with as text and graphics. With QuickTime-aware applications, you can manipulate it frame by frame. You can edit, copy, cut, and paste it. You can send it over a network. You can store it to disk. You can access it quickly and precisely.

Cut, Paste, and Preview Live Video. Even if you've never put a video together before, you can do it with the VideoSpigot. Just use it with any QuickTime-compatible digital-video editor, and you can combine multiple video clips with graphics, animation, and special effects to produce a complete QuickTime movie. You can also add synchronized audio capture via the built-in sound system in the Macintosh LC, IIsi, and Quadra, or on other NuBus Macintosh systems, by using an add-on sound input device.

Video Storage and Playback. The VideoSpigot stores your QuickTime movies to an ordinary hard disk or removable cartridge via state-of-the-art digital compression software. This integral capability compresses video in 1/20th the fraction of its original size while preserving image quality.

You can distribute your QuickTime movies in compressed form over a network, via electronic mail, or on a removable disk cartridge. For playback, the ScreenPlay QuickTime Movie Player Interface automatically decompresses your QuickTime movie and plays it right on your Macintosh. No external video devices are needed. And if you're using VideoSpigot with the Macintosh IIsi, SuperMac's ZeroSlot™ PDS Adapter means you can add more functionality to your system in the future because you don't use up your Macintosh slot.

Compression and Storage
• Stores to and plays from standard disk drives in QuickTime Movie format.
• Qualitative compression control to select desired image quality.

Audio Storage
• Monaural audio input via built in sound system of Macintosh LC and IIsi at 8 bits, 22 KHz
• Audio synchronized to video
• Compatible with Macromedia Inc.'s MacRecorder, Digital Design's Audiomedia, and QuickTime-compatible audio digitizers

Information & Orders: 1-800-666-2562
"NEXT DAY JUST $3.00!"

CALL 1-800-666-2562 TIGER ORDER HOTLINE TIGERSOFTWARE GUARANTEED LOWEST PRICES ON ANY MACINTOSH PRODUCT

Create Full 3-D, Photorealistic Images!

REVIEWER’S NOTEBOOK: MacRenderMan represents the finest software available for 3-D image creation. It is perfect for those who are new to 3-D and for those who have experience with modeling software. Showplace-MacRenderMan gives you an easy way to improve images created with RenderMan compatible modeling applications or to create a dazzling 3-D image using the pre-designed shapes that come with Showplace. With Showplace you just arrange your scene, select realistic appearances for your objects, set your lights and watch the powerful MacRenderMan create your image. Pixar's RenderMan technology was used in the academy award winning film Tin Toy and to create special effects in films such as The Abyss and Terminator 2. Showplace-MacRenderMan gives you access to this amazing technology and you can see impressive results in a short time. But if you get the urge, you can get crazy with these products and never be seen or heard from again...

MacRenderMan. Fascinating photorealistic design made easy (and fun). Three distinct dimensions in full color, with a variety of surface textures and designs. In our first session, we created several billiard balls with a variety of whacked-out designs and colors in under an hour. That hour passed quickly; the real work was handled by MacRenderMan transparently.

We began the modeling process by describing the objects (geometry and appearance), the characteristics of the lighting (the light sources) and the view we wanted of the object (the camera, if you will). We then had a scene! We could change the texture of the surface (and how the light reflects off of it) and easily control the various shading techniques. The more you work on your images, exploring the powerful capabilities of MacRenderMan, the more detailed your images become. This is a great tool for CAD projects, product design, animation, merchandising, architecture and presentation graphics. Nothing else can compare to the images you’ll create with MacRenderMan, the most visually accurate picture making product available for the Mac today.

MacRenderMan is used with 3-D design applications that produce RenderMan Interface Bytestream (RIB®) files. Use your favorite 3-D system to model objects. The design software will record these geometric descriptions into a RIB file and spool the file. MacRenderMan reads the spooled RIB file and produces a color rendition, computing it in the back under MultiFinder.

Showplace. Showplace is the forum for your objects. Give images 3-D beauty and realism. You’ll see vivid colors and rich detail.

The Only Way to Get Full-Motion Video on Your Macintosh

The VideoSpigot™ Digital-Video Frame Grabber is a revolutionary new digital-video system for making QuickTime movies with the Macintosh LC, IIsi, and all NuBus Macintosh II systems.

The VideoSpigot makes it easy and very affordable to capture full-motion video to disk — up to 30 frames per second with 24 bit color in a 640 x 128 pixel window when used with a Macintosh IIfx and 800 x 600 pixel window with a Macintosh IIsi, or embedded digital video in interactive electronic publications, product training materials, interoffice presentations, and mail sent over office LANs, among other projects.

Unlike other video products, the VideoSpigot turns video into fully digital data so you can store it on an ordinary hard disk or removable cartridge. Part of a complete family of digital video products from SuperMac, the VideoSpigot makes working with full-motion images as easy and intuitive as cutting and pasting text and graphics.

The VideoSpigot integrates all the basic capabilities needed for capturing external video and making QuickTime movies. And its ScreenPlay™ QuickTime Movie Player Interface provides easy controls for capturing video source material, trimming video, previewing your footage, storing your footage, playing your QuickTime movies to disk, and playing them back in real time.

Capture Live Video Input. When you connect a VCR, laserdisc, or video camera to your Macintosh, the VideoSpigot captures and digitizes NTSC/PAL input at native video resolution using the high-end video capture card and CPU...

Once in digital form, your video source material is as easy to work with as text and graphics. With QuickTime-aware applications, you can manipulate it frame by frame. You can edit, copy, cut, and paste it. You can send it over a network. You can store it to disk. You can access it quickly and precisely.

Cut, Paste, and Preview Live Video. Even if you’ve never put a video together before, you can do it with the VideoSpigot. Just use it with any QuickTime-compatible digital-video editor, and you can combine multiple video clips with graphics, animation, and special effects to produce a complete QuickTime movie. You can also add synchronized audio capture via the built-in sound system in the Macintosh LC, IIsi, and Quadra, or on other NuBus Macintosh systems, by using an add-on sound input device.

Video Storage and Playback. The VideoSpigot stores your QuickTime movies to an ordinary hard disk or removable cartridge via state-of-the-art digital compression software. This integral capability compresses video in 1/20th the fraction of its original size while preserving image quality.

You can distribute your QuickTime movies in compressed form over a network, via electronic mail, or on a removable disk cartridge. For playback, the ScreenPlay QuickTime Movie Player Interface automatically decompresses your QuickTime movie and plays it right on your Macintosh. No external video devices are needed. And if you’re using VideoSpigot with the Macintosh IIsi, SuperMac’s ZeroSlot™ PDS Adapter means you can add more functionality to your system in the future because you don’t use up your Macintosh slot.

Compression and Storage
• Stores to and plays from standard disk drives in QuickTime Movie format.
• Qualitative compression control to select desired image quality.

Audio Storage
• Monaural audio input via built in sound system of Macintosh LC and IIsi at 8 bits, 22 KHz
• Audio synchronized to video
• Compatible with Macromedia Inc.’s MacRecorder, Digital Design’s Audiomedia, and QuickTime-compatible audio digitizers

Information & Orders: 1-800-666-2562
"NEXT DAY JUST $3.00!"
New! WriteNow Version 3.0!

REVIEWER’S NOTEBOOK: WriteNow is the word processor that gives every document an absolutely stunning professional look. Paragraph and character style sheets help you create a clean, consistent look. NEW! An incredible print preview that displays thumbnails and facing pages — optimized for your particular screen’s size. NEW! Color text and graphics, along with new styles and graphics capabilities. NEW! One-step document creation — just throw in the text and out comes a masterpiece.

If you’re a Word user, just try WriteNow 3.0 and see what you’re missing. From page layout and design, graphics and document management to printing, System 7 support and great style sheets — WriteNow is the most robust word processor for the Mac. It just feels so nice. The columns snap to attention as you enter text, the headers and footers pop into exact position, the formatting and style sheets are crisp and professional — and WriteNow contains a giant 1.4 million entry thesaurus, a 135,000 word spelling dictionary with ultra-convenient Auto-Find and Auto-Guess spell checking. WriteNow is compatible with other leading applications such as Microsoft Word, Works, MacWrite, PageMaker — even the PC version of WordPerfect.

Includes FREE — FaxMania, another smash hit from T/Maker, 80 great fax cover sheet templates that are ready to use, right out of the box.

The Lean And Mean Word Processor. WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. Known for its incredibly swift performance and compact size. But despite the lack of size, WriteNow contains a complete set of state-of-the-art features.

Styles are available for virtually any type of document. Quickly add horizontal lines with dozens of different line weights and patterns. WriteNow performs graphic scaling (proportional and nonproportional), positions graphics vertically in a line of text (nice effect), and more.

Document management is a WriteNow long suit. A handy Clean Up command organizes your window in a snap — and the last two document iterations are automatically saved. Printing is also sleek and intelligent. WriteNow’s optimized LaserWriter character spacing delivers a clean, designer look. Print all pages, just odd pages, just even pages — or print any of them in reverse.

WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. With its incredibly swift performance and compact size, WriteNow contains a complete set of state-of-the-art features.

NEW! WriteNow version 3.0!

REVIEWER’S NOTEBOOK: It’s fast, compact and reliable, and brimming with great new features that give every document an absolutely stunning professional look. Paragraph and character style sheets help you create a clean, consistent look. NEW! An incredible print preview that displays thumbnails and facing pages — optimized for your particular screen’s size. NEW! Color text and graphics, along with new styles and graphics capabilities. NEW! One-step document creation — just throw in the text and out comes a masterpiece.

If you’re a Word user, just try WriteNow 3.0 and see what you’re missing. From page layout and design, graphics and document management to printing, System 7 support and great style sheets — WriteNow is the most robust word processor for the Mac. It just feels so nice. The columns snap to attention as you enter text, the headers and footers pop into exact position, the formatting and style sheets are crisp and professional — and WriteNow contains a giant 1.4 million entry thesaurus, a 135,000 word spelling dictionary with ultra-convenient Auto-Find and Auto-Guess spell checking. WriteNow is compatible with other leading applications such as Microsoft Word, Works, MacWrite, PageMaker — even the PC version of WordPerfect.

Includes FREE — FaxMania, another smash hit from T/Maker, 80 great fax cover sheet templates that are ready to use, right out of the box.

The Lean And Mean Word Processor. WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. Known for its incredibly swift performance and compact size. But despite the lack of size, WriteNow contains a complete set of state-of-the-art features.

Styles are available for virtually any type of document. Quickly add horizontal lines with dozens of different line weights and patterns. WriteNow performs graphic scaling (proportional and nonproportional), positions graphics vertically in a line of text (nice effect), and more.

Document management is a WriteNow long suit. A handy Clean Up command organizes your window in a snap — and the last two document iterations are automatically saved. Printing is also sleek and intelligent. WriteNow’s optimized LaserWriter character spacing delivers a clean, designer look. Print all pages, just odd pages, just even pages — or print any of them in reverse.

WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. With its incredibly swift performance and compact size, WriteNow contains a complete set of state-of-the-art features.

NEW! WriteNow version 3.0!

REVIEWER’S NOTEBOOK: It’s fast, compact and reliable, and brimming with great new features that give every document an absolutely stunning professional look. Paragraph and character style sheets help you create a clean, consistent look. NEW! An incredible print preview that displays thumbnails and facing pages — optimized for your particular screen’s size. NEW! Color text and graphics, along with new styles and graphics capabilities. NEW! One-step document creation — just throw in the text and out comes a masterpiece.

If you’re a Word user, just try WriteNow 3.0 and see what you’re missing. From page layout and design, graphics and document management to printing, System 7 support and great style sheets — WriteNow is the most robust word processor for the Mac. It just feels so nice. The columns snap to attention as you enter text, the headers and footers pop into exact position, the formatting and style sheets are crisp and professional — and WriteNow contains a giant 1.4 million entry thesaurus, a 135,000 word spelling dictionary with ultra-convenient Auto-Find and Auto-Guess spell checking. WriteNow is compatible with other leading applications such as Microsoft Word, Works, MacWrite, PageMaker — even the PC version of WordPerfect.

Includes FREE — FaxMania, another smash hit from T/Maker, 80 great fax cover sheet templates that are ready to use, right out of the box.

The Lean And Mean Word Processor. WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. Known for its incredibly swift performance and compact size. But despite the lack of size, WriteNow contains a complete set of state-of-the-art features.

Styles are available for virtually any type of document. Quickly add horizontal lines with dozens of different line weights and patterns. WriteNow performs graphic scaling (proportional and nonproportional), positions graphics vertically in a line of text (nice effect), and more.

Document management is a WriteNow long suit. A handy Clean Up command organizes your window in a snap — and the last two document iterations are automatically saved. Printing is also sleek and intelligent. WriteNow’s optimized LaserWriter character spacing delivers a clean, designer look. Print all pages, just odd pages, just even pages — or print any of them in reverse.

WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. With its incredibly swift performance and compact size, WriteNow contains a complete set of state-of-the-art features.

NEW! WriteNow version 3.0!

REVIEWER’S NOTEBOOK: It’s fast, compact and reliable, and brimming with great new features that give every document an absolutely stunning professional look. Paragraph and character style sheets help you create a clean, consistent look. NEW! An incredible print preview that displays thumbnails and facing pages — optimized for your particular screen’s size. NEW! Color text and graphics, along with new styles and graphics capabilities. NEW! One-step document creation — just throw in the text and out comes a masterpiece.

If you’re a Word user, just try WriteNow 3.0 and see what you’re missing. From page layout and design, graphics and document management to printing, System 7 support and great style sheets — WriteNow is the most robust word processor for the Mac. It just feels so nice. The columns snap to attention as you enter text, the headers and footers pop into exact position, the formatting and style sheets are crisp and professional — and WriteNow contains a giant 1.4 million entry thesaurus, a 135,000 word spelling dictionary with ultra-convenient Auto-Find and Auto-Guess spell checking. WriteNow is compatible with other leading applications such as Microsoft Word, Works, MacWrite, PageMaker — even the PC version of WordPerfect.

Includes FREE — FaxMania, another smash hit from T/Maker, 80 great fax cover sheet templates that are ready to use, right out of the box.

The Lean And Mean Word Processor. WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. Known for its incredibly swift performance and compact size. But despite the lack of size, WriteNow contains a complete set of state-of-the-art features.

Styles are available for virtually any type of document. Quickly add horizontal lines with dozens of different line weights and patterns. WriteNow performs graphic scaling (proportional and nonproportional), positions graphics vertically in a line of text (nice effect), and more.

Document management is a WriteNow long suit. A handy Clean Up command organizes your window in a snap — and the last two document iterations are automatically saved. Printing is also sleek and intelligent. WriteNow’s optimized LaserWriter character spacing delivers a clean, designer look. Print all pages, just odd pages, just even pages — or print any of them in reverse.

WriteNow has swept the industry, collecting Editor’s Choice awards and top honors. With its incredibly swift performance and compact size, WriteNow contains a complete set of state-of-the-art features.

NEW! WriteNow version 3.0!
Two Words To Success: OUTLINE & ORGANIZE

OUTLINE

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

To use thought processor for the Mac. The important items bubble to the surface while subordinate ones fall into perfect place. We find using an outliner a time-saving tool for all our writing. It's simply better-suited for the task than any word processor, but that's only the beginning.

Outlining procedures evolve into desktop publishers, outliners have become a vital tool that turns shadowy thoughts into ideas and focuses plans of action. Acta 7 is the industrial-strength thought-processor that stands heads & shoulders above the rest. Here at Tiger we can see how it earned its reputation as "the easiest to use thought processor for the Mac."

If you're still using a word processor to gather and organize your thoughts -- think again. This is the breakthrough of the '90s. Outliners are ideal for capturing quick, fleeting brainstorms before they can get away. I always keep Acta 7 running in the background. Bright idea? Click — it's instantly noted. When I'm ready, I review my notes and organize them. Rearranging, grouping, evaluating importances and so much more. That's the power of Acta 7. It processes my thinking.

Outliners are better than word processors for developing concepts, plans, letters and so much more. With Publish & Subscribe, information can be shared with other applications and other users. Acta 7 outlines become dynamic “work in process” documents.

And... Acta 7 is easier than ever to use. System 7 users will find Balloon Help at each menu and dialog box, and full access to a wide-range of features.

The Outline Is The Key... An outline is a dynamic document. It matures, new relationships become evident and can revise your original outline structure. By changing an outline's form you can view the subject from various perspectives. To get a general picture, you might want to see just its main topics. To study the outline's structure, you might want to expand it, but view only the first line of each topic. Finally, you might want to expand the outline completely, to get a broader view.

Acta 7 is the right tool at the right time. Perfect for turning thoughts into organized documents.

The First True MultiMedia Manager!

OUTLINE

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

Mariah lets you manage graphics, sounds, animation, text and more. All in one easy-to-use file. All easily retrievable — fast. All types of files, from B&W to 32-bit color Paint, PICT, PICT2, TIFF (Mac or DOS), EPSF (Mac or DOS), as well as Scrapbook and Picture Box formats.

And when you find that special file, what do you do with all those files, and how do you keep them organized — yet retrievable? Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah “Collection”. Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven’t touched in years is now easy and fast.

One of the features that sets Mariah apart is its ability to work with collections of associated art, text, sound and animation. Collections can be sorted, grouped, and reorganized. Mariah is ideal for organizing thoughts and developing concepts.

Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah “Collection”. Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven’t touched in years is now easy and fast.

One of the features that sets Mariah apart is its ability to work with collections of associated art, text, sound and animation. Collections can be sorted, grouped, and reorganized. Mariah is ideal for organizing thoughts and developing concepts.

If you're still using a word processor to gather and organize your thoughts -- think again. This is the breakthrough of the '90s. Outliners are ideal for capturing quick, fleeting brainstorms before they can get away. I always keep Acta 7 running in the background. Bright idea? Click — it's instantly noted. When I'm ready, I review my notes and organize them. Rearranging, grouping, evaluating importances and so much more. That's the power of Acta 7. It processes my thinking.

Outliners are better than word processors for developing concepts, plans, letters and so much more. With Publish & Subscribe, information can be shared with other applications and other users. Acta 7 outlines become dynamic “work in process” documents.

And... Acta 7 is easier than ever to use. System 7 users will find Balloon Help at each menu and dialog box, and full access to a wide-range of features.

The Outline Is The Key... An outline is a dynamic document. It matures, new relationships become evident and can revise your original outline structure. By changing an outline's form you can view the subject from various perspectives. To get a general picture, you might want to see just its main topics. To study the outline's structure, you might want to expand it, but view only the first line of each topic. Finally, you might want to expand the outline completely, to get a broader view.

Acta 7 is the right tool at the right time. Perfect for turning thoughts into organized documents.

The First True MultiMedia Manager!

OUTLINE

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

Mariah lets you manage graphics, sounds, animation, text and more. All in one easy-to-use file. All easily retrievable — fast. All types of files, from B&W to 32-bit color Paint, PICT, PICT2, TIFF (Mac or DOS), EPSF (Mac or DOS), as well as Scrapbook and Picture Box formats.

And when you find that special file, what do you do with all those files, and how do you keep them organized — yet retrievable? Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah “Collection”. Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven’t touched in years is now easy and fast.

One of the features that sets Mariah apart is its ability to work with collections of associated art, text, sound and animation. Collections can be sorted, grouped, and reorganized. Mariah is ideal for organizing thoughts and developing concepts.

Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah “Collection”. Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven’t touched in years is now easy and fast.

One of the features that sets Mariah apart is its ability to work with collections of associated art, text, sound and animation. Collections can be sorted, grouped, and reorganized. Mariah is ideal for organizing thoughts and developing concepts.

If you're still using a word processor to gather and organize your thoughts -- think again. This is the breakthrough of the '90s. Outliners are ideal for capturing quick, fleeting brainstorms before they can get away. I always keep Acta 7 running in the background. Bright idea? Click — it's instantly noted. When I'm ready, I review my notes and organize them. Rearranging, grouping, evaluating importances and so much more. That's the power of Acta 7. It processes my thinking.

Outliners are better than word processors for developing concepts, plans, letters and so much more. With Publish & Subscribe, information can be shared with other applications and other users. Acta 7 outlines become dynamic “work in process” documents.

And... Acta 7 is easier than ever to use. System 7 users will find Balloon Help at each menu and dialog box, and full access to a wide-range of features.

The Outline Is The Key... An outline is a dynamic document. It matures, new relationships become evident and can revise your original outline structure. By changing an outline's form you can view the subject from various perspectives. To get a general picture, you might want to see just its main topics. To study the outline's structure, you might want to expand it, but view only the first line of each topic. Finally, you might want to expand the outline completely, to get a broader view.

Acta 7 is the right tool at the right time. Perfect for turning thoughts into organized documents.

The First True MultiMedia Manager!

OUTLINE

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

Outlines are made for organizing thoughts and evaluating importances. And Acta 7 is Mac's finest Outliner.

Mariah lets you manage graphics, sounds, animation, text and more. All in one easy-to-use file. All easily retrievable — fast. All types of files, from B&W to 32-bit color Paint, PICT, PICT2, TIFF (Mac or DOS), EPSF (Mac or DOS), as well as Scrapbook and Picture Box formats.

And when you find that special file, what do you do with all those files, and how do you keep them organized — yet retrievable? Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah “Collection”. Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven’t touched in years is now easy and fast.

One of the features that sets Mariah apart is its ability to work with collections of associated art, text, sound and animation. Collections can be sorted, grouped, and reorganized. Mariah is ideal for organizing thoughts and developing concepts.

Mariah is a heaven-sent tool for every graphics operator. We put all our files in one Mariah “Collection”. Now, to find a file we just enter a keyword or two for instantaneous searches, or pull up full-color thumbnails for visual browsing. Finding images we haven’t touched in years is now easy and fast.

One of the features that sets Mariah apart is its ability to work with collections of associated art, text, sound and animation. Collections can be sorted, grouped, and reorganized. Mariah is ideal for organizing thoughts and developing concepts.

If you're still using a word processor to gather and organize your thoughts -- think again. This is the breakthrough of the '90s. Outliners are ideal for capturing quick, fleeting brainstorms before they can get away. I always keep Acta 7 running in the background. Bright idea? Click — it's instantly noted. When I'm ready, I review my notes and organize them. Rearranging, grouping, evaluating importances and so much more. That's the power of Acta 7. It processes my thinking.

Outliners are better than word processors for developing concepts, plans, letters and so much more. With Publish & Subscribe, information can be shared with other applications and other users. Acta 7 outlines become dynamic “work in process” documents.

And... Acta 7 is easier than ever to use. System 7 users will find Balloon Help at each menu and dialog box, and full access to a wide-range of features.

The Outline Is The Key... An outline is a dynamic document. It matures, new relationships become evident and can revise your original outline structure. By changing an outline's form you can view the subject from various perspectives. To get a general picture, you might want to see just its main topics. To study the outline's structure, you might want to expand it, but view only the first line of each topic. Finally, you might want to expand the outline completely, to get a broader view.

Acta 7 is the right tool at the right time. Perfect for turning thoughts into organized documents.
Galvanize Your Data...
With Advanced Backup Technology!

REVIEWER'S NOTEBOOK: Two advanced backup utility packages from Macrwts.com, PCPC NetStream for unattended network backups and HFS Backup for your home or desktop Mac. The "Set-It-And-Forget-It" backup technology with 100% reliability.

HFS Backup is compatible — from System 6.04 right up through System 7.01 Quadra. Back up any amount of data you can mount on your desktop. Backup to any type of backup media: high density floppy, removable media cartridge drives and even many tape drives. It's got Fort Knox safety features and on-the-fly compatibility with much of the design and layout work done at Macrwts.com.

The Finest Removable Hard Drives Made.
Tiger Presents The PLI 44Mb And 88Mb Cartridge Drives

REVIEWER’S NOTEBOOK: Highly acclaimed, 100% reliable and backed by a solid warranty, the PLI line of removable cartridge drives is the most respected in the industry. When your files and applications grow to roughly tested, far exceeding industry standards, so will your need for reliable backup media. Our drives, like the rest of the industry, are designed to support high-density media and to do so in a reliable, fast and cost-effective manner. We believe that TigerSoft’s PLI cartridges and drives are the best on the market today because they meet our own high standards of performance and reliability.

HFS Backup... The Pros Depend On It.
For convenience, HFS wrote the book, enabling you to quickly back up just the files you need. Why back up your entire volume of files when only one or two of them have changed since your last backup? Choose from a wide range of criteria: date, type — even files created by a certain application.

HFS Backup is the choice of information professionals, delivering fast, 100% reliable backup protection for just about any type of backup media. Besides mounted volumes and high-density drives, HFS Backup supports most popular tape drives including PCPC JetStream, HP DATStream, Apple 40SC, Archive Viper 150, and Archive Python, Gigatek DAT and WangDat. No other backup software combines vast compatibility and rock-solid performance like HFS.

For convenience, HFS wrote the book, enabling you to quickly back up just the files you need. Why back up your entire volume of files when only one or two of them have changed since your last backup? Choose from a wide range of criteria: date, type — even files created by a certain application.

SECURITY. An HFS Hallmark. Safeguarding your data is critical. Don’t find out the hard way. Trust HFS’ fail-safe security system. HFS has one the most sophisticated in the world, complete protection from password and DES encryption of your backed up files.

Another aspect of data safety is virus protection. HFS Backup has been combating virus attacks for years. Their innovative technology offers protection against unknown viruses — your virus protection software CAN’T DO THAT!

Complete system compatibility means HFS Backup will retain all file and folder access privileges on your AppleShare or AppleTalk network.

NetStream: The Network Backup. Network backups made painless and easy with new NetStream. Before NetStream, network backups were impossible. But with ingenious new breakthrough technology — network backups automated! Just start and forget it. No more worry — no more missed backups. Schedule in advance, then you continue to work uninterrupted — and all data current and safe across the network. NetStream works on any Mac and is System 7 Savvy.

NetStream enables to backup AppleShare file servers without being logged on! Administrate your network easily and conveniently. Grab the Server Folder (containing the Users and Group information and all File & Folder privileges). All this without having the server mounted.

Real Time Backups. Using NetStream’s Stealth mode, network users can be backed up even while running applications with little or no impact on network users productivity. That’s a first — and it will save you hours and precious time.

PRICES DRAMATICALLY SLASHED!
ON THE BEST DRIVES IN THE BUSINESS...

PCPC BACKUPS

BBT2465B 44mb Cartridge (Unformatted, 1 Year Warranty) $139.00

BBT2465A 88mb Cartridge (Unformatted, 1 Year Warranty) $199.00

NetStream One Node $59.95

NetStream 10 Pack $199.95

BBT2353 HFS Backup $59.95

BBT2354 NetStream Administrator $199.00

BBT2358 NetStream One Node $59.95

BBT2354C NetStream 10 Pack $199.95

PLI DRIVES & CARTRIDGES

BBT2460A Infinity Turbo 88mb Removable Single External Drive $799.00

BBT2460E Infinity Turbo 44mb Removable Single External Drive $599.00

BBT2465A 88mb Cartridge (Unformatted, 1 Year Warranty) $139.00

BBT2465B 44mb Cartridge (Unformatted, 1 Year Warranty) $79.00

BBT2465C 150mb Cartridge (5 Year Warranty) $159.00

BBT2460D 44mb Cartridge (Formatted, 5 Year Warranty) $89.00

--

Sor, No Free Shipping.
Uprade to 1-2-3: Just $69.95!

REVIEWER'S NOTEBOOK: The thoroughbred of Macintosh spreadsheets. Not a step child of the original DOS product, Lotus 1-2-3 for the Mac has been designed from the in and out of menus. This is how beautifully it compliments the functionality of your Mac — especially on Apple's hot new System 7. That's because the engineers at Lotus went back and started from scratch to design a spreadsheet that not only gave Macintosh users the ability to have the power and grace engineered into Lotus 1-2-3 for the Mac. Designed Specifically For The Mac! One of the first things you'll notice about new Lotus 1-2-3 for the Mac is how beautifully it compliments the functionality of your Mac — especially on Apple's hot new System 7. That's because the engineers at Lotus went back and started from scratch to design a spreadsheet that not only gave Macintosh users the ability to have the power and grace engineered into Lotus 1-2-3 for the Mac. New Lotus 1-2-3 for the Mac gives you everything — tear-off menus, great graphics and the entire spectrum of powerful features that make Lotus 1-2-3 the most popular spreadsheet in the world. But Mac users are lucky! Lotus has given them some new features that make 1-2-3 for the Mac even more popular. You can use Lotus 1-2-3 for the Mac for one-click access to worksheet commands. If you need several types of arrows for use in a worksheet, just tear off the ones you need from the main menu and keep them on your desktop. Move your Icon Palettes anywhere you want. There's also a very clever feature that allows you to pop up a Classic-1-2-3 menu (of familiar PC Vintage) while you're in a worksheet command. True 3-D Power. No other Macintosh spreadsheet gives you the full power of 3-D spreadsheet. 1-2-3 for the Mac breaks the barriers of the third dimension and allows you to easily handle a vast number of individual spreadsheets, each focusing on a specific aspect of the spreadsheet. And with this incredible financial software, you'll have the power and the flexibility of the Mac. Revolutionizing financial software with true 3-D worksheet capabilities: Excel doesn't have it, Claris Resolve doesn't have it. Fully featured, with System 7 support; completely customizable, 1-2-3 gives you the most functions, formulas and text. Choose your own menu, create and run macros. 1-2-3 for the Mac will allow you to easily draw information from outside databases — directly — and work with that data as if it were part of your worksheet. Nobody else gives you that kind of brute force. It's a bit of advanced technology known as DataLens — developed by Lotus. Free Adobe Type Manager. Your spreadsheets will look great on screen — and on paper. 1-2-3 for Macintosh includes Adobe Type Manager absolutely FREE! Your fonts will look great — better than true type fonts. Adobe beats Adobe when it comes to font technology. And ATM automatically down loads soft fonts (or any other fonts that reside on your hard disk). What's more, 1-2-3 Macintosh includes 8 FREE typefaces perfect for spreadsheet publishing. FREE! Only with Tiger Order Hotline When you Buy Lotus 1-2-3 for Macintosh Now you can pay your bills electronically — via modem — regardless of which bank you use, or who's on your payment list. CheckFree uses its built-in telecommunications program to handle payments through the Federal Reserve System for 100% safety and reliability. And with CheckFree, you'll pay all of your bills in about ten minutes! That's it. No checks! CheckFree keeps an electronic check register for you and works seamlessly with financial management software like Quicken and Managing Your Money. A $29.95 value. Yours Free! ORDER YOUR COMPETITIVE UPGRADE TODAY! If you are a current 1-2-3 user, you are automatically eligible. If you use Excel, Claris Resolve or another competitive spreadsheet, you too are eligible.

ALSO FREE WITH 1-2-3 — DYNOPage DynoPage is the amazing print utility that prints Macintosh page to any size or any configuration.

Why use anything else? Tiger's bending backwords to introduce you to the finest spreadsheet technology in the world — with a $69.95 Upgrade Price! After Electronic Rebate.

Information & Orders: 1-800-666-2562 Int'l Orders: 305-443-8212 Fax: 305-529-2990
Keep Schedules in Sync with Mac's Best Calendar

**REVIEWER'S NOTEBOOK:** Computerized calendars have been with us for a long time (they're a natural for any computer), and I've seen more than I can count. So when one comes around that really heads and shoulders above the rest, it's something to get excited about. It started out at a project at Clive Corp., moved on its own to Now Software (makers of the popular Now Utilities), and finally culminates in Now Up-to-Date — the only calendar that keeps your appointments and your associates up-to-date, in the office, at home, or on the road.

Now Up-to-Date reminds me of important appointments even when the application is off and I'm only running my spreadsheet. It shows me daily, weekly, monthly and yearly views that make visual sense. It even lets me take my PowerBook on the road and make schedule changes for both myself and my associates, and when I return to the office, it automatically updates both my personal and the centralized Public calendars — that's smart.

The goal was to combine the timeless functionality of the appointment calendar with the power of the Mac. To take the age-old appointment/calendar book, which people instinctively know how to use, and place it in a Macintosh, infused with powerful capabilities that simplify as well as automate. That's relatively easy task when talking about power and new features — practically any professional programmer can do that. The hard part is to make it really usable. To make it easy enough and intuitive enough for a novice to sit down and really use it. After all, who wants to have more attention on keeping their schedule than absolutely necessary?

That was the star high goal, and it's our privilege to announce the goal's finally been reached. Introducing Now Up-to-Date, the premier calendar tool that's both powerful enough to fully schedule any individual or group, plus straightforward enough to be easy-to-use and intuitive for every user.

From the unique "Public Calendars" that coordinate your schedule with your associates' schedules automatically, to the powerful "Reminder" feature that notifies everyone about a meeting far enough in advance to ensure everyone shows up on time, Now Up-to-Date is one-of-a-kind software you can't do without. Check out what Now Up-to-Date can do for you...

Even with the new PowerBooks, there are still times when the old-fashioned, printed appointment book (on which Now Up-to-Date is based) best serves the purpose. That's when you'll love the printing options with all the popular appointment book formats like DayTimer, DayRunner, Franklin Planner and Filofax. Plus you can print your calendar in a variety of other forms.

**Customize Your Calendar.** Now Up-to-Date's flexible Views and Styles let you customize your calendars, so you can see and edit them any way you want.

- View a day, multiple days, a week, multiple weeks, a month, multiple months, or a year at a glance
- Edit any event in any view
- Draw extra attention to big or important events with Electronic Sticky Notes and colorful Banners
- Control how many hours are displayed per day
- Create (and easily switch among) multiple style groups
- Display multiple views of the same calendar at the same time

The Total Organizer Solution for $99.

**Buy The Amazing Dynodex And Get DynoPage FREE!**

Dynodex is a true personal organizer, capable of handling names, addresses, phone numbers, notes and all other important information — and allows you to print perfect double-sided address book pages that fit virtually any personal organizer.

You'll now have instant access to your personal contacts both on and off the computer. At your computer, instantly look up and dial any number you need from the powerful Dynodex application — or the convenient desk accessory. On the road, all of your contacts are available in your personal organizer. Now your contact information is personal and portable.

The powerful Dynodex database delivers ultra high-speed searches. Instantly select subsets based on multi-level queries with a set of eight logical and arithmetic operators; for example, "all clients in California contacted within the last 6 months." On sorting: you get 3-key, accessing or descending on any field, along with Dynodex's speedy find, change and global delete. You can delete duplicates, Fast-Find and display any record instantly by simply clicking on it in the list window.

If your information resides elsewhere, Dynodex allows you to quickly import it for immediate use. Any text file, HTML-delimited or comma-delimited file is ready to use, and Dynodex includes a free copy of Dynotack, for importing HyperCard, Focal Point and QuickDex address files.

On to Dynodex's powerful (and very smart) printing capabilities. You can print any size address page, even double-sided pages. Print in any font, size and style on a field-by-field basis for great pages.

**FREE DynoPage.** This amazing printing utility allows you to print documents at reduced sizes and on both sides of the paper. Double-sided pages are much easier to print using DynoPage, and can be printed to any size from full-size letters, legal or tabloid, to "photo-re touched" sizes for personal organizers such as Day Timer, Day Runner, Filofax, Franklin or any custom size you want. Just drop-and-drag to print from the Finder! They couldn't have made it any easier. DynoPage comes complete with over 100 built-in layouts, and prints text in any font, size or style that's used in the original document.

Anything you can get on your Mac screen can be printed in any size or layout using DynoPage. In addition to 1-2-3 spreadsheets and charts, you can print word processing files, presentation pages, database files and more — to any size you like.

You can even print your spreadsheet's create great little "fold and staple" booklets, or print reduced versions of your spreadsheets on larger sheets to use as handouts during presentations.

DynoPage prints in a variety of useful configurations, and comes complete with 40 sheets of Dynodex Instant Address Book Paper (six-ring along with half-page), dozens of pre-designed layouts, a comprehensive manual brimming with tips and techniques and a valuable coupon for big discounts on personal organizer products. Here's a look at what you'll be able to create with DynoPage:

**Dynodex 2.0 Wins MacWEEK Target Award**

Editors Call It "Best Overall Choice" in choosing Dynodex 2.0 as an award winner. MacWEEK's editors wrote: "Dynodex significantly edges out the competition in performance, especially with larger address lists. The program's strong points include a streamlined interface, complex phone dialing capabilities, versatile import and export features, and a thorough and well-written manual. Unparalleled printing versatility, including address books, labels and rotary-file cards.

**TIGER EXCLUSIVE!**

Dynodex w/Free DynoPage and a package of DynoPaper of your choice. $99.95

**PORTFOLIO SYSTEMS**

| BBT2454 | Dynodex Macintosh w/Free DynoPage | $99.00
| BBT2453 | SmartScrap | $55.00
| BBT2442 | DynoPaper (white, cream, gray, yellow) | $14.00
| BBT2826 | Dynodex Macintosh | $49.00

Macintosh Plus II, series III, II series, System 6.0.7 or later

Information & Orders: 1-800-666-2562 Int'l Orders: 305-443-8212 Fax: 305-529-2990

Int'l Orders: 305-443-8212 Fax: 305-529-2990

**NEXT DAY JUST $3.00!**
The Science of Scanning

Logitech technology destroys the old barriers of scanning, increasing the speed and accuracy of anything you scan. Superior image quality, with the ability to produce halftones for reproduction. The set of output controls provide the best possible results on any printer or monitor screen. Its 4" wide scanning area allows full-page scans with just two quick passes.

And Logitech's rugged construction and precision roller system allows straight, unwavering scans. No curling, no skipping. The scanning speed indicator controls the movement for perfect scans. There are three settings for scanning photos and line art. Its shape is perfect, its weight and components distributed equally for balance. All of which makes getting an image from paper — into your Mac, simple and easy. The ScanMan 32 gives you a free set of software editing tools, including a 32 gray scale palette for detailed retouching. There's also a handy dimension box and tear off tool palette; use them alone or incorporate them as a desk accessory. Pop up real-time brightness and contrast controls, refine scans with amazing flexibility, rotate, flop and invert images. Save your scans in a variety of formats, including MacPaint, TIFF and PICT.

Here's What You Get: The ScanMan 32 contains everything you need. The Model 32 Gray Scale scanner, SCSI interface box and cable, power supply adaptor, ScanMan software, version 2.0, CatchWord Pro OCR software and complete user guide. Fast, easy — and powerful — the ScanMan 32 is a superior hand scanner.

Included with ScanMan 32 — CatchWord Pro: Powerful Optical Character Recognition (OCR) software that allows you to capture printed, hard-copy data by scanning it, rather than typing it. But, without quality software and a high quality scanner (like the ScanMan 32), scanning text won't work properly. "Dirty" scans produce unwanted characters and commands, requiring enormous cleanup — creating more work than rekeying.

CatchWord Pro delivers an amazing 99% accuracy in OCR testing, used in tandem with the ScanMan 32. CatchWord Pro is compatible with popular word processors, spreadsheets, databases and desktop publishers — so you can scan information directly into your application and use it immediately!

TrackMan™ — High Resolution Stationary Mouse. $10 MANUFACTURER MAIL-IN REBATE!

TrackMan puts an input revolution on the Macintosh desktop. This award-winning design takes a trackball from a large center position and makes it smaller and more manageable by putting it under your thumb. It's easier to move around the screen, freeing your fingers to work the three large tactile buttons. Shaped so your hand rests on it easily, Trackman is more comfortable than any other trackball or stationary mouse.

MouseMan™ — High Resolution Ergonomic Mouse... $10 MANUFACTURER MAIL-IN REBATE!

MouseMan is more mouse than you've ever seen before for your Macintosh. Three programmable buttons offer you ultimate flexibility — program them for tasks you perform most and watch your productivity rise! MouseMan offers the high quality and excellent tracking on any surface that have built the reputation of all Logitech mice — constructed with the finest materials.

TIGER SPECIAL

ScanMan 32 with CatchWord Pro & MouseMan MAC

Only $389

LOGITECH

BBT2509 ScanMan 32 with CatchWord Pro ... $359.00
BBT2529 ScanMan 32 with CatchWord Pro and MouseMan MAC . . $389.00
BBT2220 ScanMan 32 with Digital Darkroom . . . . . . . . . . . . . . . . . . . . . . $289.00
BBT2220 MouseMan MAC . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . $85.00
BBT1220 TrackMan MAC . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . $79.00
ScanMan 32: Macintosh Plus or better running System 6.0 or later. Handheld scanner compatible with Macintosh, A/UX and Windows Operating Systems.

TIGER SPECIAL

[Information & Orders: 1-800-666-2562 | Int'l Orders: 305-443-8212 | Fax: 305-529-2990]
A Personal Tutor For Mac Software!
Learn How To Use Excel, Word, PageMaker, 1-2-3 - And More!

**REVIEWER’S NOTEBOOK:** Puts a skilled - and very patient - expert at your side. Includes cassette tape and diskette, working together to talk you through the leading software titles. The interactive tutorials follow the tape - you can see the concepts come to life. It’s an extremely effective method.

If you really want to use your software’s capabilities - now! These lessons are very nicely organized, completely hands-on and allow any pace. You’ll be amazed at how quickly you can learn just about any program to the fullest because it’s explained and demonstrated properly.

Pick A Program, Any Program.

And realizing that it just isn’t laid out that way? Twenty minutes with GeoQuery will change all that. Providing you with a new and much better view.

GeoQuery instantly transforms your customer and prospect lists — or any business data — into interactive maps. It lets you do things that are impossible with your spreadsheet, database, or contact manager. Things like making that extra sales call you would otherwise miss, choosing the best location for a seminar or service center, and assigning optimal sales territories. Making your presentations clear and compelling.

GeoQuery is the only software that lets you do these things quickly and affordably. It’s the perfect get it done tool for anyone whose business extends further than the eye can see.

**NEW!**

**The Informative, Intuitive Mapping Software.**

**REVIEWER’S NOTEBOOK:** How many years have you been looking at your business in rows and columns? And realizing that it just isn’t laid out that way? Twenty minutes with GeoQuery will change all that. Providing you with a new and much better view.

GeoQuery instantly transforms your customer and prospect lists — or any business data — into interactive maps. It lets you do things that are impossible with your spreadsheet, database, or contact manager. Things like making that extra sales call you would otherwise miss, choosing the best location for a seminar or service center, and assigning optimal sales territories. Making your presentations clear and compelling.

GeoQuery is the only software that lets you do these things quickly and affordably. It’s the perfect get it done tool for anyone whose business extends further than the eye can see.

**While-Knuckled, 3-D Combat Action Of The Future!**

**REVIEWER’S NOTEBOOK:** The ultimate cyberpunk battleground

The CyberArena. The ultimate computer-based 3D movement and the crashing sounds of a vicious attack. Spectre is the undisputed king of Mac entertainment technology; and you enable to do multi-player battle with friends and associates net-work. Strap yourself into your BattleCraft and take off into virtual reality. Robot crafts are moving in... their tactics are controlled by real time artificial intelligence — you’ll never anticipate their movement.

Macintosh game technology just got a new cutting edge. Spectre is the incredible battle theatre of the future, where you face the intelligent attacks of dozens of crafty enemy robot craft. You speed around the CyberArena, squaring off deadly missiles, evading robot ambushes and counterattacks in your quest to capture the enemy flag. Real time artificial intelligence makes robots watch you, react to your every move, creating tactics based on your attacks. It is above and beyond any action challenge offered anywhere for the Mac or PC.

The LAN pack version of Spectre allows you and two other humans to battle each other! Slug it out in your customized BattleCraft vehicles, Glide smoothly, with blistering speed, across the futuristic landscape to trap and destroy the other players. Full multiplayer support over AppleTalk networks so single-users can blast each other in magnificent 3-D combat.

The artificial intelligence built into Spectre allows for an unlimited number of combat scenarios — the robot attack vehicles never truly do the same thing! They plan their moves according to your moves and tendencies, so you’ve got to watch them carefully from the various views, zooms and inertial mapping that your craft’s system provides. The color is incredible, the landscape battlegrounds of the CyberArena are fascinat-ing and provide the challenge of controlling your ship while you engage in blazing combat.

**Do You Have The Guts?** You begin by selecting your craft. You’ve got an opportunity to tune it by distributing 15 points between speed, adding more armor, carrying extra ammo—whatever’s best for your style of fighting. Adjust your Spectre hover engine’s ability to glide over the surface of the CyberArena.

**Map Mountains Of Data.** GeoQuery knows the location of every 5-digit ZIP code in the US — all 43,301 of them. So in the blink of an eye, your customer lists, prospects, corporate facilities, any ZIP-coded data, are magically pinpointed on GeoQuery’s built-in maps.

But GeoQuery shows you a lot more than just your business sites. It lets you see how your data relates to each other. Sales territories to customers. Prospects to dealers. Service personnel to equipment installations. Not to mention the Interstate Highways, over a thousand miles of expressways — all included in the basic package. You’ll gain new insights on ways to service accounts better. Reduce travel time and costs. And spot the opportunities for growth that others are missing.

**Know Where You’re Going.** How many times have you driven past miles of miles, and made only one call? How many accounts did you drive past on the way? How would you know? Well, those days are over.

Team up GeoQuery with your contact manager or prospect database and a quick glance at the map will tell you who’s next door. Or choose the Find Pros command and GeoQuery will instantly identify your closest account. You will make more calls in less time, sell more, and maybe get home a little earlier on Friday.

**Sell Your Ideas.** Maps are powerful tools to present and sell your ideas. Whether it’s showing a client why you can service their accounts better, explaining that restricting plan to the board of directors, or just reviewing sales results at the monthly meeting, GeoQuery’s maps will help you present your results and sell your ideas. Quickly and effectively.

Free with purchase of GeoQuery:

**DYNODEX**

A perfect place to organize your names and addresses. A $129 VALUE.

**GEOQUERY**

**PRICES, SUBJECT TO CHANGE.**

**CALL 1-800-666-2562**

**TIGERSOFTWARE**

**GUARANTEED LOWEST PRICES ON ANY MACINTOSH PRODUCT**

Information & Orders: 1-800-666-2562
Int’l Orders: 305-443-8212 Fax: 305-529-2990

Next Day Just $3.00.
The Price of the Quadra 700 Upgrade (Apple charges
The Radius Rocket and graphical applications like 24-bit color publishing, the Radius PowerView is the perfect instrument. Light-weight, small and lightweight, the Rocket 25i is perfect for intense computational tasks.

The Rocket 25 is an MC68040 CPU accelerator (same chip as used in the Quadras) which takes the Macintosh to performance levels previously unattainable. Its incredible design offers dramatic increases in productivity with the Macintosh II family of computers. Rocket 25 is perfect for intense computational and graphical applications like 24-bit color publishing, CAD, 3D rendering and scientific analysis. It is an excellent enhancement to network servers.

The Rocket 25 increases Macintosh II performance up to 6 times. When configured with Radius display systems, Rocket 25 can power a Mac II up to 50 times faster when running certain applications. This affordable accelerator is fully compatible with existing software. Call us for complete details.

The Radius Rocket 25 is a novel Motorola 68040 speed technology at an unbelievably low price. Built to dramatically speed up QuarkXPress, Adobe Illustrator and Microsoft Word. Growing 25MHz '040 processing performance for the Mac II, IIX, IICx and IICl. At just $1,395, the Rocket 25 is less than HALF THE PRICE of the Quadra 700 Upgrade (Apple charges you $3,495 for it — ouch!). One of the industry's hottest board at a great price. Full support of System 7, Nubus slot design for effortless installation. Great for speeding up RIPS! We were impressed with the software that is included with the Rockets. It allows your system to selectively enable or disable the '040 cache mode — actually making the Rocket more compatible with existing Macintosh software than the Quadras themselves!

The revolutionary Radius Color Pivot Display is the only monitor that works the way you do — in both portrait and landscape modes. See a full page without scrolling. A spectacular value!

One other note: For PowerBook users who want a clean, crisp connection to external color displays, the Radius PowerView is the perfect instrument. Lightweight, small and lightweight, the PowerView displays up to 250 colors and easily plugs into your SCSI port.

Tiger fully stocked with these magnificent new Radius products and ready to ship, but you must act fast, these are the most popular products in the business now. Your Mac will fly!

Accelerators. The Radius Rocket Accelerators provide lightning quick speed for Mac page layout and publishing applications. The Rocket 25 straps on 25MHz processing capabilities and includes a math coprocessor. The Rocket 25 is a more affordable accelerator, but without a math co-processor. Then there's the Rocket 33 — featuring the flirty rage of Motorola's 33MHz 68040 processor. The Rocket 33 clocks in at over 32% faster than the 25MHz '040'(COMPARE VALUE! The Rocket 33 is 30% faster than the Quadra 700 upgrade and is hundreds of dollars less)! The Rocket 33 is the right board for 3D modeling, like Pixar's MacRenderman, popular animation applications, publishing and image processing programs and more.

Radius Rocket 25. When the performance of a computer is increased, the productivity of its user is also increased. Since 1986, Radius has been boosting Macintosh performance; we continue that tradition today with a line of accelerators designed specifically for color publishing, graphic design, CAD/CAM, and general business applications.

The Radius Rocket 25 is an MC68040 CPU accelerator (same chip as used in the Quadras) which takes the Macintosh to performance levels previously unattainable. Its incredible design offers dramatic increases in productivity with the Macintosh II family of computers. Rocket 25 is perfect for intense computational and graphical applications like 24-bit color publishing, CAD, 3D rendering and scientific analysis. It is an excellent enhancement to network servers.

The Radius Rocket 25 increases Macintosh II performance up to 6 times. When configured with Radius display systems, Rocket 25 can power a Mac II up to 50 times faster when running certain applications. This affordable accelerator is fully compatible with existing software. Call us for complete details.

The Radius Rocket 251. This is not new Motorola '040 speed technology at an unbelievably low price. Built to dramatically speed up QuarkXPress, Adobe Illustrator and Microsoft Word. Growing 25MHz '040 processing performance for the Mac II, IIX, IICx and IICl. At just $1,395, the Rocket 25 is less than HALF THE PRICE of the Quadra 700 Upgrade (Apple charges you $3,495 for it — ouch!). One of the industry's hottest boards at a great price. Full support of System 7, Nubus slot design for effortless installation. Great for speeding up RIPS! We were impressed with the software that is included with the Rockets. It allows your system to selectively enable or disable the '040 cache mode — actually making the Rocket more compatible with existing Macintosh software than the Quadras themselves!

Color Portrait And Landscape Display In One! The immortal Radius Color Pivot. The only monitor in the world that can display a full page in color and pivot to display a full page landscape too! Ask a pro how much easier that makes his life. Now your Mac can have this freedom, along with resolution up to 640 x 870. And the Color Pivot can provide full 256 color support (8-bit) from onboard video in the II Series, or full 24-bit color with Quadras — so you don't need an interface card.

The Color Pivot is perfect for design professionals and advanced desktop publishers, but it's also an ideal upgrade for everyday use, especially if you're "in and out" of a variety of applications. Just pivot to see as much of the screen as you need. And it is an excellent value. Consider this — the only other way to see a full page in actual size without scrolling would be to buy a 10" or larger display — many hundreds of dollars more than the Color Pivot!

Support For Virtually All Macintoshes And Built-in Video Too! Color Pivot satisfies virtually every customer requirement with support for:

• 16.7 million colors on the Quadra 700 or 900 Build-in Video
• 16 colors on both Mac IIsi and Ileii Build-in Video, without an interface card
• 256 colors on the Mac LC, SE/30, IIsi and all NuBus Macintoshes with a Color Pivot Interface

So, if you need an 8-bit IIsi or Ileii color display solution, you can spend $2298 on a landscape display system from Apple. Or for only $1425, buy the Color Pivot, and get both a portrait and landscape display in one for about $470 less. Only the Color Pivot comes from the company that invented large screen display technology for the Macintosh. Radius.

NEW! PowerView Links PowerBooks To Large Color Displays! A must for PowerBook users on the run. PowerView is an external color display interface for 140 and 170 "Books. Just plug it into the PowerBook's SCSI and you're ready to go. Run the PowerBook's LCD as a second screen, or in presentation mode to see what your audience is seeing.

The Radius PowerView is a magic little box that connects the PowerBook to practically any color display. Ideal for the busy sales professional or executive on-the-go. When working in the home or office, PowerView users can work comfortably and productively with 250 colors. When on the road, users can use PowerView as an interface to large screen projectors, as well as to popular color displays, for delivering effective color presentations.

PowerView represents another technological breakthrough from Radius. Easily installed, PowerView plugs directly into the external SCSI (Small Computer Systems Interface) port found on the back of the Macintosh PowerBook and then connects to the display of choice. Currently PowerView supports the AppleColor 13" RGB Display, the Radius Full Page Display, and VGA-compatible and multi-frequency displays. Future software releases will enable support for the Radius Color Pivot and Pivot Displays.

Tiger Carries The Complete Line Of Radius Products. Call For Details.

CALL 1-800-666-2562 NEXT DAY JUST $3.00!

Information & Orders: 1-800-666-2562
Int'l Orders: 305-443-8212
Fax: 305-529-2900
The Full-Time Office Assistant For Small Business.

In this day and age of over-complicated software and highly technical jargon, it's a welcome relief to see something you can really use! And that's what we love best about Office Manager — it does exactly what it needs to be done in any small office. Efficiently. Smartly. Quickly.

Right out of the box in just a few hours, everyone in your office will be using Office Manager — getting more done in less time. Business letters that used to take 20 minutes are done in a flash! A few mouse clicks is all it takes to print standard business correspondence — and that includes the envelope.

Office Manager is the perfect complement to any accounting application. Together they do 99% of what every small office needs to do. Office Manager is the best way to handle these everyday tasks:

- Maintain Addresses
- Write Letters
- Print Labels & Envelopes
- Keep To-Do Lists
- Track Client Jobs
- Track In-House Projects
- Phone/Fax Dialing (with Call History and Redial)

These tasks make up 90% of all office activity. The Office Manager is a vital necessity in today's business world.

Address Cards. The heart of Office Manager lies in the Address File. From this central hub of vital information, all the various parts of your office fall into perfect place. More than just name, address and phone numbers automatic features), then instantly jump to your current word processor. Use it to check spelling, grammar, etc., then automatically jump back to Office Manager to print the letter and log it in the History log. You get the best of both worlds!

Merge Letters. We fell in love with this feature the moment we saw it — easy, instant, customized form letters. What a time saver! If you spend time writing repetitive letters on the same subject, you’ll love this feature as much as we do.

Predefined letters like “Thanks for Your Business,” “Special of the Month,” “Welcome New Customer,” or anything you can think of will be instantly printed with just a few mouse clicks. It’s the easiest way we’ve ever seen.

Need to send the same custom form letter to a group of people — in a hurry? No problem. A few easy clicks and you’re done. Limit your targeted group using zip codes, special categories and keywords that are assigned to address records, or a host of other possibilities. Getting the right letter to the right group of people has never been easier. It’s amazing how easy this do-it-all application really is.

Fax & Phone Dialer. How much time do you spend each day, first finding the right phone number, dialing the phone or fax machine, then possibly re-dialing because of busy or wrong numbers? I added it up one day — I spent an average of 45 seconds for each phone call, and over 75 seconds for each fax. That adds up to a lot of time each week!

With Office Manager, time is money in my pocket — your numbers are automatically monitored, and I have a complete history of every call. I keep more numbers, right at my fingertips.

Let's talk automation. Office Manager walks me through each call, giving me capabilities I never dreamed of before. I smoothly find the right Address Card (in all of two mouse clicks and the first letter or two of the person's name). Then I click on one of the three dialer buttons (two for phone and one for fax). My Mac beeps out the number, logs the date and time of the call in the History log, then immediately gives me three possible options: No Answer, Left Message, or Call Later.

Office Manager covers every possibility. If my call is answered, I can enter notes for future reference. If there’s No Answer, I have a complete history entry for this call is erased. If I Leave a Message, it says so in the History log. Or I can choose to Call Later, in which case Office Manager puts a note in my To-Do List. Now that’s automation!

Redialing is an automatic, one-click operation — from anywhere in Office Manager. You don’t have to find the original Address Card again. Any last number is redialed, then the correct Address Card is instantly displayed again with the call options ready.

Office Manager’s dialing features will work with any standard phone. (Hold a telephone receiver up to the speaker while it beeps and your number will be dialed.) But for fully automatic operation, you should get a Dialer accessory. It’s an expensive bit of modem and works great on multi-line office phones too. Ask one of our TigerReps for more information.

Fax Cover Sheet. Another result of the exceedingly smart design that went into Office Manager is the one-click Fax Cover Sheet. With the optional comments, printing an entire fax has never been easier. Slip the printed page into your fax machine, press the Office Manager Fax Dial button and presto! You’re done and ready to move on.

Job Tracking. This potent Job Tracking feature for your clients could be a separate application all by itself. This one’s a real powerhouse! Track every phase and part of a job. Every time one of your clients calls, you instantly start tracking a new job. Just down quick notes for reference. Run the automatic Timer in the background to track your valuable time. Print a Job Report tailoring it for the job for last billing purposes.

In-House Projects. There’s always a project running around the office that needs your attention. Whether it’s what supplies need to be ordered, new topics that need to be covered in the weekly meeting, or ideas for the upcoming company newsletter, you need something to keep track of it all.

Mail Manager. This optional add-on to Office Manager is a must for anyone doing bulk mailing. You get advanced sorting power, elaborate search filters and powerful mail-merge options. The smooth integration and seamless operation between Office Manager and Mail Manager make these two fit hand-in-glove. Each uses the already established features of the other to complement and expand all operations.

Assistant — Office Manager is a fully automatic organizer. It's packed with computational features and abilities that save you time and money right from the first moment. But the #1 advantage of Office Manager is the common sense, logical way everything works. You’ll instinctively know what to do next. And what you do will be twice as much done in half the time.

Letters. Business Letters. With Office Manager's built-in word processor, you’ll whip out business correspondence in record time. Office Manager pays for itself in saved time within the first month. Start with any Address Card, then one quick click starts a letter — complete with name, address, heading, date and greeting. All you do is fill in the body — then click to print it.

Another single, quick click and you just printed the address on the envelope. If you have the new LabelWriter from CoStar (available in this issue of Tiger), there’s even a special button that automatically prints the label for your envelope! This is seriously fast correspondence!

But not only fast — smartly organized. Every letter, every phone call, every fax is automatically logged in the Telephone & Mailing History file. I have a full history for future reference, complete with date, time and optional notes.

But what about the word processor you already use? Office Manager lets you start a letter with all (with text)

from anywhere in Office Manager. You don’t have to find the original Address Card again. Any last number is redialed, then the correct Address Card is instantly displayed again with the call options ready.

Office Manager's dialing features will work with any standard phone. (Hold a telephone receiver up to the speaker while it beeps and your number will be dialed.) But for fully automatic operation, you should get a Dialer accessory. It's an expensive bit of modem and works great on multi-line office phones too. Ask one of our TigerReps for more information.

Fax Cover Sheet. Another result of the exceedingly smart design that went into Office Manager is the one-click Fax Cover Sheet. With the optional comments, printing an entire fax has never been easier. Slip the printed page into your fax machine, press the Office Manager Fax Dial button and presto! You're done and ready to move on.

Job Tracking. This potent Job Tracking feature for your clients could be a separate application all by itself. This one's a real powerhouse! Track every phase and part of a job. Every time one of your clients calls, you instantly start tracking a new job. Just down quick notes for reference. Run the automatic Timer in the background to track your valuable time. Print a Job Report tailoring it for the job for last billing purposes.

In-House Projects. There's always a project running around the office that needs your attention. Whether it's what supplies need to be ordered, new topics that need to be covered in the weekly meeting, or ideas for the upcoming company newsletter, you need something to keep track of it all.

Mail Manager. This optional add-on to Office Manager is a must for anyone doing bulk mailing. You get advanced sorting power, elaborate search filters and powerful mail-merge options. The smooth integration and seamless operation between Office Manager and Mail Manager make these two fit hand-in-glove. Each uses the already established features of the other to complement and expand all operations.

Assistant — Office Manager is a fully automatic organizer. It's packed with computational features and abilities that save you time and money right from the first moment. But the #1 advantage of Office Manager is the common sense, logical way everything works. You'll instinctively know what to do next. And what you do will be twice as much done in half the time.

Letters. Business Letters. With Office Manager's built-in word processor, you'll whip out business correspondence in record time. Office Manager pays for itself in saved time within the first month. Start with any Address Card, then one quick click starts a letter — complete with name, address, heading, date and greeting. All you do is fill in the body — then click to print it.

Another single, quick click and you just printed the address on the envelope. If you have the new LabelWriter from CoStar (available in this issue of Tiger), there's even a special button that automatically prints the label for your envelope! This is seriously fast correspondence!

But not only fast — smartly organized. Every letter, every phone call, every fax is automatically logged in the Telephone & Mailing History file. I have a full history for future reference, complete with date, time and optional notes.

But what about the word processor you already use? Office Manager lets you start a letter with all (with text)

from anywhere in Office Manager. You don’t have to find the original Address Card again. Any last number is redialed, then the correct Address Card is instantly displayed again with the call options ready.

Office Manager's dialing features will work with any standard phone. (Hold a telephone receiver up to the speaker while it beeps and your number will be dialed.) But for fully automatic operation, you should get a Dialer accessory. It's an expensive bit of modem and works great on multi-line office phones too. Ask one of our TigerReps for more information.

Fax Cover Sheet. Another result of the exceedingly smart design that went into Office Manager is the one-click Fax Cover Sheet. With the optional comments, printing an entire fax has never been easier. Slip the printed page into your fax machine, press the Office Manager Fax Dial button and presto! You’re done and ready to move on.

Job Tracking. This potent Job Tracking feature for your clients could be a separate application all by itself. This one’s a real powerhouse! Track every phase and part of a job. Every time one of your clients calls, you instantly start tracking a new job. Just down quick notes for reference. Run the automatic Timer in the background to track your valuable time. Print a Job Report tailoring it for the job for last billing purposes.

In-House Projects. There’s always a project running around the office that needs your attention. Whether it’s what supplies need to be ordered, new topics that need to be covered in the weekly meeting, or ideas for the upcoming company newsletter, you need something to keep track of it all.

Mail Manager. This optional add-on to Office Manager is a must for anyone doing bulk mailing. You get advanced sorting power, elaborate search filters and powerful mail-merge options. The smooth integration and seamless operation between Office Manager and Mail Manager make these two fit hand-in-glove. Each uses the already established features of the other to complement and expand all operations.
THE SHARP WIZARD vs. MAC POWERBOOK

Pick up any Macintosh magazine and you'll see pages and pages of advertisements and reviews on PowerBook computers. They sport all kinds of bells and whistles, come with tons of software and promise all the functionality of a desktop Macintosh. And that's great. But if you talk to people who actually buy and use PowerBooks, you'll tell them that while their PowerBook is extremely cool, it's more computer than they really need when they hit the road. Using a PowerBook to retrieve phone/FAX numbers, price lists, appointments, to do lists, birthdays and expense reports is overkill. What you really need is a Sharp Wizard 8600 (or its bigger brother, the 8200, pictured below). Small, compact, without the inconveniences of battery recharging, the Wizard 8000 has everything road warriors need: scheduler, word processor, spreadsheet, city guide—everything built into applications are extremely easy to learn and use. And it fits in your pocket! PowerBook users are turning to Wizard for INSTANT retrieval of names and numbers. The PowerBook can't do that.

Designed to Do What Your PowerBook Can't. The Wizards from Sharp are sophisticated, powerful computers designed specifically to organize all of your personal information. Whether you're jotting down names, numbers and expenses or creating 3D charts and downloading spreadsheets, its power has been allocated to fast, easy collection, storage and retrieval of anything.

The Wizard focuses on the fundamentals. Like an extra-wide, super-crisp screen which allows an impressive 40 character by 8 line view. The display is the single most important feature in any small computer, and nothing I've seen compares to The Wizard. I love the way each key is exactly where you'd expect it to be. Search with one stroke, perform any task by just touching an icon. The Wizard's keyboard is tight and responsive; the keys are crafted from superior materials.

Organizer Accessories. There's an optional modem, printer, fax and a slew of software cards that turn the Wizard into a fully functioning office, so you can conduct business anywhere. With the Link cable, you can download information from your Macintosh to your Wizard and have up to-second information when you take it on the road.

Expand The Wizard's Mind... When you add software and memory cards to your Wizard, you put all kinds of possibilities at your fingertips. Memory and applications simply slide under the touch sensitive screen which acts as a keypad to perform tasks, open applications—and more.

Time Expense Manager. The powerful way to manage and prioritize your schedule, track your expenses and deadlines, and account for all the time spent on projects or meetings. Your secretary on the road.

Spreadsheet. Create fully functional, Lotus 1-2-3 file compatible, 2-column-by-999-page spreadsheets on your Wizard, or download a spreadsheet from your Macintosh! This card will hold 64K of data! Built-in features include 10 templates, complete formatting, sorting and "freezing pane" functions, math and financial calculations, spreadsheet linking capabilities, cut and paste and more.

Print A Label In Less Than 4 Seconds! LabelWriter II Provides Professional Print Quality For Typewriter and Graphics.

REVIEWER'S NOTEBOOK: Brand new, just released, The LabelWriter II is more powerful, faster and easier to use that the smash hit original LabelWriter. LabelWriter II is five times faster than the original, with higher resolution and larger label capacity. Razor-sharp images, crisp type and whisper-quiet printing. You'll be amazed at how great this little printer prints! The quality is as good as our expensive desktop lasers! Weighting in at just one pound, just set it beside your rolodex and print labels all day! This product defines the word "convenient," just plug in the LabelWriter II power cord and cable, pop in the diskette and you're ready to print. Need a single line for an envelope, file folder or floppy disk? Knock it out—faster than writing it by hand. Need hundreds for a mailing list, or coding inventory? Knock them out in record time.

Labels On Demand!

One of the most valuable capabilities you can give to your Mac. The LabelWriter II includes powerful software that enables you to quickly set up label templates, create specialized database listings, mix text and graphics on a single label and more! Also Available — AddressWriter. This neat little printer will shoot out a beautifully printed envelope, postcard, or label, complete with postal bar code, in seconds. Its straight paper path assuring envelopes feed without curling or jamming. Just pop up the LabelWriter II software over any application and print anything from within that application—or anywhere else.

Track Document Changes Instantly, Accurately and Painlessly!

REVIEWER'S NOTEBOOK: A tremendous time saver for technical writers, lawyers, engineers, office administrators and other professionals who spend tedious hours reviewing and marking document changes. DocuComp automates the review process with a patented technology that finds changes fast and displays them to you in a variety of important ways. Awarded a rare 4/4½-mike by MacUser Magazine...

DocuComp is 100% thorough in its comparisons—change one comma and it is detected and reported. But version control is more that than. It's a system to prevent costly oversights and elimination the margin for error in documents containing highly technical specifications. In-the-only product of its kind for the Macintosh.

How Does It Work? DocuComp's ingenious pattern recognition capability support most popular word processors, includes an option for comparing computer source code, this technology is the most advanced for accurately tracking insertion, deletion, replaced and replaced text. And it works with SGML (Standard Generalized Markup Language). DocuComp will let you define custom SGML tags for marking document changes.

Just plug in your DocuComp with the names of the two document versions. The versions are instantly compared and DocuComp identifies every change. You can even compare documents created in different word processors.

So you've compared two versions of the document. Now, conveniently report or save the results of a comparison by having DocuComp create a new, composite document—known as a "redlined" version. Choose from a variety of easy-to-use formats to highlight the changes. Many ways to work changes or omit previous versions.

Buy DocuComp and get RightWriter Free! Free Upgrade for DocuComp 1.5 Buyers.

CALL 1-800-666-2562

TIGERSOFTWARE

Guaranteed Lowest Prices on Any Macintosh Product

THE SHARP WIZARD vs. MAC POWERBOOK

---

Information & Orders: 1-800-666-2562 Int'l Orders: 305-443-8212 Fax: 305-529-2990

Circle 114 on reader service card

NEXrY DAY JUST $3.00!
If only you could design your own typesetter...

LoserMoster's patented TurboRes technology gives you 1000 dpi, camera-ready copy on plain paper.

An expansion port allows for optional Ethernet add-on solutions.

You can easily upgrade the Unity 1000 or odd fonts by simply copying software files from a floppy disk to the printer.

135 Type 1 typefaces are pre-installed on an internal hard disk. There's also room for more than 200 additional typefaces, so downloading fonts is unnecessary.

With a high-speed, 40-MHz processor, 32K of fast SRAM cache, andspecial DMA circuity, the Unity 1000 processes even complex documents faster than most PostScript devices.

TurboGray improves the appearance of halftone images by providing increased gray levels at higher screen frequencies.

SmartSense technology automatically switches to PostScript or PCL for each print job.

The standard 9 MB of memory can be expanded to 48 MB using industry-standard SIMMs.

You'd make it fast. You'd have it print camera-ready copy on plain paper. You'd design it to store so many typefaces that you'd never waste time downloading another font. You'd make it easy to expand and upgrade, so it wouldn't become obsolete. And you'd make it capable of printing from just about any computer out there, just in case you ever need to print camera-ready copy from another computer. While you're at it, you'd probably throw in a hundred free typefaces.

Sounds just like our new Unity 1000 Plain-Paper Typesetter. It's fast. It prints at 1000 dpi. It's expandable and software upgradable. It handles fonts like no other printer can. And, it comes with 135 Type 1 typefaces—that's 100 more than other PostScript devices.

Combine these great features with multi-platform capabilities, and you have the kind of typesetter you've been waiting for. Unity provides simultaneous connectivity to virtually all operating environments, so if your office happens to use PCs as well as Macs, you're in luck. Unity's HotPorts feature automatically selects the LocalTalk, parallel, serial, or optional EtherTalk interface, and SmartSense automatically switches to PostScript or PCL.

Give us a call to find out more about the Unity 1000. We bet it's the typesetter you've been waiting for.

1-800-950-6868
1-612-944-9330, Fax: 1-612-944-0522

Mac, Unix, PC TurboRes Typesetting—FAST!

©1992 LaserMaster Corporation, 8900 Shady Oak Road, Eden Prairie, MN 55344. The LM logo and TurboRes are registered trademarks, and LaserMaster, Unity, SmartSense, HotPorts, and TurboGray are trademarks of LaserMaster Corporation. PostScript is a trademark of Adobe Systems, Incorporated. All other product names or brand names are trademarks or registered trademarks of their respective holders. Specifications subject to change without notice. All camera-ready copy for this advertisement was produced by a LaserMaster Unity 1000.

Circle 182 on reader service card
THIS MONTH:
Microsoft Works 3.0
• Color-Matching Standard • HP's ScanJet Up • Apple, Sharp Agree to Make Organizer

Apple’s Latest CD ROM Drive
APPLE HAS introduced the AppleCD 150, a CD ROM drive that costs about 25 percent less than the previous Apple offering and is much smaller. The new drive works with all Macs from the Plus up, and is compatible with System 7 and QuickTime. It has a 380ms average access time and a 64K buffer. Users can plug headphones into the drive.

Apple’s System-Level Security
Apple Computer plans to incorporate security technology developed by RSA into Open Collaboration Environment (OCE), the soon-to-be system-level E-mail engine.

To sign a digital file, the sender uses the private key, which the recipient can verify with the sender's public key; in order to send a secure message, the sender encrypts it with the recipient's public key, which only the recipient's private key can decrypt.

Connecting LocalTalk Printers to Ethernet
Sonic Systems’ LaserBridge is Mac software that allows LocalTalk printers to tie into Ethernet networks without a router. The LaserBridge INIT is compatible with System 7. The software requires Ethernet Phase 2, but it will work with all Mac Ethernet boards. It supports Apple's LaserWriters, the ImageWriter LQ, the GCC BLP II, and HP's DeskWriter and DeskWriter C, among others. LaserBridge is shipping at a list price of $199. Sonic Systems, 408/736-1900.—T.M.

Apple Offers Printer and Scanner for Windows
IN A MAJOR SHIFT of strategy, Apple Computer has introduced a scanner and printer designed to work with DOS PC systems running Microsoft's Windows operating environment. The move allows Apple to gain economies of scale by selling into a new market that includes roughly 30 million installed systems, but it may also cause some confusion as to Apple's commitment to its own knitting.

The new devices are the Apple Personal LaserWriter NTR, a 4-ppm laser printer with a high-speed RISC processor, and the Apple OneScanner for Windows, a version of the company's existing OneScanner for Macintoshes. The $2199 PostScript Level 2 printer works with Windows machines and Macs, alone or in mixed environments. It includes HP's PCL 4+ page-description language for Windows machines.

The Apple OneScanner for Windows is essentially the same as the current, extremely popular OneScanner, but it comes with a Windows version of the Ofoto scanning software from Light Source. The other main difference is that it ships with a SCSI board that fits inside the Windows PC. Apple will charge $1299 for the OneScanner for Windows, the same price as the Mac version, despite the fact that it includes the extra SCSI board.—T.M.
Introducing the PRO series.

My, how your data has grown. System 7 and QuickTime have added a lot. To get more storage, you could buy a bigger hard disk, but that’s like getting another bowl for this fish.

Why do it? When for practically the same price and performance, your data can swim in the open sea, so to speak, of the new Bernoulli® 90 PRO from Iomega®.

The best removable solution.

Because the Bernoulli 90 PRO is removable, it never fills up. You simply insert another affordable 90MB disk—180MB with included compression. Because it’s a Bernoulli, you get the best solution available. Unlike removable Winchester drives, Bernoulli was designed from the ground up to be removable. Only Bernoulli’s patented technology resists head crash. And only Bernoulli Disks can withstand an eight-foot drop.

Use Bernoulli Disks for primary storage. Take them with you. Back up onto them. Lock them up. You get total data control. A new 18-msec effective access time is as fast as most any hard disk.

Plus, Bernoulli’s universal design means your drive will grow with you whether you change systems or platforms.

The most recommended drive.

Only Bernoulli is this highly endorsed. More often by publications than any Winchester drive. And by 99 percent of our customers.

Call 1-800-695-4028:

Unfortunately, this ad isn’t a Bernoulli. We’ve run out of space. So call today for a free brochure about the new PRO series drives. They offer the price and performance of a hard disk. But never fill up. And that’s no fish story.
Apple and Sharp to Make Personal Digital Assistant

In a major alliance of industry heavyweights, Apple Computer and Sharp Corporation have agreed to codevelop a Portable Digital Assistant (PDA) based on new Apple software and Sharp's hardware. Sharp, a leading manufacturer of LCDs and maker of the Wizard organizer, is expected to provide the screen for the hand-held electronic information device. The PDA will be an entirely new product category for Apple.

The two companies have formed separate product teams to work on the project, which is not expected to come to fruition until the beginning of 1993 at the earliest. The name, expected price, and other features were not described in the announcement.—T.M.

Apple Plan Recycles Toner Cartridges

To reduce the enormous waste of throwing away toner cartridges, Apple has begun a recycling program for cartridges from all of its laser printers. New Apple toner cartridges will include a description of the program and a prepaid mailing label for the old cartridge. Users put the old cartridge in the box and send it in, slap on the mailing label, and drop the box in the mail.

Apple said for every cartridge received it will contribute $1 to be divided between The Nature Conservancy and the National Wildlife Federation. You can also obtain a prepaid mailing label by calling Apple at 800/776-2335.—T.M.

Saving the Scrolls

The Dead Sea Scrolls are deteriorating, and the race is on to thoroughly record their meanings and material condition before time runs out. To complicate the problem, many of the photos of the scrolls taken during the 1950s are now deteriorating as well, so the negatives of those photos must be duplicated.

Dr. Bruce Zuckerman and a team of scholars from the Ancient Biblical Manuscript Center in Claremont, California, devote much of their energy to this effort, and Apple has given them a Quadra to help. Zuckerman hopes to replace the tricks he now performs in the darkroom with image processing, employing the Quadra in digital restoration, realignment of fragments, and uniform lighting of curved surfaces. He will also use it to archive thousands of photographs, old and new. Ancient Biblical Manuscript Center, 714/621-6451.—ANN GARRISON

Apple and Sharp to Make Personal Digital Assistant

In a major alliance of industry heavyweights, Apple Computer and Sharp Corporation have agreed to codevelop a Portable Digital Assistant (PDA) based on new Apple software and Sharp’s hardware. Sharp, a leading manufacturer of LCDs and maker of the Wizard organizer, is expected to provide the screen for the hand-held electronic information device. The PDA will be an entirely new product category for Apple.

The two companies have formed separate product teams to work on the project, which is not expected to come to fruition until the beginning of 1993 at the earliest. The name, expected price, and other features were not described in the announcement.—T.M.

Apple Plan Recycles Toner Cartridges

To reduce the enormous waste of throwing away toner cartridges, Apple has begun a recycling program for cartridges from all of its laser printers. New Apple toner cartridges will include a description of the program and a prepaid mailing label for the old cartridge. Users put the old cartridge in the box and send it in, slap on the mailing label, and drop the box in the mail.

Apple said for every cartridge received it will contribute $1 to be divided between The Nature Conservancy and the National Wildlife Federation. You can also obtain a prepaid mailing label by calling Apple at 800/776-2335.—T.M.

The Return of Works

INNOVATIVE NEWCOMERS like BeagleWorks and ClarisWorks have broken Microsoft’s monopoly on integrated software, forcing the giant to upgrade Microsoft Works to version 3.0.

The new Works 3.0 is already outdated. In particular, its modules have no hot links between them, unlike the Claris and Beagle Bros products. Works also lacks paint tools. But within those constraints, it is packed with useful new features, its modules share a consistent interface, and all tools are available wherever appropriate—for example, the draw tools show up everywhere (except in the communications module). Draw is also a separate module that, with linked text columns, does double duty as a desktop publishing module.

Strong new features include Word-like rulers and footnotes and a drop-down guide for aligning text in the word processor; high-low charts; multiple user-definable database layouts (with envelope and label layouts provided); many date and time formats in the spreadsheets; and a macro recorder for communications.

Works lists for $249. Microsoft, 206/882-8080.—D.L.
If there were a printer that could give you this kind of color, would you still make your presentations in black and white?

Do your business presentations go in one eye and out the other? The Colormate™ PS can easily and affordably give them the impact they deserve. Enhancing your work with truly amazing color, from brilliant primaries to soft pastels. All Pantone® approved.

The Colormate PS integrates readily with any network, PC or Mac. And it’s compatible with most popular business presentation and graphics software. Of course, Adobe® PostScript® is standard. The Colormate PS comes in two models—the economical Model 40 with 4MB of memory and 17 resident fonts, and the fully featured Model 80 with 8MB of memory and 35 resident fonts. Both feature reliable 300 DPI thermal transfer technology.

For your free Color Presentations Guide and more information, call 1-800-NEC-INFO. Or call NEC FastFacts, 1-800-366-0476, document #26567, for info via fax.

After all, the world isn’t black and white, why should your presentations be?
IN 1980, WE INVENTED A NEW WAY TO SAVE YOUR FILES.
IN 1992, WE’RE INVENTING NEW WAYS TO SAVE YOUR BUSINESS.
KEEP YOUR BUSINESS MOVING FORWARD BY BACKING UP.

While the information revolution brought great advances, it also brought great anxiety. Like knowing your company could be exposed to a loss from which it may never recover.

The loss of vital information, the lifeblood of your business.

Because in today’s computerized office, valuable files that you’ve created over the years can be lost in mere seconds.

All it takes is a slip on the delete key. A sudden power failure. A quick-spreading virus. Or, the ultimate disaster — hard disk failure.

Every bit and byte of information your business runs on can be suddenly wiped out. Critical data that can cost thousands of dollars and hundreds of hours to replace.

If it can be replaced at all.

To counter all your new found worries, Sony has a number of reassuring options for you.

Read on, or risk having your business left behind.

A SAVINGS PLAN FOR PRICELESS DATA.

It all began back in 1980 when we introduced the 3.5 inch floppy disk.

For the first time, hundreds of cumbersome pages could be preserved on one space-saving disk.

A disk that quickly became the industry standard.

Today, we’re evolving equally innovative data storage products to help your business grow.

We took a long, hard look at what computer users need today. At personal computer users, workstation users and LAN users. And at what businesses are likely to need way into the future.

Then we created a whole new generation of data media. From more versatile floppy disks and higher-capacity data cartridges to faster-access rewritable optical disks. All designed to provide the most efficient data storage and retrieval for businesses of all sizes.

FLOPPY DISKS FOR TODAY’S MOVERS AND SHAKERS.

Twelve years after inventing the 3.5 inch floppy disk, we’re still further perfecting it.

Our new XT series of floppy disks is designed for the way people use computers today. And where they use them.

These new disks have a smoother surface which drastically reduces friction between the disk and the drive.

The result is the fewest read and write errors ever. And because 20% less power is needed to run the drive, they easily cope with the harsh demands of portable and laptop computing.

The 2 megabyte XT floppy has a new, reinforced layer to protect your data from scratches and dust. Making these disks ideal for businesses on the go.

INVEST IN PRECIOUS METALS.

In business, nothing is more precious than data preservation. Except, perhaps, self-preservation.

Fortunately, over 30 years ago, Sony discovered the benefits of metal tape technology for high-density recording.

Today, you can see the rewards of our efforts in our 8mm and 4mm data cartridges. Highly advanced metal tape technology that provides even longer-term stability.

8MM DATA CARTRIDGES. DESIGNED TO SAVE YOUR DATA, NOT YOUR BIRTHDAYS.

We weren’t satisfied to just invent the 8mm video recording format.

So to meet the need for improved data integrity, we developed an enhanced data format that can store 5 gigabytes of data on a single cartridge.
grade 8mm cartridge for quick, safe, reliable backup.

Our enhanced data grade D8 holds a staggering 5 gigabytes of information (roughly equal to 7,000 standard floppy disks).

You'll find safety features never conceived for video grade 8mm tape, offering drastically improved durability. And a shelf life in excess of 30 years under recommended conditions.

For today's most demanding data storage and backup applications, Sony D8 cartridges are designed to give your business a memory worth celebrating.

**DDS 4MM DATA CARTRIDGES. ADVANCED BACKUP IN A COMPACT FORMAT.**

The 4mm DDS data cartridges use Sony’s advanced DAT technology.

Not to make music, but to store the data that keeps your business humming.

This highly advanced format was developed along with Hewlett Packard.

It results in an incredibly compact DDS cartridge that can handle up to 2 gigabytes of data, while providing maximum security for all your vital storage and archival needs for years to come.

Somehow, we thought you'd like the sound of that.

**1/4 INCH BACKUP FOR A SAFER WORKPLACE.**

Sony QD series data cartridges are designed to keep your data protected from any potential accidents.

The versatile 1/4 inch cartridges come in a variety of standards and offer superior error-free recording and easy to use convenience across a wide range of applications.

Thanks to our ongoing improvements, tape dropout has been greatly reduced, while tape speed fluctuations are a thing of the past.

There's even the new QD 9135 data cartridge with a 1.35 gigabyte capacity. Giving data-dependent businesses all the room they need to grow.

Our 5.25" rewritable optical disk is breaking all jukebox records.

REWRITABLE OPTICAL DISKS HELP YOUR VISION EVOLVE IN A WHOLE NEW WAY.

As the leader in optical technology, only Sony designs and manufactures both 5.25 inch and 3.5 inch rewritable optical media and drives.

So it stands to reason we understand the technology better than anyone else. Our 5.25 inch rewritable optical disks can sustain 10 million erase/read/write cycles, ensuring long-term data integrity. While in an optical jukebox, these highly durable disks can cope with countless loads and unloads.

And by offering the first 30 year warranty, Sony continues to write new standards for optical media.

We've also put a new spin on 3.5 inch rewritable optical media with disks that perform equally well in all 1800 — 3600 rpm ISO standard drives. Providing a new level in media interchangeability.

Durability, direct accessibility and portability make Sony rewritable optical disks the ideal storage media for forward-looking businesses.

**WE LEAD, THEY FOLLOW.**

At Sony, we're committed to inventing new formats and perfecting new standards in data media to meet changing business needs.

As new computers and new applications are developed, Sony will be developing new data media products that will hold even more information, more securely.

And we'll continue to explore the limits of data recording technology.

After all, inventing new ways of saving your business is our business.

For more information on Sony Data Media products, please call (201) 930-7025.
BridgePort Links Macs and PCs to LaserJets

Extended Systems has introduced the BridgePort ESI-2671A, a printer-sharing device that lets Macs and PCs connect simultaneously to Hewlett-Packard's LaserJet IID, LaserJet III, or LaserJet IID printers. The device, a board that fits into the internal I/O slot in the printer, includes a Centronics parallel port, an ExtendedLink port, and an AppleTalk port.

When used in conjunction with the new HP LaserJet PostScript Cartridge Plus, the BridgePort ESI-2671A provides automatic language switching between PostScript and PCL (Printer Control Language for DOS machines), but only on the LaserJet III and IID. The ESI-2671A lists for $495 and is now shipping. Extended Systems, 406/587-7575.—T.M.

THE HP PAINTJET XL300 COLOR INK-JET PRINTER PRODUCES CLEAR IMAGES ON A WIDE VARIETY OF ORDINARY PAPERS.

High-Performance Bridge/Router

NETWORK RESOURCES Corporation (NRC) has introduced the MultiGate Hub 2, a combination network bridge and router that can operate locally or as a remote device via a wide-area network (WAN). The MultiGate Hub 2's integrated hardware and software makes it useful as a building block for a wide variety of network applications. The hub's internal wiring can be 10BaseT or high-speed fiber optics.

The MultiGate Hub 2 starts at $3995 for a version with zero ports and 10BaseT/AUI and BNC media. A 24-port version with the same media lists for $5995. Various WAN and contents-addressable memory options are available, as is the fiber-optic version. The device was expected to begin shipping in June.

NRC, 408/263-8100.—T.M.

SETTING UP REMINDERS AND SCHEDULING DAY-TO-DAY TASKS ARE LARGELY AUTOMATED IN ACT.

New Act

Contact Software's Act provides a contact database; a calendar and to-do list with alarms; and a text editor to generate mail merges. It can publish data to an external word processor or a pin-mapper like GeoQuery, and can record and replay repetitive procedures automatically.

For tracking organizations with multiple contacts or people associated with multiple organizations, Act has a grouping feature; people and organizations can belong to many groups.

Act's query tools include date ranges and wild cards, but Act can't search its notes field and doesn't support Boolean searches. Recurring events can be created but can't be modified as a group.

The DOS version of Act can share contact databases on a network and can be customized by programmers. The first Mac version lacks those features and does not support AppleTalk Remote Access.

Act will list for either $395 or $495. Contact Software, 214/919-9500.—D.L.

DENISE WILTSHIRE OF THE USGS SUPERVISED THE AGENCY'S FIRST MULTIMEDIA SCHOLARLY PUBLICATION.

Geology Publishing

A PUBLISHING EXPERIMENT at the United States Geological Survey has produced Arctic Data Interactive (ADI), a scientific journal on CD ROM, with articles by several scientists studying the arctic; hundreds of megabytes of raw data, including aerial photographs, gathered by the scientists; and image-analysis software that lets others poke around in the data sets.

ADI's articles are accessed through a table of contents with hypertext links; raw data is accessed through a data directory that describes the files' origins and contents. ADI includes animations of sea ice, a discussion of U.S. government science policy, and a bibliography.

Arctic Data Interactive was programmed by Internetwork, 619/755-0439, under the supervision of Denise Wiltsshire at the USGS. It is available free of charge to libraries and environmental researchers, 703/648-4000.—D.L.
Congratulations... Now all your applications can read.

When teamed together, OmniPage® Direct software from Caere® and the Hewlett-Packard ScanJet IIp give all your existing software the ability to read text and numbers. Pages are scanned directly into your Windows® or Macintosh® applications as if you were typing them in yourself – only faster.

Think of it as the world’s most advanced reading course ever. With the HP ScanJet IIp and OmniPage Direct you can enter information directly into your most critical reports, presentations, or desktop published documents – without ever leaving your favorite word processor, spreadsheet, or DTP application.

OmniPage Direct is the latest OCR (optical character recognition) breakthrough by Caere Corporation, the company that set the standard with the world’s most powerful recognition software, OmniPage Professional. Now with OmniPage Direct, you get an easy-to-use program that reads virtually any document directly into your existing software. Best of all, OmniPage Direct comes at a breakthrough price.

Add to this the compact HP ScanJet IIp and you have the ultimate speed reading solution. The ScanJet IIp is another innovation from the leader in desktop scanners and can directly input images and text into your applications – for a very affordable price.

To learn more about how easy and affordable scanning has become, call our OCR hotline for the dealer nearest you.

Call 1-800-535-SCAN.

Carer, the Carer logo and OmniPage are registered trademarks of Carer Corporation. All other trademarks are of their respective companies. ©1992 Carer Corporation.
Lights, Camera, Movie

Vision Software is shipping CameraMan, a utility for filming QuickTime movies of all that takes place on a Mac screen. This may remind some readers of Farallon Computing's MediaTracks, but CameraMan doesn't support dialog boxes for user input, branching, or other tools for creating interactive applications. Instead, CameraMan's files can be incorporated into any multimedia authoring system that supports QuickTime (it also saves in PICS).

CameraMan can capture all or only part of the screen, or can follow the mouse around, to save on file size. Unlike the tiny window for digital video in QuickTime, screen movies can be played back at full size. CameraMan comes with a QuickTime player called MoviePlayer and lists for $149. Vision Software, 408/748-8411.—D.L.

Low-Cost 040

Accelerators Cut Out the FPU

Fusion Data Systems has introduced two low-cost 68040-based accelerators for the Ilci, the Ilsci, and the SE/30. Both accelerators use a less-expensive version of the Motorola chip. Intended for those users who don't need the benefit of the FPU (math coprocessor) built into the standard 68040, the 25MHz accelerators are the TokaMac CI 25i for the Ilci and the TokaMac SX 25i for the Ilsci and Macintosh SE/30. Both PDS boards list for $1695, about $1500 less than similar TokaMac accelerators that include the FPU, according to the company.

Applications for the 25i accelerators include desktop publishing, raster-image processing, and graphic design. Both models allow software switching between the 040 and the Macintosh's native 030 processor. The TokaMac CI 25i and TokaMac SX 25i accelerator boards began shipping in April. Fusion Data Systems, 512/338-5326.—T.M.

Lexmark Laser Printers Produce 600 dpi

LEXMARK INTERNATIONAL, the printer-manufacturing arm of IBM, has designed several new PostScript printers that work with the Mac. The printers, called the IBM LaserPrinter 10A and the IBM LaserPrinter 6A, print at 10 ppm and 6 ppm, respectively. The 10A prints at 600 dpi, using a 68020 processor for extra speed. The 6A includes a 68000 processor and produces 300 dpi, upgradable to 600 dpi. Both printers come with 39 fonts, desk accessory software for System 6 and System 7, and a 200-sheet input tray. The printers are the first from Lexmark to come pre-configured for the Mac. The LaserPrinter 10A lists for $3995, while the LaserPrinter 6A lists for $2695. Both are now shipping. Lexmark, 800/426-2468; 800/633-7662 in Canada.—T.M.
In Tinsel Town, we're the printers to the stars.

When C. David Piña created the graphics for the 63rd Annual Academy Awards, he cast his NewGen printer to play a vital supporting role.

Why NewGen? "We print a lot of grey scale, line and type images. NewGen delivers — beautifully. What I see on the screen is precisely what I get. And it's fast too; we don't wait for documents anymore."

Resolution close up, 13 point Courier enlarged 500%.

With features like Image Enhancement Technology (IET)™, NewGen delivers some of the smoothest lines, characters and curves since Casa-Shan. Plus, Automatic Recognition Technology (ART)™ which actually selects the right interfaces and emulations for you. "And it's got Program Upgrading, so my printer stays virtually obsolete-free. And that's important in this business."

As for NewGen technical support, Piña put it this way, "We've never had problems, only a few questions, and they were there — instantly."

The NewGen line offers a complete cast of PostScript-compatible printers to fill any role. With resolution from 300 to 1200 dpi plus IET. A range of speeds from 4 to 12 pages per minute. Even paper sizes of up to 11" x 17" for simply unequaled graphics and pre-press capability. All at prices that will make you a star with accounting.

Piña summed up his choice eloquently. "The NewGen was the only printer that offered everything I needed — with features I couldn't get from anyone else."

To learn more, or for your nearest NewGen Dealer, call 1-800-756-0556. We'll be happy to show you just how well our high-resolution printers can play a leading role in your business.
Coordinated Colors

MAINTAINING CONSISTENT colors from original artwork to final printed piece is the most difficult problem faced by publishers—desktop and traditional alike.

Electronic composer Laetitia Sonami creates the basic harmonic, rhythmic, and melodic parameters of a piece, which are sent to synthesizers and samplers as MIDI commands. She improvises within these parameters, using her voice and a special pair of ladies' gloves as MIDI controllers.

The gloves are equipped with sensors that measure the magnetic field between her thumb and fingers and translate the measurements into MIDI data. Sonami will perform in New York, San Francisco, and other cities this year. For dates, call 510/532-5666.—ANN GARRISON

Digital Improvisation

Electronic composer Laetitia Sonami’s concerts are both scored and improvised. Using a Mac SE and Opcode System’s Sonami’s concerts are both scored and improvised. Using a Mac SE and Opcode System’s voice and a special pair of ladies’ gloves, she improvises within these parameters, using her voice and a special pair of ladies’ gloves as MIDI controllers.

Laetitia Sonami controls a stack of MIDI equipment by flexing a glove embedded with electronics.

Setting up Magnet to automate the weekly uploading of budget files to a server.

Up Tempo

Affinity is upgrading its general-purpose macro recorder, Tempo, to Tempo II Plus version 3. Among its major new features are the ability to issue and respond to Apple events, a new macro editor, and improved support for externals. Files and folders used in externals can be selected from a standard file dialog in the title and Delinquent in the contents, and upload them to the accounts receivable server.

No Hands Software is developing Magnet, a System 7 utility intended to cut down on time spent supervising your Mac. Simply put, Magnet creates folders full of aliases of the files you use. For example, it could create an Apple menu item listing all your applications, log on to a server and open a database (even over phone lines), or keep a folder of aliases of every file you’ve used in the last 30 days.

In Magnet’s editor you can set up more-complex tasks. For example, once a month it could locate files with the word January in their names, and upload them to the accounts receivable server.

No Hands expects Magnet’s street price to be less than $150. No Hands Software, 415/321-7340.—D.L.

I Swim, Therefore I Am

Consciousness of self-characterizes homo sapiens, primates, and even dolphins. At Honolulu’s Earthtrust, zoologist Ken Marten has data suggesting that dolphins recognize themselves in mirrors. He will soon give several dolphins the power to control lights and water showers and to dump toys into the water by touching their roar-trums against an underwater touch screen connected to a Mac II. Earthtrust’s intent is to explore the intelligence of dolphins and inform people about dolphins in the hope of stopping what Marten calls “the holocaust” now destroying these creatures. Earthtrust, 808/254-2866.—ANN GARRISON

Bug Report

Quicken 3.0: A conflict with Suitcase II 2.0 interferes with display of some fields. Version 3 release 3 and later versions solve this problem; Intuit will supply a bug fix at no charge to registered users upon request.

Radius Color Pivot: If Pivot is turned to landscape mode at start-up, the Finder doesn’t display color (problem only occurs with built-in video). Radius is not sure if it can fix the problem with software; it may need to be fixed by Apple in system software.

NightWatch II: Sometimes, NightWatch II locks authorized users out of drives formatted with FWB’s Hard Disk Toolkit and Casa Blanca Works’ Drive7; Kent Marsh says it knows how to fix the bug but at press time was not sure when the bug fix would be ready.

FolderBolt 1.0: FolderBolt is incompatible with some operations in Microsoft Word; bug fixes version 1.02b will be available free online or from Kent Marsh with a shipping charge.

MacWorld will send you a Bug Report T-shirt if you are the first person to inform us of a serious, reproducible bug that we report in this column. See how to contact MacWorld.

Last year MicroNet introduced the RAVEN-030 series of disk arrays. With 4.4 MB/sec sustained data transfers, nothing was faster. This year, we’re offering the ultimate in transfer rates – up to 7.0 MB/sec with our new RAVEN-040 series compatible with the Quadra 700 and 900.

Using MicroNet’s new SCSI Manager, RAVEN-040 is capable of synchronous data transfers. No other system offers such exceptional throughput speeds. And no other system offers access times as fast as 5.7 ms.

Based, in part, on the time-proven technology which won MicroNet the MacUser Editors’ Choice Award for 1990, RAVEN-040 for the Quadra 900 goes a step beyond what was achievable through NuBus-based configurations. It connects directly to the Quadra 900’s SCSI ports, leaving all five NuBus slots open for other use.

RAVEN-040 is available in capacities from 606 to 4,260 MB. Many of the RAVEN-040 pairs can be installed inside the Quadra 900 to conserve desk space. And the RAVEN-040 is directly bootable – it requires no special INITs or mounting software.

Get the time-proven performance of MicroNet’s next generation of disk arrays. Call our sales department today for information on the powerful new RAVEN-040. 1-714-837-6033.

Quality You Can Count On.

MicroNet Technology, Inc.

20 MASON • IRVINE, CA 92718 • TEL: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: MICRONET.SLS • Compuserve: 76004,1611
RAVEN-030 and RAVEN-040 are trademarks of MicroNet Technology, Inc. All other trademarks are the property of their respective owners.

Circle 113 on reader service card
Farallon Broadens Ethernet Line

Farallon Computing introduced a broadened line of Ethernet boards to suit more Macintoshes and offer more choices of network-cabling media. The new series of 16 boards, called EtherMac, includes 3 models for NuBus: a $249 version for Thinnet/AUI media, a $249 version for 10BaseT/AUI media, and a $329 version for Thinnet/AUI/10BaseT media. The 6 models for the LC offer either Thinnet or 10BaseT or both, plus they come with either a socket for an FPU or a $150 FPU installed. Prices for the LC series start at $249. The 6 models for the Ilsi and SE930 offer the same media combinations as the NuBus boards. These models start at $299 and have the same $150 FPU option as the LC versions. A single $329 model for the Macintosh SE can connect to all three media types.

All the models have at least a 16K buffer, except the SE model, which has an 8K buffer. All the EtherMac boards are available now. Farallon, 510/596-9000.—T.M.

Relisys Hi-Res 20-Inch Monitor

Relisys has introduced a 20-inch color monitor that displays 640 by 480 pixels or 1024 by 768 pixels and lists for $1795. Called the RE-2058, the monitor automatically adjusts to scanning frequencies ranging from 31.5kHz to 58kHz, to work with a wide range of graphics adapters from different vendors. It supports screen refresh rates of up to 90Hz.

The RE-2058 also has an external degaussing control for eliminating color impurities that are caused by ambient magnetic fields. The monitor is shipping now. Relisys, 408/945-9000.—T.M.

Making Sense of Securities

Dow Jones Market Analyzer Plus 2.0 provides a wide range of technical tools for analyzing and predicting trends of stocks, bonds, and other securities, including point and figure charts, support and resistance line charts, and moving average convergence-divergence charts. Its reports are modifiable, and expert users can add their own formulas.

Market Analyzer Plus lists for $349 and is designed to work with the Dow Jones News/Retrieval Service, an online system that maintains a wide range of current and historical information about securities. All activities can be automated, including going online to retrieve quotes. Market Analyzer Plus can update the database in Dow Jones’s Market Manager Plus, avoiding double online charges. Dow Jones & Co., 609/520-4000.—D.L.

Low-End OCR

While developing the new OmniPage Direct, people at Caere took to calling it BozoScan. For good reason: OmniPage Direct is so simple it’s almost invisible. It appears as an Apple menu item that runs inside other applications, and saves its output into other applications’ files.

It has a few simple tools for selecting parts of a page based on a quick prescan; recognizes and retains point size and font (if the correct font is installed); and understands the difference between columns and tables. Because it does not create its own files, OmniPage Direct has no spelling checker and can’t batch-process scans.

OmniPage Direct lists for $595 and requires System 7. Caere, 408/395-7000.—D.L.

New E-Mail

SoftArc’s FirstClass is a full-featured E-mail system designed so that all features available over a local network are also available by modem. It works asynchronously, meaning that it can send and receive messages or files at the same time.

Other features include conferencing; tracking of who has and has not read a message; a chat mode; multiple forms; and support for making a network volume accessible.

Version 2.0, due this summer, will have a programming interface for third-party add-ons; editable forms; and rich-text support.

A five-pack for local area networks is $295; unit pricing goes down for larger installations. Software for modem-only access starts at $295 for 100 users and goes down for larger installations. SoftArc, 416/299-4723.—D.L.

Anatomy Lesson

ADAM—Animated Dissection of Anatomy for Medicine—is a human being on a CD ROM who can be taken apart by medical students, pharmaceutical salespeople, and nervous presurgery patients. It is built in layers, each of which represents a different part of the anatomy such as the vascular, nervous, and skeletal systems.

ADAM is being developed in stages. The lower extremities are shipping, with the abdominal region scheduled for summer. A woman’s body (Eve) is in the works, and elderly and children’s bodies are planned.

The system is built on SuperCard, with scripts open for modification by users who want to add their own text, scanned images, hot links, and so on. It is available by individual modules or on subscription; price varies. Adam Medical Software, 404/980-0888.—D.L.
THE SOFTWARE.
We could tell you that year after year, Aldus' PageMaker has set the standard for page layout programs—for both Macintosh and Windows. We could tell you that our latest version, Aldus PageMaker 4.2, is better than ever. It now has a Control palette to numerically position, move, and resize objects. Plus “nudge” buttons for precise adjustments. We could tell you that PageMaker 4.2's enhancements give you the power you need to express your ideas. We could simply point above, and show you what the experts have to say. (We might add that PageMaker is also MacWorld's 1992 choice for best all-around page layout program.) For information, call 1-800-685-3625. And see why our software is attracting so much hardware.
"The Xeba is priced lower than most of the send/receive fax modems now available. With Faxstt included, it is a solid buy that'll give you a full range of fax features and a data modem that will perform well—even in a wind tunnel."

—Joseph Schorr, Macworld, April '92

9624 bps Fax/Modem
Everything you could want in a fax/modem. All the style of Xeba—complete with software, cables and power supply. 9600 send and receive fax with 2400 bps/V.42 bis modem. List: $429

Limited Offer $199

96/96 bps Fax/Modem
Save toll and connect charges with modem speeds of 9600 bps up to 38.4K with V.42 bis and 9600 bps send/receive fax, plus all cables and software. List: $813

Limited Offer $399

V.32 bis Fax/Modem
Speed through large files at rates from 14.4K bps up to 57.6K bps when connected to a similar modem. 14.4K send/receive fax capability, software and cable. List: $864

Limited Offer $449

Quicktel modems from Logicode Technology, Inc., 1817 DeHavilland Drive, Newbury Park, CA 91320 (805)499-4443 Fax: (805)499-8588

Note: We're adding two exciting new capabilities, concurrent voice communication and caller identification. These features are not yet available from any modem manufacturer, but as soon as the technology permits (estimated to be third quarter of '92), we will offer it in an easy upgrade to our Xeba line. Caller identification may not be allowed in all states.
The Engines of Change

A Pennsylvania farmer and mill owner penned this advertisement in 1849: "...The subscriber will sell... Water Power, Grist and Saw Mill... the site would be a very superior one for a woollen or cotton Factory... This water power is one of the best for manufacturing purposes in Chester county, and is well worth the attention of capitalists." The ad appears in Steven Lubar's HyperCard stack The Engines of Change, which details the transformation of the United States between 1790 and 1860. Text and artifacts are drawn from an exhibition Lubar curated at the Smithsonian Institution's National Museum of American History. Intellimation, 805/968-2291.—ANN GARRISON

Under New Management

By acquiring Peter Norton Computing, Symantec became the owner of two of the Mac's leading disk-management packages, Symantec Utilities for Macintosh (SUM) and The Norton Utilities for the Macintosh (NUM). Symantec had to make a choice and it chose NUM, but the company says NUM 2.0's engine incorporates all the disk-recovery technology of SUM.

Other SUM features include disk partitioning and data encryption. Version 2 adds a backup utility and the ability to recommend routine maintenance tasks for a hard drive. Version 2 also installs WipeInfo, a trash can that makes deleted files unrecoverable.

NUM 2.0 will list for $149. Upgrades from earlier versions of NUM or from SUM are $39. Symantec, 408/253-9600.—D.L.

Apple's High-Tech Library

LIBRARIES OF TOMORROW may be much like Apple's library today. Without a single card file, its staff helps Apple employees search electronic databases of the corporate collection and the collections of hundreds of other libraries, information brokers, corporate report centers, and document vendors. The library's lab provides tools for accessing the nonprint collection, and for scanning, digitizing, and transferring files, and color printing.

The Apple Library is for employees only, it sponsors the Apple Library Users Group (ALUG), which is open to public, academic, and corporate librarians, and individuals interested in using Apple computers to manage information. ALUG, 408/974-2592.—ANN GARRISON

Survey: Systems in Use

Computers Used by Macworld Subscribers

| Total percentage of subscribers using Macintosh computers: 97 |
|-------------------------------|---------------|
| Quadra line                   | 2             |
| Mac II line                   | 58            |
| PowerBook line                | 8             |
| SE line                       | 4             |
| Mac LC                        | 15            |
| Classic line                  | 16            |
| Mac Plus                      | 24            |
| Other Macs                    | 4             |
| DOS machines                  | 39            |

Computers Installed at Subscribers' Organizations

| Total percentage of Macintosh computers installed: 82 |
|-------------------------------|---------------|
| Quadra line                   | 5             |
| Mac II line                   | 58            |
| PowerBook line                | 9             |
| SE line                       | 9             |
| Mac LC                        | 18            |
| Classic line                  | 21            |
| Mac Plus                      | 33            |
| Other Macs                    | 7             |
| DOS machines                  | 7             |

Based on two surveys mailed to 2000 readers each, with response rates of 68 percent and 74 percent. (Percent totals do not equal 100 due to multiple responses.)

NewGen's 800-dpi Laser Printer

NewGen Systems Corporation has introduced the TurboPS/880, an 8-ppm laser printer that uses controller techniques to produce 800 by 800 resolution. The printer has enhanced grayscale capability, a RISC processor, and 10MB of RAM.

Interfaces include an Ethernet adapter, a serial port, a parallel port, and an AppleTalk connector, all simultaneously active. The printer senses whether a file is PostScript, PCL 4, or HPGL. It can be upgraded to future versions of the various page-description languages. The TurboPS/880 has a SCSI port for a hard drive. Now shipping, the printer lists for $3995. NewGen, 714/641-8600.—T.M.

MACWORLD July 1992 137
Microsoft Excel 4.0 – See

Improved graphics tools and presentation support

Excel 4.0 gives you even greater control over how your documents will look. It provides everything you need to create dazzling reports, complete with charts, graphs, and notes or annotations.

• **Autoformat** gives you one-step access to 16 professionally designed spreadsheet formats.
• **Report Manager** lets you merge different sections of different spreadsheets to produce customized reports that you design.

A whole new level of easy.

Believe it or not, you can actually create a spreadsheet in just about 60 seconds with Microsoft Excel 4.0. New intuitive features replace the long, steep learning curve with quick and powerful commands that have you up and running in a flash!

• Use Excel’s customizable **Toolbar** for one-step, on-screen access to the commands you most frequently use.
• **Autosum** lets you sum designated ranges or columns with a simple double-click.
• **Autofill** recognizes trends in your data, and extends them as far as you’d like.
• **Shortcut menus** pop up to give you instant access to common, context-sensitive commands.
• **Best Fit** automatically resizes columns to accommodate the widest entry.
• And the incredible new **Wizards** are always watching and waiting in the background, ready to guide you step-by-step through any complex task.

Powerful analytical tools put you in touch with your data.

Microsoft has added a host of new analysis tools to Excel 4.0, giving you entirely new ways to view and analyze your data.

• Use the **Crosstabs** feature to create crosstab tables based on database entries that you can sort by any criteria.
• Store related worksheets together in a single file with **Workbooks**.
• **Consolidate** data from multiple worksheets, regardless of formatting, file type, or file location.
• The **Analysis ToolPak** includes the most extensive set of financial, statistical, engineering, and scientific tools that you will find in any spreadsheet.
• **Outlining** lets you expand or collapse your worksheet to view the desired level of detail.
• Plus the extraordinary **Scenario Manager**, which lets you create and save multiple “what if” scenarios and create a summary of these scenarios in just minutes.

Improved graphics tools and presentation support

Excel 4.0 gives you even greater control over how your finished documents will look. It provides everything you need to create dazzling reports, complete with charts, graphs, and notes or annotations.

• **Autoformat** gives you one-step access to 16 professionally designed spreadsheet formats.
• **Report Manager** lets you merge different sections of different spreadsheets to produce customized reports that you design.
Your choice of alignment options — left, right or centered — are only a mouse-click away.

Choose this icon, and you'll have a whole range of charting features at your disposal.

Click on this icon and your selected data will be copied right to the Windows clipboard.

Switch back and forth between spreadsheets with a simple mouse click here.

To access Excel's context-sensitive, on-line help, just double-click on this icon from wherever you are in the program.

Discover for yourself how easy spreadsheet power can be. Order Microsoft Excel 4.0 today!

Microsoft Excel 4.0
RUS9223
Publisher: Microsoft
Suggested Retail: $495
System requirements: 1 MB RAM (2 MB for System 7.0); hard disk drive: Finder 8.1 or later; System 6.0.7 or later.

$295

Microsoft Excel 4.0 Upgrade for only $99!
Upgrade and SAVE!

If you're using a previous version of Excel, you can upgrade to Excel 4.0 at substantial savings off the regular price! To qualify, just mail or fax us the title page of your user manual, or the original program disk.

Microsoft Excel Live Upgrade
Qualifying products are any previous versions of Microsoft Excel. Offer expires 9/30/92. Note: if you purchased Microsoft Excel 3.0 after 2/15/92, the upgrade to version 4.0 is free, direct from Microsoft.

UPG8010 $99

Smooth transition from Lotus 1-2-3

Excel's Custom Help for Lotus 1-2-3 lets you use your familiar 1-2-3 commands right within Excel. Excel will demonstrate its equivalent command, so you can learn as you work. Lotus files and macros can be imported right into Excel, and the program supports all Lotus file formats, so it's easy to convert your documents. Plus, there's a helpful, on-line tutorial for 1-2-3 users who want to switch without a fight.

To order, call MacWarehouse at 1-800-255-6227

MWG2M
You want all your documents to look polished and professional. You've seen how graphics and charts can jazz up those otherwise dull memos and reports. But trying to do page layout with your word processor is almost impossible. And high-end page layout programs take too much time and effort. Introducing Personal Press 2.0 — the first page layout software that does it all for you automatically!

**Personal Press 2.0 Main Features**
- "Intelligent" Templates help you create, assemble and print professional-quality documents with ease
- Full Featured Word Processing with 100,000 word spelling checker, 660,000-synonym thesaurus, search and replace, and magnification of 10% - 400%
- Interactive Graphic Previews show you what will happen before it happens
- Aldus Additions make special tasks, such as creating drop-cap letters, pull quotes and bullet text, fast and automatic
- Copy Fit automatically adjusts text to fit the space you designate
- Text Wrap lets you easily wrap text around text and graphics of any shape
- Free Rotation of text and graphics
- Image Controls let you adjust brightness or contrast of grayscale images
- Drawing and Manipulation Tools give you added flexibility
- On-line Help as well as dimmed-menu help
- Imports and exports in the most popular Macintosh formats
- System 7 Savvy features, including Balloon Help, Apple Events, Subscribe, TrueType, 32-bit Addressing, QuickTime Movie Support, and Virtual Memory

"Intelligent" Templates guide you through the whole process.

Create a publication that's perfect for your needs in a matter of minutes with Personal Press. Choose from a wide selection of professionally-designed, "intelligent" templates for newsletters, forms, memos, flyers, brochures, greeting cards, and more. The templates take care of everything — headlines, tabs, indents, image cropping, text size and style, even table of contents. The templates also fine tune the document for you, so it's clean, professional, and ready to print. Plus, each template includes several variations, so you can create a custom look without spending a lot of time or effort.

**Personal Press does the work, so you don't have to.**

Use the Copy Fit command and Personal Press will reformat your text to fit in the space you designate. AutoFlow eliminates the guesswork because it adds pages to your document as necessary. Interactive Graphic Previews show you what will happen before it happens, and provide constant, interactive feedback so you can avoid mistakes and work more efficiently. Text Wrap automatically wraps text around text and graphics of any size or shape. And with the incredible Aldus Additions, performing special tasks, such as creating drop-cap letters, pull quotes or bullet text, is fast and automatic.
Aldus Personal Press 2.0 is the first page layout software to automatically design and assemble your text and graphics. The result is a quick-to-create, professionally-designed publication. Personal Press puts it all together so you look like an expert.

But if you'd really rather do it yourself...

Personal Press 2.0 gives you powerful tools and advanced features that are easy to learn and use. There's a full-featured word processor with a 100,000 word spelling checker and 660,000 synonym thesaurus. Import text and graphics and rotate them freely just for the right look. Create various line styles, including hairline and custom widths. Adjust the brightness and contrast of your grayscale images. Preview, crop, scale, and place frames from QuickTime movies right into your document. And much, much more.

Outstanding printing and output capabilities.

With Personal Press, your documents will really look great in print! Output to the most popular Mac printers, including high-resolution black and white and color QuickDraw and PostScript printers. Rotated text prints at the highest resolution possible, and your grayscale images will come out looking clean and crisp. Personal Press will even print spot color separations.

New Version 2.0! Makes you look like an expert!

Personal Press 2.0 — Only $99

Outstanding printing and output capabilities.

With Personal Press, your documents will really look great in print! Output to the most popular Mac printers, including high-resolution black and white and color QuickDraw and PostScript printers. Rotated text prints at the highest resolution possible, and your grayscale images will come out looking clean and crisp. Personal Press will even print spot color separations.

Call 24 hours a day, 7 days a week.
IdeaFisher 2.0

- IdeaFisher is a powerful productivity tool designed to turn your computer into a brainstorming and problem solving partner. Use it to generate creative ideas for new products, marketing strategies, articles, stories or scripts, advertisements, promotional materials and many other tasks requiring new ideas. This interactive idea tool triggers your brain to break out of its habitual rut and to think in new and innovative ways. With 705,000 idea associations and nearly 6,000 thought provoking questions, you'll quickly produce great ideas. IdeaFisher is expandable. Use the built-in tools to create your own personal library and set of questions. Publisher: Fisher Idea Systems

$389

TrueLaser Printer

- The TrueLaser is Microsoft's answer to fast and versatile laser printing. It offers 300 dpi resolution, comes with 35 built-in TrueType fonts and is PostScript and RIT PGZ compatible. Its auto-switching capability allows it to change automatically between its AppleTalk, CompuServe and RS-232C interfaces. The TrueLaser is also one of the fastest printers in its class. It's powered by the AMD 29000, 32-bit microprocessor and comes standard with 2M of RAM and can be upgraded to 3MB or 6MB. Manufacturer: Microtek

$1399

WristSaver/WristSaver MousePad

- The WristSaver cradles your wrist with a contoured non-slip rubber pad and a nylon covering. It's ergonomically designed to support your wrist at the proper angle to help avoid the pain associated with Carpal Tunnel Syndrome. The WristSaver MousePad provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand. Manufacturer: 1B Innovations

$125

HayesConnect™ Version 3.0

- Turn your modems, printers, plotters, and other serial devices into shared resources on your AppleTalk network. HayesConnect is the software solution that expands the usefulness of your peripherals by enabling you to share a variety of serial devices connected to Macintosh® computers on any AppleTalk network. HayesConnect allows you to share the use of high-speed modems among many network users. No need to buy modems and phone lines for everyone; simply use HayesConnect to pool a few modems for the use of everyone in your group. Publisher: Hayes

$125

WindOWatch 1.52

- Track the hours you spend on a project with WindOWatch. It's a must for professionals who bill their services by the hour (or minute). WindOWatch operates in the background, automatically generating a timesheet as you work. Use WindOWatch to collect and organize timesheets from team members over the network or export timesheet information to a spreadsheet. Don't miss this opportunity to accurately bill your clients. After all, time is money. Publisher: ASD Software

$89

Ray Dream Designer 2.0

- You don't have to settle for flat illustrations and designs any longer. Ray Dream Designer's drawing and text tools, for creating lines, circles, ellipses, polygons, Rotters, colors and shading, are virtually the same as those in most 2D illustration programs. The only difference is, now your objects have the realistic look of three dimensions. Wrap them around an object or text for instant dimension. Comes with a library of 3D solid textures you can use as is or customize. Lighting, shadows, transparency, reflections and, best of all, perspective are all handled automatically. Requires: Mac II family with coprocessor, 32-bit QuickDraw, 4MB RAM and hard drive. Publisher: Ray Dream

$629
The brand new edition of Steven Bobker's popular Power User's Tool Kit is available now, and it's yours for the asking when you place your order with MacWare house. You pay only $1.50 to cover postage and handling. You'll find 18 valuable applications, utilities, DA's, INIT's, and System 7 extensions for your Macintosh. You'll be surprised by how easy they are to use, and at the efficiency you can gain by using just a few of these programs.

Your powerful new Tool Kit Includes:

- LightningPaint-A powerful black & white paint program with features to rival the best.
- FontView-Find and select any character in a font, no matter where they are hidden.
- Merge Scrap-Merge multiple scrapbook files into one.
- Tweaker-Change the Finder attributes of any file in a snap.

Especially for System 7 users:

- Sound Extractor-Copy sounds out of any application, suitcase or system file, and convert them into a format you can use elsewhere.
- Trash Alias-Automatically removes any aliases you've created for a file when you drag the original to the trash.
- AppleEase-The easiest way to create or remove aliases.

And much more!

Your powerful new Tool Kit Includes:

- ScanMaker 6002S
  - Unbeatable features at an unbeatable price. The ScanMaker 6002S captures 24-bit color, 8-bit gray and black and white images at resolutions up to 600 dpi. It's perfect for all work from comp to final presses projects. Also, it comes with a built-in Apple SCION interface for easy installation and some of today's most useful graphics software. Included with the scanner is the full version of Adobe's Photoshop, the ScanMaker plug-in and Sterling's Scanmath color calibration software.
  - Manufacturer: Microtek, ISBN 18019

$1449

AutoDoubler

- AutoDoubler is the easiest way to increase your hard disk capacity. It works in the background to automatically keep your hard disk compressed. It's lightning quick and completely transparent, so it won't interrupt your work. In fact, AutoDoubler's new patent-pending technique lets your Macintosh use files and applications where they are still compressed! It's fully compatible with almost all applications, disk accessories, and system extensions.

$49

DiskDoubler 3.7

- DiskDoubler gives you total control of the compressionarchiving for modern transfer, compressed backups, selfexpanding files, and lost copying of files. AutoDoubler and DiskDoubler combined give you the ultimate in speed, convenience, and control. System 7 Savvy
  - Manufacturer: Sallefast

$129

Aldus SuperPaint

- Five time winner of MacWorld magazine's World's Best Award, new Aldus SuperPaint combines painting, drawing, and image enhancement, and includes 1 thru 24 bit color, true color gradients, and EPS graphics. GRA006 $513
  - Manufacturer: Aldus

$129

Aldus Gallery Effects

- Aldus Gallery Effects is a set of sophisticated effects tools for your Macintosh, including graphic effects for Aldus SuperPaint, and Aldus SuperPaint and Aldus SuperPaint Pro. Graphic effects include: Grayscale, Color, and Black/White.

$129

Call 24 hours a day, seven days a week. NEW! Express Customer Service Number:

1-800-255-6227

(1-800-ALL-MACS)

Inquiries: 908-367-0440
FAX: 908-905-9279
Call 24 hours a day, seven days a week.

Name

Address

City

State

Zip

Please enter my free, one-year subscription to the MacWAREHOUSE catalog in the space below.

FREE CATALOG SUBSCRIPTION

MWG2
Free MacWAREHOUSE Catalog Subscription
1600 Oak Street, P.O. Box 200, Lakewood, NJ 07701

Mail coupon to MacWAREHOUSE, 1600 Oak Street, P.O. Box 200, Lakewood, NJ 07701

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

Make your Mac wear your beeper! Alarming Events™ is the personal appointments and schedule manager that not only keeps your schedule, but keeps you ahead of it! Specify the advance warning you need, and your Mac will beep, whistle, flash, or bark as you so prefer. View a day, week or month at a time — yes, decide! Print your schedule, or just parts of it, when you're on the move. Keep as many appointment books as you need, and store them on your server for convenient group access. You can even create a "to do" list that can follow you from day to day. It's true time management with all the bells and whistles!

Publisher: CE SOFTWARE

The UnMouse

The UnMouse does everything a mouse can — only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (40 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet. Manufacturer: Microtouch INT9000

More After Dark


After Dark 2.0

After Dark 2.0 displays over 35 screen savers including the classics, such as: Flying Toucan and Fish! Includes sound, password protection, logo and message display. Publisher: Berkeley Systems UT0119 $29.

More After Dark Bundle

Buy both and save. UT0133 $45

FOREIGN LANGUAGE INSTRUCTION

*PICTURE IT! or VocabuLearn 2.0

*PICTURE IT! Foreign language learning comes ALIVE! Finally, a program which creatively stimulates your child's interest in foreign languages. Children learn with text, sound and graphics! A bilingual dictionary with more than 1,000 words and over 900 high resolution graphics creates an exciting and visual learning experience.

MacPrint 1.3

- Use a Macintosh with non-Apple printers. Print Mac applications on all LaserJet printers.
- Desktop or compatible printers including all Series II, III and the MacDesk 500. Prints text and graphics at the printer's maximum resolution.

Does not require PostScript. Cable is included. Publisher: Insight Development

$95

Sensible Grammar 2.1

- Would you use a writing checker if it were built in? Sensible Grammar 2.1 makes good writing easier than ever before. Includes a unique Control Panel that adds a Grammar checker to your writing programs (like a spelling checker) when using MultiFinder or System 7. To check a selection, highlight the text to be checked and choose Check Grammar. It automatically runs, checks the selection, returns to the writing program, and pastes in the corrected text. Alerts you to more complex problems, such as unclear sentences, squinting modifiers, and dangling elliptical phrases. It flags objectionable usage ( sexist, racist, colloquial), and vague expressions. In addition, Sensible Grammar works with most popular word processors, including Word, WordPerfect, WriteNow, MacWrite, MacWrite II, and MS Works Write. PageMaker 4.2 and text files.

Publisher: Sensible Software

$55

FontBank PostScript Display Typefaces

The FontBank PostScript Display Typefaces give you a library of 250 typefaces: PostScript display typefaces. Build a versatile type library with designs ranging from the simple sans serif to the extreme ultra serif. Use them to create attractive headlines, subheadings, titles, logos and special effect. Included in the package are traditional decorative, novelty, script, brush and calligraphic faces. Use them as a facotelier to popular text or design programs. FontBank fonts, you get full-featured screen and printer fonts at an affordable price.

Publisher: FontBank

$95

Virtus WalkThrough 1.11

- The latest version of this award winning, 3-D drawing program provides everything you need to quickly capture and explore your ideas in 3-D. Multiple windows and extensive drawing capabilities provide an interactive environment for editing and viewing your ideas. Interactive 3-D presentations, QuickTime® and PICS animated movies and perspective pictures dazzle your audience. Enhanced import of 3-D DXF, PICT, DarwCAD and MacDraw. Enables import of 3-D DIF, 2-D DIF, Darw®, CAD and PICT and EPS. Winner of MacUser's Product of the Year Award 1990.

Publisher: Virtus Corporation

$309

White Knight V.11

- The perfect low-cost solution to almost any Mac telecommunicator's needs. Offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and much more flexible. 275-page user manual is geared to all levels of experience. Winner of 11 awards including MacWorld's World Class Software Award 1987-1991.

Publisher: FreeSoft

COMMODITY

FileGuard

- It's about as much software-based security as you can get in one package. MacUser, March 1992. Protect your hard drive from unauthorized access (including security bypass with a system diskette), copying and erasure, applications and files (including System folder) from unauthorized access, deletion, and/or illegal copying, desktops from alterations by unauthorized users. Keep an eye on system usage with FileGuard's Log which continuously tracks user/system activity. For each protected file, FileGuard keeps a complete log of all operations performed, including creator & owner name, dates of creation, and use attempts at unauthorized access and much more. System 7.0 Compatible. Publisher: ASD Software

$65 ea.

UserLand Frontier

- With UserLand Frontier, you don't have to choose between pretty icons and the power to customize and automate your Macintosh. For the first time, you can have power and ease-of-use. Frontier is the first scripting software that allows you to write your own desktop utilities to customize, automate and simplify the Macintosh. Finally, there's an easy way to write scripts to manage network and diskless 7-compatible applications. Frontier has all the development tools you need to get your scripts running quickly, including a full-featured debugger and structured symbol tables. You can write and edit while your scripts are running. When you're done, you can link scripts into Frontier's powerful menu bar, or save them in the Finder desktop.

Publisher: UserLand Software

$189

ExpertWriter

- ExpertWriter lets you create letters, faxes, memos of your written communications quickly, efficiently and professionally. With ExpertWriter, you can create a letter from start to finish in record time. Type your letter on your own letterhead, right on in the screen. Select an address, and it's inserted into the letter, with the salutation automatically. You can print your letter, with a matching envelope, perfectly formatted with your return address, addressee and postal barcode. Use your custom designed stationery or existing letterhead. Print labels, too! Also includes a built-in 95,000 word spell checker. ExpertWriter does everything in one step except hand it to the mailman.

Publisher: Softsource

$29

Design Your Own Home:

- Design Your Own Home: Architecture, Interiors, or Landscape. Create floor plans, elevations and building plans with structural details that you can hand right to your contractor. Do individual room plans and kitchen/bath designs. Then complete your dream house with graphic landscape plans. Interiors and landscape programs generate side views from top-view perspective. Sample plans are included.

Publisher: Abracadabra

$139

ORDER UNTIL MIDNIGHT(EST) FOR OVERNIGHT DELIVERY

ONLY $3.00
<table>
<thead>
<tr>
<th>Product Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ONET0007 PhoneNET® PILS, SE &amp; II</td>
<td>31</td>
</tr>
<tr>
<td>ONET0019 PhoneNET Slave Controller®</td>
<td>879</td>
</tr>
<tr>
<td>ONET0122 PhoneNET MicroLink®</td>
<td>313</td>
</tr>
<tr>
<td>ONET0034Tirnbank/Rcmolc® 30</td>
<td>125</td>
</tr>
<tr>
<td>OCOM0111 Novelties 1.1 Personal Edition</td>
<td>109</td>
</tr>
<tr>
<td>Insignia (Full line available)</td>
<td></td>
</tr>
<tr>
<td>AMUS018 MtpSaver 2/14</td>
<td>279</td>
</tr>
<tr>
<td>BUSO218 Mfsie Schedule 5 Pack</td>
<td>59</td>
</tr>
<tr>
<td>OBUS0014 Microsoft Works</td>
<td></td>
</tr>
<tr>
<td>OBUS0088 The Microsoft Office 20.4</td>
<td>399</td>
</tr>
<tr>
<td>Now Software</td>
<td></td>
</tr>
<tr>
<td>OBUS0212 Now Up to 128 Single</td>
<td>199</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
POWERUSER PRO SERIES
Hard Disk Drives and Tape Backup Systems

INDUSTRY-RENEWED FOR
RELIABILITY AND PERFORMANCE!
PowerUser Hard Drives have gained industry acclaim for their top
quality, high performance and reliability. The Pro Series carries
on this tradition of excellence, bringing you the latest drive
technology in a newly-streamlined, compact design. The
PowerUser Pro Series drives are shock mounted, so they're safe
and convenient solutions for Mac fanatics on the go, and each
drive features high-quality components from the most recognized
manufacturers in the industry, including Quantum, Archive and
TEAC. And with PowerUser Pro, you get everything you need to
be up and running in no time — plus lots of extras, too!

POWERUSER PRO HARD DISK DRIVES:
CONVENIENT SIZES MEAN AFFORDABLE
SOLUTIONS! Choose just the amount of storage you need,
52, 105 or owhopping 240 Megabytes! Each incorporates a
totaled Quantum drive mechanism, providing incredibly fast
access times· 17 ms or less · or even faster when you use the
handy caching software we've included. Every PowerUser
Pro drive is newly-formatted, and comes with everything you need
to be up in running in a flash, including dual 80-pin SCSI
connectors, SCSI System cable, and an external terminator.
We've even included a disk full of indispensable utilities, to help
you keep your new Pro running at peak performance.
Manufacturer's 2-year warranty.

POWERUSER PRO 52 MB
DRI 0493 ....................................... $399
POWERUSER PRO 105 MB
DRI 0494 ....................................... $599
POWERUSER PRO 240 MB
DRI 0495 ....................................... $999

POWERUSER PRO SERIES CARRYING CASE
This sturdy case is custom made for the PowerUser Pro 52, 105 and 240 MB drives, and also fits the PowerUser Pro Tape Drives (DAI and Personal).

POWERUSER PRO 52 MB CASE ACC 0693 ....................................... $29

POWERUSER PRO TAPE BACKUP
SYSTEMS: STORE IT, TRANSPORT IT, OR
BACK IT UP · FOR ONLY PENNIES PER
MEGABYTE! Whether you need gargantuan Gigabytes or
merely Megabytes, put a Pro on your Mac and you'll have an
 economical solution for archiving, transporting or backing up
your valuable data!

- For Gigabytes, you want DAT · The PowerUser Pro
Digital Audio Tape Drive. This incredible tape drive
incorporates the renowned Archive mechanism, and
uses the latest high speed technology, called "helical-
can," allowing you to store from 1.3 up to an
incredible 8.5 Gigabytes!

- For Megabytes, choose the PowerUser Pro Personal
Tape Drive. Its state-of-the-art TEAC mechanism will
back up a monstrous 160 MB of data · all on one low-
cost data cartridge that's easy to store and a breeze
to transport.

PLUS · To make your backups even faster and easier,
we've included a full copy of Retrospect, the highly-
acclaimed backup software from Dantz Development, with
both our new PowerUser Pro Tape Drives. And, of course,
your first backup tape cartridge is included · on us!

POWERUSER PRO DAT (4MM)
Manufacturer's one-year warranty
DRI 0502 ....................................... $1799
MED 0066: Extra 4mm Data Cartridge
(60 Meter, 1.3 GB, Fuji) ..................... $15
MED 0073: Extra 4mm Data Cartridge
(90 Meter, 2.0 GB, Fuji) ..................... $19

POWERUSER PRO PERSONAL
TAPE DRIVE (160 MB)
Manufacturer's one-year warranty
DRI 0503 ....................................... $799
MED 0072: Extra 160 MB
Data Cartridge ................................ $29

POWERUSER REMOVABLE HARD DISK
DRIVES: FOR THE ULTIMATE IN
"TRANSPORTABILITY" The ideal solution for Mac
users who want their data "to go," PowerUser Removables offer
both the traditional 44 MB or the new 88 MB capacity. If you're
a traveler, just pop out the removable cartridge and take it with
you. If you're stationary, but need your data to travel (even if
it's just back and forth out of your Mac), then these drives are
definitely for you. PowerUser Removables feature industry-
standard Syquest mechanisms, with a space-saving design that
complements all compact Macs. And you get your first 44 or 88
MB cartridge FREE! Manufacturer's 2-year warranty.

POWERUSER 44 MB REMOVABLE
BND 0094 ....................................... $579
MED 0035: Extra 44 MB
Removable Cartridge ..................... $75

POWERUSER 88 MB REMOVABLE
BND 0095 ....................................... $799
MED 0071: Extra 88 MB
Removable Cartridge ..................... $139

1-800-255-6227
Overnight Delivery Only $3.00!
Call 24 hours a day, 7 days a week.
© 1992 Micro Warehouse Inc.

MacWAREHOUSE
Circle 270 on reader service card
Seven whole months have passed since Apple introduced the Macintosh Quadra 900, and you’ve probably lain awake nights wondering when Apple would bring it up-to-date. Lose sleep no more, the Macintosh Quadra 950 is here. The new machine looks like the old one but provides almost a 30 percent performance improvement over the original Quadra 900. The increased performance comes from a faster version of the Motorola 68040 microprocessor and to a lesser extent from speeding up the computer’s interaction with peripheral devices.

The Quadra 950’s built-in video works with 19-inch color monitors and can display thousands of colors (16-bit color) on all sizes of color monitors. Apple’s factory installs 8MB of RAM in all Quadra 950s sold in North America, South America, and the Pacific Rim (in some European countries 4MB is installed). And a high-performance 230MB hard drive supersedes the 160MB drive as the smallest internal hard drive Apple bundles with a Quadra worldwide. (A floppy-only configuration is still available.) The Mac Quadra 700 also gets the 230MB hard drive upgrade but otherwise hasn’t changed. Best of all, the Quadra 950 is priced the same as the 900 (but you get
What's New on the Quadra 950's Logic Board? The Quadra 950 retains the 900's logic board layout, but the new board has some higher-performance silicon. All the parts of the system that connect to the faster system bus operate at a faster speed, and several chips were replaced with faster versions, including (1) the Ethernet controller; (2) the video output DAC (Digital-to-Analog Converter); (3) Video RAM; (4) the video controller; (6) the main memory controller; and (7) a 33MHz 68040. And 8MB of RAM (5) is now the standard configuration on most Quadra 950s.

Beneath the hard drive compartments sits a massive power supply held over from the Quadra 900. This power supply puts out 300 watts of internal power, enough for a full load of internal storage and expansion boards. The power supply configures itself to the local electricity almost anywhere in the world—100 to 240 volts, 50Hz to 60Hz AC.

Infrastructure
All the Quadra 950's improvements are beneath its skin. The new machine retains its predecessor's upright cabinet, three-position key lock (off, on, and secure), disk drive placement, and back panel. On the back panel are ten ports—SCSI, video, ADB (Apple Desktop Bus), Ethernet, modem, printer or LocalTalk, and four sound ports—as shown in "Out Back on the 950." The back panel also has electrical connections and spaces for the connectors of five internal expansion boards.

Inside, the 950 has four disk-drive compartments at the top. Two face the front for the installation of 5½-inch, half-height (or smaller) storage devices with removable media such as floppy disks, CD ROMs, and magneto-optical drives. You can use the two rear-facing compartments together to install one full-height device or two half-height devices. The 950 comes with a standard SuperDrive for floppy disks in the top front compartment. Apple fills one of the 950's rear compartments with a 230MB hard drive (currently made by Quantum), a 400MB hard drive (made by Seagate), or no hard drive. Macworld Lab tests found that the 230MB drive completed the test suite in about 50 percent of the time it took the 160MB drive (1MB mechanism) in the Quadra 900 used for testing.

Along with accelerating the system bus, Apple also raised the I/O (input/output) bus from 16MHz
to 25MHz. As a result, the 68040 can transfer information more quickly to the relatively slow devices connected to the I/O bus, freeing the 68040 for other work and improving overall system performance. The I/O bus handles communication and data transfer with the floppy disk drive and with devices and services connected to the ADB port, sound ports, Ethernet port, and serial ports (including LocalTalk). Accelerating the I/O bus does not speed up many of these devices and services themselves because most of them operate at speeds well below the I/O bus speed. Don't expect a faster SuperDrive, StyleWriter, TelePort ADB modem, keyboard, or mouse. Apple does claim Ethernet can get 20 percent to 30 percent faster throughput on the Quadra 950 than on the Quadra 900 under optimum, but rather unlikely, conditions (transferring files from a RAM disk file server). And in theory, while using digital telephone services such as ISDN (see "Digital Data on Demand," Macworld, February 1992), the Quadra 950 could sustain higher data-transfer rates through the modem port than could other Macs.

Two coprocessors carried over from the Quadra 900 further lighten the 68040's load by taking care of low-level communications with the ADB port, the floppy disk drive, and the serial ports (including LocalTalk networking). Each IOP (Input/Output Processor) is actually a computer with the power of an Apple II on a chip. The IOPs smooth system performance, so, for instance, you experience less mouse jerkiness during floppy disk activity and fewer system slowdowns caused by LocalTalk activity such as printing in the background or someone accessing the hard drive with System 7 file sharing. Only the Quadra 950, Quadra 900, and Mac IIfx have IOPs; the Quadra 700 does not.

Despite the faster system and I/O bus, Apple had to replace only a few chips with faster versions for the Quadra 950's main logic board. They include the main memory controller, video memory, and Ethernet controller. Other chip changes—video controller, video output DAC (Digital-to-Analog Converter), and ROM—provide new video capabilities. Other ROM changes fix two minor bugs. One of the bugs caused obscure rounding errors in floating-point calculations at the 15th digit; the other prevented Ethernet from working properly with more than 16 buffers (8 is the standard number of buffers).

The Quadra 950 uses the same 80-nanosecond RAM SIMMs as do the Quadra 700, Quadra 900, and Mac IIfx. The 950's logic board has 16 SIMM sockets, which you can populate with sets of four 1MB or 4MB SIMMs to get up to 64MB of RAM.

Sound capabilities remain unchanged. Circuitry on the logic board mixes a monophonic signal from sound input through the stereo microphone minijack or through the left- and right-channel line inputs. The 950 plays blended stereo sound through its single internal amplified speaker or stereo sound through a minijack. If you install an internal CD ROM drive, you can connect it internally to the stereo output minijack so you can hear audio CDs played on the CD ROM drive without having to purchase additional external speakers.

**Built-in Video**

LIKE ALL OTHER MACINTOSH MODELS, THE Quadra 950 relies on its microprocessor to draw every pixel on its monitor. The 950 has no graphics coprocessor dedicated to drawing the screen image, nor does it have an I/O coprocessor dedicated to hustling screen images from main memory to video memory.

The Quadra 950 is priced the same as the 900, so you get more for your money

Apple claims that built-in video is 25 to 32 percent faster on a Quadra 950 than on a Quadra 900.

The 950's faster 68040 speeds up video by more quickly processing all instructions, including those related to displaying the screen image, and by more quickly accessing video memory, called VRAM (Video RAM). This faster accessing means the 950 requires faster VRAM—80ns or faster, compared with 100ns or faster on a Quadra 700 or 900. The 950 has 1MB of VRAM soldered onto the logic board, plus SIMM sockets for adding another 1MB.

---

**Out Back on the 950**

There are ten connectors along the side of the Quadra 950's back panel. Near the bottom are covered openings, for the connectors of five expansion boards. Above these openings are electrical power connectors.
With a full 2MB of VRAM installed, the 950's built-in video gives you a new choice for the number of colors in the Monitors control panel—Thousands (16 bits per pixel). You can set this new color depth on any color monitor that works with the 950, including Apple’s 12-, 13-, 16-, and 21-inch color monitors and monitors compatible with them. With 2MB of VRAM you can also set the 12-, 13-, and 16-inch color monitors for millions of colors (24 bits per pixel), as you can on a Quadra 700 or 900. The 16-bit color depth comes close to the photo-realism of 24-bit color but displays more quickly, a strong benefit when viewing QuickTime movies. With 1MB of VRAM, you can display up to 256 colors or shades of gray on any monitor that works with the 950.

Besides the monitors already mentioned, the Quadra 950's built-in video works with 19-inch color monitors that support a 75Hz vertical, 60kHz horizontal refresh rate. (Because Apple offers no 19-inch monitor, there is no Apple standard at this size.) All other Macs, including the Quadra 700 and 900, require a video adapter for 19-inch monitors. Three Apple monochrome displays—the 12-inch, the 15-inch full-page, and the 21-inch—also work with the 950's built-in video. So do some VGA and XGA monitors made for DOS PCs. With an external adapter you can connect an NTSC or PAL television monitor, a video recorder, or other TV equipment to the video port.

Expansion

THE QUADRA 950 HAS THE SAME EXPANSION OPTIONS as the Quadra 900—two SCSI ports, five NuBus slots, and a PDS slot. You can connect up to seven SCSI devices to the pair of high-speed SCSI ports, one internal and the other external. Each of these ports has its own high-speed SCSI controller chip (the NCR 53C96) on the logic board. Having separate controllers isolates internal SCSI devices from the performance-sapping effects of long external cable runs and slow external devices such as scanners. Apple claims that on the Quadra 900, the 53C96 SCSI controllers can achieve data-transfer rates of 4MB per second. Theoretically the 950 can transfer data at more than 5MB per second, exceeding the throughput of all but the fastest hard drives you can buy today. Moreover, all Quadras including the 950 could attain even higher data-transfer rates if Apple would revise the SCSI Manager part of the system software to take advantage of the new SCSI-2 standard (for more on SCSI, see Getting Started, May 1992). By modifying the SCSI Manager, Apple could also allow up to 14 SCSI devices to connect to the 950's dual SCSI ports.

You can add five expansion boards to the Quadra 950's logic board, which has five NuBus slots and one PDS slot. One NuBus slot lines up with the PDS slot; you can use one or the other but not both. The PDS slot connects directly to the system bus and therefore presents a potential compatibility problem. PDS boards made for the 25MHz system bus in the Quadra 700 and 900 could experience timing problems with the 33MHz system bus in the Quadra 950, although these hadn't surfaced by press time.

The 950's system bus speed poses no compatibility problem for NuBus boards, which operate on a separate synchronous bus whose speed the NuBus standard pegs at 10MHz regardless of the host Mac's asynchronous system bus speed. The NuBus slots all connect to the system bus indirectly through control-
If you already have a Quadra 900, 

paying for the 950 upgrade will hurt

extensions to Apple's NuBus convention begun by the Quadra 900. Two NuBus slots have extra electrical power, 25w instead of the usual 15w. All five NuBus slots have room for boards 2 inches taller than normal, offering developers room to add expanded capabilities.

Software and Compatibility

NONE OF THE QUADRA 950'S IMPROVEMENTS REQUIRE A NEW VERSION OF SYSTEM SOFTWARE. Like the Quadra 700 and 900, the 950 comes with System 7.0.1 and will not work with an earlier version. You can also run A/CUX 3.0 on the 950.

The 950 also comes with Cache Control, Apple's control panel for making a Quadra compatible with software that trips over the 68040's copy-back cache (explained in "The Quadra Quandary," March 1992). Apple is convinced the 68040 cache problem will go away as developers upgrade application programs, and developers have been busy the past seven months proving Apple mostly right. Still, there will always be incompatible programs that people will want to use with a Quadra. Two companies offer more sophisticated control panels than Apple's Cache Control for those who need to run an application that isn't compatible with the copy-back cache.

Whereas Cache Control insists you restart the Quadra to turn off the 68040's cache (concomitantly reducing the Quadra's performance to the level of a IIci), the Animals control panel from Impulse Technology and the Quadra Compatibility INIT 3.0 from Alysis Software Corporation let you designate an alternate 68040 cache setting, write-through, that Impulse cites as its reasons for not allowing on-the-fly cache changes in Cache Control.

Value

WITHOUT QUESTION THE QUADRA 950 IS THE FASTEST, most flexible Mac you can buy. If you already own one of the Mac II models and want more speed, should you trade up? Perhaps not, considering you can accelerate a Mac II-family machine's performance to almost equal that of a Quadra 950 for less money. For example, an accelerated IIci—with 8MB of RAM, a fast 230MB hard drive, an E-Machines ColorLink SX/T video accelerator with an Ethernet port, and a Radius Rocket 33—kept pace with a Quadra 950 in virtually all Macworld Lab tests (see "How Fast Is a Quadra 950?"). Yet this upgrade package lists for about $3600 (street prices) less than a Quadra 950. (For a complete discussion of accelerator options, see "The Need for Speed," June 1992.)

What the lab tests don't tell you is how much faster a Quadra 950 (or any Quadra) can be if you couple it with a hard drive that can sustain data transfer at 4MB to 5MB per second. That rate is much faster than the SCSI transfer rate of the 230MB and 400MB drives that Apple currently stuffs into Quadras (about 2MB per second); it's also faster than the transfer rate of any type of Mac II (about 1.6MB per second). Remember that the Quadra 950 has other speed advantages—mostly theoretical right now—including SCSI-2 capability, partial NuBus 90 implementation, and a 25MHz I/O bus. An accelerated Mac II also lacks the Quadra 950's bigger power supply, its taller NuBus slots, and its four compartments for internal storage devices. None of these advantages show up in the lab tests.

If you have been planning to buy a Quadra 900, the 950's extra performance, memory, video capabilities, and hard drive space and performance at no extra cost will be welcome surprises. If you already have a Quadra 900—ouch! Paying for the 950 upgrade will hurt. When deciding whether to upgrade, estimate how much time you wait while your Quadra 900 displays, calculates, or does other work, and multiply that estimate by 30 percent to approximate how much time the 950 upgrade will save you. Then divide the upgrade cost (which Apple hadn't decided at press time) by the value of that saved time to calculate how quickly the upgrade will pay for itself. If your 900 doesn't keep you waiting now, pretend the 950 upgrade doesn't exist and save your upgrade money until a faster upgrade option comes along.

The improvements Apple has made in the Quadra 950 keep the top-of-the-line Macintosh competitive with computers from other manufacturers. Although its motives weren't altruistic, Apple deserves credit for giving its customers quick access to increased performance made possible by very recent advances in microprocessor technology.

See Where to Buy for contact information.
Imagine this. You're representing a corporation with the most exciting product on the market. You have total control. Every slide is in position, every desk has a handout. You explain a few ideas on the fly. But something's not working, you're restless. Where did you go wrong? The problem isn't with you are presenting.

Creating Static Presentations

Almost since its inception, the Macintosh presentation market has largely consisted of the three Ps: Microsoft PowerPoint, CA-Cricket Presents, and Aldus Persuasion. All three programs allow you to print slides and overhead projections, generate speaker's notes that you can use to guide your presentation, and organize slides into handouts that audience members can take home with them and study at their leisure. Slides or overheads, speaker's notes, and handouts make up the cornerstones of the traditional presentation formula. But the formula, and the programs that subscribe to it, is showing signs of age. In fact, in the two years since we last looked in on the presentation arena ("Here's the Pitch," Macworld, March 1990), only Persuasion has made any discernible improvements. But new products have entered the market to challenge these packages: Vividus's Cinemation, InfoTouch Marketing Corporation's InfoLynx, Macromedia's Magic, and Meyer Software's On The Air, while Symantec Corporation's More has evolved into a formidable competitor.

PowerPoint Microsoft PowerPoint is especially antiquated, providing no more than a bare-bones environment for combining text and graphics. A do-it-your-
You're a presenter representing a million-dollar program are thoroughly organized, well groomed, and in even rolled in a chalkboard in case you have to presentation is falling flat, your audience seems you. The problem is with the stagnant images
self philosophy pervades the program's environment to the extent that even its automated features, like the master-slide layer, require much busywork. Here's how it works. Elements placed on the master slide are duplicated throughout all slides in the presentation. However, of these elements, only the title can be modified from one slide to the next; all other master-slide elements are static. As a result, you have to create, position, and format text and graphics manually for each and every slide. Honestly, PowerPoint relies so heavily on the work ethic of the user that only a Puritan would find the program acceptable.

CA-Cricket Presents CA-Cricket Presents is slightly better than PowerPoint in offering automatic ways to do repetitive tasks. Most notably, it offers an ingenious built-in spreadsheet with charting capabilities that match those provided by Persuasion and More. Although Presents doesn’t offer much room for creativity, it makes the creation of basic charts and tables straightforward and effortless. Upon your clicking or dragging with the graph tool, Presents walks you through the creation and formatting of spreadsheet data, axes labels, and markers.

Presents also automates the creation of entire presentations. You can import one or more templates, customize them, and apply them to a range of slides. But more impressive is the Auto Present feature: after creating an outline using a separate application—such as Acta, a desk accessory that comes bundled with Ppt—and copying the outline to the Clipboard, you can instruct Presents to paste the outline and build slides according to its contents.

But while this step-by-step approach to creating presentations accommodates novices, its lack of automated editing capabilities dismays professionals. You can’t apply a new template to existing text. You can’t make a change to an outline and instruct Presents to update the slides accordingly. You can’t even edit the contents of the background—the Presents equivalent of the master-slide layer—from a slide in the presentation. In these respects, Presents is no better than PowerPoint.

Aldus Persuasion Aldus Persuasion provides an all-in-one presentation studio in which each element of a presentation—outline entries, slides, notes, handouts, and charts—is dynamically linked to the others. Take the built-in outline as an example. Each entry in the outline corresponds directly to a title or entry in a slide. Any change made to the outline affects the composition of the slides, and any change to a slide affects the entries in the outline.

Persuasion’s AutoTemplates transcend the scope of templates associated with most other applications, presentation or otherwise. When you import an AutoTemplate, you actually import several complementary templates at a time, all of which are made available in a pop-up menu at the bottom of the slide window. If you don’t care for the appearance of the current slide, simply choose a different template option and Persuasion automatically reformatates all text and graphics to fit the new layout. Each template serves as a separate master slide. But unlike PowerPoint and Persuasion, Persuasion lets you change the placement and formatting of text and graphics on the current slide if you do not like the way they were assigned by the template. Equally impressive, each master slide is equipped with a separate background that can be swapped or shared with other master slides in the AutoTemplate. Unlike template elements, background elements can only be edited from the background layer, making the background elements perfect for positioning borders, logos, and other presentation constants.

Adding Limited Motion ALL OF THE FEATURES I HAVE DISCUSSED SO FAR WERE DESIGNED SPECIFICALLY TO ACCOMMODATE THE CREATION OF STATIC SLIDES AND OVERHEAD TRANSPARENCIES. IF YOU WANT TO ADD MOTION TO YOUR PRESENTATION, THE COMPUTER SCREEN IS YOUR MEDIUM OF CHOICE.

The most common screen effect is the transition. A transition dissolves the current slide into the next. One slide, for instance, may wipe over another, grow outward from the center of the screen, or fade out of view. Transition effects are widely popular. Of the programs covered in this article, only PowerPoint and InfoLynx lack transition options.

But despite their general acceptance, transition effects add little to a presentation. Since well before the advent of personal computers, presenters achieved similar effects using two slide projectors directed at a single screen: the slide from projector A faded out while the slide from projector B faded in. Although computer presenters have a wider range of transition effects at their disposal, none improves one whet on the double-projector technique. Several programs go a step further by offering automated build, a term for the gradual buildup of text and graphic elements in an on-screen slide show.

More One such builder, Symantec’s More, has grown from a dedicated outliner into a respectable presentation program. More allows you to display subheads one after another within a single slide. You may also dim subheads before and after they have been read, define the length of time that each subhead appears, and use a transition effect to specify the manner in which the subhead fades into view.

Persuasion More is outmaneuvered by Persuasion, the rival builder. In More, you must build lines of text sequentially; you can’t build up graphics at all. In Persuasion, you define builds by using layers, in which all elements on layer 1 appear first, all elements on layer 2 appear second, and so on. You can even create stilted animation effects by overlapping one graphic onto another (see “Creating a Build in Persuasion”).
Adding Animation

IF YOU HAVE SOMETHING MORE SPIRITED in mind, then you may want to forgo the traditional crowd in favor of the recent crop of presenters with animation capabilities. On The Air and Cinemation both offer easy-to-use animation and the ability to upgrade existing presentations. Magic provides straightforward animation capabilities but cannot import presentations from other programs. None of these programs provide a built-in outliner or an automated charting function. And all three offer shamefully deficient text-handling capabilities—no leading control, no manual kerning. But each simplifies the animation process so skillfully that you'll soon find yourself propelling type and graphics with the greatest of ease.

On The Air On The Air emulates the slide metaphor employed by Persuasion and the other traditional presenters. Within each slide, you can create and import text and graphics. You may then specify the direction in which each element moves by drawing a path with one of the line tools. A dialog box lets you rotate and flip an element as it moves across the screen. You can also specify the moment at which an element debuts in a slide, when it disappears, and how quickly it moves. If you like, you can highlight each movement by adding pre-recorded sounds.

On The Air imports the contents of the Scrapbook, so it’s perfect for adding animated effects to presentations created in PowerPoint, Persuasion, or Presents (all of which export to the Scrapbook). On The Air also comes with a run-time player utility in case you want to distribute your animated presentations on disk. Although I met with some minor bugs when using the program—it wouldn’t run properly when using my Iici cache card, for example—and the manual cries out for an index, On The Air provides a tidy collection of options for only $175.

Magic If you're looking for something with a wider range of animation capabilities, Magic may better meet your needs. Magic organizes text and graphics into scenes, which are analogous to the slide metaphor used in the traditional presentation programs. All animation effects take place within scenes by moving objects, called actors. In addition to a wide array of drawing tools, Magic is the only program except More to provide Bézier-type curve editing. By contrast, On The Air has only rudimentary tools. Also, Magic is alone in allowing you to reshape basic objects, like rectangles and ellipses. To define the appearance of an object, you may fill it with a flat color or, uniquely, with an imported PICT image. To an extent, this helps to offset Magic's inability to create gradations, since you can make a gradation in a color paint program, save it as a PICT file, and then insert it into a Magic object.

As in On The Air, Magic lets you animate a sequence by drawing paths of movement. By default, an object begins moving slowly, accelerates into the middle of the move, and decelerates as it comes to a stop, which affords the move a gradual, natural appearance. But if you prefer, you may use Magic’s Cue palette to make an object move at a constant speed. You may also assign transition ef-

Presentation Alternatives

Most of the programs discussed below already have a steady day job, but they moonlight as presenters, with varying degrees of success.

The first of these are the draw programs MacDraw Pro 1.0v1 and Canvas 3.0 ($399 apiece). In both programs, you can convert a drawing so that each layer becomes its own slide. You may then set how long each slide displays and play them in order. That's the extent of Canvas's capabilities. MacDraw Pro goes a little further. You can assign the first layer as the master slide so that it appears in the background behind all the others. You can also print multiple slides per handout. But you can’t document the handouts or create speaker's notes. And neither program provides charting functions, outline capabilities, or even transition effects, making them poor solutions for anyone who creates presentations on a regular basis.

If you find yourself presenting numbers more often than textual information, you may want to turn your attention away from dedicated presentation programs in favor of dedicated graphing programs, including GraphMaster ($295), KaleidaGraph ($249), and DeltaGraph Professional ($295).

3-D Trends This three-dimensional ribbon chart was created with DeltaGraph Professional to portray market trends in major urban areas.

All three offer enough charting features to put a spreadsheet alternative like Microsoft Excel or Wingz to shame, and all three let you output high-quality color slides. GraphMaster provides a custom template option that can be used to design handouts and speaker’s notes. KaleidaGraph facilitates the creation of common slide types by automatically generating a macro that describes an existing chart so that you can apply that same look to new data. But so far as graphing presenters are concerned, DeltaGraph Professional is the clear winner.

Of the three graph programs, DeltaGraph is the only one capable of generating true three-dimensional charts with x, y, and z axes. If that’s not enough, DeltaGraph offers transition effects, a built-in spelling checker, a slide sorter, and QuickTime support, all of which are missing from GraphMaster and KaleidaGraph. In fact, if you are a scientist first and a presenter second, I recommend DeltaGraph over any other program covered in this article.

The third group of presentation alternatives includes what I will call, for lack of a better term, the HyperCard solutions. Presentation Passport from Computer Solutions enables the busy presenter to track and catalog information about presentations conducted from Digital Concepts, $125 if purchased directly from the author). Designed specifically for creating on-screen slide shows, this fantastic little product will meet the needs of most users equipped with a compact Mac. In HyperKit Emcee, you can import a tab-delimited ASCII outline, select default transition and sound effects, and automatically generate a fully functioning HyperCard stack.

You navigate the stack by clicking on buttons associated with outline titles and entries. With very little effort, you can even link a button to a menu command or an external document, making Emcee an ideal tool for creating product demonstrations. Best of all, the program's design is so straightforward, it took me less than 30 minutes to get up and running. Though it lacks color and animation features, HyperKit Emcee warrants serious consideration from the presenter on a budget.
### GENERAL

<table>
<thead>
<tr>
<th>Company</th>
<th>Aldus Persuasion 2.1</th>
<th>CA-Cricket Presents 2.1</th>
<th>Cinemation 1.0</th>
<th>InfoLynx 1.0</th>
<th>Magic 1.0</th>
<th>Microsoft PowerPoint 2.01f</th>
<th>More 3.1</th>
<th>On The Air 1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$495</td>
<td>$199</td>
<td>$499</td>
<td>$295</td>
<td>$395</td>
<td>$395</td>
<td>$175</td>
<td></td>
</tr>
<tr>
<td>Bundled utilities</td>
<td>none</td>
<td>Acta 1</td>
<td>none</td>
<td>none</td>
<td>QuickPIC2</td>
<td>SmartScraper</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Automated templates</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Run-time player</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Service bureau drivers</td>
<td>none</td>
<td>Autograph</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Built-in outliner</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Prints speaker's notes and handouts</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Slide sorter</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Number of view sizes</td>
<td>6</td>
<td>9</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Master-slide option</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Supports Events Manager and IAC</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Help (on-line/balloon)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

### TEXT HANDLING

| Spacing (leading/paragraph) | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 | 0/0 |
| Manual kerning             | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Tab stops                  | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Style sheets               | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Spelling checker/thesaurus | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Search and replace         | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Special text effects       | shadow | shadow | compress, rotate | none | none | none | none | shadow, depth | rotate |

### GRAPHICS HANDLING

| Number of drawing tools    | 7    | 10   | 8    | 0    | 8    | 4    | 6    | 6    | 6    |
| Align objects/group objects | yes | yes | yes | yes | yes | yes | yes | yes |
| Gradient backgrounds       | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Color capabilities         | 24-bit | 24-bit | 24-bit | 24-bit | 24-bit | 24-bit | 24-bit | 24-bit | 8-bit |
| Clip art package included  | 3G Graphics | PicturePak | in-house | in-house | SwivelArt, ClipMedia | in-house | ClickArt | none |

### CHARTING CAPABILITIES

| Number of transition effects | 14   | 12   | 20   | 0    | 12   | 0    | 23   | 4    |
| Dual monitor support        | yes | yes | yes | yes | yes | yes | yes | yes |
| Automated builds in one frame | yes | yes | yes | yes | yes | yes | yes | yes |
| Animation capabilities      | yes | yes | yes | yes | yes | yes | yes | yes |
| Sounds (record/import/play) | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Interactive frame linking   | yes | yes | yes | yes | yes | yes | yes | yes | yes |

### ON-SCREEN PRESENTATIONS

| To help you get started, Magic supplies a tidy collection of presentation templates complete with animation effects. The upcoming version 1.1 will support QuickTime, but not the Scrapbook; in light of Magic's inability to import a presentation from any of the three P's, I have to wonder how many longtime users will take to a program that requires you to recreate your staple presentations from scratch. If you currently use Persuasion or one of the others and your primary interest is to spice up old slides with new activity, I prefer Cinemation. Cinemation To create images, Cinemation comes equipped with its own 24-bit painting environment. It pales by comparison to most dedicated paint programs—it provides no antialiasing to create soft edges, no magic wand to select areas of like color, and no way to create custom text effects—but so far as presentation programs are concerned, Cinemation's paint mode is as good as it gets. When animating, Cinemation abandons the slide/scene metaphor used by other programs in favor of a straightforward collection of frames. Each segment in an animated sequence gets its own frame; each frame may be edited on its own and displayed for any length of time. To animate a painted image or text object, you have one of three choices. First, you can create an object in one... |
frame, transform the object in another frame, and automatically fill the in-between frames with transitional images to create a smooth sequence. Second, you can record the movement, scaling, rotation, or cropping of an image in real time. Cinema creates the frames automatically. Third, you can draw frame-by-frame animation by hand (called cel animation). Though this process is necessarily time-consuming, Cinema facilitates cel animation by supplying dimmed images of the previous frames that act as visual guides.

Updating an existing presentation with Cinemation is remarkably easy. You just import presentations (created in PowerPoint, Persuasion, or Presents) that are saved as Scrapbook files (see “Making Presentations Move”). Cinema then converts each slide into an individual frame, and provides AutoMotion templates for automatically making text and graphics move on screen. To use an Auto-Motion template, you select a kind of movement from the AutoMotion menu, such as Move Left, and Cinema makes each of the objects (usually bullet points) fly out of the right margin of the screen to their proper place on the slide. As part of this automatic process, Cinema creates all necessary frames for the completion of the animated sequence.

Adding Interactivity

While animation serves to enliven presentations, interactivity serves to make them more user friendly. Self-running presentations have long been a staple of trade shows and kiosks. Elevating the viewer from passive onlooker to active participant, however, has proved something of a problem. The choices have been prohibitively expensive (HyperCard by itself). And both choices (usually bullet points) fly out of the right margin of the screen to their proper place on the slide. As part of this automatic process, Cinema creates all necessary frames for the completion of the animated sequence.

EDITORS' CHOICE

Slide Presentation

Aldus Persuasion 2.1 Persuasion offers layered builds and automated templates, has a proven track record, and has recently introduced full support for System 7, including QuickTime. Company: Aldus Corporation. List price: $495.

Animation Only

On The Air 1.0 Straightforward and inexpensive, On The Air boils down the process of animating Scrapbook presentations into a handful of well-chosen options. Company: Meyer Software. List price: $175.

Animation and Interactivity

Cinemation 1.0 Cinema creates real-time recording, scaling and rotation animation, custom frame linking, and support for QuickTime movies. Company: Vividus. List price: $495.

Adding bonus, InfoLynx saves all files as self-running applications, so they may be run on any machine without using InfoLynx or a run-time version of the program. (This also prevents viewers from modifying your work.)

Unfortunately, that's all the good news I have to convey about InfoLynx. The interface is insanely complicated. Considering the fact that the program does nothing but create slides, link slides, and save them to disk, its 58 commands and 5 work modes must be some kind of record. The manual is generally well organized, but it lacks an index. There is no online help. So for now, InfoLynx is little more than a good idea.

Magic Links More straightforward and more versatile frame linking is available to users of Magic and Cinemation. In Magic, you may assign a link in response to a pause or a click. For example, you might instruct Magic to proceed to the next scene if the presentation remains idle for 60 seconds. You may also define any object to be a button. There's even an option that lets you play an external PICS movie and return to the current frame.

Cinemation Linking Because Cinema lets you link any single frame to any other frame in a presentation, it is easy to set up a simple navigation system in your presentation. As with Magic, you can initiate a link when the viewer clicks on a button. You can also link upon the completion of a sound or QuickTime movie or when the viewer clicks anywhere on screen. After the prescribed action, Cinema can transfer to any named frame, it can open and play a different presentation stored on disk, or it can interrupt playback.

After you have created your link, Cinemation displays a small icon in that frame so there's no question of where you've put a link in your presentation. When you double-click on the link icon, a dialog box appears telling you where the link will take you and allowing you to modify the link if you so desire. In Magic, by contrast, there's no visual reference when, where, or if you've set a link.

And keep your eye out for Interactive Solution's MovieWorks, which is designed to allow you to create animated, interactive presentations and QuickTime movies and is due to ship in late May.

The Perfect Presentation System

If you want to cover all of the bases—slide presentation, animation, and interactivity—you can't do better than the joined forces of Aldus Persuasion and Cinemation (combined list price: $990). If you're looking for something a little less expensive and you're willing to sacrifice interactivity, you might try out More with On The Air (combined list price: $570). Though it lacks the power of Persuasion's AutoTemplate feature, More is far and away a better product than either PowerPoint or Presents.

See Where to Buy for contact information.

DEKE MCCLELLAND imagines himself touring nationally with large-screen monitors to promote his books Macintosh System 2: Everything You Need to Know and Macintosh A to Z (both Sybex, 1992).
These monitors—(clockwise from top) the Radius TPD/24, Radius Pivot, and RasterOps 19" Mono/Gray Scale—topped our recommendations because of their clear, clean image quality.
COLOR MAY BE ENTICING, but it is not always appropriate. If you work primarily with text or desktop published documents that lack color, you may sacrifice speed, convenience, and a bundle of cash to use a color display.

Macworld Lab tested 22 portrait or two-page monochrome monitors, both black-and-white and gray-scale. The findings show clearly that not all monitors are created equal—although the monochrome display is a mature technology, there remain significant differences among vendors' offerings.

Macworld Lab found that the biggest differences were due to video boards, not the monitors themselves, since only a handful of companies actually manufacture monitors components. Four such manufacturers—Clinton, Hitachi, Philips, and Toshiba—account for all the CRTs (cathode-ray tubes) used in Mac monochrome displays, with Clinton and Philips accounting for the vast majority. Another four companies—Display Technologies, Hitachi, Ikegami, and Triam—supply most of the electronic components that control the CRT and interpret the signals coming from the video board.

The many vendors in the display market differentiate their display systems by how well their boards control those displays. About half of the vendors use boards they designed, while the other half use boards made by Lapis Technologies, which tailors boards for each vendor (see "Monochrome Monitor Features"). The Lapis boards differ primarily in the video-signal rate and pattern, which are slightly different for each vendor's monitor.

Theoretically, video boards can generate dramatic differences in monitor display quality, since that quality directly depends on the information coming

BY GALLEN GRUMAN
Black & White Monitors

Monochrome Monitor Tests

<table>
<thead>
<tr>
<th>Monochrome Monitor Tests</th>
<th>Maximum Brightness</th>
<th>Contrast Ratio</th>
<th>Distortion</th>
<th>Gray Linearity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Portrait</strong></td>
<td>Most people prefer a brighter monitor. We turned up the screen's brightness as high as it could go without showing scan lines. A reading of less than 20 footlamberts is considered dim; most monitors are much brighter.</td>
<td>The better the contrast, the better you can see details in both light and dark areas of an image. We calculated the ratio between the luminance of white and black squares at several spots on the screen. Six or higher is good.</td>
<td>A monitor's level of distortion determines how geometrically correct an object appears on screen—a 1-inch square should appear as a perfect square, not some other kind of rectangle. A measurement of 0 is perfect.</td>
<td>Gray linearity shows how well a monitor displays shades of gray. The ideal monitor produces, say, 60 percent gray when the user specifies 60 percent gray for an image. A measurement of 0 (no difference from ideal) is perfect.</td>
</tr>
<tr>
<td></td>
<td>Longer bars are better.</td>
<td>Longer bars are better.</td>
<td>Shorter bars are better.</td>
<td>Shorter bars are better.</td>
</tr>
<tr>
<td>Macintosh 12&quot; Monochrome*</td>
<td>35.8</td>
<td>7.9</td>
<td>5</td>
<td>76.8</td>
</tr>
<tr>
<td>Apple Macintosh Portrait</td>
<td>41.9</td>
<td>7.7</td>
<td>4</td>
<td><strong>22.9</strong></td>
</tr>
<tr>
<td>Cutting Edge 15&quot; Full Page Grayscale</td>
<td>39.7</td>
<td>7.0</td>
<td>3</td>
<td><strong>93.6</strong></td>
</tr>
<tr>
<td>Ehrman 15&quot; Full Page Monochrome</td>
<td>32.0</td>
<td>6.0</td>
<td>3</td>
<td><strong>101.7</strong></td>
</tr>
<tr>
<td>Generation Analog Full-Page</td>
<td>23.4</td>
<td>6.3</td>
<td>2</td>
<td><strong>32.2</strong></td>
</tr>
<tr>
<td>Miror Portrait</td>
<td>37.5</td>
<td>6.5</td>
<td>2</td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Mobius One Page</td>
<td>34.5</td>
<td>6.3</td>
<td>2</td>
<td><strong>55.8</strong></td>
</tr>
<tr>
<td>Radius Full Page</td>
<td>47.6</td>
<td>5.9</td>
<td>2</td>
<td><strong>32.2</strong></td>
</tr>
<tr>
<td>Pivot</td>
<td>48.5</td>
<td>5.9</td>
<td>2</td>
<td><strong>101.7</strong></td>
</tr>
<tr>
<td><strong>Two-Page</strong></td>
<td><strong>64.3</strong></td>
<td><strong>6.1</strong></td>
<td><strong>3</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>CalComp DrawingCard GrayVision</td>
<td>26.8</td>
<td>3.7</td>
<td><strong>5</strong></td>
<td><strong>55.8</strong></td>
</tr>
<tr>
<td>Mass Microsystems Rival 19&quot; Gray Scale</td>
<td>32.3</td>
<td>3.7</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Mass Microsystems Rival Monochrome</td>
<td>32.1</td>
<td>4.0</td>
<td><strong>5</strong></td>
<td><strong>55.8</strong></td>
</tr>
<tr>
<td>Mirror 19-inch Two-Page</td>
<td>39.0</td>
<td>4.3</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Mobius Two Page</td>
<td>43.1</td>
<td>3.9</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Nutmeg 19</td>
<td>38.8</td>
<td>4.3</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Radius PTO/19</td>
<td>39.2</td>
<td>4.1</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Radius TPD/21</td>
<td>36.4</td>
<td>5.9</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>RasterOps 19&quot; Mono/Gray Scale</td>
<td>34.5</td>
<td>6.7</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>RasterOps 21&quot; Mono/Gray Scale</td>
<td>35.4</td>
<td>4.0</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Relax Ikegami Gray Scale</td>
<td>33.0</td>
<td>3.8</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Sigma Designs L-View MultiMode</td>
<td>36.2</td>
<td>3.9</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>Sigma Designs SilverView</td>
<td>33.4</td>
<td>5.7</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
<tr>
<td>SuperMac 21&quot; Platinum Two-Page</td>
<td>36.5</td>
<td>6.7</td>
<td><strong>5</strong></td>
<td><strong>161.6</strong></td>
</tr>
</tbody>
</table>

* Although it is not a portrait monitor, Apple's Macintosh 12" Monochrome is included as a reference point.

** Black-and-white monitors do not display gray, so no values are shown.

For brightness and contrast longer bars are better. For distortion and gray linearity, shorter bars are better. For ELF the lighter the bar the better. The best result in each test is indicated in red.
page monitors that use built-in video, the amount of video RAM (VRAM) needed increases based on the resolution. Any Quadra with 1MB of VRAM lets you display 256 levels of gray, while a Quadra 700 with the default 512K of VRAM limits you to 16 levels. (A Quadra 900 and 950 come standard with 1MB.)

The built-in video reduces the total cost of a display system, since you need buy the monitor only. But there are some trade-offs: a video board works more quickly than built-in video because it is optimized for a specific monitor, it usually includes VRAM, and it supports more levels of gray for gray-scale monitors.

Generally, a video board increases speed by 50 to 75 percent compared to built-in video, except on the Quadras, where the speedup will be about 25 percent, since the Quadras’ built-in video is more efficient than that of other Macs. The more text-oriented your work, the less speedup you’ll see. If you plan to work primarily with text—with word processors or spreadsheets—the speed of the built-in video is fine.

If you work extensively with scanned gray-scale images, such as photographs, strongly consider getting a video board with a graphics accelerator to manage all those pixels fast enough to keep up with your work. Most such boards are designed for color monitors but will also work with gray scale. If you go this route, you need an 8-bit—not a 24-bit—board to get 256 levels of gray tones.

Interpreting the Tests

Because display manufacturers have years of experience designing and building monitors and video boards, the differences between monitors are not very sharp—quality usually ranges from good to excellent. Keep this in mind when looking at the results from the Macworld Lab tests. They point out measurable physical differences that are not always perceptible or critical. Subjective issues like amount of glare, color cast, or position of controls—as well as support and service—should be your primary concerns in selecting a monitor.

The Macworld Lab tests do give you an indication of the companies’ technical standards, which is a good indication of overall commitment to quality. A company whose display’s quantifiable performance differs significantly from that of its competitors’ display either is a cut above or is cutting corners.

That’s not to say the Macworld Lab results bear no relationship to perceived quality—a monitor that varies wildly from proper gray levels in a gray-linearity test, for example, will have noticeably inferior display quality.

Although most monitors vary from the ideal, they fall within a range that most people find acceptable. A good example of this is distortion. Most monitors are off by at least 1/4 inch, or nearly 2 percent, yet this amount of distortion is not noticeable. If you have specialized needs, such as minimal distortion across a screen because you are making fine measurements of viewed images, then the Macworld Lab results for areas like distortion will become more important to your evaluation of the best monitor.

ELF Emissions

The bars show the change in emission levels of extremely-low-frequency electromagnetic emissions as one gets farther from the monitor; the more intense the color, the more intense the emissions. Measurements of less than 1 milligauss (mG) are too weak compared with normal background emission levels to be measured accurately. Instrument accuracy is ±0.2mG. We tested ELF emissions with a Combinova MFM-10 meter from Ergonomics of Southampton, Pennsylvania.

If you work extensively with scanned gray-scale images, such as photographs, strongly consider getting a video board with a graphics accelerator to manage all those pixels fast enough to keep up with your work. Most such boards are designed for color monitors but will also work with gray scale. If you go this route, you need an 8-bit—not a 24-bit—board to get 256 levels of gray tones.

Interpreting the Tests

Because display manufacturers have years of experience designing and building monitors and video boards, the differences between monitors are not very sharp—quality usually ranges from good to excellent. Keep this in mind when looking at the results from the Macworld Lab tests. They point out measurable physical differences that are not always perceptible or critical. Subjective issues like amount of glare, color cast, or position of controls—as well as support and service—should be your primary concerns in selecting a monitor.

The Macworld Lab tests do give you an indication of the companies’ technical standards, which is a good indication of overall commitment to quality. A company whose display’s quantifiable performance differs significantly from that of its competitors’ display either is a cut above or is cutting corners.

That’s not to say the Macworld Lab results bear no relationship to perceived quality—a monitor that varies wildly from proper gray levels in a gray-linearity test, for example, will have noticeably inferior display quality.

Although most monitors vary from the ideal, they fall within a range that most people find acceptable. A good example of this is distortion. Most monitors are off by at least 1/4 inch, or nearly 2 percent, yet this amount of distortion is not noticeable. If you have specialized needs, such as minimal distortion across a screen because you are making fine measurements of viewed images, then the Macworld Lab results for areas like distortion will become more important to your evaluation of the best monitor.
A group of Macworld editors subjectively assessed the displays' brightness, contrast, clarity, and fidelity (how closely an on-screen image matches the original; for example, how well grays match the levels specified, and how geometrically correct various shapes appear), as well as glare and the accessibility of the displays' controls.

Antiglare displays require a trade-off in image quality, since common coatings blur pixels, making fine images fuzzy. Shields from Optical Coating Laboratories (offered by Mass Microsystems, for example) don't blur the image but are expensive and lower brightness. Most vendors prefer not to use antiglare coatings and expect users to close window blinds or use indirect lighting to reduce glare.

My final recommendations are based on a combination of the Macworld Lab test results, the subjective evaluations, service and support information, and the displays' pricing.

### Evaluating Portrait Displays

For PORTRAIT DISPLAYS, WE LOOKED AT PRODUCTS from Apple, Cutting Edge (and its sister company, Ehman), Mirror Technologies (and its sister company, Generation Systems), Mobius Technologies, and Radius. All show 640 by 870 pixels—enough to display a full letter-size page. At press time, Ehman/Cutting Edge had closed. Discussions were

### MONOCROME MONITOR FEATURES

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Tested</th>
<th>Price</th>
<th>Built-in Video Supported</th>
<th>Video Board Price</th>
<th>Macintoshes Supported</th>
<th>Diagonal Size of Screen (in inches)</th>
<th>Active Screen Area (w x h, in inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PORTRAIT DISPLAYS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple Computer</td>
<td>Apple Macintosh Portrait Display</td>
<td>●</td>
<td>$1099</td>
<td>○</td>
<td>$899</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>Cutting Edge 15&quot; Full Page Monochrome Display</td>
<td>○</td>
<td>$899</td>
<td>●</td>
<td>$799</td>
<td>II series, Quadras</td>
<td>15</td>
<td>7.8 x 10.5</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>Cutting Edge 15&quot; Full Page Gray Scale Display</td>
<td>○</td>
<td>$549</td>
<td>●</td>
<td>NA 1</td>
<td>II series, Quadras</td>
<td>15</td>
<td>7.8 x 10.5</td>
</tr>
<tr>
<td>Ehman</td>
<td>Ehman 15&quot; Full Page Monochrome Display</td>
<td>○</td>
<td>$495</td>
<td>●</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Ehman</td>
<td>Ehman 15&quot; Full Page Gray Scale Display</td>
<td>○</td>
<td>$495</td>
<td>●</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Generation Systems</td>
<td>Generation Analog Full-Page Display</td>
<td>○</td>
<td>$795</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Lapis Technologies</td>
<td>Lapis Full Page Display</td>
<td>○</td>
<td>$899</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Lapis Technologies</td>
<td>Lapis Gray Scale Display</td>
<td>○</td>
<td>$749</td>
<td>○</td>
<td>$299-$649</td>
<td>II series, Quadras</td>
<td>15</td>
<td>7.8 x 10.5</td>
</tr>
<tr>
<td>Mirror Technologies</td>
<td>Mirror Portrait Display</td>
<td>○</td>
<td>$449</td>
<td>○</td>
<td>$299</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Mobius Technologies</td>
<td>Mobius One Page Monitor</td>
<td>○</td>
<td>$595</td>
<td>○</td>
<td>$299</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Radius</td>
<td>Radius Full Page Display</td>
<td>○</td>
<td>$699</td>
<td>○</td>
<td>$299</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td>Sigma Designs</td>
<td>PageView GS</td>
<td>○</td>
<td>$995</td>
<td>○</td>
<td>$995</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td></td>
<td>PageView Portfolio</td>
<td>○</td>
<td>$695</td>
<td>○</td>
<td>$295</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td></td>
<td>SilverView Portfolio</td>
<td>○</td>
<td>$2695</td>
<td>○</td>
<td>$995</td>
<td>II series, Quadras</td>
<td>15</td>
<td>8 x 10.9</td>
</tr>
<tr>
<td><strong>TWO-PAGE DISPLAYS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CalComp</td>
<td>DrawingCard GrayVision</td>
<td>●</td>
<td>$1495</td>
<td>○</td>
<td>$899</td>
<td>II series, Quadras</td>
<td>21</td>
<td>19.3 x 11.8</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>Cutting Edge 19&quot; Dual Page Monochrome Display</td>
<td>○</td>
<td>$1499</td>
<td>○</td>
<td>$899</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>Cutting Edge 19&quot; Dual Page Gray Scale Display</td>
<td>○</td>
<td>$229</td>
<td>○</td>
<td>$899</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Ehman</td>
<td>Ehman 19&quot; Dual Page Monochrome Display</td>
<td>○</td>
<td>$795</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Ehman</td>
<td>Ehman 19&quot; Dual Page Gray Scale Display</td>
<td>○</td>
<td>$1395</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Generation Systems</td>
<td>Generation Two-Page Display</td>
<td>○</td>
<td>$495</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Lapis Technologies</td>
<td>Lapis Dual Page Display</td>
<td>○</td>
<td>$1199</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Mass Microsystems</td>
<td>Rival Monochrome Display</td>
<td>○</td>
<td>$799</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Mass Microsystems</td>
<td>Rival 19&quot; Gray Scale Display</td>
<td>○</td>
<td>$1239</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Mirror Technologies</td>
<td>Mirror 19-inch Two-Page Display</td>
<td>○</td>
<td>$799</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Mobius Technologies</td>
<td>Mobius Two Page Display</td>
<td>○</td>
<td>$795</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Nutmeg Systems</td>
<td>Nutmeg 19</td>
<td>○</td>
<td>$1239</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Nutmeg Systems</td>
<td>Nutmeg 19G</td>
<td>○</td>
<td>$1799</td>
<td>○</td>
<td>$400</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>PCPC</td>
<td>ShadowGraph</td>
<td>○</td>
<td>$1099</td>
<td>○</td>
<td>$459-$599</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Radius</td>
<td>Radius TPD/19</td>
<td>○</td>
<td>$1099</td>
<td>○</td>
<td>$459-$599</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>Radius</td>
<td>Radius TPD/21</td>
<td>○</td>
<td>$1399</td>
<td>○</td>
<td>$459-$599</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.3 x 10.8</td>
</tr>
<tr>
<td>RasterOps Corporation</td>
<td>19&quot; Mono/Gray Scale Monitor</td>
<td>●</td>
<td>$999</td>
<td>○</td>
<td>$399-$579</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.2 x 10.6</td>
</tr>
<tr>
<td></td>
<td>21&quot; Mono/Gray Scale Monitor</td>
<td>●</td>
<td>$1299</td>
<td>○</td>
<td>$399-$579</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.2 x 10.6</td>
</tr>
<tr>
<td>Relax Technology</td>
<td>Begaoni Gray Scale Package</td>
<td>●</td>
<td>$799</td>
<td>○</td>
<td>$299</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.2 x 10.6</td>
</tr>
<tr>
<td>Sigma Designs</td>
<td>L-View Multimode</td>
<td>○</td>
<td>$1235</td>
<td>○</td>
<td>$299</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.2 x 10.6</td>
</tr>
<tr>
<td>SuperMac Technology</td>
<td>21&quot; Platinum Two-Page Display</td>
<td>○</td>
<td>$1199</td>
<td>○</td>
<td>$299-$559</td>
<td>II series, Quadras</td>
<td>19</td>
<td>14.2 x 10.6</td>
</tr>
</tbody>
</table>

- ○ = yes; □ = no; ABV = Apple built-in video; C = Clinton; CO = company's own; D = Display Technologies; H = Hitachi; I = ikegami; L = Lapis; P = Philips; T = Toshiba; TR = Trium; Z = Zenith.
- * Works only with built-in video. ‡ Does not support LC internal video. † Requires PowerView SCSI interface to connect to Classic II. ‡ Requires Apple 8+24 or 8+24 GC board. * Requires $995.
- 1 Supports only Quadra built-in video. 2 Requires special cable available from RasterOps.
under way for another company to buy its inventory for resale, but no final decisions had been made about the products' future. Two other companies offer portrait displays but could not provide evaluation units: Lapis Technologies and Sigma Designs.

Although portrait monitors are typically used for black-and-white applications like word processing, most support gray scale. Exceptions include the Lapis Full Page Display and the Mobius One Page Monitor. The others support 16 levels of gray when used with the Mac's built-in video; they typically support 256 levels of gray when used with a video board.

All the tested portrait monitors work off the built-in video circuitry for those Macs that have it, except the LC and LC II. The LCs' built-in video is incompatible with most monitors, whether monochrome or color, because it does not conform to video standards the way the built-in video of other Macs does. (The LCs' video is, of course, compatible with Apple's monitors.) If you have a Mac that lacks built-in video, or want extra features like acceleration or better gray-scale support, you can get a video board bundled with a monitor or purchase a board separately. (Acceleration typically requires buying a board designed for color displays but that also works for gray scale; color users need acceleration more than monochrome users do.)

In our subjective evaluation we found few differences among the portrait displays we tested—not surprising, since most use monitors prepackaged by Zenith with identical tubes made by Clinton. However, because monitor quality can vary, even from the same manufacturer, it is wise to look at a monitor in use before purchasing it.

Still, one display stands out—the Radius Pivot, which has what is clearly the best quality when used with its video board. Not that it was perfect in our tests: we saw occasional banding in grays. In addition to providing a clearer, higher-contrast display than the other monitors, its software lets you use the Pivot either in landscape mode as if it were a 14-inch monitor or in portrait mode. This is a neat trick, but because it is not worth the higher cost ($849) for many users. But the Pivot's high quality, which is the most important consideration in buying a display, is worth the extra money. Companies buying many monitors are likely to get both a price break and a product that adjusts to a range of user needs and preferences.

If your budget forces you to compromise, pick any of the other displays, except the Apple portrait, based on the best deal you can get. (The Apple portrait performed only fairly in the subjective evaluations, despite being the standard by which many people measure a display.)
An intriguing product is Sigma Designs' SilverView Portrait, whose 21-inch size means it can display almost two 11-by-17-inch pages. While we did not have a unit for formal testing, its display quality was high in subjective tests.

**Evaluating Two-Page Displays**

THOSE SEEKING TWO-PAGE DIS­
plays will find more options. There are more companies offering products and more sources for the components they use (although Clinton and Philips still dominate the tube suppliers, and Zenith and Ikegami dominate the electronics suppliers).

We tested two-page displays from Apple, CalComp, Mass Microsystems, Mirror Technologies (its sister company, Generation Systems, has an identical product, which we did not have for testing), Nutmeg Systems, Radius, Sigma Designs, and SuperMac Technology. Several other companies offer two-page displays but could not provide evaluation units, including Ehmach/Cutting Edge, Lapis Technologies, and PCPC. All were changing their product lines or suppliers at the time of testing.

Of the monitors tested, the Apple two-page had the poorest quality because of its washed-out look at high brightness settings and overly dark look at lower settings. That monitor has since been discontinued, so it is not included in our benchmarks.

Several monitors did well. Our favorites were the Radius TPD/21, RasterOps 19-inch gray-scale display, and Sigma Designs SilverView monitors. The CalComp display was a clear second choice. The others were decent—not outstanding, but certainly not bad.

Among our five favorites are all four monitors that display true gray rather than the bluish gray that has become the signature Macintosh display color—these are the CalComp display, both RasterOps models, and the Sigma Designs SilverView. There is no objective reason why either gray color is better, although people working in publishing or image editing are likely to prefer a monitor whose display more closely matches what is printed. Among the true-gray monitors, we found the RasterOps 19" best due to superior subjective ratings. All units displayed gray levels very well. The SilverView had a noticeable yellow cast to its gray that might bother some users, but it does not affect image fidelity.

Many monitors performed passably in most of our categories but excelled or fell flat in one or two. For example, we strongly preferred the Radius 21-inch monitor's brightness level and the RasterOps' contrast and screen flatness. But we disliked the hard-to-reach controls of the Mirror/Generation Systems and Nutmeg monitors and found the glare from the Radius 19-inch and Sigma Designs L-View MultiMode to be more noticeable than we prefer.

### Understanding Multiple Resolutions

Though common to the DOS universe, the concept of multiresolution monitors that let you view an image at different sizes is new to the Mac platform. In the monochrome market, Sigma Designs offers the L-View MultiMode, which supports six resolutions: 36, 46, 60, 72, 92, and 120 dots per inch.

The term resolution implies amount of detail when it is used in printing and photography; an imagesetter has higher resolution than a laser printer and creates higher-quality images by using more and finer dots. But in displays, viewing an image at 120 dpi does not mean edges and curves will be smoother than the same image at 72 dpi, as it would in printing or photography. Instead, resolution means the same dots seen at 72 dpi will be displayed as smaller dots positioned closer together. The effect is like a photocopier, bringing in more of the image by reducing it. You can enlarge the image by reducing the dpi, although it will get coarser.

Multiresolution displays allow you to switch from a true-size view to a bird's-eye view or to a close-up, which is especially helpful in layout. And unlike similar zoom controls within page-layout programs, display-based controls show enlarged or reduced images without loss of detail.

Multiresolution displays vary resolution by changing the speed of the electron beam that "paints" an image on the inside of the monitor tube. The MultiMode board, for example, has three active settings—120, 92, and 72 dpi. (It draws two lines with identical data to achieve 60-, 46-, and 36-dpi settings.) At 120 dpi, the beam sweeps across the tube quickly, illuminating only a few phosphors at a time to form fine lines. At 92 and 72 dpi, the beam sweeps proportionately more slowly, illuminating larger groups of phosphors to create thicker lines.
Small Mac, Big Screen

Many owners of compact Macs like the SE and the Classic would love to have a large monitor in place of the tiny screen sealed in the Mac's case. But most compact Macs don't have the computational resources to drive such a large display.

There are no video boards for the Classic II, since its design precludes inexpensive or easy solutions. The advent of the PowerBooks, however, has led several companies to announce video options that use the SCSI port. These options will allow you to hook color or monochrome 13-inch or portrait monitors to any SCSI port, including the Classic II's. Radius is shipping its PowerView SCSI adapter. Sigma Designs also recently introduced its Power-Page, which uses the SCSI port and has a video board built in to the monitor, so no bulky adapter is needed.

Owners of the Mac Plus will also be hard put to find solutions, although they do exist. One of the more innovative is MicroMac's approach of upgrading a Plus (or an SE or SE/30) by repackaging its components, plus some new ones, in a new box that more resembles an LC or III. Lapis Technologies offers the more conventional solution of a video board, the DisplayServer Plus, that fits into the Plus.

SE and SE/30 owners will have little trouble finding boards for their Macs. "Monochrome Monitor Features" lists two-page displays that support those Macs.

An unusual large-monitor solution for compact Macs is the BTM 14" High-Resolution Monitor, which works with all compact Macs but the Classic II—including the Mac 128K. This $440 monitor is aimed at the visually impaired, since its purpose is to make the image bigger, not to add more pixels for sharper image display or to provide two-page viewing.

But as you might expect in subjective evaluations, we didn't agree on everything. For example, some members of the testing team thought the Nutmeg monitor offered very good gray display, some thought it was fair, and others thought it was merely adequate. Likewise, we disagreed about the curvature of images shown on the CalComp monitor, with some thinking it was too curved at the bottom and others thinking it was fair or good.

Because selecting a monitor is so subjective, you should look at any monitor before you buy to make sure that you want to look at it day in and day out for the next few years.

In most cases, display costs are comparable, when you factor in the display board (sometimes it's optional, sometimes it's included). Exceptions are the Cutting Edge 19" Dual Page Grayscale Display ($2299), the Mass Microsystems Rival 19" Grayscale Display, and the Sigma Designs SilverView, which list for about $2200 if you buy a video board for them—that's about 30 percent more than most two-page gray-scale competitors. While we strongly like the Mass Microsystems and Sigma Designs displays, their list prices are good cause to look elsewhere.

Quadra owners, however, will find that four monitors—the Mobius Two Page Display, both RasterOps monitors, and the SuperMac 21-inch monitor—may have a price advantage because they work from the Quadras' built-in video, which means a video board is not needed. However, more video RAM will be needed to drive them at their high resolutions (you'll want 2MB of video RAM), so the cost of extra memory may balance that of a video board—it depends on how much VRAM you already have.

Commonalities and Differences

ALTHOUGH THE LIMITED NUMBER OF SUPPLIERS to display vendors restricts choices, especially for portrait monitors, the continuing movement to a market of mix-and-match components gives vendors the opportunity to lower costs and standardize basics, and users the opportunity to enjoy special, custom features. For example, Mirror has added ADB ports to its monitors to make it easier to move the Mac out of the way and still be able to plug in keyboards and input devices. Sigma Designs offers a multiresolution feature (see "Understanding Multiple Resolutions"). And Radius offers a display, the Pivot, that works in two orientations. Increasingly, innovations like these will distinguish displays; the basic elements—the tubes and electronics—will become more standard.

And Apple's trend of providing built-in video will cause video-board makers to add features that will keep users buying boards that would otherwise be unneeded. For example, RasterOps offers an extended desktop (a virtual screen, which is larger than your monitor can show at once) and hardware pan and zoom to navigate through the extended desktop quickly.

These changes and the fragmentation of product offerings into monitor-only and monitor-plus-video-board groups can be confusing. Fortunately, many vendors offer solid solutions to fit the various Mac models—new and old—and the diverse needs that users have.

See Where to Buy for contact information.

Macworld Lab testing supervised by DANNY LEE.
How do Lotus 1-2-3 and Resolve stack up against Excel?

BY CHARLES SEITER

There are, we must assume, more difficult things than beating Microsoft Excel in the Mac market. Pitching a perfect game in the World Series seems to be one such task; reducing the national debt looks like another. Nonetheless, for the last five years the only spreadsheet providing serious sales competition for Excel has been the spreadsheet built into the integrated application Microsoft Works.

This does not overstate Excel’s historical dominance. The last time Macworld pitted Excel against its rivals (see “Can Excel Be Beaten?” November 1989), we found that Informix Software’s Wingz 1.0 was faster than Excel 2.2 at most numeric tasks, and that Ashton-Tate’s Full Impact 1.1 was tops for its case-of-use and interface refinement. Since then, Excel 3.0 has simply gobbled up the best features of those programs and continued its hold on more than 90 percent of Mac spreadsheet users.

Now Excel is facing two formidable competitors that have the resources for a concentrated corporate assault on its position. Resolve, introduced by Claris last year, employs Wingz’s excellent computation and graphing code (Informix sold the code to Claris), and Resolve has this additional recommendation: Claris is not going to be forced out of the Mac software market anytime soon.

Similarly, Lotus 1-2-3 is a solid Mac product, and it’s backed by a company that won’t lose interest in selling spreadsheets. In fact, there are about twice as many registered Lotus users worldwide as there are Macintoshes, according to Lotus.

To help you determine which of these programs is right for you, I’ve compared Excel with Lotus 1-2-3 and Resolve in a variety of function categories—computation, editing and auditing, graphics, macros, database access, and connectivity. I’ve also picked my overall favorite among the three contenders.

I’ve concentrated these evaluations on Excel, Resolve, and Lotus 1-2-3 because they are directly competitive as full-featured, dedicated spreadsheet programs. I didn’t include Microsoft Works and Claris Works because they are not dedicated spreadsheet packages (see “All-in-One Programs,” Macworld, June 1992, for a review of those programs). Full Impact isn’t included in this review, as its future was unclear at press time. Although Borland International, which acquired Ashton-Tate and its products last year, is still supporting and selling Full Impact, the company hasn’t disclosed its plans for the program. And while a new version of Wingz is on the
way, these days Informix is selling Wingz mostly to large corporate customers who will use it as the basis for developing their own internal, customized spreadsheet/database programs. For that reason I opted not to review Wingz this time around.

If you aren't crunching big numbers, you can get along with calculator DAs, computed fields in databases, or special-purpose programs (Intuit's Quicken, for example, is probably what you should use for checkbook balancing instead of a spreadsheet). But if you are wrestling with a lot of numerical data, both the range of mathematical/financial functions and the computational efficiency of a spreadsheet are of primary importance.

For most business or home users, there is no significant speed difference among the Big Three. For the benchmark known as Recalc Plain, I had to construct a very large (10,000-cell) worksheet to pry out speed differences of more than 10 percent in a recalculation. The newer Macs, featuring 68030 systems with fast clock speeds, will erase even these small differences.

Each of the three programs employs a different approach to recalculation. Lotus has a clever background recalc scheme—the cells you see on screen are computed first; then, while you’re looking at the results, other parts of the spreadsheet are recalculated. Microsoft spent years perfecting a minimal recalc scheme in which Excel’s recalc looks only at the cells affected by the last entry. Resolve features Informix’s original, lightning-fast Wingz code, although Resolve’s interface takes some of the breeze out of the Wingz recalc. All of these spreadsheets approach the theoretical speed limit for the number of multiplications per second for any given computer.

For scientific computations, in which algorithm variations among the three programs bring out more recalc speed differences, both Resolve and Excel offer more functions than 1-2-3 does. Resolve is the unchallenged speed champion at computations involving transcendentials; and Excel’s array-handling capabilities (which interpret formulas defined on blocks of cells rather than just on single cells) make it the first choice for matrix, linear algebra, and optimization problems that typify complex models in business.

Another advanced business computational feature in a spreadsheet is a solver for performing “what-if” analyses. Basically, a solver runs an accounting problem backward. Finding the interest rate that will enable you to keep payments under $1000 per month on a $150,000 house, for example, would be a simple back-solving, “what-if” variable on that mortgage problem. In this area, Excel has an elaborate multivariable solver that compares to stand-alone third-party products (see “What If?”). Lotus 1-2-3 has a basic solver that’s at least fancier than anything you’re likely to write as a macro. Resolve has some helpful advice in the manual about simple “what-if” problems, but it doesn’t implement any special code.

On balance, Excel has many strengths and no weaknesses as a computational product—which is one good reason the program has been able to keep such a tight grip on the spreadsheet market.

Each of the three spreadsheet programs enables you to attach notes to cells, but only in Excel can you pick the cells out for display one at a time. With 1-2-3 and Resolve, you have either all notes displayed or all notes hidden. 1-2-3 is unique among the three programs in that it lets you perform editing directly in worksheet cells—a nice but not essential touch that was years overdue. Excel stands alone with its outlining capability, a significant aid in editing large worksheets.

And speaking of large worksheets, with Excel and 1-2-3 you can split screens, which is great for scrolling through an endless spreadsheet in one screen while viewing the row and column headings in another. Unfortunately, Resolve, in an inexplicable omission, doesn’t offer any form of split-screen capability.

At one time Excel had an edge in error-tracking, allowing users to trace chains of cell references. Resolve and 1-2-3 now implement the same tracking ability in different ways, but both programs are effective.

The big structural difference for auditing is 1-2-3’s handling of true three-dimensional worksheets, which allows for a cleaner, more auditable design of complex worksheets than any other technique (see “Working in 3-D”). A 3-D worksheet has a single file name and can have interrelated worksheets as part of that same file. The separate worksheets are identified by letters (D:A1 is the first cell in the fourth sheet in the set, for example).

This arrangement allows sets of worksheets to be consolidated into a single file in order to share formulas, meaning that a basic structure only needs to be developed and audited once and applied across a set; it also means that a summary sheet will be small and easy to inspect. In the area of editing and auditing, outstanding 3-D capability tips the scales in favor of Lotus 1-2-3.
Categories of information. In this example, 1-2-3 is creating a third worksheet that will combine the information in no other spreadsheet, are just one example.

Adequate command of color, and the ability to manage charts as separate objects. Three-dimensional files are the best way to construct complex models and to create an interrelated set of spreadsheets that all contain similar categories of information. In this example, 1-2-3 is crunching the first-, second-, third-, and fourth-quarter financial data for two different sales offices and creating a third worksheet that will combine the information from the other two.

Wire-Frame Graphics. Resolve is full of surprises, although many of them are left over from the underappreciated Wingz. Wire-frame plots, available in no other spreadsheet, are just one example.

plots and other exotica; see “Wire-Frame Graphics”), respectable drawing tools, adequate command of color, and the ability to manage charts as separate objects.

Within this mutually imitative profusion of graphics facilities, there are great similarities in output quality but wide differences in the amount of effort required to make a boardroom-quality presentation. Excel, for example, has added a graphing icon to its tool bar in 3.0, letting you, with a single click, create a chart for the data you have selected.

Instant access to the somewhat dated Excel charting facilities doesn’t address the real problem, though: Excel charts are modified with complex menus, exist in separate windows, and aren’t truly integrated graphics objects. An implicit admission by Microsoft that charting needs an overhaul may be evident in its plans for version 4.0. (Microsoft’s upgrade to Excel should be available by the time you read this. Among other features, 4.0 adds 3-D surface charts and polar charts, as well as QuickTime support. For more information, see Macworld News, May 1992.)

Resolve offers more graph types (3-D, wire-frame, and polar charts, for example) than Excel does, approaching the scope of such programs as DeltaPoint’s DeltaGraph Professional, and you manipulate the graphs through a clear and intuitive set of dialog boxes. In fact, Resolve looked like the last word in charting simplicity until 1-2-3 appeared.

Remarkably, considering that Lotus spent years inflicting impossibly difficult and inadequate spreadsheet charting on millions of PC users, it has brought to the Mac a charting interface that anticipates most real-life charting requirements. The charts you pick from the 1-2-3 sample gallery look like finished products rather than starting points, and you modify the charts by double-clicking on chart elements and filling in one-element-at-a-time dialog boxes. You don’t even need to consult 1-2-3’s superior help facility, and you can shrink a set of charts to a set of small icons on your worksheet. This enables you to manage a number of charts conveniently on a single small screen.

All things considered, the graphics prize goes to 1-2-3, mainly because it returns good results for the smallest amount of time invested in both training and actual charting work.

LOTUS 1-2-3 FOR MACINTOSH’S MACRO language (which is the same as the PC version’s) is one of the most widely used programming languages in the world, with millions of users actively writing and debugging code every day. This situation is almost tragic, for two reasons. First, despite being useful, 1-2-3 macros are the least readable and most bug-friendly of modern programming constructs; and second, many macros already available in 1-2-3 turn out to be mere fix-ups for printing, display, or charting inadequacies in the MS-DOS environment.

Macintosh users, for example, are frequently shocked to hear that DOS 1-2-3 users by the millions have shelled out good money for a utility that simply allows a spreadsheet to be printed sideways —a choice available in every Mac application in the Page Setup dialog box. The result of this environment dissimilarity is that not much of the giant body of 1-2-3 macro code will do Macintosh users any good without a serious overhaul.

In a burst of corporate optimism, anticipating defections from Microsoft, Lotus outfitted 1-2-3 with a translator for Excel 2.2 macros. But 1-2-3’s cryptic macro notation (can you figure out what /WR means by looking at it?) and lack of in-worksheet macro-linked buttons (which would make it easy for new users to operate a template) solidly place 1-2-3 in last place as a Mac macro maker.

Excel 3.0’s macro code is marginally more congenial than 1-2-3’s; offers debugging help in the form of code tracing; pro-
vides easy editing and convenient single-stepping (see "Making Excel Macros"); and gives ambitious programmers a dialog box editor to make macro-based programs faster to write and more professionally looking.

The option of running macro scripts as add-ins means that code can be integrated automatically into Excel worksheets; you don’t have to remember to load macros separately when you use the worksheet. In addition, linkage of macro code to buttons lets programmers make self-explanatory worksheet templates even for complex problems. The profusion of business, science, and personal software in the Heizer Software catalog testifies to the versatility of the Excel macro language as well as to the high degree of compatibility between Mac and Windows codes.

Resolve employs a macro system that is nearly the same as Wingz’s admirable HyperScript—the closest approach to a real programming language ever included in a spreadsheet. It’s more English-like than Pascal is, it’s easy to read and modify, and it enables you to attach buttons to scripts just by dragging buttons from a palette and running Learn Script for the desired action (see “Writing Your Own Scripts”).

For customizing templates to meet your needs, the macro system in Resolve can’t be matched. But Resolve isn’t really suitable for programming commercial templates because it has no debugging help or dialog editor, thereby restricting you mostly to shorter projects. Thus, the verdict on macros is a split decision—Excel has the facilities for handling application-size projects, while Resolve is superior for smaller-scale work.

### Spreadsheets Compared

<table>
<thead>
<tr>
<th>Feature</th>
<th>Claris Resolve 1.1</th>
<th>Lotus 1-2-3 for Macintosh</th>
<th>Microsoft Excel 3.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>$399</td>
<td>$495</td>
<td>$495</td>
</tr>
<tr>
<td>Capacity</td>
<td>32K X 32K</td>
<td>256K X 8K X 256K</td>
<td>256K X 16K</td>
</tr>
<tr>
<td>Recommended memory</td>
<td>2MB</td>
<td>2MB</td>
<td>1MB</td>
</tr>
<tr>
<td>Recommended memory</td>
<td>4MB</td>
<td>3MB</td>
<td>2MB</td>
</tr>
<tr>
<td>Security/password</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Editing and Auditing</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell notes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>In-cell editing</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Split screens</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>3-D worksheets</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Between-worksheet links</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Cell-reference tracking</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Outlining</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td><strong>Computation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of functions</td>
<td>149</td>
<td>140</td>
<td>146</td>
</tr>
<tr>
<td>Matrix math</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Array arithmetic</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Solver</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Graphics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line, bar, 3-D bar, area, x-y, and pie charts</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Wire-frame</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Surface</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>High-low-close</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Macros</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dialog box editor</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Compiler</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
<tr>
<td>Number of commands</td>
<td>340</td>
<td>198</td>
<td>276</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SYLK support</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>WK1 and WKS support</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Excel 2.2 import and export</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Excel 3.0 import and export</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Data Access Manager support</td>
<td>no</td>
<td>no</td>
<td>no</td>
</tr>
</tbody>
</table>

* = yes; O = no. 1 Solver can handle only a single variable 2 Solver can handle multiple variables and multiple constraints. 3 Also supports WK3. 4 Read only.

### Database Access

All three products enable you to define a data table and perform sorts and searches within the defined area. For many users, this is enough; the database function in Excel is probably the most-used “database application” on the Mac.

There are nonetheless wide differences in database functions among the three spreadsheet programs. Resolve, for example, simply provides a table in which you can perform not-very-fast sorts and searches. Excel offers more, including a query form that enables you to enter search criteria field by field.

1-2-3 has advantages over both its competitors in data handling. The Form view (formatted single-record view) of the database lets you make updates to the data in the spreadsheet table. Besides this, 1-2-3 offers a true relational join, which is a way to combine existing tables to generate new tables with different sets of records and fields. Lotus has done a conscientious design job here; its internal database capabilities set the standard, making 1-2-3 my choice in this category.

### Connectivity

This category covers several topics—file-format exchange, System 7 communications, and external database access. File-format compatibility among the three spreadsheet packages varies. Even
though these are the three leading Mac spreadsheet packages, not all of the programs can read and write files to each of their counterparts, in the way that the top word processors can all share files.

One of the features promised with Resolve 1.1—a new, minor upgrade from version 1.02—is the ability to import and export Excel 3.0 worksheets. (Resolve 1.1 wasn't available at the time of our evaluations but should be shipping when you read this.) Excel can't read Resolve files, and 1-2-3 doesn't include SYLK, which is nearly the universal file-exchange format on the Mac. As a result, to make up files for benchmark testing, I was obliged to use .WKS as the common format.

1-2-3 has a variety of egregious problems importing simple tabbed text. For example, the program doesn't read most tabbed text files correctly. According to Lotus, there are no immediate plans to fix this rather shameful flaw. However, since most users will probably import DOS 1-2-3 files, this problem may not be critical.

1-2-3's cross-platform features include the ability to call up the classic DOS menu by pressing the backslash key (\)(see "3-D or Not 3-D"). For Macintosh users this glimpse of DOS is a historical curiosity; for DOS transplants it means instant access to familiar territory.

Excel's cross-platform credentials are just as solid; the Mac version of Excel is nearly identical to its Windows counterpart (they share several manuals). The odd man out in this comparison is Resolve, a resolutely Mac-only product.

All these products were designed after the System 7 revolution, and all support publish and subscribe and Apple events. 1-2-3 combines its own Data Lens software with Apple's Data Access Manager for importing corporate data from mainframes and minicomputers.

Similarly, Excel tries to combine Microsoft's Dynamic Data Exchange with Apple events to communicate with external databases. In both 1-2-3 and Excel, Apple events are used to send and receive data messages from other computers, and the software translates the data into a form the spreadsheet can use as a data table.

If your company has a main database that uses SQL as a database query language, rest assured that someone in the company can program 1-2-3 or Excel to download data. Resolve 1.02 merrily ignores the problem, giving no obvious way to communicate with external databases except perhaps by using custom scripts to manipulate System 7's data-access features. (Resolve 1.1, however, promises support for Data Access Manager.)

Excel and 1-2-3 thus find themselves tied in the connectivity category, with Resolve 1.02 basically declining to participate in the competition.

MW EDITORS' CHOICE

Microsoft Excel Although Lotus 1-2-3 won one more category than Excel, on balance Microsoft's spreadsheet program still comes out on top for two reasons: Excel has no important omissions, and it offers wider scope as a computing and programming environment than do 1-2-3 and Resolve. The program's outlining features and goal-seeking solver module make it the best choice for advanced users, and the abundance of books and third-party training materials provides an easy introduction for beginners. Company: Microsoft Corporation. List price: $495.
At a visit to the National Grocers Association convention in Florida earlier this year, George Bush was amazed when he saw a supermarket price scanner successfully decipher a bar-code label. The president was getting a firsthand look at a form of optical character recognition (OCR)—that seemingly magical technology that enables computers to read. OCR isn’t magic. Computers have been reading for decades—ever since those misshapen numbers first appeared on the bottom of checks. For our purposes, OCR means scanning pages of hard copy and generating editable text files. Anyone who frequently needs to bridge the gap between the printed page and the Mac stands to benefit from OCR. But frequently is the key word, because OCR can require a big investment. The best OCR programs—Caere Corporation’s OmniPage Professional and Xerox Imaging Systems’ AccuText—retail for $995 and $799, respectively, and require a 68020- or 030-based Mac with at least 5MB of RAM—and 8MB is preferable for best performance. Programs such as Logitech’s CatchWord Pro and OCR Systems’ ReadRight for Macintosh sell for much less and run on 68000-based Macs such as the Classic and SE, but they are much less accurate. And they still need several megabytes of memory to deliver acceptable performance. You’ll need a gray-scale and color scanner such as Apple’s $1299 OneScanner or Hewlett-Packard’s $1095 ScanJet IIp, or a black-and-white scanner like Abaton’s TransScribe 300 ($1095) or the Microtek MS-2 ($1195) (both include the OmniType
OCR program). To save time when scanning page after page, add an automatic document feeder for another few hundred dollars. (Apple's OneScanner doesn’t support a document feeder.)

After getting all these components hooked up and working together, you may find that your OCR program isn’t very accurate, especially with complex or poor-quality originals. With clean, typographically simple originals, such as business letters, you may see accuracy rates of nearly 100 percent; but when the pages get complex, with multiple columns, sidebar s, tightly spaced headlines, and a variety of type sizes, prepare for an onslaught of typos.

Lest I paint too bleak a picture, there are some excellent OCR programs, and given clean documents and an experienced operator, these programs can be extremely effective. And there are some economical hardware alternatives that may work well enough for occasional use (see “Reading by Hand”).

Six Steps to OCR

A TYPICAL OPTICAL CHARACTER RECOGNITION job has six phases. Each phase affects the accuracy of the final product and also imposes its own demands on a scanner, an OCR program, and your skill as an OCR operator.

Set up for the scan. At this stage, you specify details such as the scanning resolution and brightness. The OmniPage series, WordScan Plus, and ReadRight also let you choose to retain or discard formatting such as italic or bold type. Some programs can even scan a document containing graphics and save the graphics separately—handy if you’re updating an old technical manual containing schematics and diagrams.

Scan the original. An OCR program can’t deliver accurate results without a high-quality image. Accuracy plummets if the scan is skewed (crooked), or if you’ve adjusted the brightness of your scan poorly, creating a muddy or washed-out image. An image that is too dark causes problems because characters in the scan tend to touch and the hollow portions of round characters (such as the e) tend to fill in. A washed-out image complicates recognition because fine character details are lost. For example, if the top and bottom of an O are lost, an OCR program may misread the character as two parentheses—(). (See Lab Notes in this issue for more details on OCR scanning.)

A new development addresses the need for a high-quality scan. Hewlett-Packard’s AccuPage technology (supported by HP’s ScanJet Ile and ScanJet IIP scanners) and Calera’s AnyPage technology (currently supported by Microtek scanners), when used in combination with supporting OCR software, automatically analyze gray-scale scans to find text, and create black-and-white scans with optimum results (see “Bringing Type Out of the Background”). Calera’s products currently support both technologies, and Calera’s products will support AccuPage by the time you read this.

Most programs support the automatic document feeder (ADF) attachments that are available for many flatbed scanners (but not for Apple’s). AccuText, WordScan Plus, WordScan, OmniPage, OmniPage Professional, and ReadRight even allow you to scan double-sided originals: first you run the odd-numbered pages through the ADF, then you scan the even-numbered ones, and these programs automatically put the scanned pages in the correct order.

Select the text to be recognized. If you are scanning a complex multicolumn page, you need to tell the OCR program which columns you want it to recognize and in what order to recognize them. All programs provide a marquee tool that enables you to select the areas, or zones, you want to recognize (see “Zoning in Progress”). With Calera’s WordScan, you can select only one column at a time—recognizing a multicolumn page means a lot of extra effort.

Instead of manually selecting zones, you might prefer to rely on a program’s automatic zoning, or page decomposition,
Getting a high-quality scan from a hand scanner is a challenge. You must make multiple passes and then use the scanner’s stitching feature to attach the swaths.

Getting a high-quality scan from a hand scanner is a challenge. You must move the scanner steadily—about 2 inches per second—and not skew the image by tilting the scanner. Scanning a page from a book or magazine is complicated by the binding (the manual for Typist Plus Graphics actually suggests that you tear pages out to scan them). And although the scanners themselves are small, they require external SCSI interfaces and power adapters, so they aren’t practical PowerBook companions.

One interesting alternative is Computer Friends’ Lightscan 400PS (sold as part of the $699 Character Scanner package). This two-piece unit works as a hand-held or sheetfed scanner. The scanning portion is 8½ inches wide, and is thus able to scan a letter-size page in one pass. Place the scanner in the included sheet feeder and you can automatically scan up to ten pages. The Lightscan 400PS includes Olduvai’s Read-It Pro 3.0. No other OCR programs support the Lightscan, although you can save scans as TIFF files for recognition in a different program.

A hand scanner can be a workable alternative if you usually scan narrow columns or images anyway. Thunderware’s LightningScan 400 comes with Olduvai’s Read-It Personal, a version of Read-It Pro. Logitech bundles CatchWord Pro with the ScanMan, while Caere’s Typist Plus Graphics includes Caere’s own OCR software and The Graphic Editor. For OCR work, Caere’s Typist Plus Graphics is the best of the bunch. If you scan carefully, you get OmniPage-caliber accuracy. Typist Plus Graphics is also the only package that can insert recognized text directly into an application.

Typist Plus Graphics is the best of the bunch. If you scan carefully, you get OmniPage-caliber accuracy. Typist Plus Graphics is also the only package that can insert recognized text directly into an application. Typist Plus Graphics is not Quadra-compatible, but should be by the time you read this.

If you already have a hand scanner, you might consider Prism Enterprises’ $99 ReadingEdge OCR software. It has the same basic features (and, alas, mediocre accuracy) as Prism’s TextScan.

No other OCR programs support the Lightscan, although you can save scans as TIFF files for recognition in a different program.

Adjustment

Final bitmap

Once the grays that represent the background are identified, they are converted to white, while the grays that represent type are identified and converted to black.

The resulting black-and-white scan of the page is passed to the part of the supporting OCR program that recognizes shapes as letters.

Reading by Hand

If you can’t justify or afford a flatbed scanner’s four-figure price tag, you might consider a hand-held scanner such as Caere’s S695 Typist Plus Graphics or Logitech’s $499 ScanMan Model 32. Hand scanners look like huge mice and scan in swaths about 4 inches wide. And therein lies one rub: to scan text columns (or images) wider than the scanner, you must make multiple passes and then use the scanner’s stitching feature to attach the swaths.

That sounds appealing, but it’s practical only if you have a 68020 or later Mac and at least 5MB of memory, preferably 8MB. Even then, your Mac may slow unacceptably as it juggles tasks.

Proofread and polish. All programs except AccuText display recognized text in a window where you can make corrections. Suspicious characters are indicated by a symbol such as an at sign ( @) or a tilde ( ~). (You can specify a different character in case your original happens to contain a raft of at signs or tildes.) By searching for these symbols, you can quickly locate obvious errors.

OCR errors can confound a word processor’s spelling checker because they

Three ways to scan for OCR: the ScanMan Model 32, Lightscan 400PS, and Typist Plus Graphics.
# Rating OCR Programs

## Performance

<table>
<thead>
<tr>
<th>Basic Office Documents</th>
<th>Challenging Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Times are in seconds. Shorter bars are better.</strong></td>
<td><strong>Fax</strong></td>
</tr>
<tr>
<td>A one-page résumé printed from a LaserWriter in 10-point Times and Helvetica; 249 words.</td>
<td></td>
</tr>
<tr>
<td>A one-page business letter typed with a film ribbon; 168 words.</td>
<td></td>
</tr>
<tr>
<td>A one-page résumé printed on an ImageWriter LG in 10-point Courier type; 382 words.</td>
<td></td>
</tr>
<tr>
<td>* Did not recognize legal-size page.</td>
<td></td>
</tr>
</tbody>
</table>

### Percent Accuracy

<table>
<thead>
<tr>
<th>Basic Office Documents</th>
<th>Challenging Documents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Longer bars are better.</strong></td>
<td><strong>Fax</strong></td>
</tr>
<tr>
<td>These figures are for recognition time only. The fastest program in each test is highlighted in red. Speedy recognition is always welcome, but make sure to consult the accuracy figures below to accurately gauge a program's overall effectiveness.</td>
<td></td>
</tr>
</tbody>
</table>

### Multicolumn Documents

**Performance**

Although many programs claim the ability to read multicolumn text automatically, we found that the error rates were unacceptable for all programs except OmniPage Professional and OmniPage 3.0, which were able to recognize these multicolumn documents in 30 to 107 seconds. To get acceptable error rates with all the other programs, we had to manually select and order recognition zones on the scanned page. This manual process took 5 to 10 minutes per page for most programs.

**Percent Accuracy**

The percent accuracy is a helpful number to use when comparing two or more programs' overall efficiency. Look for a program that produces the fewest possible errors on the kinds of documents that you'll want to scan most often. The most accurate program in each test is highlighted in red. Accuracy results were rounded to the nearest whole number.

**Magazine**

An article that included headline, subheading, 3 columns of type, a boxed sidebar, and graphic; 552 words.

**Newspaper**

An article that included a headline, 4 columns of type, and a pull-quote; 927 words.
differ from conventional typos. All programs except Recognize, OmniType, and CatchWord Pro also provide spelling checkers geared toward OCR-oriented blunders. Xerox and Caere also sell foreign language dictionaries, and Caere sells medical and legal dictionaries as well.

OmniPage Professional has the best editing features. Besides allowing you to change fonts, sizes, and styles, its editing window has a ruler for specifying alignment and creating and adjusting tabs, margins, and first-line and hanging indents. You can also display the portion of the scanned page's bitmap to manually correct an error. WordScan Plus and AccuText provide a similar feature.

Save the file. Programs that can retain formatting information let you save recognized text in a variety of popular word processor formats. Many programs also support database- and spreadsheet-oriented formats such as SYLK. Recognize, ReadRight, and Read-It Pro also support the Claris XTND file-translation technology. If you have a set of XTND translators such as those sold by DataViz, you can save recognized text in a wide array of Macintosh and PC formats (see Reviews, "MacLinkPlus/PC 6.00," Macworld, March 1992).

**Zoning in Progress**

Most programs let you specify which zones you want to recognize and in what order. Here three zones have been defined and linked in AccuText. If you used automatic zoning for this page, the figure captions in the middle column would end up in the middle of the text.

AccuText includes a HyperCard stack called AccuStack that lets you import recognized text into a HyperCard stack. A single card can contain an entire document, a page, or even a zone from a page. If you've scanned a mailing list, you can create a stack in which each name and address is on its own card.

**Matching the Program to the Job**

For overall accuracy, the winner is OmniPage Professional. Finishing first, or tying for first, in five out of the seven tests, OmniPage Professional was the most consistently accurate over a wide variety of documents. OmniPage 3.0 came in second, doing nearly as well as OmniPage Professional, followed by AccuText, which did especially well with the text-laden legal document (contract).

Here's a description of each test along with a list of the top three finishers in each event. (Caere's OmniType was often in the top three, but isn't included here because the program is actually an older version of OmniPage that is not sold, but is bundled with the Abaton Transcribe/300 and Microtek MS-2 scanners.)

The typewritten document was a simple, one-page business letter typed with film and cloth ribbons. The trickiest aspect of recognizing these documents was some occasional underlining, which, because it cut through character descenders, utterly confused TextScan, ReadRight, and ReadIt Pro. Winners: OmniPage 3.0, OmniPage Professional, and WordScan. In these tests, OmniPage Professional (and OmniType) turned in two of the three perfect scores of the entire competition.

The laser-printed document was a one-page résumé containing 10-point

---

**Reading the Future**

By the time you read this, Caere will have replaced OmniPage 3.0 with OmniPage Direct. OmniPage Direct will be able to insert recognized text directly into an application—much as Caere's Typist handheld scanner does now. OmniPage Direct will also support HP's AccuPage technology and, according to Caere, will be more accurate than OmniPage 3.0.

Olduvai is updating Read-It Pro to incorporate an interactive training mode. Read-it Pro 4.0 will also include spelling-checker dictionaries for French, German, Italian, and Spanish, and will allow you to create dictionaries containing your own entries. Version 4.0 will also provide publish and subscribe commands and Apple-events support, and will be able to send scanned text to Claris's MacWrite Pro, Paragon Concepts' Nisus XS, and WordPerfect's WordPerfect 3.0 (none of which were shipping at this writing).

For those who want a stand-alone OCR device that could be used in an office much as a copier is today, UMAX has announced the Readstation, a stand-alone OCR device that includes a 300-dpi monochrome scanner, a PC-format floppy drive, a Motorola 68020 processor, and the OmniPage Professional OCR engine for $5495. The Readstation is due to ship in May.

One program Macworld has tested and liked in previous years was being updated while I was working on this article. TextPer 3.7, from Barcelona-based CTA, will combine full omnifont features with the ability to read 34 languages. And talk about high end: for $5995, CTA plans to sell TextPer 3.7 with a RISC-based coprocessor board that speeds recognition times dramatically. I tested the board with a prerelease version of the program, and recognition times were more than twice as fast as OmniPage Professional's—very impressive. TextPer 3.7 will also be available without the board for a reasonable $495.

At this writing, ExperVision is putting the final touches on a Macintosh version of its TypeReader program, which previously ran only under Microsoft Windows on IBM PCs and compatibles. TypeReader will incorporate ExperVision's Machine-Learned Fragment Analysis technology, which the firm originally developed for the demands of recognizing more than 7000 kanji characters. TypeReader will retain formatting and columnar information, and it will provide a text editor, a pop-up verifier window, a 100,000-word dictionary (medical, legal, and geographic dictionaries will also be available), and a deferred-processing option. The program will also support Hewlett-Packard's AccuPage technology. Final pricing had not been determined at press time; the Windows version retails for $5895.

Perhaps the best news for OCR (and for scanning in general) is that software developers and scanner manufacturers are edging toward a standard set of commands for controlling scanners, video frame grabbers, and other graphic input devices. A new specification, called Twain, will enable software developers to create programs that let you scan both text and graphics directly from within a program.

Some of the Mac developers on the Twain bandwagon include Adobe, Aldus, Caere, Light Source (which develops Ofoto, the scanning software included with Apple's OneScanner), Eastman Kodak Company, and OCR Systems. Participating hardware developers include Hewlett-Packard (its ScanJet IIC and IIP already support Twain), Logitech, Ricoh, and Microtek Lab.
Helvetica and Times fonts. Formatting was more complex than in the typewritten document, with employment dates and employers listed in a two-column format. Winners: OmniPage 3.0, OmniPage Professional, AccuText, and CatchWord.

The dot matrix document, a one-page résumé printed on an ImageWriter LQ in 10-point Courier type, was included in our tests because most OCR programs have trouble with dot matrix output; the relatively crude character shapes are difficult to recognize. Generally, dot matrix output printed in the near-letter-quality mode that many printers provide is easier to recognize than draft-mode output, where the dots that form each character often don't touch each other. Winners: OmniPage Professional, OmniPage 3.0, and AccuText.

The legal document was a one-page contract, offset printed in 8- and 10-point Helvetica, with large passages in all-uppercase letters. Legal-size (8½ by 14 inches) documents impose larger memory requirements, since the larger page size results in a larger scanned bitmap. Winners: AccuText, WordScan Plus, and a tie between WordScan and Recognize. The OmniPage series didn't do well in this test, turning in accuracy scores of between 71 and 82 percent. (Note that for documents printed in Courier or a similar font, the typewritten document may be a more applicable test.)

The magazine article was one page from a multicolumn feature (from Scientific American) printed on glossy paper, with several type sizes and styles, a graphic, a sidebar, and a caption. Many of the programs were unable to automatically recognize multicolumn documents accurately. Instead, we had to manually order recognition zones to get reasonable results. Winners: OmniPage Professional, OmniPage 3.0 (both could automatically recognize complex pages), and AccuText.

The newspaper article was a four-column New York Times article with a graphic, a pull quote, and a caption. Text printed on newsprint can be difficult to recognize because newsprint is darker than standard white business paper. And we had the same problems with automatic recognition that we had with the magazine pages. Winners: OmniPage Professional, WordScan, OmniPage 3.0, and AccuText.

The plain-paper fax was a fixed version of the laser-printed résumé used for testing. The results here were disappointing; the best score in this event was OmniPage 3.0's 27 percent—you could almost pound on the keyboard at random and get better results. All OCR developers acknowledge that their wares fall flat with faxes. (Several suggest that you can improve results by transmitting a fax in fine mode if the sending fax supports it. Fine mode doubles a fax's resolution to 200 by 200 dpi; standard resolution is 200 by 100 dpi.) Winners (such as they are): OmniPage 3.0, WordScan Plus and ReadRight (a tie), and WordScan.

**Performance**

_IN OUR TESTS, THE OMNIPAGE SERIES and AccuText were the fastest in the recognition process, although Recognize and the WordScan series were fairly spry, too. With complex documents—the contract and magazine and newspaper articles—the OmniPage series often left AccuText in the dust, but the performance gap wasn't as large with the simpler docu-

---

**OCR FEATURES AT A GLANCE**

<table>
<thead>
<tr>
<th>Company</th>
<th>AccuText 3.0</th>
<th>CatchWord Pro 1.0</th>
<th>Recognize 2.0</th>
<th>OmniPage 3.0</th>
<th>OmniPage Professional 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>Xerox Imaging Systems</td>
<td>Logitech</td>
<td>Dest Corporation</td>
<td>Care Corporation</td>
<td>Care Corporation</td>
</tr>
<tr>
<td>Minimum memory/processor requirements</td>
<td>4MB/68020</td>
<td>2MB/68000</td>
<td>1MB/69000</td>
<td>4MB/68020</td>
<td>5MB/68020</td>
</tr>
<tr>
<td>Suggested retail price</td>
<td>$799</td>
<td>$399</td>
<td>$695</td>
<td>$695</td>
<td>$995</td>
</tr>
<tr>
<td><strong>SCANNING AND SETUP OPTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Formatting retention</td>
<td>fair</td>
<td>poor</td>
<td>fair</td>
<td>good</td>
<td>excellent</td>
</tr>
<tr>
<td>Graphics extraction</td>
<td>poor</td>
<td>fair</td>
<td>fair</td>
<td>good</td>
<td>excellent</td>
</tr>
<tr>
<td>Scanner support</td>
<td>fair</td>
<td>fair</td>
<td>fair</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Supports automatic document feeder</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Collates double-sided documents</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>ZONING AND DECOMPOSITION OPTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preview window</td>
<td>excellent</td>
<td>fair</td>
<td>good</td>
<td>good</td>
<td>excellent</td>
</tr>
<tr>
<td>Multiple zones per page</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Zoning (automatic/manual)</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Manual control of zone recognition order</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Skewing or table column options</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Zone templates</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>RECOGNITION OPTIONS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deferred batch recognition</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Background recognition</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Recognize from saved image files</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Trainable mode</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Spelling checker</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>User dictionaries</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Pop-up bitmap from text-editing window</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td><strong>TEXT EDITING AND EXPORT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text-editing window</td>
<td>none</td>
<td>fair</td>
<td>fair</td>
<td>fair</td>
<td>excellent</td>
</tr>
<tr>
<td>Supports Claris XTND</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Supports publish and subscribe</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Supports Apple events</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

* = yes; = no; NA = not applicable. 1 OmniType, a subset of OmniPage, is available only with the Abaton Transcribe/300 and Microtek MS-2 scanners. 2 You must have 4MB to use
ments. The least accurate and slowest programs were ReadRight and TextScan.

**The Rest of the Story**

**ACCURACY AND PERFORMANCE RATINGs** are important, but they don’t reflect a program’s design and ease of use. My pick for the best-designed interface goes to OmniPage Professional. Caere’s programs have had rough edges in the past (some remain in OmniPage 3.0 and OmniType), but OmniPage Professional is clean and straightforward. The program supports System 7 features, providing publish and subscribe commands and Apple-events support. OmniPage Professional is also the only program that requires System 7.

Caere’s OmniPage Professional is the only program that includes a gray-scale image-editing program—The Graphic Editor. It doesn’t stack up against programs such as Adobe Photoshop or MicroFrontier’s Enhance, but The Graphic Editor is adequate for minor touch-up work.

AccuText finishes second in overall elegance, primarily because the program lacks a text-editing window. The AccuStack HyperCard-import stack is a nice plus, though, and AccuText’s manual is more comprehensive than Caere’s (although I like OmniPage Professional’s plastic quick-reference card). AccuText does not support as many scanners as does OmniPage Professional. AccuText can’t even drive the Apple OneScanner (we had to let AccuText recognize the TIFF file produced from our scans); at press time AccuText had been upgraded to support the OneScanner.

Calera’s WordScan and WordScan Plus have adequate manuals, but the programs themselves are awkward. For example, you can’t save the document until you close the text window. That’s confusing and not the way a Mac program is supposed to work.

Both WordScan programs are also incompatible with the 68400 processor used in the Macintosh Quadra family. (They will run if you disable the 68400’s cache, but that slows down the machine.) Calera says 68400-compatible updates should be available by the time you read this, along with support for Hewlett-Packard’s AccuPage technology. But for now, look to Caere or Xerox for a high-end package. (CatchWord Pro also crashes on a Quadra when you use the Export command.)

As for the low end, WordScan 1.0 was usually more accurate than Read-It Professional, CatchWord Pro, or ReadRight, but WordScan 1.0’s one-zone-per-page limit may be a serious drawback if you regularly scan documents with complex layouts. The aforementioned low-end packages provide better format retention and zoning features, and are easier to use than WordScan 1.0. You need to weigh those pluses against their inferior accuracy. If you rule out WordScan 1.0, I recommend CatchWord Pro or Read-It Pro. But if you’re serious about OCR, consider a high-end program first. It may pay for its extra cost in reduced proofreading and correction time.

New technologies promise to make OCR easier and more versatile, but don’t look for 100 percent accuracy any time soon. Making dramatic improvements in accuracy and progressing to handwriting recognition, the most challenging OCR job, may require the kind of processing power that only the next generation of RISC-based computers will bring. Until then, remember that OCR replaces typing, not proofreading.

See Where to Buy for contact information.

---

**Read-It Pro’s Omnifont features.**

1 Read-It Pro 4.0 will provide these features.

---

<table>
<thead>
<tr>
<th></th>
<th>Read-It Pro 3.0</th>
<th>ReadRight for Macintosh 1.0</th>
<th>TextScan 4.0</th>
<th>WordScan 1.0</th>
<th>WordScan Plus 1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olduvai Corporation</td>
<td>OCR Systems</td>
<td>Prim Enterprises</td>
<td>Calera Recognition Systems</td>
<td>Calera Recognition Systems</td>
<td>Calera Recognition Systems</td>
</tr>
<tr>
<td>1MB/68000</td>
<td>$595</td>
<td>$199</td>
<td>$395</td>
<td>$295</td>
<td>$595</td>
</tr>
<tr>
<td>$595</td>
<td>poor</td>
<td>good</td>
<td>poor</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>none</td>
<td>fair</td>
<td>fair</td>
<td>poor</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>fair</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td>good</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>good</td>
<td></td>
</tr>
<tr>
<td></td>
<td>poor</td>
<td>poor</td>
<td>good</td>
<td>limited</td>
<td></td>
</tr>
<tr>
<td></td>
<td>fair</td>
<td>good</td>
<td>good</td>
<td>NA/NA</td>
<td></td>
</tr>
<tr>
<td></td>
<td>good</td>
<td>fair</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fair</td>
<td>fair</td>
<td>fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>fair</td>
<td>fair</td>
<td>fair</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>none</td>
<td>fair</td>
<td>fair</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Setting up to work at home means doing more than putting a Mac on the kitchen table.

By Saul D. Feldman

Each morning, millions of people slog through bumper-to-bumper rush-hour traffic to get to work while others get to the office by ambling from the bedroom to the den. Some people arrive at the office in expensive clothes while others sit at their desk in pajamas. Some workers get flak from ever-vigilant bosses for arriving late while others work when the spirit moves them.

There are a myriad of home-office occupations, from those you'd expect—like computer consultants, programmers, graphic designers, writers, and newsletter publishers—to other not-so-obvious professions, including private detectives, translators, architects, textile designers, public-relations counselors, occupational-safety consultants, and even services that transmit daily business news via fax.

People start home-based businesses for many reasons. They may be looking for a new challenge or may want to be their own boss. And a growing number of home-based businesses are a result of the troubled economy.

No matter what home-based business you may be contemplating, there are legal, financial, and personal considerations you should be aware of.

Local Laws

Setting up an office in your home is more than a matter of where to place the furniture and office equipment. Each municipality has its own tax and zoning laws for home-based businesses. You should call your local taxing and zoning authority to find out what laws affect you.

The laws vary widely. For example, Philadelphia requires every business in the city, whether in a home or office building, to pay a one-time business privilege tax of $200. The city taxes both your gross receipts and your profits. Atlanta charges an annual fee of $60 to have an office in your home and levies additional taxes if you have receipts greater than $3000. San Antonio has no requirements for registration and no taxes for home-based businesses.

Zoning is another potential problem. Calls to several major cities revealed that none prohibit a business in the home, but many have regulations against signs in the window or on the lawn, against many clients coming and going, and against excess noise. Phoenix's ordinances let you have a home office. But you can't have employees working in the home (though you can employ relatives who live with you), use more than 25 percent of your home for business purposes, or use equipment or machinery not typically found in the home (computers are not a problem). San Francisco's laws mirror Phoenix's, but they also prohibit a separate entrance for most businesses.

Federal Income Taxes

"A home office raises a red flag for an IRS audit," says Martin Lerner, a San Francisco lawyer. The Internal Revenue Service began cracking down on home-office deductions in 1976 and tightened up considerably last year. Most people who have a home-based business
report income and expenses on Schedule C of the federal Form 1040 tax statement. If you include home-office deductions on Schedule C, you now must itemize these expenses on a new tax form, Form 8829.

Despite increased scrutiny, the home-office deduction is well worth pursuing. You just have to follow the rules scrupulously. In compiling home-office expenses, remember that these expenditures cannot exceed your income.

If you plan to claim a home office on your federal income tax, you must have a dedicated area set aside as a home office. A room that is sometimes an office and sometimes a den won’t do. Take care to follow IRS regulations that the room be used “regularly and exclusively.”

Deducting insurance is a different issue, says IRS spokesman Larry Wright. You can deduct insurance (the full amount) only if you have a separate rider covering your business. Standard homeowners’ or tenants’ insurance is not deductible (see “Avoiding an IRS Audit”).

One crucial tax issue is how you handle computers and software. Section 179 of the tax code says you may write off $10,000 in business-related tangible personal property that you purchased in a tax year. This includes computers and office equipment. Alternatively, you may choose to depreciate this same equipment over a five-year period. If you expect to have hardware and other capital expenses over the years, the Section 179 deduction may be more beneficial. If these are one-time expenses, you may be better off using depreciation to spread the tax savings over a five-year period.

If you are using your computer strictly for your home business, there is no problem in claiming it as a business expense. But if it has other uses (personal or recreational), you must be using it at least 51 percent of the time for your business to claim a deduction. The best way to document this is to keep a log of computer usage. This can be either handwritten or a file that you maintain on your Macintosh.

People with home offices are favorite targets for IRS audits. “Returns with home-office deductions get more scrutiny,” says James Dingus, an accountant in Cleveland. According to San Francisco tax lawyers Stephen Moskowitz and Marcus Merchasin, the favorite word of an IRS auditor is disallowed.

Moskowitz and Merchasin emphasize that the IRS is a collection agency; it does not set policy or make the law. They claim that taxpayers have a good chance to win in court, but you have to decide if the fight is worth your time and money.

Tax lawyers, accountants, and IRS agents agree on very few issues, but they do concur on one key point: Keep good records of your income and expenses. Keep receipts. Log business expenses. If you use your car for business, keep accurate trip records. This is a great use for a spreadsheet or database.

The record keeping doesn’t stop just with income and expenses. Because you have no employer deducting income taxes from your salary on a regular basis, the federal government wants to make sure that it gets its share of your profits on a periodic basis. You have to make quarterly prepayments for both income tax and Social Security, using the 1040ES form. Workers with a sideline business can avoid this paperwork by increasing their tax withholding at their primary job.

If your estimates are too low and you owe the IRS a lot of money, you may owe a penalty as well; while the rule is complicated, a penalty is likely if you owe at least $500, what you owe is at least 10 percent of your total tax liability, and you underpaid taxes the previous year. To avoid this, guess your profits for the year (this gets easier after a couple of years), figure out how much you would be taxed on that (probably 20 to 25 percent for federal taxes), divide that amount by the number of paychecks you get, and have
your employer withhold the result for each paycheck.

If you are self-employed, you also have no employer contributing to a retirement plan. You can reduce your taxable income by setting up your own retirement fund under the Keogh plan. This is an excellent tax shelter, as well as a sound move for your retirement, but it does involve even more record keeping.

To keep informed on the IRS's latest thinking on home offices, order the free IRS Publication 587, Business Use of Your Home. As with all IRS publications, it is available by calling 800/829-3676.

There is also the matter of state and local income taxes. Most state and local tax agencies base their taxes on the adjusted income from your federal tax form, although they may have minor differences in how they let you compute deductions. A few states, like Massachusetts, have their own regulations. Because these vary from place to place, as well as from year to year, be sure to know your local income-tax regulations.

Insurance

INSURANCE IS ANOTHER POTENTIAL minefield for home-office workers. There are two major types of insurance that concern you—health and business.

Most large employers and many small companies offer health insurance as part of their benefits package. But when you are self-employed, you must fend for yourself. Given today's medical costs, you are asking for trouble if you're not insured. The U.S. Congress's Office of Technology Assessment estimates that almost 19 million Americans have individual health insurance. If you are generally healthy and don't have any medical conditions, you won't have much trouble finding coverage.

You might consider joining a health maintenance organization (HMO), where doctors' visits and hospitalization are covered for one flat fee. A few years ago, some HMOs were not accepting individual members, but competition today is heating up and many are seeking new enrollees. The Kaiser Foundation Health Plan, with facilities in 16 states, is the nation's largest HMO. About 10 percent of its members are individual members.

Home-Office Tools

Just about every Macintosh office should have at least one good spreadsheet, database, word-processing, and telecommunications program. But home offices have specialized needs, both for your particular type of business and for the clerical and record-keeping tasks that a support staff would do for you at a traditional office. Of the many home-office products I evaluated, the following stand out as particularly useful and well designed.

Accounting

You are probably not a CPA, and you may have an accountant do your taxes. But on a day-to-day basis, you need to know how much money you have, how much money you owe, how much is owed to you, and how you are spending your money. You need to know whether you are making or losing money.

M.Y.O.B. 2.1 is designed for the small-business owner who is not an accounting expert. You can create a balance sheet, write checks either by hand or with your printer, and do a simple analysis of your business's financial status. M.Y.O.B. also generates customizable invoices and tracks inventory. Several nonaccounting features are extremely useful: you can maintain a to-do list and calendar, track customers, and compute billable time. Well-designed tutorials guide you through the program, and a HyperCard stack teaches basic accounting terms.

Quicken 3.0, the popular financial software program, is less comprehensive but is still a good choice for accounting novices with smaller businesses. You can integrate home and business accounts or keep them separate. Quicken is simple to learn, has extensive financial report capabilities, and doesn't bog you down in accountant-speak. You can pay bills electronically through Quicken's link to Checkfree. When you start up the Macintosh, Quicken's Billminder function automatically notifies you when bills are due. Unfortunately there are no similar ticklers to remind you when money is due your clients. You also can't generate invoices as you can in M.Y.O.B.

Billing and Logging

Several small-business accounting programs have a billing module, but in TimeSlips III 2.5, the poor charge clients by the hour, you may need more power. TimeSlips III 2.5 keeps track of your billable hours. Each time you begin working for a new client, enter the project and your hourly rate on the program's desk accessory. Click your mouse and the meter begins running. You can transfer the running tally to TimeSlips' comprehensive billing features. Your invoices will look good, too, thanks to TimeSlips' page-layout module. The TimeSlips DataBank is especially handy if you charge for phone consultations or if you need to document computer usage for an IRS deduction. An optional module links TimeSlips' data to major Macintosh accounting programs.
Costs vary by region. For Kaiser, sample family rates are $299 per month in Northern California and $351 in the Middle Atlantic states. Depending on the region, the only cost other than medicine is a fee of up to $5 for each visit. But if you use an HMO, you must use its physicians and its hospital facilities, although you can generally choose from among them.

If you want greater choice of hospitals and physicians, consider a plan like Blue Cross, even though monthly costs are likely to be higher. California's rates are typical for Blue Cross: if you are between 30 and 40 years old and have two children, your monthly payment is $392. You pay the first $250 for doctors' bills, and Blue Cross pays 80 percent of the remainder, up to a cap after which Blue Cross pays the full amount of covered services. Depending on the policy, hospitalization costs you between $250 and $2000.

Many organizations, such as professional and alumni associations, offer health insurance for their members. In some cases you get a better deal than you could find on your own, but in other cases the costs are greater. Shop around.

If you have a medical problem and seek health insurance, you may have trouble. A report by Citizen Action, a Washington, D.C., public-interest group, notes that, depending on the company, between 8 and 24 percent of all applications for individual insurance were denied. The group also cites an Office of Technology Assessment report stating that 20 percent of individual applicants "received a substandard risk classification, leading to a pre-existing illness exclusion or above-average premiums."

The other type of insurance you need to consider is for your business itself. Many people with home offices rely on homeowners' or tenants' insurance to cover their office contents against theft, fire, or other damage. Calls to several insurance companies revealed that each has its own way of treating home offices and computers. Some require a separate rider. Others cover computers up to a set amount (usually no more than $8000). Just as with health insurance, you have to shop around.

To avoid problems with future claims, tell your agent that you are running a business from your home.

You can also purchase separate computer owners' insurance. For example, Safeware, an insurance company based in Columbus, Ohio, covers hardware and software in one policy. You pay $89 each year for $8000 in coverage, or $129 for $14,000. There is a $50 deductible. Earthquake coverage is extra, a policy change made after the 1989 Loma Prieta quake in the San Francisco Bay Area. The ComputerInsurance Agency, based in Pleasantville, Ohio, charges $160 for $8000 in hardware coverage and $1600 in software coverage. You pay $280 for $14,000 in hardware coverage and $2900 in software coverage. There is a $50 deductible; earthquake coverage is included.

Lawyer Lerner also recommends that you consider business-interruption insurance and perhaps business-liability insur-

ance. Be sure you are covered for personal liability, especially if you have clients coming to your home.

Some people believe that they can protect themselves by incorporating, since this sets up the company as a separate legal entity, shielding the individual from claims. Lerner believes that this is generally unnecessary.

Voices of Experience

If you are planning to set up a home office, talk to other people who have made this step. They can give you some excellent expert advice.

Social isolation is perhaps the number one complaint of people who work at home: you don't get out of the house to go to work, and you may spend day after day behind your computer. To avoid this, you need to plan for contact with others. Many of the people we talked to in the Seattle area make friends by participating in home-office organizations, such as the Northwest Electronic Business Association. Others join local social groups like alcoholic or smoking cessation groups. Community activities are also a good choice. If you are interested in joining the computer world, consider a local Mac user group.

If you need to log just computer use, Timelog 1.0 couldn't be easier to use. Just place it in the System Folder and Timelog automatically keeps a record of how you use your Macintosh. It gives you a choice of textual or graphical reports on all programs you used, how long you used them, and the total time the Macintosh was on. Data can be exported to spreadsheets or printed from the program. But be warned: Timelog reports on all programs you use, including games.

Contact Management

Many people with a home office spend much of their time with a telephone glued to their ear. Contact-management software helps you keep track of these calls. These programs can keep a record of phone numbers, categorize entries (like suppliers, customers, and prospects), dial the phone, log calls, and let you take notes. You can export and import data to and from other programs and print output in forms ranging from labels to pocket address books.

Three excellent contact-management products are worth considering for the phone-based business. TouchBase does all its work from a handy DA. You can even export data to Sharp's Wizard hand-held personal information device and generate custom fax cover sheets. Dynodex includes both a DA and a stand-alone program. Its screen layout is not as well designed as Touch-

Rase's, but it does offer easier data entry. Address Book Plus is the most comprehensive of the three, offering detailed phone entries, easy data entry, and a variety of output formats.

All three of these programs do miss one feature. If you charge clients for phone calls, it's essential to have an easy way to track long-distance calls. None of these programs can print a separate report listing all your calls.

Labels and Envelopes

There is a good chance you'll be doing a lot of mailing in your business, both day-to-day correspondence and mass mailings.

MacLabelPro 1.5 is essentially a desktop publisher for labels. With it, you can create professional-looking mailing labels complete with graphics and postal bar codes. (Proposed postal regulations would offer a discount on mail that includes this code.) Although it is no substitute for sophisticated databases, MacLabelPro keeps a record of names and addresses that you can export to other applications.

If you want to print directly onto envelopes, check out MacEnvelope. It offers the same kinds of publishing and printing features as MacLabelPro but does also has guidelines to help you print your envelope to meet finicky postal regulations. An online reference gives you current postage rates and standard postal abbreviations.
Avoiding an IRS Audit

Nine years ago, Thomas Cadwallader, a university professor, and his wife, Judy Douglas, a transportation planner, deducted expenses for a home office and a personal computer. It took them five years of learning tax code rules and fighting through the legal system before the U.S. Tax Court allowed the computer deduction. Cadwallader and Douglas are still fighting for the home-office deduction.

Home-office and computer deductions fall into murky areas of the tax laws. Cadwallader and Douglas claimed a deduction for a computer, since both used it for office work. The IRS disallowed the deduction because neither person's employer required the use of computer on the job. But the U.S. Tax Court ruled that to effectively perform their jobs, Cadwallader and Douglas needed a computer. The deduction was allowed.

Cadwallader and Douglas claimed a home-office deduction because Cadwallader didn't have sufficient room at his campus offices to store research materials and he did a lot of writing at home. The IRS said the home office did not qualify because it was not Cadwallader's principal office; the U.S. Tax Court ruled that to effectively perform their jobs, Cadwallader and Douglas needed a computer. The deduction was allowed.

Accountants and the IRS are conservative about deductions. Tax lawyers are less conservative, citing cases like Cadwallader's and Douglas's as evidence that the IRS's policies are overly restrictive and do not stand up in court. Whether you do your own taxes or not, you need to consider the tax implications of running a home-based business. An error could cost you money or, worse, an audit. Here are some tax tips to keep in mind all year long.

Matching Expenses to IRS Forms

- Keep a running tally of what you pay (including sales tax) for equipment and supplies. A tally helps you determine if you're reaching a deduction limit for business property expenses or if investing in new hardware this year rather than next might ease this year's tax burden.
- Mark what type of expense each item is so it will be easier to figure where to claim each deduction. Some expenses are deducted on Form C (Profit or Loss from Business) and others on Schedule 8829 (Business Use of Your Home).

Categories to Track for Schedule C

- Business utilities. Do not include electricity and heat unless you have separate meters for your office. Include only charges for business phone calls, if you have a separate business phone line, include its base charges.
- Supplies. This includes consumables such as stationery, pens, printer ribbons, and postage. It also includes software that has a limited life span, such as a tax-preparation or calendar program.
- Equipment and business insurance. Do not include homeowners' insurance—deduct that in Form 8829.
- Business travel.
- Commissions and fees.
- Advertising expenses.
- Other. This includes electronic information services and professional dues and publications.

Categories to Track for Form 8829

- Rent or mortgage interest and real estate taxes. If you rent, list rent in the "Other" line, not in the "Mortgage Interest" line.
- Utilities. Report only those shared between personal and business quarters, such as electricity and heat. You cannot deduct any part of basic phone charges from a personal or shared line.
- Insurance. Report homeowners' and renters' insurance only.

Home Deduction Warnings

A home office must be used "exclusively and regularly" for business to be eligible for tax deductions. If your employer provides office space, working at home does not qualify you for home-office deductions. If you claim multiple businesses at home, you must all qualify; otherwise, none does. If you run a sideline business, you should be able to prove that you intend to make a profit from it. One IRS guideline for proving this is to be profitable three years out of five. Here are some general guidelines to follow:

- Keep your home office separate from your home's private portion. That means no games on a business Mac and no rollaway bed in the office. If you have an office in shared space like a den, you must prove the space was used for the business, and it's never used for nonoffice purposes (usually by testifying or producing photographs). Violating this strict division can result in all of your home-office deductions being disallowed.
- Deduct mortgage interest for the business portion of your home Form 8829 and the rest of your mortgage interest on Schedule A. (IRS Publication 530 covers the rules for mortgage interest depreciation.) If you plan to sell your house, do not deduct a home-office expense for that tax year; otherwise you may be liable for a large capital gains tax.
- Form 8829 deductions cannot exceed your gross home-business income. (You can report a loss from deductions on Schedule C.)
- If your Form 8829 deductions exceed your gross home-business income, you might get more tax relief by deducting your entire mortgage interest as a personal deduction (on Schedule A) than by deducting the personal part on Schedule C and the business part on Form 8829.
property Deductions
The IRS lets you deduct the cost of tangible property—furniture, computer equipment, vehicles—from your business income. This reduces the property's real cost by 20 to 30 percent, depending on your tax bracket. You can deduct tangible property by depreciation or Section 179 election.
Depreciation means you deduct part of the purchase cost each year, over a period of years. The period depends on the type of property, based on the IRS's view of its useful life. Computers and peripherals have a five-year period. For equipment that you purchase only once every several years, depreciation is a good method because it spreads the tax benefits over several years.

The Section 179 election lets you deduct the full cost of tangible property in the tax year it was purchased, although there is a cap of $10,000 or your net profit, whichever is less. The immediate tax relief is a great incentive to use the 179 election. Since computer equipment often requires upgrading every year or so, you are likely to have a new property deduction each year.

Selling old property or trading it in for a credit on new property is considered income. If you use depreciation and sell or trade property during its depreciation period, expect headaches in adjusting the depreciation amounts to compensate for the change in depreciation basis—like calculating the current fair-market value.

Some tax accountants say to count software purchases as supplies, but an IRS spokesman said to consider them business property, since software's usefulness covers several years. If you use the Section 179 election, software may make your total purchases surpass the limit, forcing you to use depreciation to deduct some property; you'll get less tax relief and more paperwork.

Warning
Stay in touch with tax rules by reading the IRS publications for each tax form. IRS Publication 587, a guide to home-based businesses, is especially useful. And—especially if you are new to the home-office life—invest in tax-planning books. But remember that, no matter how much you rely on advice, no one but you is responsible for your tax decisions.—GALEN GRUMAN

Home Sweet Home Office
But there are many advantages to working at home. If you have a home office, you have lower overhead than many of your competitors. You don't have to pay for an expensive office or worry about work clothing. You can take advantage of high technology to do much of the work that used to be handled by clerical staff. You can set your own hours. Night owls can work until 2 a.m. and get up late. Larks can begin work at 5 a.m. and quit early. You can make your own policies and plan the direction of your business.

If you are starting a home-based business, your major concerns are probably finding clients and doing the work. But you can save yourself a lot of grief by knowing in advance what laws, regulations, and personal considerations will affect your enterprise.

Working at home can be a rewarding experience, both financially and personally. "Enjoy my independence, and I enjoy my home. I think those are the chief prerequisites for someone contemplating a home office," says building designer Stembridge. Textile designer Anderson-Shea sums it up: "Don't apologize for working at home. You're the envy of everyone who drives to the office."
Two-Axis Multiple Master Typeface

**Myriad**

**PROS:** Breakthrough in electronic font technology; compatible with existing printers; 247,016 possible type styles; ships with new and upgraded typeface utilities.

**CONS:** No optical-size axis.

**COMPANY:** Adobe Systems.

**REQUIRES:** Mac Plus; 2MB of RAM; hard drive; PostScript or other AppleTalk printer; System 6.

**LIST PRICE:** $370.

When PostScript-generated type debuted in 1985, some hailed it as a revolution in typesetting, others feared it might render their current technology obsolete, and a few isolated curmudgeons dismissed it as inferior to traditional typesetting. They were all correct. Today, the scope of the PostScript language has made it a typesetting standard, as the first group predicted. Its popularity has forced typesetters and commercial printers to upgrade their equipment, as the second group anticipated. But sophisticated desktop publishers have begun to express impatience with the limitations of vector-based fonts. Unless you’re willing to use a font editor such as Letraset’s FontStudio or Altsys’s Fontographer, type outlines are static—scalable but otherwise inflexible. In the pre-electronic days, the best type designers didn’t merely create a single outline and call it a Q; they created many Qs, each optimized for a specific type size and style. A 72-point Q offered thin stems and delicate serifs to emphasize elegance; a 6-point Q featured thick stems and heavy serifs to enhance legibility.

Multiple Master is the combination of Myriad Multiple Master ships with 30 extreme fonts-called master styles and empowers you to create more than 200,000 variations, each unique. Myriad Multiple Master ships with 30 styles and empowers you to create more than 200,000 variations, each unique.

**Myriad Opportunities**

MYRIAD, ADOBE’S 275TH FONT PACKAGE, is the company’s flagship Multiple Master font. Like previous PostScript fonts, Myriad includes screen fonts and printer fonts. All fonts are compatible with any Mac and any PostScript printer. (Adobe Type Manager 3.0, included with Myriad, enables the font to print to QuickDraw and other AppleTalk output devices.) Myriad also works with current versions of most screen-font utilities, including Fifth Generation Systems’ Suit-
install the usual collection of screen and printer fonts, Adobe Type Manager 3.0, and a Multiple Master INIT. If you use Adobe's Type Reunion or Font Downloader, you must upgrade these utilities as well. The absence of an Installer program makes the installation process cumbersome. But once the programs are loaded, I found that they worked in perfect unison. Type Reunion separates primary fonts from Myriad and Myriad Italic into their own submenus (rather than combining plain and italic into the same submenu as you might expect). Font Downloader 5.03 lets you download Multiple Master fonts to a PostScript printer's RAM or hard drive. All utilities are fully compatible with System 7.

Myriad combines the range of options inherent in the Multiple Master technology with elegant execution and functional design (the original work of Adobe type artists Carol Twombly and Robert Slimbach). If I had to find any fault, it would be that Myriad provides no design axis with which to manipulate optical size. Adobe claims that optical sizing is not applicable to Myriad because its regular weight performs equally well at small and large type sizes. Optical sizing will be introduced by the next Multiple Master font, Minion, which will be available by the time you read this. But Myriad exceeds all previous ideas of electronic font perfection. For the design professional, Multiple Master will function as an indispensable type laboratory.

—DEKE MCCLELLAND

MM Mechanics

NO MATTER HOW MANY CUSTOM fonts you decide to create, the Mac will download at most two printer fonts—Myriad and Myriad Italic—to the printer. The printer fonts are not exceptionally large, roughly 75K apiece, so you do not have to worry about overloading the printer's RAM. Included with each printer font is a new PostScript operator, called MakeBlendedFont. This operator uses the weight and width numbers contained in the screen font name to generate a PostScript dictionary (small, about 4K); that dictionary makes on-the-fly changes to character definitions in the corresponding Myriad printer font. It all happens quickly and without taxing the limitations of your existing PostScript printer. (If you use a non-PostScript output device, the calculations are performed by the Macintosh, which necessarily increases the printing time.)

To use Myriad and the Font Creator utility under System 6 or 7, you have to
REVIEWS

Just Like Printing

This modified Print dialog box lets you choose the destination of your faxes and provides several sending options. You can send names of individuals or groups into the Send To box from the scrolling phone-book list on the left. The Delay button holds faxes until a specified time; the Note button lets you add a note to the cover page.

Print dialog box, and click on Send. You can use the FaxStatus DA to report the call's progress.

From the Print dialog box, you can set up new fax addresses and telephone numbers, and save them in your fax phone book. You can send the same fax to multiple destinations, and you can select groups. Choosing a group as the destination automatically sends the fax to all the individuals in the group. If you use the Delay feature, the software will hold all faxes for the time frame you specify, and then send all the faxes for the same destination in one phone call, thus saving toll charges.

Faxes of word processing documents that were sent to a variety of stand-alone fax machines from the PowerModem were clear and readable. As with any fax modem, you achieve the best results with text using Adobe Type Manager or TrueType fonts. Since fax modems are essentially QuickDraw devices, fax output from page-layout programs and PostScript drawing programs such as Adobe Illustrator is likely to be poor.

I was also able to receive faxes with the PowerModem; the unit woke the sleeping PowerBook and saved the incoming fax, which I was then able to read on screen and print to a LaserWriter. I found that the printed copy was much easier to read than the screen version, due to the superior resolution of the LaserWriter over the PowerBook screen.

Problems

The most annoying problem is that when the fax software is active, the PowerBook's screen never goes to sleep, although the hard drive's sleep function works correctly. Because the screen's backlighting is the PowerBook's primary power consumer, this problem causes the battery to lose its charge more quickly than normal. Having the screen on all the time cut down my PowerBook 140's active time from just under 3 hours to 1½ hours.

This sleep mode problem is also of concern when faxes are received by a sleeping PowerBook, or when the PowerBook is set to automatically wake up and send a previously scheduled fax. In both cases, the PowerBook wakes up correctly, but the screen does not go back to sleep mode. Pending a software fix, PSI suggests a workaround whereby you turn the screen backlighting off entirely if you're running on batteries and you leave the PowerBook unattended to send or receive faxes. The fax software, supplied by STF Technologies, is not 32-bit clean, a flaw that causes random crashes when using virtual memory. At press time, PSI stated that its new version would fix the sleep problems and would be 32-bit clean.

There is also a conflict between AppleTalk Remote Access (ARA) and the PowerModem. When ARA is switched on, it completely takes over the modem port, and the fax software cannot gain access to the port. If you set up the PowerModem to be an ARA server, you cannot receive faxes. This problem limits ARA, and it also affects other manufacturers' products. If you frequently use ARA from a PowerBook, you should consider a 9600-bps modem such as Global Village's PowerPort/V.32; using ARA at 2400 bits per second is painfully slow.

The PowerModem is a better unit than the send-only fax modem Apple includes with the PowerBook 170, and the fax software is superior. The PowerModem is not the best choice for people who expect to regularly use AppleTalk Remote Access, or for those who do a lot of online work that requires a high-speed data modem. But if you are a light user of the data-modem features and primarily want to send and receive faxes, the PowerModem is a good addition to your PowerBook. — Tom Negri

Userland Frontier 1.0

Userland Software

PROS: Robust scripting language and Apple-events controller; completely customizable; AppleLink and Compuserve online support. CONS: No stand-alone script execution; incomplete documentation; weak telephone support. COMPANY: UserLand Software (415/325-5700). REQUIRES: Mac II, hard drive. SYSTEM 2. LIST PRICE: $249.

Userland calls Frontier the "utility of utilities." It is first and foremost a powerful scripting language called UserTalk. UserTalk includes more than 350 verbs that fall into roughly 30 categories, including file, window, and dialog management; word and outline processing; string handling; and program management. There is also an advanced set of programmer verbs that let you manage resources (an Apple term for part of a program), communicate with other software, browse a network, and even crash your own Mac. Scripts are designed to automate a collection of desktop actions.

Frontier is also a complete development environment. Frontier is tightly integrated with a table-oriented database. Each table entry can be a simple data type, like a string or an integer. For more complex needs, a table entry can be a script, an outline, a menu bar, a word processing document, or a picture. A table entry can also be another table (up to 25 levels deep), allowing you to create complex, hierarchical data structures.

Frontier also lets you create agents—scripts that operate in the background on your system. You can, for instance, create an agent that checks the time every minute and launches a backup script at a specific time of the day. Frontier is also compatible with all forms of Apple's interapplication communication (IAC). You can use Frontier's IAC verbs to control or interact with other programs on your own desktop or across a network.

And Frontier is completely customizable. Frontier menus, which are a special data type, are stored in the object database. You can change most of Frontier's menus by editing the data. Menu commands are based on Frontier scripts, so you can change the operation of any command. The program includes robust word and outline processors for managing text and outline objects, and an interactive debugger for testing scripts.

Frontier is somewhat like HyperCard in that there are different layers for different people. Power users can customize their desktops using Frontier as the command center, or create scripts to automate network-management functions for a group of Macs. Programmers can use Frontier to test IAC-aware software, create prototype applications, and manage their desktops.

The more you delve into Frontier's complexities, the more work you have to do. The program comes with a User Guide and a UserTalk Reference Guide. Both are excellent for what they cover, but both are incomplete. The User Guide glosses over the more complex topics; the UserTalk Reference Guide has no explanations of the advanced verbs. Some verbs and key database objects are not explained anywhere.

UserLand does provide the following:

First, the object database has a variety of 

190 July 1992 MACWORLD
According to Apple, QuickTime will change the way people use their computers. Forever.
MacroMind Director® 3.1

NEW VERSION

Create, combine and synchronize graphics, text and animations with audio and video. Add full interactivity with buttons and scripts. Author, edit, playback, export and import QuickTime Movies. Add interactivity to QuickTime Movies with enhanced lingo scripting. New expanded help, increased Score functionality, and higher performance overall. Incorporate 3D models from Swivel animation from MacroMind Three-D, sounds from MacRecorder as well as all standard Mac file formats. Includes Macintosh Player for license-free production distribution, and Accelerator a $195 value, for smoother animation playback and less screen flicker. Playback interactive productions on Windows or Iris workstations. Version 3.1. Suggested list, $1,195. Special upgrade offers. See coupon.

Limited Time Offer. Buy Director 3.0 between April 1 and June 30, 1992 and we'll send you a Director 3.1 upgrade, free! A $149 savings.

LifeForms™

NEW!

Create sophisticated human motion animations with this new, easy-to-use package. Access shape libraries of figures in sitting, standing, jumping, sports and dance poses, and more. LifeForms automatically creates smooth human motion between any two positions you define. Add natural human motion to Swivel 3D Pro, MacroMind Three-D and Director productions. Save motion sequences as QuickTime™ Movies. Suggested list, $495.

Swivel 3D™ Professional 2.0

Create, rotate, scale and animate 3D models with this complete modeling and design environment. Hierarchically link object parts. Export 3D views and animation sequences. Swivel 3D models are compatible with MacroMind Three-D and Director for advanced animation and rendering of 3D models. Supports 24-bit color, full screen display, Pixar MacRenderman™ output, AutoCAD™ DXF output, Adobe® Illustrator™ EPS, PICT and PICS files. Version 2.0. Suggested list, $695.

FilmMaker™


MacRecorder SoundSystem

The industry favorite for sampling, recording, editing sounds and multimedia production. E-mail. Soundsend: all new versions. User interface: all new functions. Playback: all new functions. Save with up to $150 off. MacRecorder SoundSystem, new version (includes software) $795 for just $75.

MacroMind Three-D™ Professional 2.0

Now supports QuickTime™! This exciting, entry-level multimedia authoring tool features a draw-like environment and tool palette for the creation of moving text and graphics with sound. Import, playback, animate, create and export QuickTime Movies—even add transitions. Includes object transparency, pre-defined templates, and easy interactivity via on-screen buttons. The perfect introduction to multimedia. Includes QuickPics, a $149 value, free. Version 1.1. Suggested list, $395.

FilmMaker Professional


Swivel 3D™ Professional 2.0

Create, rotate, scale and animate 3D models with this complete modeling and design environment. Hierarchically link object parts. Export 3D views and animation sequences. Swivel 3D models are compatible with MacroMind Three-D and Director for advanced animation and rendering of 3D models. Supports 24-bit color, full screen display, Pixar MacRenderman™ output, AutoCAD™ DXF output, Adobe® Illustrator™ EPS, PICT and PICS files. Version 2.0. Suggested list, $695.
ClipMedia™
Volume 1
A high-quality, royalty-free collection of 250 sound effects, 75 animations, 50 digital video sequences, 50 music pieces and 75 graphics. Use these multimedia elements as needed in business presentations, video productions and QuickTime Movies. Available on CD-ROM for Macintosh and Windows users. Mac version includes digital video and animations saved as QuickTime Movies in addition to PNGs. Volume I Business & Technology. Suggested list $395. Order now and save $100. See coupon.

Macromedia®
System Pro
1/2
porting and to spice up productions, even StealEdit Pro, an edition of SoundEdit, includes an enhanced file, unlimited multiple tracks, and record from disk, the ability to sounds in 8- or 16-bit format at rates to 48KHz, and more. Works with any Macintosh.
Record Sound System Pro, $295. Upgrade to SoundEdit Pro

ModelShop II™
Create and manipulate realistic spatial models with this completely interactive design and presentation tool. Quickly create models in hidden surface perspective with CAD-like accuracy. Allows real-time walk-through of architectural models, landscapes and visualizations. Add professional-quality animation and photorealism with Macromedia Three-D for architects and design professionals. Tested list, $895. Includes QuickPics, free, a $149 value!

MacroMind Three-D™
A professional tool for creating high-quality 3D animations and photorealistic images for use in video and multimedia productions. Imports a wide range of 3D model file formats and provides a hierarchical time-line for easy animation of unlimited shapes, lights and cameras. Import models from Swivel 3D and export animations to MacroMind Director. Supports video animation controllers, image special effects (bump and texture maps, shadows, etc.), 3D text from TrueType fonts and RenderMan® RIB. Version 1.1. Suggested list, $1,495.

MacroMind MediaMaker™
Assemble and synchronize video, CD-Audio with Macintosh graphics, sound and animation to create custom video productions. Fully automated Print-to-Video command allows accurate, easy output to videotape. Version 1.0. Suggested list $695.

MacroMind TitleMaker™
Create professional-looking, animated titles and credits for MediaMaker business, education and home videos. Includes over 150 customizable templates. Replace template text and graphics with your own. Version 1.0. Buy direct from us, $149.

MacroMind Three-D®

SwivelArt™
Collections of 3D Clip Graphics

Suggested list price

- 3D Viewpoint Cars ........... $250
- 3D Maps I ................... $250
- 3D Maps II .................. $250
- 3D Graphics Original ..... $299.95
- 3D Viewpoint Air and Sea .... $250
- 3D Viewpoint Anatomy ..... $250

Action™
Create dramatic business presentations and demos complete with animation, motion, sound, text and graphics with this easy-to-use Windows based package. Includes 120 professional presentation templates. The best tool for presenting from desktop, portable or laptop PCs. Soon available for the Macintosh.

Version 1.0. Suggested list, $495.

1-800-248-4477 Ext. 27
So what are you waiting for?
Here's a quick way to get started with QuickTime and save some cash in the process.

Just call us and order your Professional Authoring or Getting Started Kit.

You’ll get Director 3.1, MacRecorder Sound System Pro and ClipMedia Volume 1 for just $995—and save a whopping $944 off the regular price.

Or, you’ll get Magic, MacRecorder Sound System Pro and ClipMedia Volume 1 for $599—an incredible savings of $540.

Either way, you’ll get everything you need to start making Movies—QuickTime ones, of course—right away.

So choose your kit and call us direct at 1-800-248-4477, Ext. 27.
### SPECIAL OFFERS

**QuickTime Kits**
- Professional QuickTime Authoring Kit, $995 (Reg. $1939, Save $944)
- Getting Started With QuickTime Kit, $899 (Reg. $1139, Save $240)

**Upgrades**
- Sound Edit Pro. Upgrade for just $75
- Director Upgrade, Ver 3.0 to 3.1, $149
- Director Deluxe CD-ROM Upgrade, Ver 3.0 to 3.1, $249. Includes ClipMedia clips, hundreds of valuable tips and hints, and "save-disabled" versions of Magic, Swivel 3D Pro, ModelShop II, Sound Edit Pro, and LifeForms to play at your leisure.

**ClipMedia**
- Business and Technology ClipMedia Volume 1. Order now for $295, a $100 savings. Specify CD-ROM for Macintosh or Windows.

**Want to know more?**
Check here for free information on MacroMind-Paracomp multimedia products, including a Multimedia Info Kit, complete with videos, demo disks, configuration guides, how-to booklets and more, just $24.95! Shipping is free. Information on MacroMind-Paracomp training.

**Call, or send this order form to:**
MacroMind-Paracomp, Inc.
P.O. Box 1810, Carmel Valley, CA 93924-1810

---

### Product Name | Type | Quantity | Cost - Each | Total
--- | --- | --- | --- | ---

---

I enclose my check for $ | Total Merchandise Sales Tax (IN, CA 8%) Shipping & Handling (In Canada, $25) | TOTAL |

---


---

1-800-248-4477 Ext. 27
text help files, scattered around at different levels, that explain the contents of the database. Fortunately, you do not always know the location of these files. You can use the program for hours and still find help files you have never seen before. Second, Frontier comes with another application called DocServer. DocServer, an IAC-aware program that can be controlled from Frontier, lets you search an online help file that contains descriptions of most Frontier verbs. Unfortunately, the help file does not contain information for the advanced verb set. You have to load a separate document describing the advanced verbs and rebuild the DocServer index. But there are inconsistencies between the printed material and the online help.

Overall, Frontier is a powerful, interesting, and complex tool. I’ve automated a few of my more mundane desktop-management requirements, but my work doesn’t involve repetitive tasks that can be easily scripted. I suspect that many typical Macintosh users don’t need Frontier, at least not for scripting.

UserTalk is about as complex as HyperTalk but more robust. So if you’re willing to learn to write scripts, you can use Frontier to perform routine file maintenance and update a group of networked Macs. You can also use Frontier to integrate a group of IAC-aware applications, such as PageMaker 4.2, Excel 3.0, and QuickKeys, for repetitive data-management tasks. You can automate certain desktop functions to change a group of file names, eliminate old Microsoft Word temporary files, or change the creator type for a group of files. You can use the program to automate complex software testing functions. These tasks just scratch the surface of Frontier’s capabilities.

Unfortunately, Frontier doesn’t let you create double-clickable scripts. And if you write a script that is to be used by a group of people, you must also provide users with their own copy of Frontier. Although UserLand does provide substantial volume discounts, outfitting a network can be expensive. But these are minor flaws in a ground-breaking product.

—Steve Mann

**PostScript Level 2 Printer**

**TI microLaser Turbo**

**PROS:** Compact size; can automatically switch between a Mac and a PC on a network; modest processing speed gains over nonturbo models.

**CONS:** Higher price PostScript Level 2 technology yields few discernible benefits; paper-tray software unusable with Turbo models; Turbo board incompatible with some printer drivers.

**COMPANY:** Texas Instruments (817/774-6001).

**REQUIRES:** System 6.0.2; LaserWriter driver 5.2.

**LIST PRICE:** $2349 (includes AppleTalk board).

The Turbo has been furnished with a Weitek 8220 RISC processor—a special processor that greatly speeds page-description tasks.

TI promises its new RISC-based controller can deliver up to a sixfold increase in printing speed. The key words here are *up to*; don’t expect blistering speeds on every print job. On simple text documents, the Turbo printed only about 40 percent faster than the non-Turbo microLaser. Several time-saving PostScript Level 2 features, such as compression and decompression of large bitmapped files and form and pattern caching, simply don’t work unless the printer is paired with a Level 2 printer driver—and none was available for the Turbo when I tested it. Without the Level 2 driver, only a fraction of the more significant Level 2 features are tapped. TI said a Level 2 driver would begin shipping this summer.

While the Turbo’s PostScript interpreter is faster than that found in a nonturbo microLaser, it’s equipped with the same 9-pages-per-minute Sharp JW 9500 print engine used in TI’s less expensive models. This means that the Turbo can process complex PostScript information more rapidly, but even at its maximum speed it can’t push out pages any faster. If you are looking for super speed and you’ve got the money, consider the microLaser PS35 XL ($3249) or the Turbo XL ($3749), both rated at 16 ppm.

To a degree, the TI microLaser Turbo’s cutting-edge PostScript technology is a liability. The Turbo board does not always work with current applications that use their own printer drivers, such as Aldus PageMaker. You have to override the PageMaker driver and use the standard LaserWriter driver (by holding down the option key while choosing Print from the File menu) in order for the printer to work.

In fact, not even the current version of TI’s own software, Paper-Tray Manager, is Level 2-compatible. Paper Tray Manager allows you to switch between the standard and optional paper trays during print jobs and automatically shift orientation for envelopes. TI has promised a Level 2 version of Paper Tray Manager by July, but meanwhile, Turbo owners have been missing out on some of the printer’s best hardware features.

Setting up the Turbo is a clean and simple process that involves installing three separate disposable cartridges of toner, developer, and OPC (organic photo conductor). In addition, a cleaning pad and waste-toner bottle must be snapped into place before printing for the first time. Toner cartridges are rated to continue

---

**REVIEWS**

**Frontier Windows** This figure shows the Frontier main window and the first two levels of the object database. Clicking on a table entry opens a window to the next object level.
YOU'RE USING PRESENTATION SOFTWARE AND THEIR EYES ARE STILL GLAZED OVER.

Let’s face it. Audiences today are bored to death with presentation software. Everyone on the planet is using it. And it all looks the same. But there is a way to break the snooze factor—project your software on one of In Focus’ new color LCD projection panels. Not only will your ideas look better, they’ll have the waking power you need.

FORTUNATELY, OUR NEW LCD PANELS WILL MAKE

Simply slip one of our lightweight, portable panels on top of an overhead projector, and plug it into your PC or Mac. In mere seconds you’re giving a full-color interactive presentation right off your computer. (Let everyone else fumble with transparencies and slides.) So you come across looking more polished, professional and persuasive. A change your audience will definitely notice.

YOUR IDEAS SCREAM OUT

And talk about efficient. Since you don’t have to make hard copies of your presentation, turnaround time and outrageous costs are no longer issues. Plus, you can animate your information, even work with it during the meeting, which is infinitely more interesting than static data. All in vibrant colors, with unparalleled quality, saturation and contrast.

& WAKE THE DEAD!

We offer a wide variety of products including the new 7000FX+ with 24,000 colors; the TVT-3000 active-matrix panel for multimedia; and the 7600XGA—the only panel for projecting stunning XGA images at 1024 x 768 resolution. So call 1-800-327-7231 for a free brochure with all the specifics. And bring dead presentations back to life.
If you want to get into QuickTime, the four boxes you see to the right—Director 3.1, MacRecorder Sound System Pro, ClipMedia and Magic—are the right place to start.

You can quickly create QuickTime Movies—complete with sound, animation and motion—to use in your multimedia productions. And quickly play them back in any QuickTime compatible app.

(For a limited time, you can also save a quick $94. See inside.)

Actually, if you already know our products, you already know how to author QuickTime Movies.

Just open or create any animation or presentation. With sound. Or not.

And simply export the production as a “QuickTime” Movie.

That’s it.

And if you don’t know our products?

Then open up this insert.

You’ll find multimedia tools for novices and pros, plus 3D graphics packages, modeling software, even a 3D human figure animation package.

You’ll also find great offers on new products and upgrades.

So call us today at 1-800-248-4477 Ext. 27.

And get everything you need.

Quick.

Multimedia Info Kit

Want to learn more about multimedia? For just $24.95, we’ll send you an info kit with a video tape, demo disks, configuration guides, how-to booklets, and more. Call 1-800-248-4477, Ext. 27, today.

Apple is a registered trademark and QuickTime is a trademark of Apple Computer, Inc. MacMind Director, MacMind Windows Player, MacMind Accelerator, MacMind Author, MacMind Three-D, MacMind Tile Maker, ClipMedia, MacRecorder, SoundEdit, and MacMind-Pincep Magic are trademarks or registered trademarks of Macmillan-Pincep, Inc. MediaMaker is a trademark of The Multimedia Corp., and LifeForms is a trademark of Kinetic Effects, both with exclusive license to Macmillan-Pincep. All other marks are owned by their respective companies.
"So that's multimedia," one user was overheard whispering to another at a recent QuickTime seminar. Because there on a projected Macintosh screen was a QuickTime "Movie"—complete with graphics, video, music and sound effects.

Then a developer asked, "If I'm using MacroMind Director to do an animation, how do I do QuickTime?"

Many questions like these are being stimulated by QuickTime, Apple's new multimedia technology for the Macintosh.

Put simply, QuickTime defines a new data format for "time based" information (video, animation, music, etc.) and a standard compression scheme to save processing time and disk space.

To end users, QuickTime means that multimedia will be coming to their screens in new, inventive ways. To developers, it means it's definitely time to do QuickTime—or fall behind as the standard takes hold.

How to get into Movies

Actually, as long as your favorite multimedia authoring tool supports QuickTime, creating a QuickTime Movie is as easy as a "Cut and Paste." (A "Movie" is Apple's term for integrated time-based data.)

Take, for example, the Director animation the developer asked about at the seminar.

To create such an animation, simply continue to use Director like always. You then can add music and digitized sounds that you've sampled and edited with MacRecorder* SoundSystem* Pro.

Or spice things up further by popping a ClipMedia™ disk into a CD-ROM player and grabbing a QuickTime video clip.

Using Director, you synchronize the audio-visual elements. Then, instead of saving it in the normal Director file format, just export your production as a QuickTime Movie.

And that's it. You've just created a QuickTime Movie ready for playback in any QuickTime compatible application.

You can play back the Movie within Director itself. Or within an entry-level multimedia tool such as Magic*.

You can even import standalone Movies into end user apps—to spice up a spreadsheet, for example. Or to make your message very clear in your E-mail. Or to add extra impact to a word processing document.

Now showing on Windows

QuickTime is great for the Macintosh, but what if you need to play back a production on one of the world's 9 million Windows*-based computers?

If you're using Director, moving a Mac-based production to Windows is fairly easy.

You simply save your production in the standard Director format and use a package such as Windows Player™ to convert it for playback.

Your original Mac-based production can now be distributed and played back under Windows, complete with color, sound and interactivity. (A similar Player product is also available for playing Director productions on Silicon Graphics Iris Workstations.)

Of course, the other way to end up on Windows is to start there in the first place.

Take Action!, the easy-to-use, Windows-based package for busy professionals. Action! helps you create dynamic business presentations that—unlike static packages such as PowerPoint* and Persuasion*—contain the power and persuasion of motion and sound.

By presenting with Action! and a portable PC, you get the added impact of interactive multimedia—and do away with the hassles of overheads and slides.

Choices

Today, especially with the introduction of QuickTime, multimedia means many things, including "multi-platform."

If you're using MacroMind Director to do an example. Or to make your animation the developer asked about Windows, complete with color, sound and interactivity. (A similar Player product is also available for playing Director productions on Silicon Graphics Iris Workstations.)

Of course, the other way to end up on Windows is to start there in the first place.

Take Action!, the easy-to-use, Windows-based package for busy professionals. Action! helps you create dynamic business presentations that—unlike static packages such as PowerPoint* and Persuasion*—contain the power and persuasion of motion and sound.

By presenting with Action! and a portable PC, you get the added impact of interactive multimedia—and do away with the hassles of overheads and slides.

Creating a QuickTime Movie with Director is as simple as exporting your production.

On Windows, Action! brings the power of motion and sound to business presentations.

You can create QuickTime Movies on the Macintosh.

You can author productions on the Mac, convert them to another format, and play them back on other platforms. Or create presentations directly on Windows.

The choice is yours.
last for approximately 3000 pages. The replacement cost for all three cartridges runs about $19.80 per 1000 pages.

With the optional AppleTalk board installed, the Turbo's default configuration is Mac-compatible, so all you have to do is connect an AppleTalk cable (not included), plug in the power supply, and you're ready to print. The standard Turbo comes with 2.5MB of memory (expandable to 10.5MB) and 35 PostScript fonts. A disk of screen fonts and a free copy of Adobe Type Manager are also included.

Using the printer with PCs as well as Macs, the Turbo automatically switches between the unit's PostScript interpreter and its built-in HP LaserJet series II emulating. Also noteworthy is its ability to monitor up to three communications ports (parallel, serial, and AppleTalk) simultaneously, switching to the active port. For enhanced PC-connectivity, Epson, Diablo, and Proprinter emulation boards are available for $135 each. Remember, though, that the Turbo board only affects the processing speed of PostScript.

Other options include a SCSI interface for connecting a hard drive to store downloadable fonts ($249); a second 250-sheet paper tray, which fits underneath the unit ($275); and a 40-envelope feeder ($275). HP font boards run from $135 to $399.

Like TT's earlier microLaser versions, the reasonably priced Turbo is an admirable performer and a dependable machine. But unless you plan to use the PC-oriented features, you might want to save some money and stick with the nonturbo microLaser Plus PS 35. The $500 you pay to get turbo power buys some modest speed gains, but it also gets you the same 9-ppm engine; the same 300-by-300-dpi resolution; and a PostScript upgrade, the true significance of which has yet to be defined.—JOSEPH SCHORR

THE LATEST VERSION OF QUARKXPRESS, 3.1, adds dozens of new features that address almost all of the reservations I've had about previous versions, including the instability of those versions. It still crashes a bit more often than PageMaker, but I've yet to have this version corrupt a file.

The interface is much improved, with three new palettes (for creating, editing, and applying styles, colors, and traps), better zooming, accurate rulers, more control over guides, a Picture Preview check box in the import dialog box that lets you see graphics before you import them, lots of new preferences, and the ability to see objects while you're moving them.

That last feature does more to improve QuarkXPress's utility for designers than any other: you can now see objects while you move, scale, rotate, and crop them, rather than just seeing the bounding boxes.

QuarkXPress 3.1 lets you handle layered items much more easily. By option-shift-clicking you can select items that are behind other items, and holding down the option key changes the Bring to Front and Send to Back menu items to Bring Forward and Send Backward. So you can move items a layer at a time.

Zooming is improved in two ways. When you go to Fit in View window, QuarkXPress centers the current page in the window. When you zoom to a numeric percentage, it centers the currently selected object(s) in the window. These seemingly minor changes speed up production (and alleviate frustration) more than almost any other new feature. Another frustration reliever: you can grab guides anywhere on the page, rather than having to scroll over to the margins. You can also remove all horizontal or vertical guides by option-clicking on the rulers.

New preferences (some of which appeared in the Freebies package of XTensions for 3.0) include color guides, live scrolling (with constant screen redraw), adjustable scrolling speed, automatic saving of libraries, adjustable pasteboard width, calibration of Pantone color output, and positioning of registration marks (see "What's Your Preference?").

Improvements

TEXT EDITING AND FORMATTING have significant improvements, including the ability to search for the first occurrence of an item; three new types of tab stops (aligning with the right indent, aligning on a comma, and aligning on a specified character); proper alignment of decimal-tabbed figures, even if they are followed by parentheses or superscript letters for footnotes; an enhanced hyphenation routine (academy and electromechanical now hyphenate properly, for instance), and kerning and tracking limits of up to 500 units (a unit is 1/200 of an em).

The new automatic ligature feature combines ligature pairs (fi and fl, for instance), printing one special ligature character from the font instead of printing two closely kerned characters. Remarkably, when letterspacing increases to a certain point (due to kerning, tracking, justification, or whatever), QuarkXPress breaks the ligature into separate characters. It also breaks apart the ligature to check spelling. Very clever.

You can now load fonts without closing documents, and QuarkXPress updates both the active font list and any open publications. Styles (still called Style Sheets) haven't changed much, unfortunately, aside from the styles palette. QuarkXPress still generally wipes out local formatting when you apply a style.

The Colors palette is a big improvement, and other new color features let you do things you couldn't do before. You can create color blends—for instance, a blend from magenta to cyan—within a frame. You can even blend from a process color to a spot color—something you'd have hard put to do in other programs.

Version 3.1's traps palette, though perhaps useful only to a small percentage of users, shows the most change from version 3.0. You can specify trap attributes for each object (rather than for each color, as in 3.0), and there's Absolute as well as Proportional trapping (so automatic trap overlaps are all the same size, rather than varying in proportion to the difference between the two abutting colors). The trapping is still not perfect, but a careful user can handle many trapping situations.

Other color improvements include support for files in OPI (Open Prepress Interface), CMYK TIFF, and Seitz for...
mats, and color specification using the TruMatch and FocolTone systems.

Printing is what QuarkXPress is all about, and there are a few new features here, as well. You can print master pages, choose not to print blank pages, control whether output is calibrated, and see the status of the print job while it’s printing.

More important, the XPress Data file is now XPress Preferences, and you no longer need to include it with your QuarkXPress publications. Kerning, tracking, and other information is included in each publication, and you’re prompted for which information to use if the publication’s settings conflict with those in XPress Preferences.

QuarkXPress 3.1 is not perfectly behaved. It still annoyingly makes boxes opaque when they’re selected with the Content tool; the relationship of styles to local formatting is still confusing and confused; the trapping controls don’t let you do everything you need to do; and redraw speed is not blazing (and you can’t interrupt redrawing—one of PageMaker 4.2’s best new features). But these failings are not fatal flaws. QuarkXPress 3.1 has emerged as a full-featured, stable, well-designed program, with hardly a strike against it. If I were buying a page-making program today for the first time, I would buy QuarkXPress.—STEVE ROTH

MicroPhone II 4.0

PROS: Heavy-duty scripting features; supports many System 7 features; customizable interface.
CONS: Poorly implemented balloon help; lacks useful modules for Loran Interface.
COMPANY: Software Ventures Corporation (610/644-3222).
REQUIRES: Mac Plus, System 6.0.

Telecommunications Software

MicroPhone II, version 4.0, has a little something for everyone.

All in all, this is not a dramatic upgrade to the product, but refinements are evident throughout MicroPhone’s well-designed interface. Most menus and dialog boxes have been streamlined. Instead of choosing the baud rate from 20 radio buttons, you now select it with a single pop-up menu. An improved file-transfer setup routine saves you the trouble of shifting to a second dialog box to adjust settings associated with each of the six transfer protocols the program supports. Most of the dialog boxes can be moved around anywhere on the screen. You have

prisingly easy to learn, thanks to the point-and-click approach to script building. The Watch Me feature records commands as you perform them and neatly translates your clicks and keystrokes into a basic script. When you choose commands from the Script Command menu, MicroPhone prompts for the proper syntax and argument to complete the expression and automatically checks for syntax errors when you save your work. Working with scripts has been made even easier with the inclusion of the Script Manager, a window that provides a listing of all scripts you have created as well as buttons that let you copy, modify, delete, import, export, or run existing scripts.

Once you’ve created a script, you can invoke it with a keyboard command or assign it to an icon that will appear on an icon bar that floats across the program’s main window. The icon bar is scrollable, so it can hold as many scripts icons as you please, and you can resize it and orient it horizontally or vertically.

The MicroPhone manuals provide good sample scripts and thorough (though sometimes technically complex) explanations of each script command and function. The script language takes a little experimentation, but I found it fairly easy to grasp and useful for automating many telecomm routines.

But it’s disappointing to find that the program offers such poor help features. MicroPhone’s balloon help offers only the most basic—and sometimes useless—information (for example, pointing to “Modify Service” under the Phone menu produces a balloon that says “Modifies a Service”). The help feature doesn’t explain any of the terms that a newcomer to telecommunications will find unfamiliar. Also, the balloon help isn’t available at all in dialog boxes, where expressions like “CRC Type” and “Resurrect Transfers” are sure to raise a few questions. Better online help is definitely needed.

The program is only slightly bigger than the previous version—767K instead of 567K. If you install the full complement of scripts for online services (scripts for GEnie, CompuServe, and the Software Ventures BBS are included) and the Loran document, the MicroPhone folder takes up about 2.5MB on your hard drive.

But not everyone needs MicroPhone’s $295 worth of sophistication. If you want to create your own electronic BBS, do heavy-duty scripting, or design custom interfaces, you’ll find everything you need here. But if you plan to use your modem to dial up a few of the popular online services and little else, less-expensive software will do the job—though without MicroPhone’s polish.—JOSEPH SCHORR
QuickTime Movie-Editing Software

DiVA VideoShop 1.0

**PROS:** Continuous, immediate display of movie in progress; excellent frame-specific navigation features; multiple tracks can play side by side; handles every stage of production from recording through presentation.

**CONS:** Unpolished; tools don’t work consistently in all modes; insufficient, error-ridden manual.

**COMPANY:** DiVA Corporation (617/491-4147).

**REQUIRES:** Mac II (also runs on LC); 4MB of RAM, hard drive with 40MB of free space; System 7. Recommended: 8/16MB of RAM; 16-bit monitor.

**LIST PRICE:** $595.

**MW** ★★★★☆

_All right, you've been bitten_ by the QuickTime desktop movie-making bug. You bought your VideoSpigot, or your RasterOps digitizing board, so that you can convert VHS tapes into digital movies on a color Mac. Now you have to edit this stuff: mix sound tracks, superimpose credits, and fade out at the end. Right now, two programs exist that can help. There's Goliath—otherwise known as Premiere, which Adobe got from SuperMac. And now, slingshot in hand, there's VideoShop.

DiVA (the six-person company that created this upstart) has bigger plans for your QuickTime movies than Premiere does. Both programs are competent as editing programs—they let you apply Photoshop filters, create fancy transitional effects from one scene to another, make cuts and splices, mix multiple sound tracks, and so on.

But the VideoShop experience begins before the editing: with the proper driver software (called a VDIG, available for most digitizing boards, including the VideoSpigot), you can record directly from a camcorder or VCR into VideoShop. Because the program is integrally knit into HyperCard (a fact played down by DiVA), installing a finished movie into a stack of your own is as simple as dragging its icon there.

The Video Desktop

_When you launch VideoShop, a funny thing happens to your desktop._ You can still see your drive and folder icons, but all your files disappear except for QuickTime movies. These appear as jumbo icons; after being processed by VideoShop, each QuickTime icon becomes easily identifiable because it shows the first frame of the movie.

There is a simple beauty to this filing system: as far as your brain knows, you're still in the Finder. Use the Find command. Double-click on a folder to open it. Double-click on a movie icon to play it at full size. Yet you can't drag something to the Trash, rename an icon, or copy anything.

To assemble your movie, you drag icons from their folders on the "video desktop" and drop them into the Sequencer window—empty horizontal tracks, for video and audio. Voilà: instant storyboard. Rearrange scenes by dragging icons. Add another video track and drag it above the first one—VideoShop superimposes them, which is how you overlay titles and graphics (and how, if you're an animator, you could create your own Who Framed Roger Rabbit?).

With a double-click, the storyboard expands to show you the actual frames of your movie (or every other frame, or every tenth, or whatever) laid out like a filmstrip. Here editing is intuitive and easy, because you can select frames for editing by dragging through them.

**Show Me**

_by far the most important and impressive feature of VideoShop, however, is the immediacy of playback._ You can put the playback window anywhere you want it to be and make it as big as you want it to be (in any shape)—although on my Mac Ilex, a larger window meant jerky playback and more sound dropout. You can play back any chunk of a movie at any time. You can control playback from the keyboard. And you can even "scrub" to find a specific moment by dragging a handle left or right; you hear the sound (and see the video) play backward or forward as you do so. This critical facet of VideoShop stands in stark contrast with Premiere, where you never get to see your movie-in-progress until you compile it into a Preview.

You can even have multiple video tracks playing side by side within a single playback window. You could create an on-screen "video wall" presentation, with images popping in and out of different places on the screen, all perfectly synchronized.

Better still, the playback window is intimately tied to the Sequencer window, where you do the actual editing. Double-click on a frame in one window to jump to that frame in the other. These scrolling shortcuts (and several dozen others) make navigation effortless—or at least more so than with Premiere, which offers only a single scroll bar (with no numeric readout) by way of navigation.

**Trade-Off Derby**

_How profoundly does David trounce Goliath?_ Premiere is light-years easier to learn; each of VideoShop's five tools (arrow, hand, scissors, magnifying glass, and eyedropper) works only in certain modes, yet they're never dimmed to warn you they're unavailable. Other minor disappointments lurk: applying a transition takes several minutes; the Delete Clip... command gives you no warning (as is implied by the ellipsis) before nuking footage; and the horribly sparse, mistake-stopped manual is maddening. DiVA promises that a new, improved manual is in the works.

Unfortunately, you're left completely in the dark about how to work with movies you've drag-installed in HyperCard stacks. There they sit: several movies on the same card, playing over and over again. In its efforts to dissociate its product from HyperCard, DiVA withholds any instruction for controlling playback, customizing a movie's appearance, or just stopping the darned things from looping endlessly over again. The one thing the manual does tell you, alas, is that these aren't stand-alone stacks; they have to reside on a system with VideoShop.

Still, the importance and grace of VideoShop's instantaneous, universal playback can't be overemphasized. Likewise, it seems natural and intuitive to select specific frames for editing simply by dragging through them. The video desktop takes a day to get used to, but it means you never have to open or import any raw QuickTime footage. VideoShop's ambitious, effective, creativity-conducive design deserves four stars—but I'm holding one star in escrow until an updated version wipes away the rough edges, lousy manual, and clumsy interface issues that occasionally dampen the joy.

—David Pogue
REVIEWS

Spelling Checker and Thesaurus

Thunder 7 1.0.5

PROS: Universal, fast, automatic corrections; customizable dictionaries; user-definable shortcuts. CONS: Questionable suggestions.

COMPANY: Baseline Publishing (901/682-9676).

REQUIRES: Mac Plus; System 6.0.4. Recommended: 2.5MB of RAM; hard drive. LIST PRICE: version 1.0.6 $99.95.

MOST WORD PROCESSORS INCLUDE A SPELLING CHECKER, so why pay for a stand-alone alternative? Because it works everywhere you enter text, watching patiently, then pointing out possible errors, helping you avoid embarrassing mistakes.

Thunder 7 is a dictation with an INIT component. In the Control Panel, you designate which dictionary (50,000 words or 86,000) and thesaurus to use. Optional scientific/engineering, legal, and medical dictionaries are available for $19.95 each. You can specify the applications and DAs in which Thunder 7 is to be active (each application can have a custom set of dictionaries). When Thunder 7 is active, a check mark appears at the right end of the menu bar. You can make selections from this menu, or use user-definable #key shortcuts.

In interactive mode, Thunder 7 watches as you work, analyzing every keystroke for misspellings, duplicate words, and incorrect capitalization and/or punctuation. If it sees something suspect, Thunder 7 beeps. You can either ignore the possible error, fix it manually, or press + cohesive equal sign (+) for suggested alternatives. Double-click on the replacement you want or press its corresponding number, and Thunder 7 stops searching, returns to the document, and makes the change, leaving all other text alone.

If Thunder 7 fails to give an acceptable suggestion, enter your own word, and before replacing, see if it appears in the open dictionaries. If your word is correct but doesn’t appear, you can add it to a custom dictionary. Add it to a glossary, and the next time you type that suspect word, the program backs up and corrects it.

In document mode, you copy text to the Clipboard, then press + cohesive backslash (\) for the Check Selection window. Each suspected error is highlighted in context, and suggestions appear automatically or on demand. As in the interactive mode, you can choose from the list of suggestions or enter a word of your own. A Statistics option in the document mode analyzes the selection and calculates the reading level, and the number of characters, words, syllables, sentences, and paragraphs. After the entire selection has been checked, you can paste the corrected text back into the original document or leave it on the Clipboard. Baseline supplies compatibility modules for 16 applications and claims full interactive compatibility with all programs that don’t modify the use of the Clipboard. Corrected text retains all graphics, styles, and formats. The batch mode functions as a global search-and-replace module. You create a list of words to change, such as replacing each Mac with Macintosh, then apply this list to your file.

Thunder 7 is a spelling checker, not a dictionary on disk. Still, it comes with a Merriam-Webster thesaurus containing 40,000 words with definitions. When you look up a word, Thunder 7 displays a brief meaning, as well as synonyms and antonyms. You can delve into the related words, or simply replace the word in the document with the one you double-click on.

The best thing about Thunder 7 is how quickly and transparently the interactive mode worked in all the programs I tested it with. My biggest complaints are that it sometimes fails to come up with suggestions for obvious mistakes (signficantly), lets nonexistent words slip by (trix), and falsely flags correct words (performance). Its speed, customization, and features set are admirable, but before you can trust Thunder 7 implicitly, it needs a dictionary with greater integrity.—OWEN W. LINZMAYER

Scientific Graphing System

SigmaPlot 4.11

PROS: Complete set of math transformations of data; appropriate assortment of graph types; good publication tools; dozens of example files.

CONS: File import problems; intermittent crashes.

COMPANY: Jandel Scientific (415/924-8640).

REQUIRES: Mac Plus; 2MB of RAM; hard drive.

LIST PRICE: $49.50.

IF YOU’RE FAMILIAR WITH DELTAPoint’s DeltaGraph Professional or have seen the charting capabilities of Excel 4.0, you might at first think the collection of graphs in SigmaPlot is somewhat skimpy. While presentation charting packages now routinely offer such dramatic effects as 3-D charts with variable lighting and shading effects, SigmaPlot doesn’t offer any 3-D capabilities at all. The graph types (bar, histogram, boxplot, pie, needle plot, scatter, line) offered, however, are just the presentation graph types that appeal to a particular audience: the editors of scientific journals. You might not be able to get gradient shading, but you can adjust styles of axis tick marks and grids, insert axis breaks, add all sorts of graphics and labels, and fine-tune positioning of axes and axes elements to satisfy the most meticulous style requirements of professional journals. SigmaPlot’s strength is not just that it prepares attractive graphs for publication, but that it provides a complete repertoire of functions, transforms, and programming constructs for matching data to math formulas. The program lets you lay out multiple graphs on the same page, and the manual includes pages of definitive advice on optimizing laser-printer hard copy.

But it’s the set of functions for curve fitting and data transformation that makes SigmaPlot worth the money. Besides the expected linear and polynomial regression and splines, you can formulate curve fits to arbitrary mathematical representations. As a simple example, you can fit a Gaussian curve to supposedly normally distributed data and save the residuals for inspection. In fact, SigmaPlot has enough statistical functionality to handle ANOVA and t-tests—for analyzing most experiments so that you probably won’t need a separate statistics program. Although the curve-fitting procedures use a language that’s at least as complex as FORTRAN, an actual curve-fitting session proceeds through a few simple dialog boxes. The manual on transforms and curve fitting is a model of clarity, and details the computational algorithms used by the program.

SigmaPlot for the Mac, strong as it is, needs some polish on Mac fundamentals. The first two versions have been almost whimsically incompetent at importing Excel files (tabbed text becomes the preferred medium of exchange), and the program seems to lock up every few hours under Systems 6 or 7 with equal probability. Undoubtedly these infelicities will be amended anon, but someone at Jandel should have flagged at least the Excel problem (the Windows version, curiously, imports Excel Windows files properly). Despite these glitches, SigmaPlot is a program every experimental scientist needs. It offers unique analytical capabilities in a relatively easy-to-use format, and a short path from raw data to publishable graphs.—CHARLES SEITER

Normal, Right? One of the distinctions between SigmaPlot and a presentation graphics package can be seen here—a data set is compared for normal distribution to a Gaussian curve, and differences are plotted in a journal-quality graph.
EVERY ONCE IN A WHILE, THERE’S A VALUE OF HISTORIC PROPORTIONS.

1962 VOLKSWAGEN BEETLE: $1,399

The best value in PostScript printer history. The ‘60s VW bug is among the greatest values in history. According to the reviewers, so is the ‘90s GCC BLP Elite. It’s the most affordable Macintosh PostScript printer.

Extra low price. Extra fonts free. At $1,399, the BLP Elite is an even better value. And if you order one by June 30, 1992, you’ll receive 21 extra fonts at no extra cost. That’s 38 fonts for the price of 17!

Everything you’ve ever wanted. The 4 page-per-minute BLP Elite comes with a fast 16.67 Mhz 68000 microprocessor. Built-in AppleTalk for networking. 2 megabytes of RAM, expandable to 4. Support for ATM and TrueType. With crisp, clear, 300 dpi output for the most complex graphics.

A lot you won’t find anywhere else. Edge-to-edge output for oversized spreadsheets or banners. A straight-through paper path for wrinkle-free printing on almost any stock. A user-friendly, interactive LCD status panel. A big 200-sheet paper tray. And a quiet, economical low-power ‘sleep’ mode.

And all you need to keep you going. The BLP Elite also comes with a low per-printed-page cost – thanks to its patented toner recycling system. And every GCC printer comes with a one-year trouble-free warranty and toll-free support.

Own a piece of history. Call 800-422-7777. Call 800-422-7777, extension 502, for the name of your nearest GCC dealer, or to order directly from GCC. Because these days, there’s no better value than the BLP Elite.
**Digitizing Tablets**

**DrawingBoard II and DrawingPad**

**PROS:** Transparent artwork cover, double-function button on side of stylus; pressure-sensitive pen nib.

**CONS:** Difficult to assign macro buttons and switch functions; hard to use side button; understaffed tech support; DrawingPad has no off switch.

**COMPANY:** CalComp (714/821-2000). **REQUIRES:** Mac Classic; System 6.0.5. **LIST PRICE:** 12-by-12-inch $645; DrawingPad $395.

---

**COMPARED WITH THE BARE-BONES Wacom tablet, the DrawingPad and DrawingBoard II tablets offer two extras. The first is a transparent, hinged cover for securing artwork and sketches that you intend to trace. The second is a menu strip with buttons for changing drawing modes and accessing macros. The pressure-sensitive stylus offers a double-function side button to which you can assign tasks. For example, you might select tools by pressing the lower side of the button, double-click by pressing the upper side of the button, and draw with the pressure-sensitive nib.

A cdev (or control panel for System 7 users) allows you to change the way the tablet and stylus operate. As with most tablet eves, you can choose between absolute and relative tracking. Both modes are available from the menu strip.

You can rotate the orientation of the tablet with respect to the screen. For example, by rotating the orientation 90 degrees counterclockwise, you map the right side of the tablet to the top of the screen, the top of the tablet to the left side of the screen, and so on. You can also adjust the ratio of the active area of the tablet to one or more screens. For example, if you’re tracing a small image, you might map the boundaries of the image across the entire screen so that tracing a small segment represents a long stroke inside your paint program. You can even toggle between two ratios.

The cdev provides options for assigning functions to the macro buttons on the tablet’s menu strip. Unfortunately, these options could have been better implemented. For example, to assign a macro, you press the keystrokes that you want a macro button to perform. This assumes you have previously assigned macros to these keystrokes using a utility such as QuickKeys or Tempo II. Ironically, these utilities intercept the keystrokes as you try to enter them into DrawingBoard II’s cdev. So you must first turn off the macro utility, then enter the keystrokes into the DrawingBoard II cdev, and finally reactivate the macro program.

Even though you can assign keystrokes, mouse clicks, double-clicks, or mode toggle, putting the stylus’s side buttons to work is another matter entirely. If the pen nib is such as touches the tablet when you press the side button, the tablet reacts unpredictably. To get the keystroke, you have to float the stylus above the tablet—but not too high or the tablet won’t track the stylus—and press the lower side of the button, a decidedly unnatural technique.

CalComp’s technical support is also a frustration. I always had to leave a message with an operator—there’s no voice mail—and wait for a representative to return my call. Four of my messages were never returned. When someone did call, the person was courteous but generally not well versed on the Mac. In fact, I was able to acquire satisfactory support only after expressing my frustration to a public relations rep.

The CalComp tablets cost several hundred dollars less than their Wacom counterparts. Also, the CalComp tablets’ processing unit doesn’t take up additional space on your desk, as do the Wacom tablets. But the Wacom tablet is more stylish; the stylus feels better in your hand; and the processing unit provides an off switch. Neither CalComp’s stylus problems nor its less-than-stellar tech support are debilitating, but they need work.—DEKE MCCLELLAND

---

**Printer-Driver Software**

**BetterWriters 1.0.1**

**PROS:** Enhances draft-mode printing; LaserWriter feature emulation. **CONS:** No AppleTalk support; incompatible with some major applications.

**COMPANY:** GDT Softworks (604/291-9121). **REQUIRES:** Mac Plus; System 6.0.2; compatible printer. **LIST PRICE:** $69.

---

**My friends call me a gearhead, accusing me of always needing to have the latest thing. Well, I don’t have a laser printer; just the old ImageWriter II that I bought with my Mac Plus and that I usually keep hidden away in the closet. Fortunately, GDT Softworks has developed its BetterWriters series, a package of QuickDraw printer drivers for those of us who have not joined the laser revolution.

The $69 BetterWriters package contains substitute drivers for the ImageWriter I, ImageWriter II, ImageWriter LQ, StyleWriter, and DeskWriter. You simply install in the System Folder the driver appropriate for your printer, select it in the Chooser, and start printing.

The first thing you notice is that BetterWriters offers more quality options than Apple’s standard driver does. On an ImageWriter you have the choice of Best, Fair, Fast, Draft High, Draft Mid, and Draft Low. The three draft modes offer the best printing speed and also some of BetterWriters’ strongest features.

The BetterWriters drivers offer a variety of options for making draft output more presentable. With Apple’s drivers, draft-mode text is not kerned because the software defaults to the ImageWriter’s resident monospaced fonts. GDT Softworks includes a screen font called ImagePro that enables the ImageWriter’s proportionally spaced fonts. Choosing the Tall Adjusted and Fractional Widths options (under Page Setup) produces Draft High text that is fully presentable, and it is twice as fast as Best mode.

The drivers support a number of non-standard paper sizes and allow you to specify custom paper sizes for those odd-size forms and labels. Support for TrueType, Adobe Type Manager, and color round out the package’s features. The package supports network communication through Shiva’s NetServer and similar products, but does not support AppleTalk.

BetterWriters performs some of the printing gymnastics that laser printers do, such as inverting images and flipping them horizontally and vertically. You can also elect to print only even or odd pages, which is convenient for printing double-sided pages. Reduction and enlargement are available from 10 percent to 400 percent in 1 percent increments.

The BetterWriters drivers won’t turn an ImageWriter into a desktop publishing house. The ImageWriter is still limited by the low resolution inherent in a dot matrix printer, and the BetterWriters drivers don’t interpret PostScript, as Custom Applications’ Freedom of Press does. However, GDT Softworks has implemented good gray-scale pattern-matching in the higher-quality settings that definitely enhances graphics output.

The only problems with BetterWriters are some minor incompatibilities with common applications including Microsoft Word, Aldus PageMaker, and QuarkXPress. To GDT’s credit, these problems are documented in the manual’s appendix, and some are remedied by simply disabling one or two of BetterWriters’ features.

BetterWriters is a solid product. For roughly $1800 less than the price of a new laser printer, you can have significantly better-looking output from an ImageWriter, DeskWriter, or StyleWriter, along with added performance features. I know I’m not the only one in the Mac community who’s not rushing toward the latest and greatest. Kudos to GDT Softworks for supporting us.—GEORGE L. REYNOLDS
If you think the only way to avoid running out of memory is to avoid running a couple of your favorite applications, think again. Think about all those memory-hogging fonts and sounds you’ve got stuffed into that bulging System File.

Then do what over 200,000 resourceful Mac users do every day. Instead of closing your applications, open a Suitcase.

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

What’s more, Suitcase compresses your screen font and sound files by up to 60%.

Thereby giving you that much more precious disk space to work with. It even lets you put your screen and printer fonts on a server for all to share.

Thereby making each disk on the network that much more spacious.

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

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

Even if you’re running out of memory in System 7, because System 7 still stuffs your resources into your System File.

And System 7 still makes you close down all your applications and restart your Mac each time you install a new font. Which is a real pain in the, uh, system.

Suitcase, on the other hand, gives you unlimited access to all your resources.

And total control over how you organize them. Each suitcase can pack up to 800 fonts, 64 DAs, and any number of FKEYs and sounds.

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

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

Get Suitcase. It eliminates them. Call us at 1-800-477-8212. We’ll tell you about our vaunted 24-hour toll-free technical support.

We’ll also tell you that Suitcase is backed by a one-year money-back guarantee.

So you can be sure this baggage will live up to its claims.
REVIEWS

Educational Exploration Game

Spelunx and the Caves of Mr. Seudo

PROS: Imaginative; appeals to wide range of ages; full of surprises; educational. CONS: Minor bugs; some features don't work on monochrome Macs; copy protected. COMPANY: Broderbund Software (415/382-4400). REQUIREMENTS: Mac Plus; 2MB of RAM (4MB for color system running System 7); hard drive: System 6.0.7. LIST PRICE: $49.95.

Spelunx is a scholarly teddy bear and the creator of a magical underground kingdom named after himself. His friend Mr. Seudo helped develop the wacky toys and inventions in the kingdom. You never meet either character as you point and click your way through the game's tunnels and rooms, but you come to know them through their amazing creations.

The caves contain more than 20 of these creations, including a Seudo Scope, which lets you change the spin of planets as you view them (you first select coordinates on a graphing machine); an animator for designing and storing icon-based movies; a Tree Gene-o-rator that produces custom tree seedlings; a tiny farm populated by slightly intelligent ants; and a programmable polka dancer who dances to musical sequences you create. Any of these inventions could capture a child's attention and imagination.

Among my software testers, 8-year-old Anna Marie loved the polka dancer and the tree machine, while 11-year-old Johanna spent hours drawing pictures and playing the arcade-like "catch the toast" game. Andy, who's 12, dubbed the surprise-filled desk drawers "awesome." And 14-year-old Ben explored everything and then used the game editor to add passages to the maze that links the four rooms. Each kid found different ways to play, to learn, and to explore.

Unlike earlier games by the Rand brothers, Spelunx and the Caves of Mr. Seudo supplements the black-and-white HyperCard graphics with flashy color animated sequences. The color animation is a big plus if you have the equipment for it and a minor frustration if you don't. If you use

Computer Usage Recorders

TimeLog 1.01

PROS: Powerful reporting options; tracks both program and file use; inactive time can be allocated to inactivity or the current file. CONS: No network features; no option to combine times. COMPANY: Coral Research. REQUIREMENTS: Mac Plus, System 6.0. LIST PRICE: $97; five-pack $340; ten-pack $630.

TimeLog's cdw lets you specify a maximum size for the tracking file, specify the minimum time interval before TimeLog considers the Mac to be inactive, decide how to account for periods of inactivity, and designate a hot key to produce an instant Most Active Files report from inside any program.

Report styles include a history chart, showing the total or average times each file or program was used; a comparative-use table, displaying usage graphically or numerically; and a list of total usage times. Reports can cover any period of hours and dates, and can be sorted by frequency of use, program name, or file name. TimeLog can also calculate the total usage for any folder or volume. If you keep projects in separate folders, you can use this information to do time billing. TimeLog data can be exported to a spreadsheet for further analysis.

To track the files and programs used, TimeLog creates special files with the same names and stores them in a folder in the System Folder. If you use many files, the contents of the tracking folder grow quickly. For three days of use, TimeLog created 112 new files on my system. But the files are tiny, so the impact on disk space is minimal.

TimeLogWatch, an INIT, accounts for time spent in specific windows, rather than tracking program use (although it can do that, too). For example, you may work on several documents in a word processor. You can see how much time you spent on each file, rather than calculating the total time you used the word processor. Every named window opened in a program—including tool palettes and help windows—appears in the log. You can instruct WindoWatch to ignore certain file or window names (Clipboard, for example), and tell it to credit all time to a given application. You also decide how pauses and unattended files are handled, and you can set file-naming conventions.

The WindoWatch log lists the cumulative time spent in each window over whatever period the log has existed. You can sort the log by name or time; combine several entries into one; create a list of frequently used windows; search for entries; and remove all entries under a minute, for example. Logs can also be archived or exported to a text file for additional analysis.

If your main concern is to track program and file use, WindoWatch will handle the job nicely. If you have numerous programs in your system, however, using WindoWatch for time billing may be a maintenance nightmare. The log records only window names, not file creators or the dates the files were used. If you only use a few documents per client or adopt a consistent file-naming convention (such as using the company name in the file name), you stand a better chance of gathering usable billing information.—STEVEN A. SCHWARTZ

Talking Heads The Pinhead Puppets open their mouths when you click on them; if you speak into the Mac's microphone, they lip-synch your words.

Talking Heads

Shoobedooobop Software Testing Team

206 July 1992 MACWORLD
With all this attention from the press it's not surprising that Now Utilities is already one of the best-selling products on the Macintosh. Now Up-to-Date looks to be just as popular. Call Now at 1-800-237-3611 to learn more about both of these great products, and how they can help you get more out of your Macintosh.

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

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

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

In fact, every utility in the collection is the best of its kind. Every utility in the collection is also designed, tested, and guaranteed to work together — and with anything you may desire to connect to your Macintosh, including other Macs. So you don't even need to own a network: Now Up-to-Date makes a great single user product, too.

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

Now UP-to-DATE

The only calendar that keeps your appointments and your associates up-to-date — whether you're in the office, at home, or on the road.

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

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

**Organize Your Appointments**

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

**Remember Your Meetings**

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

**Mobilize Your Office**

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

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

Cinematica 1.0

PROS: Automatically records object transformations; can simultaneously animate two or more transformations; supports QuickTime; straightforward frame linking. CONS: Underdeveloped paint program and 24-bit video capabilities; background feature doesn't allow gradations; rudimentary text-handling capabilities. COMPANY: Vividus (415/494-2111). REQUIREMENTS: Mac Plus; 2MB of RAM for color; hard drive; System 6.0.7. Recommended: 4MB for color; color monitor. LIST PRICE: $495.

CINEMATICS’ BASIC APPEAL IS that it merges animation, interactivity, and presentation features (see “When Words Aren’t Enough” in this issue) into one program, but its real beauty is its ease of use. Animating an object is simple: you choose the Record command and then transform the object by moving, scaling, rotating, or cropping it. You can also place the original object in one frame and the transformed object in a later frame and use the Fill In Motion feature to automatically generate the movement of an object for all the frames that are in between.

The best way to animate two or more transformations at the same time—say, both movement and rotation—over the span of a few frames is to change the object into a movie within a movie. For example, you could first record the movement of a bouncing ball. Then you would change the ball into a movie within a movie and record its rotation. Cinematica integrates the two sets of frames, so that the ball rotates and bounces at the same time.

To record an animation, you must first acquire an object to animate. You can import an image stored in paint or PICT format, or use the program’s built-in painting tools to draw a new image. The program provides access to 16 million colors, but the paint function is otherwise paltry, lacking antialiasing and all but the most basic tools. The paint program offers a collection of automated gradations, but the only way to apply these to a background is to create a gradient as an object and manually paste it in behind other objects in the desired frames. On the bright side, you can lock objects into place so you don’t accidentally move them when you animate other objects.

If you want to draw each frame by hand, a technique known as cel animation, Cinematica helps by offering ghosts. These are dimmed versions of objects from a selected range of frames, which you can use as a reference when painting a new image. Unfortunately, only one contiguous range of ghost frames can exist at a time; you can’t see ghosts from just a few key frames, so that you know where you’re coming from and where you’re going as you draw.

You can pause the playback of a sequence at any frame. The pause may last until the viewer clicks on a specific object, or it may end after a specified amount of time. If the current frame contains an imported QuickTime movie, you can simply pause the frame until the movie finishes playing. At the end of the pause, you can create a link to any other frame in the current file or you can link to an external PICS or QuickTime movie. Create several linked objects within a single frame and you have an interactive presentation: clicking on different buttons takes you to different frames.

Cinematica’s image-handling and text-handling capabilities are less than stellar. The program doesn’t take sufficient advantage of 24-bit video, so ghosted objects appear dotted rather than tinted; also, rotated and scaled bitmaps frequently appear jagged rather than smoothed via antialiasing. The program’s text-handling capabilities are no better. The closest Cinematica comes to leading control, for example, is a simplistic grid function that you can’t modify. But taking into account Cinematica’s strong interactivity and animation features, I think it will prove a sturdy application in versions to come.—DEKE MCCLELLAND

Form-Letter Templates

Correct Letters 1.1


MAYBE THIS HAPPENS TO YOU, too. It usually strikes me when the letter I need to write is a bit unusual—thanking a panelist for appearing on a TV talk show, for example, or answering an inquiry from the Internal Revenue Service. I know what I want to say, but I’m not sure if I’m saying it correctly. So I end up staring a hole in the Mac’s screen. Sounds familiar? Then Correct Letters is for you.

Correct Letters consists of a HyperCard-based program called the Viewer, and a Letters Library of more than 250 ready-made business letters. The Letters Library is organized into 11 primary business-as-usual categories, including folders for Sales/Marketing/P.R., Credit & Collections, Customer Service, and Personnel. Each folder contains several subcategory folders, to make finding the right letter a little easier. Since the letters in the Letters Library are plain text files, you can open them with your favorite word processor.

For simple letters, just type in the missing details (such as name and address), choose Print, and voilà, your letter is complete. The hard part—composing the body of the letter—is done for you. If the letter doesn’t quite fit your situation, you can customize it. This may sound as if it defeats the product’s purpose, but sometimes a little inspiration is all you need. To this end, Correct Letters is worth its weight in gold.

You can also use the Viewer to browse the Library and view the letters. An instructional note accompanies each letter, describing the letter’s content, angle, and purpose. When you’ve found the letter you need, clicking on the Launch button opens your word processor and a copy of the letter, which you can customize, print, and save.

My favorite feature of Correct Letters is the online Guide to Letter Writing. The Guide is organized by small topics to teach you about the planning, structure, appearance, and grammar and usage of business correspondence.

I have just one complaint: HyperCard’s Find command is disabled, for no obvious reason. To be fair, many users won’t miss it. However, I’m a firm believer in Freedom of Search, so I found a simple way around this limitation. Simply choose Message from the Go menu, type find, followed by your keyword enclosed in double quotes, and press return. This technique is especially handy when you’re unsure if a letter exists. I wanted to write a letter of apology for, well, a returned check. None of the letters in the Apology Letters folder fit the bill, so I searched for the keyword apology and found an apology for a returned check in the Credit & Collections folder. No two ways about it: the ability to search by keyword should be a standard feature in Correct Letters.

The Find issue aside, Correct Letters is a good product. If a proper business letter means the difference between a closed door and a closed sale, then Correct Letters is a smart business investment.—JOE HUTSKO

The Writing Business

The Launch button automatically opens your favorite word processor and a copy of the letter, ready to be filled in and printed.
Now, MS-DOS Files Can Look Just Like Mac Files.

With AccessPC®, you just pop any DOS floppy in your drive, and in a couple of clicks, what you see on your desktop are Mac files.

And they not only look just like Mac files, they act just like Mac files in Mac applications.

You can edit, copy, save, print, play with the numbers, print again, ...

Put MS-DOS disks in your SuperDrive, double-click on the DOS file, and open it in your Macintosh application.

Plus, it includes powerful Multi-Drive™ and Media Formatter™ utilities, free. You get instant compatibility even with DOS removable cartridges and optical drives. And you can get access up to ten times faster than with other utilities.

Insignia Solutions Inc. provides new meaning to the word utility.

AccessPC is so easy to use, it gives new meaning to the word utility.

Insignia Solutions Inc., 800-848-7677, 528 Clyde Avenue, Mountain View, CA 94043. FAX (415) 964-4592. All other product names are trademarks or registered trademarks of their respective owners.

Circle 235 on reader service card
**Satellite 3D 1.5.3**

**PROS:** Applies perspective to isolated objects. 

**CONS:** Confusing interface; inadequate documentation; operates on entire illustrations only; improperly handles composite paths. 

**COMPANY:** Calliscope (415/964-8550). 

**REQUIREMENTS:** Mac II; 2MB of RAM; Adobe Illustrator or Aldus FreeHand. **LIST PRICE:** $199.

**REVIEWS**

**SATELLITE 3D, A NEW GRAPHICS-transformation tool packaged as a utility, provides two services. First, it enables you to display an illustration in perspective, as if it were mounted on a plane that could be rotated in three-dimensional space. Second, it provides an Extrusion command, which adds depth to surface images. Unfortunately, the program is confusing and the interface is inconsistent.**

Before opening an illustration in Satellite 3D, you must choose Extrusion and specify the amount of depth to be applied to the illustration. You can also position a light source and enter minimum and maximum brightness values. The depth controls are straightforward enough, but the lighting controls are unnecessarily complex. One scroll bar lets you position the light source anywhere from the Zenith to the Nadir of an illustration. To control the horizontal and forward/backward position of the same single light source, you use the Backlight/Wireframe Zone scroll bar (there is in fact no actual backlight). The manual gives two explanations, both telling you that the options provide “access to a dialog box where you can indicate the position of the light source as well as the values of high and low lights.” And that’s it—there’s no online help or other reference. Calliscope provides technical support, but the phone number is buried in the ReadMe file.

After setting the Extrusion values, you can open an illustration. Satellite 3D opens any image saved in the Illustrator 3.2 or FreeHand 3.1 EPS format. After a spell, another dialog box appears, in which you specify the orientation of the illustration. One set of scroll bars rotates the point of view in relation to the illustration, another rotates the illustration in relation to the point of view. Normally these two similar functions would produce perceptibly different results. However, in Satellite 3D one set of scroll bars merely duplicates the results of the other.

After you apply the orientation settings, Satellite 3D renders your illustration on screen. From there, you can change most of these settings (to change the Extrusion setting you must reopen the illustration). All settings are applied to the illustration; Satellite 3D provides no way to select an individual object and treat it distinctly.

Satellite 3D’s object handling rates fair. Type handling is another matter. The program ignores type unless it has been converted to outline paths. Even then, as the manual says, you should redraw the letters to avoid composite paths and masks, both of which the utility mismanages. If your illustration contains overlapping objects, you have to choose Sorting, which accurately layers objects (at the expense of speed).

Saving the 3-D illustration as an EPS file that you can edit in Illustrator or FreeHand is perilous. If you close a file prematurely, Satellite 3D prompts you to save not the illustration itself but the Spatial Situation, which amounts to a preference setting. If you don’t save the current file before clicking on the Close button, you’ve lost the illustration for good. If you click on OK but then change your mind and click on Cancel, the Close command cancels and you return to the unsaved file. Satellite 3D merely closes the file without saving it.

Neither Illustrator nor FreeHand provide sufficient transformation capabilities. Satellite 3D offers a function that both programs lack, but I cannot in good conscience recommend this program.

—DEKE MCCLELLAND

**Software-Development System**

**Think C 5.0**

**PROS:** Easy to use; tightly integrated software-development environment; fast compilation. **CONS:** Insufficient documentation for novice programmers.

**COMPANY:** Symantec Corporation (800/441-2234). **REQUIREMENTS:** Mac Plus; System 6.0. Recommended: 2MB of RAM. **LIST PRICE:** $249.

**REVIEWS**

**WITH ITS SPEED AND WELL-integrated compiler, editor, linker, and symbolic debugger, Think C 5.0 is an excellent software-development tool, especially for beginners. The compiler, designed specifically for the Mac, is 100 percent ANSI-compatible. You can create applications, DA's, device drivers, and stand-alone CODE resources with it. Think C includes extensive libraries and source files for accessing all the Macintosh Toolbox routines, including System 7 features. The compiler also has a number of non-ANSI extensions, such as inline assembly language, that make it even easier to write programs.**

The heart of a Think C program is the project: the set of source-code modules and libraries that you collect to make up a complete program. The compiler tracks all the program fragments and their dependencies, simplifying software development. If you make a change to one module and then try to run the updated program, the compiler first asks if you want to update the project. If so, it compiles all the modules that refer to the source code you just changed.

Think C includes both an editor and a linker as part of the development environment—you don’t have to switch back and forth between separate programs. After you make changes to your program, all you need to do is choose the Run command. Think C automatically links all the modules and launches your program in a separate partition (if you’re using MultiFinder or System 7). If you’re running the Finder with a System prior to 7.0, Think C quits itself and launches your program. When your program finishes, Think C starts up again.

In addition to the compiler, editor, and linker, Think C’s symbolic debugger lets you follow the execution of your program at the source-code level. You can trace each program statement as it executes and examine the program’s values of variables and data structures. The debugger, a separate program, is activated simply by turning it on in the development environment. When you start running your program, the debugger windows appear. The source window shows your source code and the current execution point. The data window shows variables and structures and their values.

Overall, Think C has a lot of features that make it easy to develop programs. For instance, when you’re editing source code, you can hold down the option key and click on the editor window’s title bar, and a list of all the referenced files appears. If you select one of those file names, another editor window opens for that source file. The program also has a variety of options for controlling code optimization, non-ANSI extensions, and processor-specific code generation.

Although version 5.0 is not a radical improvement on past versions, it is a significant upgrade. Changes include System 7 compatibility (32-bit addressing, virtual memory, and support for the Inside Macintosh, Volume 6, specifications), increased code optimization, and improved editor shortcuts. Version 5.0 also includes the Think Class Library 1.1, a set of source-code modules that help you create object-oriented programs. TCL 1.1 includes support for many System 7 features, including Apple events and file aliases.

While Think C 5.0 is easy to use, beginners won’t find the documentation helpful. It doesn’t include a C language reference manual, and the user’s manual does not discuss Macintosh programming or the Toolbox in any depth. In spite of the lack of hand-holding, Think C is an outstanding development environment.—STEVE MANN
Why Your Next IBM Computer Should Be A Macintosh.

SoftPC makes your Mac an IBM compatible. With SoftPC, the new Macintosh computers are more than just powerful and portable. They are also the most compatible computers available. Now they can run a whole world of MS-DOS software. Because SoftPC* from Insignia Solutions lets you run any MS-DOS program on a Macintosh. Even over a Novell PC network.

And SoftPC works on any Mac, from the Plus to the new Powerbooks and Quadras.

It's simple. Just load SoftPC and an IBM window appears on the screen. There's no hardware installation required. It's like having two computers in one.

If you don't believe it can be that simple, call us at (800) 848-7677. We'll answer all of your questions, and show you how your next IBM computer could be Macintosh.

*Trademarks of Insignia Solutions Inc. All other product names are trademarks or registered trademarks of their respective holders.

Circle 72 on reader service card
Fiction-Writing Tool

Plots Unlimited 1.4

PROS: Can be used to quickly outline a story plot from scratch; easy to learn and use. 
CONS: Not helpful for stories in progress; weak interface.
COMPANY: Ashleywilse (310/456-1277).

My second exercise was to plot a story I had only vague ideas about: two characters, the first and last pages, a mood, and two lines of dialogue. I chose one of seven plotting methods and restricted the possibilities by specifying that this was to be a mystery with a female protagonist and a female stranger.

The program responded, "There are no conflict situations in the file that match the conditions you have selected." I then tried a method with fewer specifics; Plots Unlimited offered only one starting point, which was light-years from what I had in mind. I moved on to a wide-open method but in an hour of browsing couldn't find a good starting point among 1055 possibilities.

My third exercise was to solve the midplot crisis of my own half-finished suspense novel. Unfortunately, Plots Unlimited didn't help in the course of two hours and four methods. I followed directions by breaking my story down to essentials, but the program still couldn't move it forward; the plot twists it proposed just didn't fit.

The interface isn't difficult, but it needs quite a bit of improvement. First and foremost, it requires too much mousing. The cursor keys don't work, my universal QuicKeys macros for clicking buttons don't work, and there are only seven keyboard commands. I already have repetitive strain injury from too much mousing, so three days of Plots Unlimited left me in pain.

Another problem is that buttons and menu items are often boldfaced when they should be grayed out to indicate they're disabled, so I'm still wasting time clicking on inactive buttons. Also, there were times when I wanted to change my choice of the plotting method and had to start over to do so. The horizontal scroll bars don't work in the MasterPlot section, although the company is working on fixing that bug.

My experience suggests that the program is best for brainstorming from scratch. Still, writing and brainstorming styles are so individual that I can't predict similar results for all users. My guess is that Plots Unlimited is most helpful with category romances or TV and movie scripts, not novels. You won't turn out a million-dollar plot just by clicking on buttons. You might, however, produce a usable rough working outline in an hour's time.—ANN GARRISON

The LZR 960 had difficulties printing legal-size documents in landscape orientation, generating low-memory error messages. Memory alerts also occurred while printing various complex Illustrator documents that included several downloadable PostScript Type 1 fonts, resulting in either slow printing or a message that the document had too many fonts. The tested printer had 2MB of RAM; at press time, Dataproducts announced that the LZR 960 is now shipping with 3MB of RAM. Dataproducts claims that this RAM increase should solve most memory problems; RAM expansion up to 10MB is also available.

A 250-sheet letter tray, a 250-sheet legal tray ($59), or a 40-envelope feeder ($39.99) slides into the bottom of the printer. The tray fronts are flush with the front of the printer, but the legal-size tray protrudes at the back. The printer also has a manual-feed slot. Paper exits the printer either face-down on top or face-up from a tray in the back. The face-up tray is useful for heavy paper stock and sheets of labels.

The LZR 960 has AppleTalk, RS-232 serial, and parallel interfaces; and you can plug in a SCSI hard drive to store PostScript printer fonts. (The printer comes with 35 built-in fonts.) The LZR 960 automatically switches to the active interface.

Dataproducts sells the LZR 960 for $2695 with a two-year warranty, but the mail-order company Hardware That Fits also sells the printer as the RealTech Laser for $1995. The Apple Personal LaserWriter NTR lists for $2199. Given that the NTR is more limited, with a 70-page paper tray (a 250-sheet tray costs $199 extra) and a 4-ppm print engine, I'd recommend the LZR 960 or the RealTech Laser.—TOM NEGRI

PERSONAL PRINTER PERFORMANCE

<table>
<thead>
<tr>
<th>Test</th>
<th>LZR 960</th>
<th>Apple Personal LaserWriter NT</th>
<th>Apple Personal LaserWriter NTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courier</td>
<td>163</td>
<td>317</td>
<td>325</td>
</tr>
<tr>
<td>FreeHand</td>
<td>465</td>
<td>2093</td>
<td>534</td>
</tr>
<tr>
<td>MacDraw Pro</td>
<td>141</td>
<td>395</td>
<td>182</td>
</tr>
<tr>
<td>Multiple Fonts</td>
<td>160</td>
<td>599</td>
<td>277</td>
</tr>
<tr>
<td>Newsletter</td>
<td>108</td>
<td>190</td>
<td>175</td>
</tr>
</tbody>
</table>

Macworld Lab compared the LZR 960's performance to that of Apple's personal printers using 5 tests: Courier (a 20-page Word 5 document in courier, including bold and italic); FreeHand (an Aldus FreeHand illustration); MacDraw Pro (a newspaper graphic containing over 2200 objects, plus text); Fonts (a 7-page Word 5 document in several fonts and styles); and Newsletter (a 2-page Aldus PageMaker document containing several fonts, 3 gray-scale scanned images, and a MacPaint image). Times are in seconds.
Shredder 1.0.1

**PROS:** Easy to use; supports Apple events. **CONS:** Tech support difficult to reach. **COMPANY:** DLM Software (619/283-2343). **REQUIRES:** Mac. **LIST PRICE:** $69.

**TrashMaster with Incinerator 1.0**

**PROS:** Inexpensive; customizable trash emptying. **CONS:** Some exiguous functions; some features available only with System 7. **COMPANY:** UNIXtron (214/727-2329). **REQUIRES:** Mac. **LIST PRICE:** $69.95.

**Cross Country**

**PROS:** Inexpensive; good instrument-flight tutorial, audio air-traffic-control dialogs. **CONS:** Black-and-white screens; weak flight dynamics; incomplete operating manual. **COMPANY:** T-34 Microsystems (904/396-2785). **REQUIRES:** Mac Classic. **LIST PRICE:** $180.

**Desktop Trash-Management Software**

**Shredder 1.0.1**

**PROS:** Easy to use; supports Apple events. **CONS:** Tech support difficult to reach. **COMPANY:** DLM Software (619/283-2343). **REQUIRES:** Mac. **LIST PRICE:** $69.

**TrashMaster with Incinerator 1.0**

**PROS:** Inexpensive; customizable trash emptying. **CONS:** Some exiguous functions; some features available only with System 7. **COMPANY:** UNIXtron (214/727-2329). **REQUIRES:** Mac. **LIST PRICE:** $69.95.

**Cross Country**

**PROS:** Inexpensive; good instrument-flight tutorial, audio air-traffic-control dialogs. **CONS:** Black-and-white screens; weak flight dynamics; incomplete operating manual. **COMPANY:** T-34 Microsystems (904/396-2785). **REQUIRES:** Mac Classic. **LIST PRICE:** $180.

**Instrument-Flight Trainer**

**Cross Country**

You can control Cross Country with either a mouse or a joystick. To manipulate cockpit controls, you must first press the spacebar to switch to cursor mode, and then point and click with the mouse to control knobs, slide levers, or push buttons directly on the instrument panel. There are no keyboard controls. After making panel adjustments, you press the spacebar again or click inside the Attitude Indicator to return to flight mode. This procedure is somewhat inconvenient. Also, because Cross Country doesn't have buttons for changing radio frequencies (a recurrent chore in IFR flight), you must position the cursor in a precise way to change individual frequency digits—an error-prone and tedious process.

You control the wind speed and direction, cloud ceiling, and turbulence, so you can practice pilot techniques of compensating for these factors. You also can selectively disable various instruments for partial-panel and emergency-procedure drills.

Cross Country's crude flight dynamics probably constitute its worst flaw, although it's not a critical one. Things move with a mechanical surety that belies real flight; turns are perfectly round, deck angle never varies once you set it, and instrument needles move at steady, fixed rates. It doesn't have an aerodynamic feel.

Perhaps the single best feature is Cross Country's built-in instrument-flying tutorial. Ten lessons cover everything from basic maneuvers and instrument scans to procedure turns and precision approaches. The text is concise, yet contains valuable procedural strategies based on military IFR techniques. Lesson files on disk let you practice the material and evaluate your performance, and sound files simulate air-traffic-control communications.

All in all, Cross Country accomplishes its mission of IFR procedural training. If you want to add an instrument rating to your license, this program lets you get a taste of flying on the gauges while acquiring skills useful to any pilot.—MEL BECKMAN
Sony 20" Color ............................................. $1698
Sampo 20" ....................................................... $598
• Two Page displays
• Perfect for DTP & CAD/CAM
• Include Interface cards
• Full Page Display .......................................... $398

14" Goldstar Color ........................................... $368
• Plug compatible with the Ilsi, CI, and the LC.

14" Sony Trinitron ............................................. $498
• Compatible with the Mac LC only.

16" Sony Trinitron ............................................. $1198
• Plug compatible with the Quadra.

SONY 19" Trinitron Color 1698.00

Sony Trinitron 19" Color System

$1698.00
8 Bit System
$2598.00
24 Bit System

• The SONY 19" Trinitron is one of our best buys yet! True Trinitron color at a great price!
• Includes 8 bit or 24 bit Video board and cable
• 2 page display supports all Mac IIs*, the St, SE-30, and the LC

Sampo 20"

Mono System ................................................... $598.00

Grey Scale System ............................................. $898.00

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

NuDesign Full Page Grey Scale ................................ $398.00

• Plug compatible with St, CI, and Quadra (16 levels of Grey).
• Available with 1 Bit interface card for all Mac IIs*, SE-30, SE and LC $488.00.

* 10 bit Monitor manufactured by Sampo for Apollo HP

Sony Trinitron 19" Color System

20" Sony Trinitron System

W 8 Bit interface ...... $1698
W 24 Bit interface ...... $2598

20" Ikegami Trinitron System

W/RasterOps 8Bit ........ $2398
With 24Bit .................. $3198

20" Trinitron 11 Color System

8 Bit System .................. $1698.00

24 Bit System .................. $2598.00

• Includes 8 bit or 24 Bit Video board and cable
• 2 page display supports all Mac IIs*, the St, SE-30, and the LC

NuDesign Full Page Display

Grey Scale For CI, SI, Quadra $398
Il, IIfx, FX, SE, SE-30, 1Bit $488

Umax UC-630 With PhotoShop ....................................... $1268.00

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

Automatic Document Feeder ......................................... $498.00

• Rated four mice by MacUser (Dec '91)
• Rated fastest by MacUser (Dec '91)

NuDesign/Tamarack Scan-600 With PhotoShop .................... $1098.00

Transparency/Slide Scanner Option .................................... $648.00

• Rated four mice by MacUser (Dec '91)
• "Its hardware is impressive" MacUser (Dec '91)
• "Tamarack and Umax produced the best images..." MacUser
• "Tamarack and Umax excel in speed and color accuracy..." MacUser
• Includes Adobe Photoshop

Sharp JX-320 With PhotoShop ........................................ $1598.00

• One pass scanner
• 8 1/2 x 11 Scanning area
• Includes Adobe Photoshop

60 East Chestnut - 145, Chicago, IL 60611

800-621-8467
Hours: 8:30 - 8:00 CST. Saturdays 10:00 - 4:00
Technical Service and Order Tracking call: 312-664-8225
Three Great Monitors...

Sony GDM-1954 19" Trinitron .............................................. 1698.00
Sampo 19" Dual Page Display .............................................. 598.00
NuDesign Grey Scale Full Page Display .................................. 398.00

The Sony GDM-1954... 19" Sony Trinitron quality at an incredible price

Sony branded... These monitors are backed by the quality and support that the Sony label is known for.

The Details...8 Bit interface for all Mac IIs*, LC, SE-30, SI and Quadras .............................................. 1698.00
24 Bit interface for SI, CI, II, IIX, IIFX, and Quadra .............................................. 2598.00

The Sampo 19" Grey scale... An inexpensive path to Dual Page Viewing

Quality... The 19" Sampo/Apollo was manufactured by Sampo for Hewlett Packard/Apollo as a workstation monitor. These 19" ultra high resolution monitors give a crisp dual page image with up to 256 shades of grey. We bought the last of their new inventory at a great price!

The Details...8 Bit interface for all Mac IIs*, SE, LC, SE-30, SI and Quadras .............................................. 598.00
8 Bit interface for all Mac IIs*, LC, SE-30, SI and Quadras .............................................. 898.00

The NuDesign Grey Scale Portrait Display... An amazing price for a Full Page Monitor

Quality... The NuDesign Portrait Display gives you a flicker free, high contrast image. The 15" ultra high resolution screen gives better linearity and focus in the corners than either Apple or Radius.

The Details...8 Bit Plug compatible with the SI, CI and Quadra .............................................. 398.00
1 Bit interface for all Mac IIs*, SE, LC, SE-30, SI and Quadras .............................................. 488.00
8 Bit interface for all Mac IIs*, LC, SE-30, SI and Quadras .............................................. add 398.00
Flat screen version of the above............................................................... add 50.00

---

Sony 19" Color .............................................. $1698
Sampo 19" .............................................. $598
Sony branded... Two Page displays
Perfect for DTP & CAD/CAM
Includes Interface card
Portrait Display .............................................. $398

Sony 19" Trinitron Color 1698.00

---

60 East Chestnut - 145, Chicago, IL 60611
800-621-8467
Hours: 8:30 - 6:00 CST, Saturdays 10:00 - 4:00
The NuDesign 3.5" Optical... 128mb in your shirt pocket at an amazing price!

The NuDesign 3.5" Optical is our Hottest New Product. Fast, reliable and a great buy!

Read On...

Fast!- With the 64k read ahead cache, the short seek scanning function and a 3megabytes per second burst transfer rate you will find that this drive competes well with hard drives.

Lowest Cost per megabyte- With 3.5 optical media at only $59.00 per 128mb disc your cost per megabyte is only .46¢, a fraction of the cost of Syquest or hard disks.

Totally Compatible (ANSI/ISO Standard)- Following the ANSI/ISO standard assures that your optical drive will always be able to interchange discs with other ISO standard drives.

45 watt switching power supply and a metal cabinet - Assures that your drive is well protected and powered.

Includes Hard Disk Tool Kit from FWB- This is the application recommended for Optical drives by MacWeek Editors.

The NuDesign 128mb 3.5" Optical Drive ........................................ 1398.00

The NuDesign 2.1 Gig DAT... High Quality, Fast Backup At An Incredible Price!

The NuDesign Dat Drive is the newest addition to our backup line. This drive combines a very fast and accurate mechanism with Retrospect 3.1 from Dantz Development.

Just look at these specifications...

10.9mb per minute average backup speed- Gives you the ability to get the job done fast!

High speed random access- This special feature allows you to get to your data quickly.

Four-head Direct-Read-After-Write data verification- Assures that your data will be there when you need it.

Automatic built in head cleaner- Allows your drive to remain clean and error free.

SCSI II compatible interface- This gives your drive the ability to remain compatible for years to come.

45 watt switching power supply and a metal cabinet - Assures that your drive is well protected and powered.

MTBF 50,000 hours- Means that your NuDesign drive will handle years of usage.

Includes Retrospect by Dantz Development- The first name in Macintosh backup software (a 248.00 value!)

The NuDesign 2.1 Gig DAT .......................................................... 1348.00

800-621-8467

60 East Chestnut - 145, Chicago, IL 60611

Hours: 8:30 - 8:00 CST, Saturdays 10:00 - 4:00
MAC DIRECT

The Fujitsu PicoBird 4 Drives
520, 425 & 330mb

9 ms access times and a 256k cache make them fast!
- 20% faster than the Quantum 420
- 30% faster than the Maxtor 535

MacWorld Editors Choice Award Winner (May,92)

The Fastest and most Reliable 3.5" drives in the world.

Fujitsu Drives

Internal / External

45 MB 3.5" Low Profile/Low Power 3yr warr, 50,000 MTBF .............. $228 ...... $298
90 MB 3.5" 3yr warr, 50,000 MTBF ................................... $278 ....... $348
135 MB 3.5" 3yr warr, 50,000 MTBF ................................... $378 ....... $448
165 MB 3.5" 3yr warr, 50,000 MTBF ................................... $498 ....... $568

- Incredibly reliable less than .0006% returned on the 45mb!
- 3 year warranty! 50,000 hours MTBF (Mean Time Between Failure)

330 MB 3.5" 9ms Access ................................................... $1128 .... $1198
425 MB 3.5" 9ms Access ................................................... $1098 .... $1198
520 MB 3.5" 9ms Access and Fast SCSI ................................ $1249 ... $1318

- Incredibly fast the PB-4 drives are the fastest 3.5" drives we have tested!
- 5 year warranty! 200,000 hours MTBF

330 MB 5.25" 16ms ......................................................... $1288 .... $1388
680 MB 5.25" 20ms ......................................................... $1288 .... $1388

- 20% faster than the Quantum 420
- MacWorlds fastest 1.2 Gig drive (July '91)

1.2 Gig 5.25" 11.5ms (MacWorld's Fastest Gig!)........................ $1948 ...$2048

- 30% faster than the Maxtor 535
- 5 year warranty! 200,000 hours MTBF

2.06 Gig 5.25" 11.5ms (5,400RPM & Fast SCSI)....................... $3318 ... $3418

- MacWorlds fastest 1.2 Gig drive (July '91)
- Includes 12 function audio remote control

DAT Tape Backup

Sony 2.1 Gig DAT $1248!

- Up to 2.1 Gig per tape
- Our best buy ever on DAT!
- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

Sony 2.1GB DAT $1248!

- Up to 2.1 Gig per tape
- Our best buy ever on DAT!
- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

NuDesign Dat 2.1 Gig Capability $1348
ArDat 2.1 Gig Capability $1398
WangDat 2.1 Gig Capability $1498

NuDesign 3.5" 128mb Optical $1398
- 30ms access time
- Read/Write reliable storage
- Includes cartridge

Ricoh 600mb Optical $2198
- Read/Write reliable storage
- Great for archiving, color scans, etc.
- Includes cartridge

Chinon CD-ROM

Chinon CDC-431 $548
- Includes driver CD carrier and cables
- Includes 12 function audio remote control

NuDesign Optical 2.1 Gig Capability $1398
- Up to 2.1 Gig per tape
- Our best buy ever on DAT!
- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

Sony 2.1 Gig DAT $1248!

- Up to 2.1 Gig per tape
- Our best buy ever on DAT!
- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

Conner Drives

C42 MB 3.5" LPS $218 ...... $278
C 45 MB 3.5" LPS $298 ...... $378
C 120 MB 3.5" LPS $428 ...... $498
C 170 MB 3.5" LPS $548 ...... $598
C 212 MB 3.5" LPS $648 ...... $728

- Up to 10 mb per minute backup time
- Includes SoftBackup II for Fast network and unattended backup capabilities

Sony 2.1 Gig DAT $1248!

60 East Chestnut - 145, Chicago, IL 60611

Visa, Mastercard, Amex, COD, Telecheck Approved Checks, Gov., Corp., Univ., P.O.'s welcome. All new drives, preformatted with latest stable system software. Factory warranty, bracket, cables and software included. 30 Day Money back guarantee on drive products only. Return Authorization number required for returns. Prices, terms and availability subject to change without notice.

800-621-8467

Fujitsu Special!

Fujitsu 520MB Int. $1249
Fujitsu 1.2 Gig Int. $1948
- 5 Year Warranty
- 200,000 Hours MTBF
- 9 ms 11.5ms access time!
- Incredibly Reliable!
- Perfect for the Power User
**Interface Utilities**

**Zephyr Palettes for PageMaker 1.0.2**

**PROS:** Provide convenient access to frequently used PageMaker and FreeHand menu functions; allow-on-the-fly formatting; compatible with Adobe Type Reunion; friendly technical support.

**CONS:** Grouping instructions are not saved; most pop-up menus don’t scroll; some problems grouping font families; user cannot type selection directly into pop-ups.

**COMPANY:** Zephyr Design (206/324-0292). **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.3; Aldus PageMaker 4.0 or Aldus FreeHand 3.0. **LIST PRICE:** $79.95 each.

---

**Network Bulletin Board**

**PacerForum**

**PROS:** Users can set interest level for bulletin boards; can include images; sounds, or files with messages; can search topics and text; can set inactive topics to be deleted after specified period of time.

**CONS:** Displays look best on color monitors; no integration with other network software; no provision for archiving.

**COMPANY:** Pacer Software (619/454-0565). **REQUIRES:** Mac Plus or Power; AppleShare server; AppleTalk network. **LIST PRICE:** $549 (five clients and one server).

---

**REVIEWS**

**Network Bulletin Board**

**Zephyr Palettes (ZP) are cleverly conceived utilities that make Aldus PageMaker and Aldus FreeHand easier to use. Each utility creates several small palettes that float above the PageMaker or FreeHand application window. Each palette duplicates—often enhances—a function found in the main program’s pull-down menus. For PageMaker, there are font, size, leading, tracking, alignment, style, and zoom palettes. For FreeHand, palettes are for font, size, style, effects, leading, alignment, pen, and zoom. You choose which palettes to display on screen.

**ZP consists of a cdev (or control panel for System 7 users), shared by both versions, and a Zephyr Palettes folder that goes inside the System Folder. The PageMaker version also supplies an addition for PageMaker 4.2 that can be used in place of the cdev. You can move palettes to any location on screen and set them to reappear there the next time you open the program. You can also use a ZP Group command to fix a palette arrangement; then you can move the whole unit on screen as needed. Unfortunately, ZP does not remember grouped palettes, so when you open the utility again, you must group them again. Zephyr Design expects to fix this in an upgrade.

The size, leading, and tracking palettes contain the same items as do the PageMaker and FreeHand menus, but Zephyr Palettes adds the ability to constantly preview selections (at some sacrifice in speed). Moving through the size menu, for instance, changes the type size on screen. Unfortunately, when a palette (except the font palette) is close to the bottom of the screen, the lower part of the pop-up menu does not scroll into view and is lost. Nor can you type a number directly into the pop-up menu’s window.

The font palette contains two pop-up menus. One displays typefaces arranged by family, with individual members shown in a submenus. This can coexist with Adobe Type Reunion, which performs a similar function; you can still use Type Reunion to control FreeHand or PageMaker’s font menu. Zephyr Palettes is less successful than Type Reunion at correctly arranging font families. ZP’s second pop-up menu lets you create and select custom groups of fonts, minimizing the size of the floating font menu.

The utilities are modestly priced but quite useful, particularly on large monitors. A number of details remain to be smoothed, but none are fatal. Purchasing Zephyr Palettes means buying a work in progress—but it’s worth the investment.—**Bill Justin**
Canon introduces the CJ10 color copier, printer, scanner.

Now the power of color is yours.

With a CJ10 on your desk top, you can make color copies and overhead transparencies with virtually the same picture-like clarity and crisp, black text as those made by Canon's renowned Color Laser Copiers. That's 400 dpi resolution and up to 256 gradations per color.

And the CJ10 can be connected to your computer with an optional IPU to allow you to print and scan in 24-bit color at 400 dpi.

What's more, Canon's optional interface kits have everything else you need to begin scanning and printing in full color in either Macintosh® or Windows™ environments.

The CJ10 desktop full-color system is easy to use, easy to maintain, and priced so that it's easy to buy.

For more information, simply call 1-800-OK-CANON.

Windows is a trademark of Microsoft Corporation.
Macintosh is a registered trademark of Apple Computer, Inc.

Circle 110 on reader service card
Kiwi Power Windows 1.5

**PROS:** Handy window menu; variety of preset and user-defined window arrangements; powerful work-set function; cleverly designed window-rotation command. **CONS:** Work-set management unnecessarily difficult; preset window arrangement names often too cryptic. **COMPANY:** Kiwi Software (805/685-4031). **REQUIRES:** Mac Plus; System 7. **LIST PRICE:** $79.95.

**IWt POWER WINDOWS (KPW) IS A SYSTEM EXTENSION THAT ADDS A NEW MENU TO THE MENU BAR OF THE SYSTEM 7 FINDER AND THE MENU BAR OF ALL OPEN APPLICATIONS. KPW'S HIERARCHICAL MENU LISTS ALL OPEN WINDOWS IN BOTH THE FINDER AND YOUR APPLICATIONS. THIS SINGLE SUBMENU SELECTION CAN MOVE YOU TO ANY WINDOW IN ANY APPLICATION—even if it's buried under piles of other windows or hidden from view with one of the application menu's Hide commands—from anywhere else on the desktop.

Two Layout commands neatly arrange your windows—either those of the current application (local) or those of all applications (global)—in one of dozens of preset schemes. Preset layouts can organize almost any number of windows on one or more screens; they range from simple stacks of full-size windows to a wide variety of more-complex tiling arrays. You choose whether to include Finder windows in global layouts and whether to keep the right edge of the screen clear (so you can see your disk icons). Reorganizing windows takes a little time, but it's much faster and more precise than doing so manually.

You can also create custom layouts by taking a snapshot of a window arrangement. Like preset layouts, custom layouts can be local or global, but unlike preset layouts they can be used only with a specific number of windows. The KPW Manager utility lets you create custom layouts on a mock desktop, edit custom layouts, rename layouts, and add or remove layouts from the menu.

With KPW, you can also create work sets, predefined collections of specific applications and documents. Although superficially similar to HandOff II's briefcases, work sets differ in that they re-create the precise position and size of all windows (including Finder windows, and their view mode, if you so choose). Work sets are created by taking a snapshot of open programs and documents (not via a dialog box, as in HandOff II); and they cannot be edited (briefcases can). Work sets can be opened from the KPW menu, from a folder added to the Apple menu, or by double-clicking on a work-set file. (A separate system extension, BeHierarchical2, converts folders into submenus in the Apple menu.) Unfortunately, work-set management (deleting work-set folders, for example), is much harder than it needs to be. In addition, I often ran into many extension conflicts.

A Rotate command allows you to cycle through all the windows in an application. Used with a preset layout, Rotate rearranges all the windows so that the second window assumes the size and position of the first, and so on. A Send to Back command does exactly that for the active window and is handy for moving a big window out of the way. Minimize and Maximize commands shrink and expand windows to previously established sizes and locations. And if you choose, KPW can remember all your open windows at shut down and reopen them for you at the next start-up.

I was pretty skeptical when I first received KPW, but I now believe most Mac owners would find it handy. Work sets will appeal to anyone who repeatedly opens the same sets of documents. If you keep a lot of windows open at once (especially on large or multiple screens), you'll appreciate the instant window selection and preset and custom layouts. And if you work with only one or two documents open at a time, Kiwi Power Windows may well revolutionize the way you work.—ROBERT C. ECKHARDT

**Finder Utility**

Workspace 1.0

**PROS:** Organizes applications and documents; eye-catching interface; automatic time tracking. **CONS:** Recognizes only 23 applications; no Find function; difficult to distinguish documents in miniature form. **COMPANY:** Ask Interface. **REQUIRES:** Mac Plus; 2MB of RAM; hard drive; System 6.0.5. **LIST PRICE:** $149.

**EVEN WITH SYSTEM 7'S NIETY FILE-handling enhancements, managing multiple applications and documents using the Macintosh Finder can be a chore. Workspace tries to improve on the Finder with a novel visual approach that makes an intriguing first step but left me wishing for more.

An application and extension (INIT). Workspace has one version for monochrome systems and one for color systems. The application functions as an "office manager." Workspace opens to a window showing a cheerful work area containing a table flanked by shelves and drawers. You can also choose one of the two more-avant-garde room layouts.

On the left of the screen are nine application binders, arranged by category (drawing, page layout, and so on). The first time you run Workspace, it scans your hard drive and totes programs into the appropriate binders using pointers—similar to System 7 aliases—to link files. Double-clicking on a binder brings up a list of its applications for you to open. But the binders are identical except for color, and you must click on them or press the option key to view their names.

Also, the program recognizes only 23 programs. You have to place other applications into binders manually. And since Workspace lacks a Find function, you must navigate through layers of folders in search of programs. Clicking on tool icons left on the tabletop also launches applications, but that's no improvement on the Finder.

Workspace's most useful feature is its ability to handle groups of related documents, or projects, which it keeps in portfolios. When you begin a new project, Workspace creates a folder on your hard drive to store its files; you can either transfer existing documents into the folder or simply link them to the project. New documents are automatically saved to the open project (you can move them if you want). Double-clicking on a portfolio displays a scrolling list of the project's documents. Shift-clicking isn't supported, so you must open multiple documents one by one; or you browse and open files from the Project Overview window, which presents documents in miniature form, but many types of documents (spreadsheets and word processing files) are often indistinguishable in this view.

Workspace automatically logs time spent on projects, suspending timekeeping after a user-specified period of inactivity. You can also turn time recording on and off manually. You can view and print daily, weekly, or monthly time reports.

If you just hate dealing with the Finder and need automatic timekeeping, I'd say give Workspace a try. For my money, though, it doesn't offer enough value compared with more conventional software like Now Software's Now Utilities or Microseeds Publishing's HAM. With a few additional file-management functions (version 1.1 may be shipping by the time you read this), Workspace could become a worthy competitor.—FRANKLIN N. TESSLER
Introducing the amazing new SupraFAX-Modem™ V.32bis! On the fax side, it has 14,400 bps send and receive fax, Class 1 and 2 commands, and compatibility with the millions of Group 3 fax machines in use. On the data side, it connects at 300 to 14,400 bps and provides up to 57,600 bps throughput with V.42bis compression. (It has MNP 2-5 and 10, too.) Plus its revolutionary display gives you 25 different status reports! And for just a little more, you can easily add caller ID and voice capabilities later this year. In addition to the $399.95 stand-alone version (without cables and software), the Macintosh package combines the SupraFAXModem V.32bis, cables, and FAXsoft™, Micro-Phone™ 1.6, and CompuServe Information Manager™ software for $479.95.

Supra Corporation

1-800-967-8772

9600 bps Version
$299.95

7101 Supra Drive SW, Albany, OR 97321 USA • Fax: 503-967-2401 • 503-967-2410

* Low-cost, user-installable Voice & Caller ID upgrades available Q3 '92.

Distributed by Merisel/Macamerica and Beamscope.

All trademarks belong to their respective companies.
When a bug showed up in a new program, the first to know was a guy in Montana. And everyone on CompuServe.

Why settle for always being the last to know when you can be among the first with a CompuServe membership? We put an entire world of up-to-the-minute information right at your fingertips.

Our online, interactive hardware and software support forums can put you in touch with thousands of experts. Even the authors of new and popular software programs.

Whether you're a novice or an expert, there's someone out there who can help you with your specific problems and concerns. Or keep you on top of the latest developments.

There are libraries of software available for each hardware and software forum that you can download for free as a CompuServe member.

And there are forums that can offer you help on just about everything: cameras, pets, model building, scuba gear—you name it.

So get CompuServe today. See your computer dealer, or call 1 800 848-8199, for more information or to order. Outside the United States, call 614 457-0802.

CompuServe®
The information service you won't outgrow.
Wishing I'd thought the Finder in System 7 was supposed to eliminate the need for add-ons such as file finders, program launchers, and file managers. How come we're suddenly inundated with utilities that try to out-Find the Finder? Anyway, nobody's objecting; it's fascinating to see what each company thinks the Finder is missing.

**HAM 1.0**

**HAM STANDS FOR "HIERARCHICAL APPLE menu."** Sure, you can stick any folder you want into your System 7 Apple menu, but wouldn't it be nice if a submenu popped out to show you what's in that folder? That's what HAM does (Microseeds Publishing, $99). Heck, you can stick your whole hard drive into the Apple menu, and HAM gives you menu-selectable access to anything on it, sprouting up to five submenus to show you what's inside nested folders. (Since other programs offer different combos of the same features, I'm going to call them by number; see "Features Key." HAM has features 2, 4, 5, and 6.)

The brilliant part of HAM is the Recent Items folder that it puts into the Apple menu; from the Recent Items submenu, you can choose any program, folder, or document you've opened recently (feature 5). You save hours of foraging. And you can launch a whole globe of related applications and documents at once (features 2 and 6).

I ran into some little bugs, and $99 is steep, but in general HAM is a joy—a simple and system 7 accessory.

**MenuChoice 1.1**

IT'S ONLY FAIR TO MENTION THAT FEATURES 4 AND 5 ARE AVAILABLE FOR ONLY $15 IN THE FORM OF MenuChoice, A SHAREWARE CONTROL PANEL BY KERRY CLENDINNING.

**Hand-Off II 2.2.5**

HAND-OFF'S MOST FAMOUS FEATURE IS APPLICATION SUBSTITUTION, WHEREBY WHEN YOU DOUBLE-CLICK ON A MACWRITE DOCUMENT, FOR EXAMPLE, YOUR PREFERRED WORD PROCESSOR (SAY, MICROSOFT WORD) OPENS THAT DOCUMENT—NO "APPLICATION NOT FOUND" MESSAGE. I NEVER REALLY GOT JAZZED UP ABOUT APPLICATION SUBSTITUTION (FEATURE 3); IT'S GOOD FOR MACWRITE, TEXT, AND PICT FILES, BUT THAT'S ABOUT ALL I CAN THINK OF.

Fortunately, substitution is almost beside the point in the new Hand-Off (Connectix Corporation, $99), which also gives you features 2, 4, 6, 7, and 8. What really makes Hand-Off sail is the tiny menu it crams at the edge of the screen, listing your choice of files and programs for quick launching. Of course, that's what System 7's Apple menu is for, so the Launch menu is a tad redundant in that respect. Like almost all new releases, there are bugs lurking; otherwise, Hand-Off is filled with clever touches and good design.

**On Cue II 2.0**

ON CUE USED TO BE A SIMPLE FILE LAUNCHER LIKE HAND-OFF'S LAUNCH MENU. THE NEW VERSION (ICOM SIMULATIONS, $99.95) IS LOADED TO THE GILLS WITH FEATURES (1, 2, 5, 6, AND 8)—AND MORE. AN EXTENSION MANAGER LETS YOU DECIDE, AS THE MAC IS STARTING UP, WHICH EXTENSIONS (INITS) YOU WANT TO LOAD; A DISKTOP CLONE, WHICH LETS YOU SEE TECHNICAL INFO ABOUT ANY FILE; AND A CLONE OF NOW UTILITIES' SUPER BOOMERANG PLACES POP-UP MENUS INSIDE THE OPEN AND SAVE DIALOG BOXES OF YOUR PROGRAMS. THESE POP-UPS LIST OPENED ITEMS, AND ALSO OFFER A FIND FUNCTION.

Quick Finder, one of On Cue's pieces, is a bit of genius: it's a neat list of every program you've got (feature 9). Double-click on a program to launch it. You don't have to know what folder it's in, what disk it's on, or anything. Better still, you can change the list to show only Word files, only control panels, or whatever.

Unfortunately, On Cue is still too fragile for my taste; load its extension in the wrong order, or own one piece of incompatible software, and it bugs out. A fix is in the works and should be released by the time you read this.

**Now Utilities 3.0.2**

OVER THE YEARS, NOW UTILITIES HAS APPROPRIATED MANY OF THE GOOD IDEAS OF ITS RIVALS; THE CURRENT PACKAGE (NOW SOFTWARE, $129) GIVES YOU FEATURES 1, 2, 4, 5, 7, 8, AND 9—PLUS AN ALARM CLOCK, AUTOSAVER, EXTENSION MANAGER, AND SO ON.

Another cold reality for Now's competitors: after several years of refinement, these utilities are nearly bug-free and guaranteed to work together. The crown jewel is Super Boomerang, which is nearly impossible to describe in one sentence. Suffice to say that it puts a list of recently opened items every place you look—in the Apple menu, in Open and Save dialog boxes, and even as a submenu under Open in your programs' File menus. With its lightning-fast Find command, Now Menus (providing features 4 and 7), Multi-Master (features 2 and 9), and the other miscellaneous modules in the package, Now Utilities is a lot of highly polished bang for the buck.

**MasterFinder 1.2**

AFTER SPENDING HOURS WITH THE MANUAL, I THOUGHT THIS FINDER-REPLACEMENT PROGRAM WAS THE PLANET'S BIGGEST DOG (OLDUVAI CORPORATION, $149). IT SEemed confusing and buggy.

Then Olduvai sent me a draft of the fine new manual, and suddenly light dawned. MasterFinder turns out to be a rather good idea. The premise: you see four tall, thin windows, or "panes," each showing the contents of one folder or disk. (According to my friends who know this kind of thing, the interface resembles the one on the Next computer.) You can briskly collapse these directories and open others; copy, move, trash, and rename files; and find all files whose names contain, say, the word Mac in a fraction of a second. MasterFinder gives System 7 a real lift because in this era of bloated, sluggish software, it's light and fast.

However, even if you can live with permanent list view (and four windows, max), there are a few things MasterFinder doesn't do better than the Finder; for example, it doesn't open a file, and Get Info on an alias doesn't have a Find Original button. On the other hand...
other hand, power users may well get quite a charge out of MasterFinder (it sends Apple events, edits type and creator codes, and so on), and it offers features 1, 2, and 5. Just don’t go near it until the new manual is ready.

Workspace 1.0

THIS FINDER REPLACEMENT BURSTS WITH CREATIVITY and new ideas. Instead of square icons on a gray desktop, Workspace (Ark Interface, $149) gives you a bright, beautifully drawn, 3-D picture of an office (and features 2 and 5). Instead of in folders, all documents for a particular project are kept in a portfolio, which you drag to a cabinet when you’re not using it. Programs are stored in binders on a shelf; to use one, you drag a binder to the table, where it inexplicably changes into a tool (like a pencil or a telephone); to launch a program, you double-click on a tool.

The idea behind Workspace is that this massive expansion of the desktop metaphor ought to be easier to understand than the Finder, particularly for the beginner. (And the fact that Workspace places new files into the open project folder automatically is brilliant—never lose things.) But Workspace doesn’t let you copy files from disks, find things, compare folder contents, or put things in the Trash. These must still be accomplished in the regular Finder. So rather than learning Workspace instead of the Finder, the novice must learn Workspace in addition to the Finder. Also, a new idea isn’t always a better one.

Tiles 1.0.1

I JUST DON’T GET TILES (CE SOFTWARE, $99.95). When this application is running, you can create a clickable icon for any program, file, or QuicKeys macro. You can arrange these icons in a window, or place them on the desktop—but when you quit Tiles, the icons disappear.

Yes, it’s nice that you can launch a group of things with one click (Tiles has features 1, 5, and 6)—though this feature doesn’t work with DAs. But look, if you want a program that launches files when you double-click on an icon, I know one you can get for free: the Finder. Why buy something that adds clutter to the screen?

DiskTop 4.0.2

CE SOFTWARE MORE THAN REDEEMS itself with this potent desk accessory ($99.95). It’s a one-window, list-view, virtual Finder with features 1 and 2. Except for the fact that it has no icon view, it does everything the Finder does, and more. (such as being able to find, list, or delete all Word files created last week; or letting you edit creator codes, if you’re into that techie stuff). I don’t see how System 6 users can survive without it, even access to the Finder in System 7 (or MultiFinder) makes DiskTop slightly less relevant. The fact that it can often copy a file from a floppy disk that the Finder claims has a “disk error” is a happy bonus.

QuickTools 1.0

POWER STRIP, PART OF THE QUICKTools set (Advanced Software, $79.95), is a vertical palette of program icons you click on to launch. A pop-up menu on each tile lists the documents that are tied to that application.

It may sound like Tiles, but it’s faster, simpler, and isn’t an application unto itself. The strip nestsleays neatly against the side of the screen; with a click, you can collapse it into a tiny handle, out of your way until you click again. It truly is easier to launch a program (or, if it’s running, bring it to the front) with a single click on an omnipresent palette rather than use menus (as with Hand-Off and its ilk).

There’s something unfinished about Power Strip, however; it can’t be rotated, program icons have no labels, and all desk accessories appear with a generic suitcase icon. That’s too bad; you can add anything in the System 7 Apple menu (folders, documents) to the strip, but since to Power Strip they’re all desk accessories, they all appear with the same darned suitcase case icon (and only part of their name). When files, folders, and DAs have their own icons (as they will in a planned upgrade), I’ll leave this half-inch-wide bit of handiness on my screen all day long.

Kiwi Power Windows 1.5

AN UNDISCOVERED GEM FOR SYSTEM 7 users only (Kiwi Software, $79.95). This extension puts a permanent menu on your menu bar. Its commands are descriptions of window arrangements: Even Tall, Duo Wide, and so on. Each command rearranges all the windows on your screen into a gorgeous layout: tiled, stacked, side by side, whatever—even if several programs are running. You can also tell KPW to memorize a configuration of windows that you’ve set up by hand.

KPW can even memorize the documents and programs in the windows as “work sets,” which can be launched as a group, qualifying KPW for features 2 and 6. KPW can pop a work set into your Apple menu for super-quick multiple-document launching. (The sole disappointment: work sets can’t launch desk accessories.) The manual is so well written it’s almost poetic. KPW 1.5 even comes with a polished-up version of the former shareware HAM clone, BelHierarchic 2.1, so you get feature 4, as well.

The Upshot

ALMOST EVERY PRODUCT HERE MESSES with the Finder, and thus is incompatible with something or other. And these products are certainly incompatible with each other. Unless you think system crashes make life more eventful, buy with care.

Though individual features are better in other packages, it’s my duty as a critic to point out that you can get almost all nine features in Now Utilities. At this writing, its utilities are the most stable, have the best price per module, and are guaranteed to work together. Furthermore, you can install these doodads individually—they’re not all crammed into one gumshy superextension. Between Super Boomerang, MultiMaster, and Now Menus, you may never double-click on an icon again.

See Where to Buy for contact information.

Contributing editor DAVID POGUE wishes to reassure the reader who wrote to ask if the Desktop Critic is “over the age of 18, judging by the photo.” David is 29.
Why you should try our fonts.

Price! Because with our "Buy one, get one free" special, you won't find a better font value anywhere.

Quality! Because we design our fonts to meet the high standards of our customers. And of course, our fonts are all Type 1 PostScript format, completely compatible with Adobe Type Manager. Using system 7 or Windows, IBM. Many of our fonts are available in TrueType format as well.

Selection! Because we feature over 650 fonts, and even more on the way. Whether you need fonts for your Mac or IBM PC system or even on CD-ROM, you're sure to find them at Image Club.

Service! Because we do anything to keep your business. And that means before, during & especially after you place your order.

Guarantee! Because satisfaction is guaranteed, or your money back.

Order it today! Use it tomorrow!

1. To order, carefully select the fonts you want. Complete font families only. Minimum order on this special offer is $100.
2. Select the same value of fonts for free.

Again, complete font families only.

Call 1-800-661-9410

The 30 Day No Risk Guaranteed

If you are not satisfied with our software, simply return it to Image Club within 30 days and we will promptly refund every penny.

Image Club Graphics, Inc.
Suite 5, 9080 Eleventh Street Southwest
Calgary, Alberta, Canada T3C 3G2
Phone (403) 263-8008 / Fax (403) 263-7605
Appalachian Home/Computerw 72660-32

This ad isn't big enough to show the whole Image Club Typeface Library. To see 300 more fonts, call for a free catalog.
CONSIDER THESE ADVANTAGES

- Leasing is FAST and EASY!
- Get more computer for your money - Leasing costs less
- Tax advantage - payments can be a deductible expense
- Have the system you need NOW, when you need it!
- Conserve your working capital
- Equipment pays for itself
- Have flexibility to expand

HERE'S HOW:
Just call with your business info, trade references and bank contact. We'll quote your package and ship your order upon quick credit approval!

*All leases are 3 year leases with 10% residual. Call for details.

**BUSINESS LEASES AT AMERICANS BEST RATES**

Why Lease your Mac from MacFriends?

- Competitive Pricing
- Customer Product Design Assistance
- Better Performance and Warranties
- Unlimited Toll-Free Technical Support for 2 years
- Products Pre-assembled and Tested
  We're the Nation's MAC Specialists!

Mac Friends Today, The Quickor The Better!

Call MacFriends Toll Free Today!

Call Toll Free Today!

331-1322

800-331-1322

QUICKOR KARE

- 2 years extended service
- Next day air equipment replacement
- Unlimited toll free technical support (Unlimited hands holding by experts!)

STOP! Don't be fooled when comparing systems.

Quickor Kare

- 2 years extended service
- Next day air equipment replacement
- Unlimited toll free technical support (Unlimited hands holding by experts!)
New Products

The Latest Macintosh Releases

Edited by Evan Cooper

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail, unless otherwise noted. Vendors for information on availability.

Hardware

2400 Plus V.42 Fax modem
A 2400-bps data modem that supports V.42bis and MNP 5 data compression and MNP 2 to 4 and MNP 10 error correction; also supports Group III, Class 1 and 2 fax standards and can send and receive faxes at 9600 bps. Requires cable, which is available for about $20 from computer stores to connect to a Mac. $279. Ven-Tel, 408/436-7400, 800/538-5121; fax 408/436-7491.

Axion Switch
An electronic switch that connects to a serial port and allows three serial devices to be connected to a port at the same time. The user can switch between the devices through the Control Panel; one of the devices is assigned as the default device, which is automatically chosen at start-up. $159. Axion, 408/235-0227; fax 408/247-3673.

250
A standby uninterruptible power supply designed to provide 250va of power to computer devices during brownouts, blackouts, and other power problems. The product has two spike-protected AC outlets, plus AC power and battery-indicator lights. $139. Tripp Lite, 312/329-1777; fax 312/644-6505.

BookEndz
A docking station for the Mac PowerBook that allows the user to connect to printers, external hard drives, network nodes, and other peripherals. The BookEndz unit attaches to the peripheral connection; the user can access all the devices by sliding the back of the PowerBook into a station—making one connection. Model BE100 for PowerBook 100, $119; model BE110 for PowerBook 120 and 170, $179. Pilot Technologies, 612/828-6002, 800/682-4967; fax 612/828-6806.

ComputerEyes/RT
A video-digitizing device that lets the user capture still images in 24-bit color in as little as 1/4 of a second from NTSC composite or S-video sources. The SCSI device can capture video samples at a resolution of up to 640 by 480 pixels and has an on-screen live-action preview window. Adjustments can be made to an image's brightness, contrast, and color levels, and captured images can be saved in PICT and TIFF formats. The product has 921K of video memory and a 32K color lookup table. $599.95. Digital Vision, 617/329-5400; fax 617/329-6286.

DaynaPort SCSI/Link
An external SCSI Ethernet adapter for use with PowerBooks and other Macs that have no internal slot for an Ethernet board. The product has two 25-pin SCSI connectors, an external termination switch, and comes with a 12V power supply. The product is available with a BNC connector for thin wiring, or an RJ-45 connector for 10BaseT wiring. SCSI cables are available separately with either 25-pin or 30-pin connectors to support either PowerBooks or desktop Macs. $399. Dayna Communications, 801/531-0600, fax 801/399-9135.

DesignJet
A 300-dpi monochrome raster printer/ploter that prints 6 pages per minute and can take 24- and 36-inch-wide rolls of paper up to 150 feet long. To work with a Mac, the printer requires a software language. $10,995. Hewlett-Packard, 408/973-1919, 800/752-0900; fax 208/344-4809.

Digital Waveboard
A NuBus board that provides 16-bit, four-track, direct-to-disk, random-access audio recording. The board requires the company's Digital Performer software (8995), which provides MIDI sequencing functions and has on-board AES/EBU and SPDIF digital input and output. The built-in digital bus allows direct connection with any DAT recorder or stand-alone A/D/D/A converters. The product records software as well as a four-page installation pamphlet with photographs. $599. APS, 816/478-8300, 800/225-2752; fax 816/475-4596.

HubWorks-8
A stand-alone Ethernet hub with eight RJ-45 ports for connecting to 10BaseT Ethernet lines, a BNC connector for thin Ethernet, and an AUTO connector for thick Ethernet. The box comes configured for thin or thick Ethernet via a switch on the front panel; there are also three LED status lights per port for indicating collisions, link integrity, and polarity reversal. $399. TechWorks, 512/794-8533, 800/688-7466; fax 512/794-8520.

HyperSpace Shuttle
An optical storage device based on the HyperSpace rewritable optical drive that holds up to five ISO-standard removable 5.25-inch, 650MB cartridges to provide up to 3.25GB of online storage. The drive's robotic mechanism takes 6 to 8 seconds to switch cartridges, and the drive itself has an average seek time of 28ms, according to the company. The included software allows for disk locking, password protection, and automatic cartridge mounting; each individual cartridge appears on the desktop as two icons (one for each side of the disk) and can be accessed like any standard Macintosh volume. Limited file-sharing capabilities are available with the current software, and future upgrades will include greater network support. $7990. Ritch Corp., 408/432-8000, 800/955-3453; fax 408/943-9364.

LabelWriter II Plus
A desktop printer with a 138-by-138-dpi resolution specifically designed to print labels for envelopes, packages, file folders, notebooks, and so on. The product's print head is 21/4 inches wide and can print on a variety of label sizes, from 11/4 by 31/2 inches to 21/4 inches by 4 inches; it also prints 31/2-inch disk labels. The printer comes with addressing software for laying out labels. $399. Costar Corp., 203/661-9700, 800/426-7827; fax 203/661-1540.

Lazer 1560
Series of 400-dpi laser printers that accept paper sizes up to 11 by 17 inches and come with one, two, or three paper trays. The printers produce 15 pages per minute and are equipped with AppleTalk, RS-232, Centronics Parallel, and SCSI ports. All models have PostScript Level 2, RISC-based controllers and feature 4MB of RAM, expandable to 16MB. Each paper tray holds up to 250 sheets. Single-tray model $5695; double-tray $6495; triple-tray $6995. Dataproducts Corp., 818/887-8000, 800/334-3174; fax 818/887-4789.
NEW PRODUCTS

A single-pass color slide scanner that scans positive or negative 35mm slides or film at a 2700-dpi resolution. The product captures up to 30 bits per pixel and 10 bits of dynamic range per color, and then optimizes the image to 24 bits. The company's Virtual Scanner Interface software, an Adobe Photoshop plug-in that displays images in real time as they are scanned, is included. $2695. Santos Technology, 310/320-9686, 800/966-9960; fax 310/212-6688.

**Notes**

- The product has five gamma-correction settings and seven brightness selections, and connects via a serial port. It ships with the company's ScanDo desk accessory for adjusting scanning settings. The software supports TIFF, PICT, MacPaint, and EPS file formats. $995. Nisca, 214/242-9696, 800/245-7226; fax 214/245-0942.

- The product has five active matrix LCD projection panel that can display more than 24,000 colors, and also can display live video in NTSC, PAL, or SECAM format with the addition of a video adapter that is priced at $695. The Ovation SX includes a remote control that can access all the device's functions and can emulate keyboard strokes. $195. Proxima, 619/457-5500, 800/447-7694; fax 619/457-9647.

- A single-pass scanner that scans 24-bit color and 8-bit gray scale in a single pass and has a scan area of 4 by 6 inches.

**NEW MODEL**

**microLaser Plus**

MORE SPEED SAME PRICE

No matter which Mac you pick, we've got a PostScript printer to go with it. Personal or shared. Home office. Home run. Take the new 9 ppm microLaser Plus PS17. At only $1,499*, it's ideal for home or professional use, giving you PostScript software from Adobe* and 17 scalable fonts. Plus it's only 13.4" wide and 14.2" deep — a natural deskside companion for any Mac.

Company office. Great company. For more power where power counts, there's the $1,849* microLaser Plus PS35 with 35 scalable fonts. Same small size. Same quick speed. Even more value.

Pick a Macintosh. The complete PostScript® printer.
Pick a microLaser.™

family solution from Texas Instruments.

Mac and microLaser. The perfect pair.
Whenever microLaser you pair with your Mac, there are bonuses microLaser offers that other printers can't. Like easy-to-use controls and upgrades you can do yourself — without tools or technicians. And because it's compatible with the Apple LaserWriter®, microLaser works like it was made for the Mac. Even when you use its multiple paper trays, because each microLaser comes with TI's Paper Tray Manager software.

Find out where you can pick the right microLaser for your Mac. Call 1-800-527-3500.

Circle 313 on reader service card
integrating Macintosh and PC networks that allows Mac and Novell NetWare users to share printers, files, and other network resources. The software runs on a dedicated PC, turning it into an AppleShare server; Macintosh users can then see PC files as Macintosh icons, and PC users can see Macintosh files with standard PC names. A Macintosh user can also open a PC file and run the associated application by clicking on the file's icon. 1MB min. memory. $695 for 40 users. Miramar Systems, 800/966-2432; fax 805/966-1824.

**MacPing**
A testing program for AppleTalk networks that can troubleshoot up to 60 computers simultaneously and determine which part of the network is experiencing trouble. 1MB min. memory. Single-user version $69; unlimited-user version $149. Dartmouth Computing Services, 603/646-2643; fax 603/646-2810.

**MicroMath Calc**
A program that runs as an application or a desk accessory that functions as a sophisticated calculator that can work with many types of numbers, including real, complex, Gaussian, binary, and hexadecimal numbers. The DA has hundreds of units of measure and physical constants for use in conversions built in, and it can parse algebraic expressions written in long form. The Standard Apple Numerics Environment (SANE) is used throughout the program, and many arithmetic, logarithmic, and trigonometric functions are provided. Basic financial and statistical functions are also included. 512K min. memory. $99. MicroMath Scientific Software, 801/943-0299; fax 801/943-0299.

**Minotaur, The Labyrinths of Crete**
A game for play over a network or by modern which can have up to seven players at a time. The players are put into a randomly generated labyrinth and, with the aid of a variety of objects found in the maze, attempt to kill their opponents. There are more than 80 different items in the maze that the players can use, including weapons, spells, magic, and armor. The program runs in 8-bit color and comes with two master disks. 2MB min. memory. $199. Bungle Software Products Corp., 312/493-2849; fax 519/493-4557.

**OPTS**
An application that translates documents written using Unix troff, nroff, or mm macro-package document formats into RTF documents (used by Microsoft Word and WordPerfect) for use on a Mac or a DOS machine. The program automatically determines which format the document is in and converts it accordingly; it can also convert from RTF format to Unix format. 1MB min. memory. $179. Systems Design Associates, 908/730-7677, 800/847-1732; fax 908/730-6966.

**Paris Book of Hours**
The fifth volume in a series of PostScript clip art containing medieval and Renaissance images, this volume contains images (saved as EPS files) based on sixteenth-century French woodcut lettering and typographic ornament and, with the aid of a variety of objects found in the maze, attempt to kill their opponents. There are more than 80 different items in the maze that the players can use, including weapons, spells, magic, and armor. The program runs in 8-bit color and comes with two master disks. 2MB min. memory. $199. Bungle Software Products Corp., 312/493-2849; fax 519/493-4557.

**Rotate This**
An addition for Aldus PageMaker 4.2; allows a user to rotate a bitmap counterclockwise to any degree specified. Images can be flipped left to right or top to bottom. The software does not manipulate text. 3MB min. memory. $49. Equilibrium, 415/332-4343, 800/524-8651; dept. E3; fax 415/961-4201.

**Science CAP**
A HyperCard program that assists teachers in preparing classroom science activities for children in grades five through eight. The product is a collection of more than 500 files containing diagrams, worksheets, science-related activities, overheads, teaching forms, quizzes, and answer sheets. The nine featured topics are Animals, Astronomy, Brain and the Mind, Cells, Chemistry,
SurfGuard
An application that backs up to cartridge tape drives, digital audiotape drives, 8mm helical-scan optical disk drives, or any other Hierarchical File System (HFS) volume. Backups can be performed on a user's local hard drive or on volumes on an AppleShare file server. 1MB min. memory. $99. Surf City Software, 714/289-8543; fax 714/289-1002.

UK Network
A HyperCard stack that lets users explore the careers of 145 English blues, rock, and pop bands from the sixties to the nineties. Each section on a band contains detailed biographical information, a discography, and a genealogy that is linked to other entries. The program also includes UK Network Trivia, a game based on the information in the stack. 2MB min. memory. $27.50. Music Society, 416/282-8810.

Word-A-Day Daily Planner
A daily calendar and planner that displays a new vocabulary word each day and challenges users to choose the correct definition; points are awarded for correctly defining a word. The planner portion of the program lets the user view calendars by day, week, month, or year, and print each view in a variety of sizes. From one screen the user can edit date, time, and appointment information. 2MB min. memory. $19.95; also available as an add-on to the Far Side Computer Calendar for $19.95. Amazone, 206/820-7007; fax 206/823-0568.

XTension Manager
A QuarkXPress XTension for controlling the loading of XTensions when Quark is launched or after the application is running; users can define a default set of XTensions and save other sets for later use. 3MB min. memory. $69. DK & A, 619/488-8118; fax 619/488-4021.

ProArt Professional Art Library Portfolio
A collection of clip art in EPS format that includes over 3000 pieces of art in more than 50 categories; the art is designed to be used in presentations, publications, and newsletters. The CD also includes a run-time version of Multi-Ad Search and a catalog of the images with keyword-searching capabilities. 2MB min. memory. $99. Multi-Ad Services, 309/692-1530, 800/447-1950; fax 309/692-5444.

SpaceTime and Art
A collection of materials on the subject of outer space with more than 300 high-resolution, 24-bit color images in PICT, TIFF, and EPS formats; an annotated database of astronomical organizations; education-al institutions; space-related publications; and QuickTime movies on recent theories about the creation of the universe. The CD also contains HyperCard reference stack on current cosmological concepts and a tutorial on graphics terminology, compatibility, and technical issues. 1MB min. memory. $199. Wayzata, 218/326-0597, 800/735-7321; fax 218/326-0598.

MacBlaster
A pair of amplified desktop speakers for use with a Mac that can be connected through the sound port. The speakers, which are 4 inches in diameter, are designed to provide full coverage of the entire frequency range available on the Mac sound chip. $89. Thor Manufacturing, 702/324-6600, 800/346-4694.

MacShield
A line of computer monitor shields designed to reduce ELF and VLF emissions from the displays on all Mac compact models, the Apple 12-inch and 13-inch RGB displays, Apple's Portrait display, the Apple 12-inch monochrome display, the Seiko 14-inch RGB display, several monitors from SuperMac and RasterOps, and the Sony 14-inch RGB display. $99. Environmental Services & Products, 303/442-2578; fax 303/442-0670.

Moustray
A device that attaches to the edge of a desk, designed to act as a shelf for a mouse or other input device; installation requires no tools and the product is designed to let a user use the input device without bending the wrist. A variety of models are available for desktops of different widths. $19.95. Workspace Solutions, 801/429-7379, 801/484-7044, 800/285-4591; fax 801/429-3331.

CD ROMS

ACCESSORIES

Moustray
A device that attaches to the edge of a desk, designed to act as a shelf for a mouse or other input device; installation requires no tools and the product is designed to let a user use the input device without bending the wrist. A variety of models are available for desktops of different widths. $19.95. Workspace Solutions, 801/429-7379, 801/484-7044, 800/285-4591; fax 801/429-3331.

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.

New Aldus SuperPaint 3.0.

Let's put this argument to rest. It's both. SuperPaint is the all-in-one program that makes it easy to do it all—combining paint, draw, and image enhancement—saving you time and money.

As you can see, its range of capabilities makes it perfect for either business users or graphic designers. And now with the added color capabilities, EPS import and export, textures, and gradients, it gives you even more creative options (by the way, it still works great in black and white).

Of course, the best way to settle any argument over SuperPaint is to try it. See your Aldus dealer or call 800-685-3630 for more information.
“Order by 10pm (PST), have it tomorrow for just $3”

DP + Hard Drives
DataPlace: Available only at Mac’s Place! These quality Quantum hard drives and Syquest Removable Cartridge drives come with DataWare formatting software, Alysis Software’s More Disk Space and Central Points MacTools Deluxe. Each drive features a selectable SCSI ID switch, two 50 pin SCSI connectors, an external fuse and two AC Plug-ins.

Bemoully Transportable 90 MB
IOMEGA: Long known for reliability, IOMEGA now offers fast, 19 millisecond access time, and affordable removable storage with a 5-year warranty. Durable in design and built for speed.

WriteNow 3.0 w/“Grammatik”
T/Maker: Fastest word processor for the Mac. Latest upgrade to the 2-time winner of MacUser’s Best New Word Processor award. Includes lightning-fast, 135,000 word spelling checker, a 1.4 million word thesaurus DA and the most powerful, yet easy to use style sheets. MS Word compatible.

SIMMs
Mac’s Place: Expand the mind of your Mac! One Meg SIMM, 80 nanoseconds, only $35! Four Meg SIMM only $128!
Also included, Connectix Macintosh Memory Guide, the complete guide for RAM configuration, expansion, tricks and traps. Call for PowerBook RAM prices.

Kaboom and After Dark
Nova Development/Berkeley Systems: The ultimate screen saver meets the ultimate sound utility! Prevent screen burn-in with After Dark’s Flying Toasters, colorful fish and other incredible displays. Energize your Mac with Kaboom!’s 150 wild and wacky sounds. You’ll never settle for a simple beep again! If you love your Mac, you’ll love this value-bundle!

Personal Press 2.0
Aldus: New Version! The only page layout software that intelligently assembles your text and graphics automatically so you look like an expert. Includes full featured word processing, “Intelligent” templates, Copy Fitting, AutoFlow, text wrap, free rotation, and drawing tools.

Here’s the fine print for the Mac’s Place Speed Shopper Sweepstakes.

*The first rule is to remember these dates: April 20 to July 31, 1992. Those are the days you can enter our sweepstakes. No entries will be accepted later. There are two ways to enter. Every time you place an order between the dates above, you’ll be asked if you want to enter our sweepstakes. Obviously, the more times you order, the more times you’ll be entered in the sweepstakes. If you’re not ready to order, you can enter by writing your name, address and phone number on a postcard and sending it to: Sweepstakes Offer, Mac’s Place, 8461 154th Ave NE, Redmond, WA 98052. All correspondence, including addressing, must be in your personal handwriting. No machined and/or electronic correspondence will be accepted. No mass/bulk mailing of any kind will be accepted. Please note that we cannot take sweepstakes entries over the phone without an order. Sweepstakes drawing will be held on August 14, 1992. Mac’s Place employees and their families are not eligible to enter. Good luck!
Enter the Mac's Place Speed Shopper Sweepstakes any time from April 20 to July 31, 1992. Whoever wins the grand prize is going to have an amazing amount of fun. We'll fly you and a companion to our warehouse which is packed with sophisticated graphics programs, exciting games, state of the art CD ROM hardware, Fax/modems, business software, monitors, and even a **PowerBook 170**. Then a whistle blows and you're off, piling boxes in your shopping cart—tossing equipment worth hundreds—no thousands—of dollars in your backpack. Your goal is to take home as much as possible. When you're done, we'll whisk you and your companion to the Seattle area's elegant Woodmark Hotel for an all-expenses paid weekend of luxury.

If you don't win the grand prize, don't despair. Second prize is a PowerBook 100 and a $500 Mac's Place gift certificate. Third prize is a Mac's Place $1,000 gift certificate. Order from this ad and we'll enter your name in the Sweepstakes. See rules for details.

Our Hours: Monday through Friday 6AM-10PM PST and Sat/Sun 6AM-6PM PST Call 1-800-367-4222 US & Canada

*We understand Macintosh products better than anyone because we work on them every day. And since our sales consultants aren't paid on commission like other companies we know, we'll guide you to exactly the right products that will work best for you. Our only job is to make you happy. That's what customer service is all about. Right?*
"The only place that runs on Macs." —Mac

BeagleWorks Competitive Upgrade
Beagle Brothers
Upgrade to where the true meaning of integrated software has finally been defined. Includes seven modules so fully integrated you can easily access the Word Processor, Database, Spreadsheet, Chart, Paint, Draw and Communications modules from anywhere in the program using revolutionary In-Contexting Editing™. Non-Upgrade price $184.

Classic Accelerator! w/FPU
NewLife Computer Corp.
NewLife Accelerators are designed for performance without sky-high costs. With an Accelerator installed in your Mac Classic, even the most demanding software won’t slow you down. Imagine...the performance of a 68k in the footprint of your compact Mac! Call for complete pricing on all NewLife Accelerators.

Voice Navigator SW
Articulate Systems
New! Voice Recognition is a reality now & affordable too! Provides Voice Recognition for ALL Mac Applications. Work faster & easier using your voice instead of key strokes & pulling down menus. Comes FREE with your choice of a high quality Desktop or Headset Microphone.

SoftNode 1.0/Universal SoftPC 2.5
Insignia Solutions
Add SoftNode to either Universal SoftPC or SoftAT and your Mac will run MS-DOS applications and share programs over a Novell PC Network! With SoftPC, your next IBM computer could be a Macintosh.

FolderBolt/NightWatch II
Kent Marsh
If you share a Mac with others, ensure privacy by using FolderBolt to lock files on your hard disk or floppy. A simple click of the mouse locks and unlocks folders. NightWatch II gives you the most impenetrable hard disk protection in the industry. It offers three levels of protection – diskless, key disk and classic token disk.

ThoughtPattern
BananaFish
Get organized and work more efficiently with ThoughtPattern, the information manager that lets you integrate notes and files. Features automatic cross-referencing, powerful searches, alarms, priorities and direct launching of other applications.

Painter 1.2 /6 x 9 Tablet
Fractal/Wacom
Painter, the natural media painting program chosen by critics: MacUser Eddy 1991, S-Mice, MacWeek’s Target Award. The Wacom tablet has the premier pressure sensitive stylus. Now specially priced together.

DupLocator
Midnight Software
Finally!! Organize all your disks and files across any grouping of media. Build new organized disk(s) from your file collection. Delete, move, copy, color or archive/compress files. Locate/remove duplicate files by name, type, creator, size or by creation/modification date. Supports all Macs/networks.

DupLocators
Midnight Software
Finally!! Organize all your disks and files across any grouping of media. Build new organized disk(s) from your file collection. Delete, move, copy, color or archive/compress files. Locate/remove duplicate files by name, type, creator, size or by creation/modification date. Supports all Macs/networks.

Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090
System 7 Compatible  System 7 Savvy  30-60 Day Money Back Guarantee
“Order by 10pm (PST), have it tomorrow for just $3”

**Ofoto**

*Light Source*  Now professional quality gray scale scanning is as easy as the click of a button. Ofoto automatically scans, classifies, straightens, crops, and sharpens your image. You get a crisp accurate reproduction of your original image on the very first scan, leaving you more time to exercise your creativity.

**ScanMaker 6002S w/PhotoShop**  

*Microtek*  Create beautiful reproductions with vivid colors and extremely sharp definition. The latest color/grayscale flatbed scanner from Microtek. Scan at up to 600 dpi resolution at full 24 bit color. Easy to use controls allow adjustments of the scaling, resolution, brightness and contrast, shadow/highlight and more.

**Cricket Graph/Cricket Draw III**  

*Computer Associates*  

**Cricket Graph** - Quick and easy to use charting application ideal for anyone who needs to create graphs for reports, presentations or data analysis. Cricket Draw III - intuitive, object-oriented drawing program, produces professional-quality graphics. Both entry level and skilled users will appreciate it's ease of use and power.

**LabelWriter II Plus**  

*CoStar*  Print labels easily and in all different sizes and shapes with the new LabelWriter II Plus! This palm-sized printer produces labels ideal for addresses, packages, diskettes, name tags, and Rolodex cards, you name it. Includes all you need for the all-in-one label printing solution.

**MacUSA/MacGlobe**  

*PC Globe*  MacGlobe and MacUSA are the new state-of-the-art electronic atlas programs that deliver instant profiles of 190 countries and all 50 states and Puerto Rico. Both programs are packed with maps, graphics and annually updated data. Easy to use, versatile, and affordable.

**Control Classic**  

**Diamante Software**  MAKE MORE SALES! Combination database, wordprocessor and calendar provide unparalleled information management. Completely automates the process of sending follow-up form letters and phone calls. Prints fax cover sheets, speed memos, custom reports, labels and envelopes and much more. Received MacUser's highest rating for a contact management system!

**Snooper**  

*MAXA*  Find problems fast with Snooper, the revolutionary suite of hardware diagnostic and testing tools. Snooper is easy-to-use, powerful and saves you time. No set of Mac utilities is complete without Snooper, the hardware diagnostic. Also available with Nubus diagnostic card for only $168.

**The Miracle Piano Teaching System**  

*Software Toolworks*  The first keyboard that teaches you how to play it! Makes learning even the basics a pleasure. Professional keyboard with 49 standard-sized velocity-sensitive keys, 128 digitized instruments and sounds, with full MIDI-compatibility. Includes hundreds of songs and lessons and full orchestral accompaniment.

“We speak fluent Seven.” –Mac
“You can get great prices and great service.” —Mac

Access CD Allegro
Optical Access Int. LCD The fastest CD-ROM drive available with a 310 ms. access time. Includes SuperCache software for lightning speed access to large amounts of information. Features headphone jack, stereo RCA type audio connectors, and deluxe desk accessory. Includes cable, sample CD, and one caddy.

Optical Access Int. LCD 128 megabytes in your shirt pocket. This 3.5" optical drive is the cutting edge of technology, enhances with SuperCache software for lightning fast operation. The ultimate data security and affordability. Includes: cable, and removable 3.5" media cartridge (ANSI compatible).

Access RD/Aria™

Equalizer LC w/FPU/PowerMath LC/LC II
DayStar Digital LCD Equalizer LC — put a 16MHz 68030 into your '020 LC and gain as much memory as your hard drive will allow using Virtual Memory under System 7. Put a PowerMath chip card in your LC or LC II and boost your spreadsheet recals and math and science programs.

Training Modules for Word 5.0
Personal Training Systems LCD MS Word 5.0 Training Modules. Special exclusive offer! Order Word 5.0 now and you can buy one of four, award-winning, audio tutorials for Word 5.0 from PTS for only $15. Since they are modular you can select the appropriate level for your needs. Limited time only, call now!

EtherMac II-TN and 10T
Farallon LCD Available in every cabling type, and for every Mac bus. EtherMac C Combo cards come with connections for all cable types (Thick, Thin, or 10Base-T) and come standard with 64K Ram for data-intensive operations including server use and A/UX support. 5-year warranty. Call for pricing on full line.

Full Metal Mac
Soft Wars LCD Conflict simulation game that places each opponent in the role of a combat infantry officer in command of modern infantry elements. Gets down to the nitty-gritty of modern, small arms infantry combat — the sweat, fear, chaos, pressure and unpredictability. 1 or two players.

PersonToPerson (2-user)
Asante LCD Mac communication software system that mirrors "traditional"office interactions. Instead of shouting across the workplace, PersonToPerson allows users to send voice messages across the network. Includes an In/Out Board and a Post-It™ Note Window. Not file server or net-administration required!

PhotoDisc CD-ROM Vol. I, II, III
“Order by 10pm (PST), have it tomorrow for just $3”

**PROmotion**

**Motion Works** Easily create full color animations with multiple audio tracks, even if you can’t draw. Interface follows traditional animation techniques such as cell based actors, onion skinning and path based motion. Other features include cell tweening and Print to Video. Export your animations to QuickTime™ or Berkeley Systems After Dark.

**Infini-D/Replicas I & II**


**DiVA VideoShop**

DiVA VideoShop is a fun, easy and powerful application for creating and editing QuickTime movies. Used with any QuickTime digitizing board, DiVA VideoShop’s recording module lets you record video and audio clips directly onto your hard disk. For ease of editing, DiVA VideoShop uses icons (moving icons) to represent each clip. You can incorporate clip media from the Image Bank CD Collection of 300 movies, 70 music scores, and a sound effects library, all included in the box. Call for Special RasterOps STV or SuperMac Video Spigot Bundle Pricing!

**MacroMind Director 3.1**

MacroMedia New Version! The professionals choice for multimedia production is now the ultimate QuickTime authoring tool. Author, edit, playback and export interactive QuickTime movies with no additional hardware. Other features include expanded help, added functionality in the Score, a $195 Accelerator, and license free distribution of your multimedia productions.

**Interactive Training - MacroMind Director**

Media In Motion The comprehensive computer-based interactive course designed to help individuals learn MacroMind Director in just one session! Complete instruction on Director 3.0 and 3.1 including all key components, cast creation, scripting QuickTime™ and more. Save time and guarantee your proficiency in using Director.

**CameraMan**

Vision Software New! Make a full-color movie of whatever’s happening on your Mac screen with CameraMan! Records all screen activity in real-time to a QuickTime™ or PICS movie. Use your screen movies in multimedia, presentation, and QuickTime™ packages. Free movie player included!

**PACo Producer**

CoSA Add sound and accelerate playback of your animations or videos while eliminating memory constraints. PACo Producer, the next generation of QuickPICS™, creates movies from any program that outputs PICS, PICT or QuickTime™ files. PACo movies play on all Macs, PCs running Windows and Unix workstations.

---

**Call 1-800-367-4222 US & Canada • Visa/MC/AMEX accepted**
Your order will ship to you overnight for just $3.
That's $3 per order not per item.
If you work with graphics applications, multimedia, databases or any large file, you know the frustration of waiting. Waiting while the hard drive reads, waiting while it writes, waiting for just about anything involving the hard drive.

PLI has the solution. It's called the MiniArray.

Consider this: with the MiniArray, a Mac IICl can duplicate a 100MB file in just one minute, the kind of performance you might get from a $30,000 RAM Drive. Only this is not a RAM Drive.

The MiniArray is two very fast drives that share the work. That gives you twice the cache, twice the number of read/write heads and three times the sustained data transfer rates of a Mac IIx, a whopping 5MB per second. And because the MiniArray uses a technique called data striping, your average access time will be cut almost in half.

And with all that speed comes the capacity you need. Sizes range from 240MB to 4GB to fit any need, while prices start at less than $2,000 (so you can update your software, or maybe even your wardrobe, along with your drive). And you can feel secure about your decision with our two-year warranty, which can be extended to give you up to five years of coverage.

As you might expect, there is a catch.

This low price also gets you PLI's QuickSCSI, included with every MiniArray. That means the features of QuickSCSI—disk mirroring between daisy-chained hard drives, support for an additional seven MiniArrays or hard drives and increased speed for all attached SCSI devices—are a pleasant bonus to an already great deal.

So the next time you're waiting on your hard drive, call and order the new PLI MiniArray.

*Data redundancy for the MiniArray provided by optional PLI Redundant Software. All products are trademarks or registered trademarks of their respective companies.

---

You'll love it for the SPEED but you'll buy it for the PRICE

800-288-8754
Peripheral Land Incorporated • 47421 Bayside Parkway • Fremont, CA 94538
510-657-2211 or Fax 510-683-9713

MiniArray. So what are you waiting for?

Circle 208 on reader service card
Questions and Tips from Macworld Readers

BY LON POOLE

The tip about fixing broken supports for SIMMs with photoreactive glue made for stained glass (Quick Tips, March 1992) rang a bell with Stuart David of New York. He accidently snapped 1/8 inch of plastic off a support and was faced with replacing the logic board for $700. His low-tech solution: shoving four trapezoidal wedges cut from shirt cardboard between the wiggly SIMM and its sturdy neighbors (see “Makeshift Supports”). He made the top of each wedge slightly wider than the distance between the SIMMs, and the bottom of each wedge slightly narrower than that distance. The height of the wedge is about an inch, depending on the innards of the particular Mac model. While there’s no warranty attached to this kind of repair, David is still holding strong after two years. I have also heard of people stretching a rubber band around the front of a loose SIMM and the back of a secure SIMM behind it. (This method won’t work for the last SIMM because there is no SIMM behind it.) If you’d rather not jury-rig a repair, you can have a broken SIMM socket replaced for $100 to $150 by an independent service technician who does board-level repairs on Macs. Look for computer repair shops in the yellow pages of any large city. Few Apple-authorized service centers repair circuit boards because Apple instructs them to always swap the whole board and return the defective board to Apple’s repair center in Cupertino. As you can see, this approach can cost more money for no good reason.

LaserWriter Toner Refills

Five months ago I asked readers to send in their experiences with toner refills for laser printers, and promised to summarize the results. I expected to hear mostly from people who had trouble, figuring people wouldn’t take the time to write about good news. Jo Anne Edwards of Johnson, Vermont, wrote about troubles with refilled cartridges purchased from Toner Etc. of Portsmouth, New Hampshire, for her office’s Hewlett-Packard LaserJet Series II, which prints about 25,000 pages a year. Seals broke off inside cartridges instead of sliding out, cartridges ran out of toner quickly, and new cartridges arrived empty. In the same letter, Edwards reported excellent results with refilled cartridges purchased elsewhere for her LaserWriter IINT at home. Several other readers reported no problems and as good or better quality with refilled toner cartridges from various sources. But nobody else wrote about problems, leading me to believe refilled toner cartridges must be pretty reliable.

Mail-Order Mac

I am planning to buy a Mac Ilsi by mail order. I have been told that Apple offers no warranty for mail-order purchases. Is there any way I can check on the reputation and dependability of the various mail-order companies?

Lynn Noyes
Nevada City, California

No dealer will handle warranty repairs on equipment with missing or obliterated serial numbers because Apple won’t reimburse a dealer for parts and labor without serial numbers. Some equipment bought by mail lacks valid serial numbers to prevent the equipment from being traced back to the authorized dealer who originally ordered it from Apple. Mail-order companies buy overstocked Apple hardware from authorized dealers who, scheming for a better discount from Apple, ordered more than they can possibly sell to consumers. Reselling to mail-order companies violates a dealer’s agreement with Apple and could result in Apple revoking the dealer’s authorization to sell Apple products. Although the supply of mail-order Macs relies on shady dealings, there’s nothing illegal about your buying Apple hardware by mail. That’s why it’s called the gray market and not the black market. Apple will not void or reduce your warranty simply because you didn’t buy from an authorized dealer, but if your equipment has no serial numbers, you essentially have no warranty. The moral: Make sure you get a money-back guarantee before buying by mail, and when your equipment arrives, check for complete and unaltered serial numbers.

To get the lowdown on three dozen mail-order companies and learn how you can protect yourself when buying by mail, read Conspicuous Consumer, Macworld, November 1991.

Font Confusion

I have been trying to sort out all this font stuff. I know how each of my fonts looks on my Mac Ilsi screen and my Personal LaserWriter IINT printer, but I’m still a bit confused. My three types of font icons seem to correspond to more than three types of fonts. What are the differences between TrueType printer fonts with their screen fonts, PostScript printer fonts with their screen fonts, and screen fonts that don’t seem to have printer fonts? Why do some screen fonts without printer fonts print smoothly (New Century Schoolbook) and others print jagged (London)? Are TrueType screen fonts necessary? I read Desktop Publisher’s Survival Kit. It’s a great book, but I couldn’t find the answers to those questions. Can you suggest another book?

Phil C. Hagemann
North Babylon, New York

Buying Macs by mail, understanding fonts, seeing all in Spectre, and more

MACWORLD July 1992 241
HOW TO/QUICK TIPS

Makeshift Supports
If you break the support for a SIMM, try wedging trapezoidal pieces of shirt cardboard around it (top) or snapping it in place with a rubber band (bottom).

Your Macintosh can display and print text using three types of fonts: fixed-size, TrueType, and PostScript. No one of them is strictly for printing or screen display. A fixed-size font contains exact pictures of every letter, digit, and symbol for one size of the font. Fixed-size fonts are often called bitmap fonts because each picture precisely maps the dots, or bits, to be displayed or printed for one character. Each fixed-size font looks great in one size only. If you need a font in a size for which no fixed-size font is installed, the system must scale the closest installed size up or down to the size you want. The results are usually jagged.

TrueType fonts define characters not with fixed bitmaps but with variable-size outlines. The Macintosh system software smoothly scales TrueType outlines to any size on screen or any printer and then fills in the outline with dots at the screen or printer resolution. Because the system software makes a custom bitmap on the fly for a particular text size and output device, results are always smooth.

Like TrueType fonts, PostScript fonts use outlines to define character shapes, and consequently they look smooth at any size. PostScript fonts were originally designed for printing, and the system software used a set of matching fixed-size fonts installed in the System file for screen display. Most LaserWriters and many other output devices have PostScript fonts installed. Other PostScript fonts can be put in the System Folder (or the Extensions folder in System 7), and the system software transfers (downloads) them to the printer as needed. Today the more common PostScript fonts have TrueType equivalents for screen display and for printing on devices that don’t use the PostScript page-description language. Alternatively, your Macintosh can display PostScript fonts on screen after you install Adobe Type Manager (ATM) and the PostScript fonts in your System Folder. (ATM can’t use fonts built into your printer.) In the meantime, ATM is available in the U.S. and Canada for a $7.50 shipping fee (call 800/521-1976, ext. 4400). The ATM special offer includes four versions of Adobe Garamond and a coupon offering the four basic LaserWriter fonts—Cour 1. Helvetica, Times, and Symbol—for $49. The Adobe Plus Pack, which includes the other seven standard LaserWriter fonts—Avant Garde, Bookman, Helvetica Narrow, New Century Schoolbook, Palatino, Zapf Chancery, and Zapf Dingbats—lists for $198.

Even with TrueType fonts installed, you may want to keep corresponding fixed-size fonts (all sizes) installed, for several reasons. TrueType and fixed-size fonts have slightly different letter-encoding that can change line breaks in old documents and can reduce the amount of text that fits in a small space on spreadsheets, database layouts, and HyperCard screens. Furthermore, fixed-size fonts look a little better on screen and display a bit faster on slow Macs than do programmed TrueType fonts.

You may wonder how the Mac decides when to use fixed-size, TrueType, and PostScript fonts when more than one is installed. On screen, the Mac prefers an installed size of a fixed-size font, next a TrueType font, and then an ATM PostScript font. On a PostScript printer, the Mac prefers a PostScript font from the printer’s ROM, RAM, or hard drive (if any); next a PostScript font downloaded (copied) from the Mac’s System Folder (or Extensions folder); then a TrueType font; and finally a fixed-size font. On other printers, the Mac prefers a TrueType font, next an ATM PostScript font, and then a fixed-size font.


VM Disk Hog
My Mac Iici has 5MB of RAM, but I need 7MB of memory to use Mathematica Enhanced 2.0. I used System 7’s Memory control panel to set virtual memory to 7MB, expecting to surrender 2MB of hard drive space. When I happened to restart my Mac with System 6.0.7, the VM Storage file became visible, and I noticed it took 7MB! With that much hard drive space used for virtual memory, I should have 12MB of total memory when operating under System 7, but I only have 7MB. Is this a bug or is there an explanation?

Jeff Derluyn
Roselare, Belgium

Before answering your question, I must lecture you about the best uses of virtual memory. Opening one big program that needs more memory than the amount of RAM installed, as you are doing, usually degrades system performance markedly. Virtual memory is best used for keeping multiple programs open, none of which requires more than the amount of RAM installed.

For performance reasons, System 7’s virtual memory does indeed use a disk file the size of your total memory setting—in your case, 7MB. Two virtual memory alternatives from Connectix (800/950-3880 or 415/571-5100), Compact Virtual 3.0 and Virtual 3.0, have an option that lets you reduce the virtual memory file’s size by the amount of installed RAM. Performance declines, but Connectix claims that with this disk-space-saving option turned on, its virtual memory is about the same speed as System 7’s disk hog. With the disk-space-saving option turned off, Connectix claims, its virtual memory is faster than System 7’s. Compact Virtual 3.0 brings virtual memory to a Mac Plus, SE, or Classic retrofitted with an accelerator board that has a 68030 microprocessor. Accelerated or not, those Macs can’t use System 7’s virtual memory because their ROMs lack the necessary information. Connectix found a way around that limitation and began distributing Compact Virtual 3.0 in March through companies that make accelerator boards. Virtual 3.0, which will bring the disk-space-saving option and faster virtual memory performance to Macs that can use System 7’s virtual memory, was still under development at this writing.

Trackballs and Eyeballs

TIP It’s possible that the pretty shooter marble I found at a local children’s store (Such a Business, in Emeryville, California) works better than the gray trackball Apple provided with my PowerBook 100. It adheres well to the inner rubber rollers and certainly has a more solid feel. Take your Mac to a toy store and check the fit.

Don’t let that naughty disappearing (“submarining”) pointer make you go blind. Try installing the 6K system extension called Eyeballs in your Extensions folder (or System Folder). The two little eyes it adds to the menu bar are more than amusing. They really help by always staying at the pointer, even when you can’t see continues.
Introducing Photography Without All The Negatives.

New FotoMan™—the portable, affordable camera for your Mac.

No more wasting time and money having film developed! Pocket-sized FotoMan shoots up to 32 pictures in a session, and digitizes them in 256 shades of gray. With a built-in rechargeable battery, automatic flash and outdoor filter, you can take shots anywhere— one button operation and infinite field of focus make it easy! Pop the pictures into your Mac via the modem or printer port (you don’t need a digitizing board), and use Digital Darkroom™ software to crop backgrounds, change sizes, adjust contrast—even create special effects. All for just $799. For the whole picture call: 1-800-231-7717.
When working in Adobe Illustrator you may need a lighter shade of a process color for decorative accents, tint boxes that run behind type, and so on, but you may not be sure how much lighter to go. You can try to find the desired tint by guessing at different combinations of cyan, magenta, and yellow. Instead, Robert Engman of Northampton, Massachusetts, suggests you have Illustrator create a range of tints like the range shown above. Then you pick a tint you like from the range and have Illustrator tell you its color mix.

Here’s what you do:

1. Begin by drawing a straight line and painting it the process color for which you want to find a tint—for example, 89 percent cyan, 15 percent magenta, and 65 percent yellow (the top line above). When you use the Style command to set the process color, be sure to set the line weight heavy enough (6 points) so you will be able to easily distinguish the variation between tints.
2. Copy the line, drag the copy a couple of inches below the original, and change its color to white.
3. Create a blend between the two straight lines. The number of steps depends on how subtle you want the difference between tint steps to be. For example, 19 steps gives you a 5 percent difference between steps.
4. Select the blended lines and preview the selection. Determine which tint you like, switch an artwork view, select the line whose tint you liked, and use the Style command to ascertain the line’s color mix.

Tint Finder

Sky View To view the Spectre battle from above, just type the secret word.

it. I look at them innumerable times, waggling the trackball when desperately sniffing out a truly elusive pointer.

Jay Shockey
Berkeley, California

You can get Eyeballs, by Ben Haller, free from a user group or an online information service.—L.P.

Spectre Omniscience

TIP I’ve found a great new tip for playing Velocity Development’s Spectre. The manual tells clearly how you can use the tab key to rotate through the three different battle views. But there is a fourth, undocumented view that can make winning at Spectre a whole lot easier. To see this new view, type God at any point during game play, and the screen switches to an overhead view. From this vantage you can see all the other players (enemies), the blocks, and even everyone’s shots (see “Sky View”). To switch back, just press the tab key. Have fun with it. It makes it a lot easier to wipe up (especially if you’re playing on a network).

Cliff McCollum
Edmonton, Alberta, Canada

One LaserWriter, One Mac

TIP Every manual, bible, encyclopedia, and big book for the Mac gives the impression that you must use network connectors and cables to connect a LaserWriter II or Personal LaserWriter NT to a Mac. This is not true. You only have to buy all that stuff if you’re hooking more than one Mac to the printer—in other words, setting up a network. Those of us whose network consists of one Mac and one LaserWriter can use a $10 serial or null modem cable, such as the one used to connect an ImageWriter II to the Mac. Network connectors cost $20 to $50 each and you would have to buy two.

Howard Atkins
Gilbert, Arizona

No More Alias Trouble

TIP In Insights (February 1992) you wrote about some strategies for quickly removing the word alias from the end of alias files created by System 7’s Finder. I find it more convenient never to have the word appended to the file name at all, since I inevitably ended up removing it.

I used ResEdit on a copy of the Finder to edit the first string (text) in the Finder’s STR# resource number 20500. This is the string the Finder appends to the original file name to make up the alias name. I changed the string to one blank space, rather than making it completely empty, so the names of original files and their aliases would be different.

Nicholas P. Wilde
Boulder, Colorado

Copy Multiple Icon Names

TIP With System 7, you can select and copy a list of icon names from the desktop, a folder window, or disk window (shift-click the icons or drag across them in any view, then use the Copy command). The maximum length the list can be is 256 characters. After copying, use the Paste command in any program that lets you paste multiple lines of text.

Eric Aggar
Saratoga, California

PowerBook Printer

TIP The Power Book 170 has a built-in fax modem and fax machines are so common, you need only connect the fax modem to a phone line, dial up a nearby fax machine (on the same desk perhaps), and “print” any document on the fax machine. If you travel light, you can’t beat it.

Scott Tilden
North Brunswick, New Jersey

You can have a fax modem installed in a PowerBook 100 or 140 as well.—L.P.

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to Quick Tips, Lon Poole, at the addresses listed in How to Contact Macworld at the front of the magazine (include your address and phone number). All published submissions become the property of Macworld. Due to the high volume of mail received, we’re unable to provide personal responses.

Lon POOLE answers readers’ questions and selects their tips for this monthly column. His two most recent books are Amazing Mac Facts (Microsoft Press, 1991), a collection of the best published tips; and Macworld Guide to System 7 (DG Books Worldwide, 1991).
E-Machines continues to set the 16-inch standard for business productivity. With "switch-on-the-fly" dual resolutions, accelerated 24-bit color, video-out and integrated 10BaseT Ethernet networking. On one card, that drives any display, costs less than a single function card and takes up only one slot. You get the increased productivity of viewing up to two pages, and fast Ethernet data exchange that allows you to see more and do more in a lot less time. Nice with any display. Just right with an E-Machines 16-inch display.
The next time you visit your local software dealer, look for it. You'll discover some of the most exciting multimedia CD-ROM software titles ever developed for play on your Mac, PC or MPC. Software ranging from reference, education and personal productivity to sports, travel and entertainment. Titles created not just for you, but also for your children, by the most innovative publishers and developers at work today. When you purchase a software package with the Sony Electronic Publishing logo and CD-ROM symbol, you'll know you're getting the best CD-ROM software available. So look for it at your software dealer today.

Circle 282 on reader service card
Spreadsheet Techniques

BY JIM HEID

BUSINESS WITHOUT SPREADSHEETS? It's easier to imagine soup without sandwiches or Abbott without Costello. The spreadsheet program has been around for only a little more than a decade, yet it's hard to imagine doing business without it. Creating budgets and business plans, estimating profit and loss, forecasting sales, experimenting with mortgage options, analyzing statistics—spreadsheets have turned these and myriad other calculation-intensive chores.

The basic concepts are simple. A spreadsheet consists of horizontal lines, called rows, and vertical lines, called columns, that intersect to form a grid of boxes called cells. Rows are labeled by number, and columns by letter, giving each cell its own address (such as A2 or B3). You move from cell to cell using the mouse or the keyboard's arrow keys. You type numbers (or sometimes, text labels) into the cells and then create formulas that describe the mathematical relationship between the numbers and calculate the results (see "Spreadsheet Basics Illustrated"). For example, a formula you type in cell A3 could calculate the total in A3. You can then apply the total in cell A3 to other calculations-intensive chores.

How to: All After typing the equal or plus sign that denotes the beginning of a formula, point to the first cell to be included in the formula and then click. The program enters that cell's address in the formula. You can then type a math operator (or choose a function) and click on another cell to add it to the formula. If the formula needs to refer to a range of cells, drag across the cells to automatically create the range reference.

How to: Define Name

NAME THAT CELL

UNLIKE THE SPREADSHEETS IN MICROSOFT Works and ClarisWorks, the Big Three allow you to assign descriptive names to cells and cell ranges. You can take advantage of this to create more descriptive formulas. For example, say you're creating a spreadsheet that calculates a car's gas mileage. If you name the cells that hold the miles-driven and gallons-used information, you can create a descriptive formula such as =MilesDriven/ GallonsUsed. That says a great deal more about the formula's workings than =A5/ B5 does, and you'll appreciate the clarity if you have to modify the spreadsheet six months after creating it.

How to: Excel

To use the name in a formula, choose Paste Names from the Formula menu and then select the desired name.

How to: 1-2-3

Select the cell to be named and then choose Create from the Range pop-up menu, located in the console (or choose Create from the Name submenu in the Range menu). Type a name for the cell (spaces are permitted) and click on OK. To use a name in a formula, select the name from the Range pop-up. You can tell 1-2-3 to use the text in adjacent cells by using the Name submenu's Label Create command.

How to: Resolve

Select the cell to be named and then choose Name Ranges from the Format menu. To use a name in a formula, choose Paste Function from the Calculate menu, then choose Names from the Function Type pop-up, and then (why?) double-click on the desired name.

How to: All

You can also name an entire range of cells. Select the cells by dragging across them, and then use the appropriate naming command. Once you've named a Range, you can use the spreadsheet's navigation features (such as 1-2-3's Range pop-up or Excel's Goto command) to quickly jump to that range. This spares you from tedious scrolling when you're working with a large spreadsheet. You can also use a range name in a formula for clarity; for example, the 1-2-3 formula @SUM(QuarterlySales) is more descriptive than @SUM(B1..B6). This method also makes it easier to create and modify graphs, since each of a graph's components (bars, lines, pie wedges, and so on) can refer to a named range instead of a series of cell addresses.

Avoid putting a space in a name. (Excel won't let you do it.) To simulate a space, use an underscore character, as in Quarterly_Sales. Press shift-minus sign (-) to get the underscore character.

Format Cells Appropriately

SPREADSHEET PROGRAMS CALCULATE NUMERIC VALUES very accurately—using up to 19 decimal places. That's comforting, but it's often more precision than you really need. Dollars-
fit more data on a page? Decrease the type size of every cell or use a narrower font. (If you use a laser printer, you can accomplish the same result by specifying a reduction percentage in the Page Setup dialog box. This approach yields more cells per printed page without forcing you to squint at tiny cells on the screen.)

**How to: Excel** To change a cell’s number or date format, choose Number from the Format menu and then double-click on the desired format. To change a cell’s alignment, click on the appropriate alignment button in Excel’s tool bar. If you want lengthy text labels to wrap around to subsequent lines, choose Alignment from the Format menu and then check the Wrap Text box. To change a cell’s font or size, use the Format menu’s Font command. You can also summon bold or italic by clicking on the appropriate tool-bar icon. To reuse a set of formatting options, create a style: format a cell as desired, type a brief, descriptive name in the style portion of the tool bar, and press return. To apply that style to another cell, select that cell (or a range of cells) and then choose the style’s name from the tool bar’s pop-up menu.

**How to: 1-2-3** To change a cell’s number or date format, choose Format from the Range menu to display the Range Format dialog box. Select the desired format and then click on OK. You can also use the Range Format dialog box to add often-used formats to the Range menu. To change a cell’s font or size, choose Font from the Style menu. If you frequently use a specific font, size, and style combination, click on the Show In Menu button before closing the Style Font dialog box. You can also use the Style floating palette to summon the plain, italic, or bold styles.

**How to: Resolve** To change a cell’s number or date format, choose Format from the Range menu (in the Format menu). You can customize the list of formats in the submenu by choosing Set Format and create your own display format by choosing Custom Format. Use the Format menu’s Font, Size, and Style submenus to change a cell’s appearance or text alignment.

**How to: All** If you’ve changed a cell to appear in bold or in a larger type size, the cell’s contents may not fit within the column’s width. In Excel and 1-2-3, simply double-click on the cell’s right-column boundary, and the program resizes the column to accommodate its widest cell. In Resolve, you must resize the column manually by dragging its boundary. All three programs also provide a variety of keyboard shortcuts for changing cell alignment and type style.

---

**Borders and Shading** Appropriate use of cell borders and shading can make a spreadsheet easier to read and use. In this Claris Resolve spreadsheet, top and bottom cell borders separate each line of the loan-amortization table, lessening the chance that readers’ eyes will skip to an adjacent row as they scan from left to right. Color shading helps highlight key areas of the spreadsheet.

**Citizen Spreadsheet** BEFORE THE MAC, SPREADSHEETS WERE dull tables of numbers that only a bean counter could find attractive. But not only do Mac spreadsheets provide access to the Mac’s typographic talents, they also sport some desktop publishing features. In fact, if you need to create fill-in-the-blank forms such as invoices and insurance applications, a spreadsheet might be a better tool than a publishing program. The spreadsheet’s row-and-column grid ensures that a form’s elements are visually aligned with each other. You can configure cell borders to act as lines and boxes, and you can shade cells, rows, or columns to set them apart. Best of all, you can use the spreadsheet program itself to fill out and calculate values on the form.

Even if you don’t have publishing aspirations, you can use borders and shading to create more readable spreadsheets. If a spreadsheet contains long rows, add a top and bottom border to the cells in each row. This creates a line (in graphic arts parlance, a rule) that visually separates each row, lessening the chance that readers’ eyes will stray to adjacent rows as they scan across the spreadsheet. If your spreadsheet contains dozens of rows, consider adding a blank row after every five or ten rows to make the spreadsheet less dense on the screen. If you’ll be printing the spreadsheet, consider applying a light shading to every other row. “Borders and Shading” illustrates these techniques.

Spreadsheets created with the Big Three can even contain images created in other programs. You can take advantage of this feature to add a company logo or scanned image to forms or spreadsheets.

**How to: Excel** To add a border to all four edges of a cell, choose Border from the Format menu and then select the Out-continues
What
You Seek
Seeking Macintosh information, and lots of it? Look no further than MACWORLD Expo/Boston 1992. MACWORLD Expo has it all; there’s amazing exhibits, brand new products and Macintosh excitement. And if you’re seeking concentrated, in-depth information on a variety of subjects, look no further than the MACWORLD Expo Conference Program.

Is What You Get
MACWORLD Expo/Boston 1992

The Conference Program
The MACWORLD Expo/Boston 1992 Conference Program offers more insight and expertise than ever before. To get your Macintosh “drive” up and running in the morning, the Keynote Address by Apple Computer and friends is a must. It’s become an annual tradition! Then you can plan to attend up to TWELVE intensive conferences whose topics reflect the growing sophistication of the Macintosh user. And with MACWORLD Expo’s one-price conference admission, you can create your own agenda. You can spend as much time as you’d like at any or all of these conference seminars:
1. The Design Conference. Insights, guidelines, and hard-earned secrets for — and from — graphic artists, advertising agencies, designers, and production houses.
2. The Multimedia Conference. Macintosh magic combining video-audio-text-animation-graphics, including the latest technological developments and dazzling examples of multimedia in everyday life.
3. The Programmer/Developer Forum. The ultimate gathering for veteran and novice Mac techies; the place to share your latest brainstorm.
4. The How-to-Get-Started Conference. Complete guidelines for those who are brand-new to the Mac, or need a concentrated lesson on popular Mac applications.
5. The Advanced User Conference. Experienced users share their expertise to reveal hot new ideas and insider’s tricks.
6. The You-Asked-for-It Conference. Fact-filled sessions covering the latest market developments and responding to your special requests — including the perennial favorite, MUSE (MACWORLD Expo User Group Extravaganza).
7. The Connectivity Conference. Users share insights on solving connectivity problems, and vendors discuss new developments in networking that will impact your business, your bottom line, and your Macintosh.
8. The Big Business Conference. Sessions dedicated exclusively to solving the problems of Mac users in large organizations — focusing on databases, executive information systems, software licensing, MIS issues, and more.
9. The Home Office/Small Business Conference. Hard-learned lessons on how to reduce the chaos in a Mac home/small business, along with a look at hardware and software especially designed to save you time and money.
10. The Entertainment Conference. Trends, how-to’s, and exciting examples of the Mac’s uniquely helpful role in music, desktop video, production, and more. The Mac can slash your costs!
11. The Special Interest Group Conference. For “birds of a feather” looking to compare Mac notes with others in a similar setting — you can solve special problems, see how colleagues across the country are getting more mileage out of the Mac, and develop an invaluable “user network.”
12. The Education Conference. A complete mini-conference program in one! Twelve education-specific sessions make this the world’s largest and most information-rich collection of Macintosh topics designed especially for educators. An excellent and unprecedented opportunity for educators, administrators, and students nationwide to show and be shown new and classic examples of the Mac as a teaching tool — including multimedia, CD-ROM, HyperCard, networking, and QuickTime for teachers.

And don’t miss the UGWUMP
(User Group Welcoming/Unwinding/Meeting Place)
— MACWORLD Expo’s “People Networking Parlor” for user groups. Share success stories, exchange newsletters and literature. Learn how to start a user group in your area!

Seeking more Macintosh excitement at MACWORLD Expo/Boston 1992? Just turn the page...
SAVINGS, DISCOUNTS AND CONVENIENCE
FOR MACWORLD Expo/Boston 1992

Tuesday, August 4 - Friday, August 7, 1992 at The World Trade Center and Bayside Exposition Center

We’re pleased to offer a complete package of savings, discounts and convenience to make your MACWORLD Expo/Boston experience even more enjoyable. Let’s start by getting you to Boston—

**AA Save Up To 45% on American Airlines!**

Substantial savings are available when you fly American Airlines to MACWORLD Expo/Boston. As the official airline of MACWORLD Expo, American is again pleased to offer discounts of 5% to 45% on your fare. Dial 1-800-654-2240, and ask for Star File # S-0172AL. You’ll automatically receive the preferred rates.

**Hertz Discounts**

If you’re planning to rent a car, you’ll get a great rate from Hertz. Call 1-800-654-2240, and ask for meeting # 10468, and tell the reservations operator you’re attending MACWORLD Expo.

**Limosine Service**

Luxury limousine and executive sedan services are available. Contact First American Limousine And Towncans Sedan Service @ 1-800-547-5460 for reservations.

**Hotel Accommodations**

Participating hotels in the Boston area are offering MACWORLD Expo discounts. To receive the preferred rates, simply call one of the hotels listed below and mention you’re going to MACWORLD Expo. There’s a limited number of rooms available at preferred rates, so make your plans early!

Published rates are starting rates: see hotels listed below.

**All Aboard for the MACWORLD Expo Shuttle!**

MACWORLD Expo’s Boston locations are The World Trade Center, 164 Northern Avenue and Bayside Exposition Center, 200 Mount Vernon Street. Complimentary and convenient shuttle bus service connects you with both locations. Please check with the concierge at your hotel for the best way to make use of the shuttle service.

**Downtown Shuttle Stops:**

- Copley Square - Corner of St. James & Dartmouth Streets (C)
- Boston Common - Corner of Boylston & Tremont Streets (B)

**Shuttle Schedule:**

**August 4 - August 6, 1992**

- 9am-11am Downtown Morning Shuttle
- 9am-6pm Bayside Expo Center & World Trade Center Express
- 5pm-7pm Downtown Evening Shuttle

**August 7, 1992**

- 9am-11am Downtown Morning Shuttle
- 9am-3pm Bayside Expo Center & World Trade Center Express
- 2pm-4pm Downtown Evening Shuttle

*(Please note: the shuttle schedule listed above is subject to change. Check the Aug. 5: 10 a.m. - 6 p.m., Aug. 6: 10 a.m. - 3 p.m., Aug. 7: 10 a.m. - 3 p.m., MACWORLD Expo Information Hotline at 617-361-3941, 24 hours per day, seven days a week.) We’ll see you in Boston!*

**More Information**

To listen to prerecorded information about MACWORLD Expo/Boston 1992, call the MACWORLD Expo Information Hotline at 617-361-3941. (24 hours per day, seven days a week.) We’ll see you in Boston!

**Show Hours**

- Exhibition: Aug. 4: 10 a.m. - 6 p.m.
- Aug. 5: 10 a.m. - 6 p.m.
- Aug. 6: 10 a.m. - 6 p.m.
- Aug. 7: 10 a.m. - 3 p.m.

**Preregistration Savings**

Preregister for MACWORLD Expo/Boston by June 26 to save $15 on all Conference Sessions* and Exhibits ($75 now vs. $90 cash at the door), or $10 on Exhibits-only admission ($20 now vs. $30 cash at the door). When you preregister, you receive your admission badge in advance so you can walk right into MACWORLD Expo. There’s no waiting in line.

**Early Bird Registration**

If you miss the preregistration deadline on June 26, you can still register before the start of the show to avoid long lines! On-site Early Bird Registration is from 11 a.m. - 3 p.m. on August 3, at the full registration rates of $90 (cash at the door) for all Conference Sessions* and Exhibits, and $30 for Exhibits-only admission (cash at the door).

**Hotels**

- 57 Park Plaza (B)
- 482-1800; $100/$110
- Back Bay Hilton (C)
- 236-1100; $150/$170
- Best Western
- 731-4700; $99/$109
- Boston Marriott Copley (C)
- 236-5800; $185/$205
- Boston Park Plaza Hotel
- 426-2000; $125/$145
- Charles Hotel
- 864-1200; $176/$186
- Colonade (C)
- 424-7000; $150/$170
- Copley Plaza (C)
- 267-5300; $175/$195
- Four Seasons (B)
- 338-4400; $215/$235
- Guest Quarter Suites (H)
- 783-0000; $150/$170
- Hilton at Dedham Place
- 329-7900; $125/$135
- Holiday Inn Boston/Backpine
- 277-1200; $110/$120
- Holiday Inn/Government Center (B)
- 742-7630; $141/$157
- Holiday Inn Randolph (H)
- 961-1000; $87/$95
- Howard Johnson/Southeast (H)
- 288-3030; $75/$85
- Hyatt Regency Cambridge (H)
- 492-1234; $145/$145
- Lafayette Hotel (B)
- 451-2600; $160/$180
- Lenox Hotel (C)
- 536-5300; $145/$155
- Logan Airport Hilton
- 569-9300; $135/$135
- Marriott Long Wharf
- 227-0800; $210/$239
- Meriden (B)
- 451-1900; $195/$205
- Midtown Hotel (C)
- 262-1000; $109/$119
- Omni Parker House (B)
- 227-8600; $145/$165
- Ritz Carlton (B/C)
- 536-5700; $195/$195
- Royal Sonesta Cambridge
- 491-3600; $140/$140
- Sheraton Boston (C)
- 236-2000; $142/$142
- Sheraton Tara Braintree (H)
- 848-0600; $99/$99
- Tremont House (B)
- 426-1400; $105/$120
- Westin Copley (C)
- 262-9600; $170/$190

**Legend:**

All phone numbers are in the 617 area code. Rooms are priced for single and double occupancy.

- (C) = Hotel is within walking distance of Copley Square Shuttle Location.
- (B) = Hotel is within walking distance of Boston Common Shuttle Location.
- (H) = Hotel is providing its own shuttle service to MACWORLD Expo.

*All conference sessions are on a first-come, first-served basis with no guaranteed seating.

MACWORLD Expo is sponsored by Macworld, the Macworld Magazine, an IDG Communication publication. MACWORLD Expo is an independent trade show produced by World Expo Corporation, and managed by Mitch Hall Associates and is affiliated with Apple Computer, Inc. MAC and MACINTOSH are trademarks of Apple Computer, Inc. World Expo is an IDG company, the world’s leader in informational services on information technology.
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. Send completed forms to:

MACWORLD Expo/Boston,
P.O. Box 4010, Dedham, MA 02026.

Registration forms received after June 26 will be returned. 

Please register me for:

☐ Package One $75

☐ Package Two $95 + $20

Admission to exhibits only. Preregister by June 26 ($30 cash only at the door).

Please send my registration badge and further information to:

Your industry or profession

10. Other (specify) ____________

15. Manufacturer (non-computer)

16. Other (specify) ____________

20. R & D

29. Student

30. Other (specify) ____________

U.S. Attendees: You will be mailed your badges on or about July 20. Be sure to check box indicating where badge should be sent. All other badges will be held at the Preregistration Counter at the BaySide Expo Center for pickup beginning Monday, August 3.

International Attendees: If you're preregistering from outside the U.S. and want your badge sent to you instead of picking it up at the BaySide Expo Center, check the appropriate box below and add $45 to your preregistration 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.

Bonus for All Attendees: All registration fees include a six-month, $7.50 paid subscription to MACWORLD Magazine. The basic subscription rate is $30 for 12 issues. Just stop by one of the MACWORLD Magazine booths during the Expo, fill out the special 6-issue card, and drop it off. If you don't fill out this card, we can't send you your 6 issues of MACWORLD.

☐ Check if applicable. I'm an International attendee and would like my badge shipped by Federal Express. Enclosed is an additional $45.

By June 26 and save $10 to $15

The largest Macintosh event in the world will be in Boston from Tuesday, August 4 through Friday, August 7 at the World Trade Center and the BaySide Expo Center. And when you preregister by June 26, you'll save time and money.

Please send my registration badge and further information to:

Please check one:

☐ Home Address

☐ Company Address

Last Name _________________________ First Name _________________________

Street Address ___________________________ State ______ Zip __________

City ____________________________ Country (Other than U.S.) ______

If mailing to company address:

☐ 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 cardholder's name below:

Last Name _________________________ First Name _________________________

Cash only at the door. After June 26, you must register at the show.

Please check the appropriate information:

Your industry or profession

10. Other (specify) ____________

15. Manufacturer (non-computer)

16. Other (specify) ____________

20. R & D

29. Student

30. Other (specify) ____________

Size of your organization (number of employees national and international)

31. Under 50

32. 50-99

33. 100-499

34. 500-999

35. 1,000-5,000

36. Over 5,000

Which personal computer(s) do you own/use?

37. Macintosh (128K, 512K(E))

38. Macintosh Plus

39. Macintosh Classic/Classic II

40. Macintosh LC

41. Macintosh SE/SE 30

42. Macintosh II/IIS

43. Macintosh II si

44. Macintosh II ex/ci

45. Macintosh IIx

46. Macintosh Quadra Series

47. Macintosh Portable

Powerbook Series

48. Apple II Series

49. IBM PC (or compatible)

50. None

51. Other (specify) ____________

*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 forms, with check or money order to: MACWORLD Expo, P.O. Box 4010, Dedham, MA 02026.

MW 792
When you look out over the exhibit floor at MACWORLD Expo, it’s like looking through a kaleidoscope. Just a slight turn to the left or right, and you get an entirely new and fantastic view. In every direction, there’s something different. Something dynamic. Something daring.

These new and fantastic sights are what MACWORLD Expo is all about: presenting a creative vision to stay ahead of our changing world. At MACWORLD Expo, the Macintosh becomes a kaleidoscope, an instrument of constant change and fascination.

What You Seek Is What You Get
As the world’s largest Macintosh event, MACWORLD Expo showcases uses and applications for the MAC in Networking, Spreadsheet analysis, Databases, Education, Research, Word processing, Accounting, Law, CAD/CAM, Forecasting, Design, Publishing, Illustration, Animation, Music, Programming, Entertainment and Multimedia (to name but a few.)

What you seek is what you get: you’ll find all the latest in hardware, software, peripherals and services at MACWORLD Expo!

MACWORLD Expo/Boston 1992: When and Where
This year’s MACWORLD Expo/Boston promises to be bigger and better than ever. Over 400 companies will cover 300,000 square feet of space at Boston’s World Trade Center and Bayside Exposition Center. Mark your calendars for August 4 - August 7 to see the Macintosh at its absolute best.

The Conference Program
In addition to the 400-company strong Exhibition, MACWORLD Expo/Boston also offers a complete Conference Program of intensive seminars. Guided by a distinguished faculty comprised of those who truly lead the Macintosh industry, as well as cutting-edge users who are driving the demand for technology, the Conferences offer insights that are simply not available anywhere else. You can expect to come away from the MACWORLD Expo Conference series smarter, more productive, and inspired!

A+ for Education
If your specialty is education, assign yourself to MACWORLD Expo’s MacResource Center. Sponsored by Apple Computer, Inc. and A+ Publishing, the Center is a place for Macintosh-using educators to take a break from the show floor, discover new software solutions and receive a complimentary copy of the Official MACWORLD Expo Guide to Educators. Visit the Center and you may be eligible to win free software, Apple gifts, or a new Macintosh Classic II and StyleWriter printer.

If You’re Used to Looking at Life Through a Window, May We Recommend a Kaleidoscope?
If you’re a committed DOS user, MACWORLD Expo/Boston still has something for you. First, you’ll see for yourself the unique advantages offered by the Macintosh; you’ll find solutions on the MAC that are just not possible with DOS. You’ll also learn about MAC/DOS connectivity and how to take advantage of the best of both systems. To put the power of Macintosh to work for you, make your MAC connection at MACWORLD Expo/Boston!

MACWORLD Magazine Subscription Bonus
When you register for MACWORLD Expo/Boston, your registration fee automatically includes a six-month, $7.50 paid subscription to MACWORLD Magazine. (The basic subscription rate is $30 for 12 issues.) To activate your subscription, just stop by one of the MACWORLD Magazine booths during the Expo and fill out the special six-issue subscription card. Your first personal copy of MACWORLD Magazine will be on the way.

Don’t Miss Out on Incredible Preregistration Savings
Preregister NOW for MACWORLD Expo/Boston to take advantage of incredible savings! When you return the attached preregistration card with your payment by June 26, you’ll save $15 on all Conference Sessions* and Exhibits ($75 now vs. $90 cash at the door). Preregistration not only saves you money, it also saves you time. When you preregister, we send you your admission badge early so you can walk right into MACWORLD Expo. No fuss. No waiting. You can get a jump on the 50,000 people expected at this year’s Expo!

The deadline to receive your preregistration discount is fast approaching. So fill out the attached form today and send it in with your payment by check or credit card. And if the registration form is missing from this ad, or if you have any other questions, just call the prerecorded MACWORLD Expo Information Hotline at 617-361-3941. Then get ready to see Macintosh’s creative vision in a changing world. You’ll see wonderful things through the kaleidoscope of MACWORLD Expo.
Spreadsheet Basics Illustrated

When you first open a spreadsheet program, such as Microsoft Excel (shown here), you see a worksheet consisting of rows and columns that intersect to form a grid pattern of cells. The active cell—the one your typing or formatting affects—is indicated by a bold border. When you type a text label or formula, it appears along with the active cell's address in the formula bar.

Creating a formula involves first typing an equal sign, and then pointing to cells and typing math operators such as the division symbol (/) shown below at left. This formula calculates a car’s gas mileage by dividing the contents of cell B1 by the contents of cell B2. When creating or editing a formula, you can undo your typing by clicking on the X icon in the formula bar, or enter your changes by clicking on the check-mark icon. When you enter a formula, the spreadsheet calculates its result (below, middle).

All spreadsheets provide a battery of functions, which are preprogrammed formulas that accept arguments and then return a result. For example, the AVERAGE function accepts as its arguments a list of numbers or, as shown below at right, a range of cell addresses, and then returns the average of those numbers or cell contents:

<table>
<thead>
<tr>
<th>cell</th>
<th>formula</th>
<th>result</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>=SUM(B1:B10)</td>
<td>50.5</td>
</tr>
<tr>
<td>B1</td>
<td>=AVERAGE(B1:B10)</td>
<td>5.05</td>
</tr>
</tbody>
</table>

To include a graphic in a spreadsheet, open the graphic in the program, select it, and choose Copy. Next, switch to or start Excel, select the cell where you want the graphic to appear, and paste. You can resize the graphic by dragging its handles; press shift to avoid altering its proportions. To import a graphic to a cell, choose the cell, choose Paste Special, and then click on the Paste button. Thereafter, you can edit the spreadsheet in Excel by double-clicking on the cell you pasted. When you return to Word, you’ll see that it has automatically updated the document to reflect your edits.

Word and Excel mesh beautifully, but if you paste some copied cells into a different program, any text or border formatting you did in Excel is lost. If you want to retain borders, shading, and other formats, copy the spreadsheet cells as a picture. In Excel, select the cells and then press the shift key while opening the Edit menu. Notice the Copy command now reads Copy Picture. Choose Copy Picture, and then select the As Shown When Printed option. Now switch into the second program and paste. You can also use this technique to move a chart into another program.

How to: Excel To copy the data in a range of spreadsheet cells into another program, select the cells and choose Copy from the Edit menu. Next, start or switch to the second program and choose Paste. If you paste the data into Microsoft Word, it appears, with formatting intact, as a table whose cells you can edit and format individually. If you want to create a link with the original spreadsheet, choose Word’s Paste Special command. In the Paste Special dialog box, select the Excel option and then click on the Paste button. Thereafter, you can edit the spreadsheet in Excel by double-clicking on the cells you pasted. When you return to Word, your cell has automatically updated the document to reflect your edits.

Excel, Resolve doesn’t let you maintain proportions by pressing the shift key.

Exchanging Data

Even with their fancy layout features, spreadsheet programs aren’t word processors or page-layout programs. If you want to include spreadsheet data or a graph in a lengthy document, you need to export it. Which method you choose depends on how you want the cells to appear in the final document, and on whether you want to be able to quickly update a table or graph if its underlying spreadsheet changes.

How to: Excel To copy the data in a range of spreadsheet cells into another program, select the cells and choose Copy from the Edit menu. Next, start or switch to the second program and choose Paste. If you paste the data into Microsoft Word, it appears, with formatting intact, as a table whose cells you can edit and format individually. If you want to create a link with the original spreadsheet, choose Word’s Paste Special command. In the Paste Special dialog box, select the Excel option and then click on the Paste button. Thereafter, you can edit the spreadsheet in Excel by double-clicking on the cells you pasted. When you return to Word, you’ll see that it has automatically updated the document to reflect your edits.

How to: Resolve To copy a range of spreadsheet cells into another program, select the cells, choose Copy, start or switch to the second program, and choose Paste. Neither 1-2-3 nor Resolve can copy cells as a picture, so all formatting is lost when you paste copied cells into another program.

How to: All Three programs support System 7’s publish and subscribe commands. If you use a word processor or publishing program that also supports publish and subscribe, you can use its Subscribe To command to include published cells or graphics in your documents, as shown in “Publishing and Subscribing.” The benefit of exchanging data through publish and subscribe is that you can...
Publishing and Subscribing

If you use Apple's System 7 software, you can create links between a spreadsheet or chart and a document created in a word processor or any other program that supports System 7's publish and subscribe features. Here, a Lotus 1-2-3 graph is included in a Microsoft Word 5.0 document.

1. Select the chart and choose Create Publisher from the Edit menu's Publishing submenu. When the Create Publisher dialog box appears, type a name for the edition file (the graph) and then press return.

2. In Microsoft Word, choose Subscribe To from the Edit menu. The Mac automatically selects the edition file you just created and shows a preview of it.

3. The graph appears in the Word document.

4. To change the way the graph is updated when it or its underlying data change, use Word's Subscriber Options dialog box (top) or 1-2-3's Publisher Options dialog box (bottom). Both let you specify when and how Word should receive an updated version of the graph. Finally, a graphing tip: When creating a heading for a graph, summarize the key point or trend that the graph depicts. For example, the graph in this illustration is titled "West Leads in Sales Gains." That says more about the graph than would, say, "Year-End Sales Results."

Quickly update the word processed or desktop published document if the original spreadsheet changes.

One final point about graphs and the Clipboard: The graphs that spreadsheet programs create are actually object-oriented graphics that you can modify using programs such as Adobe Illustrator or Aldus FreeHand. Paste a graph into a draw program, and you can embellish it using the program's drawing tools.

Next Steps

When you've mastered the techniques covered here, you may want to explore the advanced features the Big Three provide. All three provide macro, or scripting, languages that let you automate repetitive tasks and create custom menus and dialog boxes. You can write a macro yourself by typing it, or you can tell the program to record a macro based on your actions. You can create on-screen buttons that execute macros when clicked on.

If you create huge spreadsheets, investigate your program's linking features. To link one spreadsheet to another, you create a formula that refers to one or more cells in another spreadsheet. By creating and linking small spreadsheets, you can keep your project more manageable.

If you haven't purchased a spreadsheet yet, see "Spreadsheets That Count," in this issue, for some recommendations and critical comparisons. For insights on designing spreadsheets, read The Elements of Spreadsheet Style, by John M. Nevison (Brady, 1987). Nevison shows how to create spreadsheets that are easy to read and modify, that clearly state their objectives and assumptions, and most important, that yield accurate results. Once you master Nevison's rules and the ins and outs of your spreadsheet program, you'll spend less time asking "how" and "why" and more time asking "what if."

See Where to Buy for contact information.

System 7 brings dynamic new capabilities and ease of use to everyone who uses a Mac. System 7 builds on the Mac basics you already love, and paves the way for a whole generation of powerful new software. A simple click of the mouse installs the software. Then advanced features take over, letting you work faster, easier, and more productively.

- Multitasking provides effortless switching between applications
- Finder 7 lets you customize your desktop to the way you work
- File Sharing allows access to any folder and its contents among workgroups
- Publish & Subscribe lets you update several documents by only changing one
- True Type gives you crisp, clear type of any size

And that's just for starters! Now it's easier than ever to get System 7 up and running on your Mac, because you can get it right from MacWAREHOUSE! Join the generation of System 7 power users! Order System 7 today!

FREE! with your order!

Make System 7 even easier with this Personal Training Systems Tutorial!

Get up and running with System 7 in a flash! This Personal Training Systems Tutorial is the fastest, easiest way to put all the power of System 7 right to work on your Macintosh desktop. And it's yours FREE with your order for any product from MacWAREHOUSE! Just ask for item #AAA0021 when you place your order.

AppleShare 3.0
Connect up to 120 users using a variety of cabling choices. New version offers faster server start up, improved integrity and error handling, plus the ability to mount and unmount removable media while the server is running.

AppleTalk Remote Access
Gain direct access to information and resources from your AppleTalk network. Simple to set up and use. High performance is optimized for a broad range of modems. Provides multiple security levels, and requires only System 7 and a high-speed modem. No special hardware required.

Macintosh PC Exchange
Open PC files on 3.5" MS-DOS and Windows-formatted floppy disks. Read DOS files on your Mac desktop. Open, save, rename, move, copy, and delete documents just as if they were Mac files! Customize the program for even faster access. Requires Apple SuperDrive or compatible.

QuickTime Starter Kit
Play QuickTime movies right on your Mac! Pause, fast-forward, rewind, advance frame by frame. Copy video and animation clips and paste them together. Transform still images and information into a single movie. Use a video-capture card and sound digitizer to record movies with the touch of a button. QuickTime brings Multimedia to the Mac!

AppleShare 3.0 SYS0001
Publisher: Apple Computer, Inc.
Price: $279
System requirements: 2MB RAM; hard disk drive.

AppleTalk Remote Access COM0131
Publisher: Apple Computer, Inc.
Price: $175

Macintosh PC Exchange COM0126
Publisher: Apple Computer, Inc.
Price: $69

Copyright 1989 MicroWareHouse, Inc. MacWAREHOUSE is a division of MicroWareHouse, Inc. MacWAREHOUSE and Macintosh are registered trademarks of Apple Computer, Inc. Items availability and price subject to change without notice. Apple, the Apple logo, Mac and Macintosh are registered trademarks of Apple Computer, Inc. QuickTime is a trademark of Apple Computer, Inc.
HOW TO MICROSOFT WORD 5

Tips for the Mac’s most widely used application

For years, Microsoft Word users have had a love-hate relationship with their word processor. Thankfully, with the introduction of version 5, Word users have more reasons to love than hate. The shortcuts and techniques that follow cover both new and existing aspects of Word and are offered in the hope that they will tip the scale even more toward the positive side.

Some of the tips below were suggested by three of the most Word-literate people I know: Marianne Carroll, author of Hands-On Word 5: Practical Solutions for Everyday Users (Brady, due summer 1992); Helmut Kohler, author of The Little Mac Word Book (Peachpit Press, 1992), and Jim Heid, author of Macworld Guide to Microsoft Word 5 (IDG Books Worldwide, 1992). Assistance was also provided by the always helpful Microsoft Technical Support team.

Picturing Your Words

Special text effects are now possible with Word’s new graphics tools. For small amounts of text, such as a single-line headline or a photo credit, enter the text directly in the Picture window with the text tool. For larger amounts of text, such as a sideways caption for a sideways graphic, you may be better off entering and editing standard text in the document, converting the text into a graphic (by selecting the text and pressing option-D), pasting the graphic and then double-clicking on the graphic text to open the Picture window. In either case, once the text is in the Picture window, you can format, rotate, flip, reverse, and color it as needed.

To eliminate unwanted white space to the left of and above graphic text (or any graphic image), move the text or the graphic (using option-A to select all its parts) into the upper left corner of the Picture window. You can also crop the graphic itself by dragging it so that the unwanted portions disappear past the Picture window’s top or left edge—this is the only way you can crop the left or top portion of a graphic in Word 5. To nudge the image once it’s more or less in position, make sure the text or graphic is still selected in the Picture window and press the appropriate arrow keys. To eliminate white space to the right of and below a piece of graphic text or an image, back in the main document window, drag the bottom and right handles of the selected image. A little experimentation is usually required to get just the right amount of white space. (See “Custom Framing” for more about positioning graphics.)

Ribbon, Right or Wrong

Rather than opening the Character dialog box (via the Other or Character command) to specify a nonstandard font size, it’s much faster to use the ribbon, as long as it’s already visible (it’s the top strip of buttons and boxes in the document window). Just select the text to be formatted, click inside the ribbon’s point box (the second box from the left), continues...
enter the desired point size, and press the return key. Subscript.
scripts and superscripts can also be formatted from the ribbon (using the two buttons to the right of the character style buttons), but the result is less than satisfactory. Although the selected character moves up or down the requisite 2 or 3 points, the character’s point size remains unchanged—to big for a proper superscript or subscript.

You can get around this problem and still avoid opening the Character dialog box by using the superscript and subscript keyboard shortcuts, ~shift-plus sign (+) and ~shift-minus sign (-). (Note that I’m referring to the plus and minus keys on the main keyboard, not the numeric keypad.) These two key commands not only raise or lower selected characters but also reduce them to the next smaller standard point size. The keyboard shortcuts differ from the ribbon icons in one other respect as well. The ribbon icons toggle superscripting and subscripting on and off; the key combinations are not toggle commands and cannot turn existing superscripting and subscripting off. Instead, to return any characters superscripted or subscripted with key commands back to normal size and position, you must use the Revert To Style command (~shift-spacebar).

No-Fault Default
When you install Word 5, you are asked to choose a default font and font size. Word uses these defaults each time it opens a new, untitled document. Much as in Word 4, you can change the default font and size by redefining the Normal style in the Style dialog box and clicking on the Use As Default button. But there’s also a more obvious method: simply select Default Font from the Font menu (or open the Preferences dialog box and click on the Default Font icon) and choose the desired font and point size from the pop-up menu.

Easy on the Eyes
The Page Setup dialog box’s Fractional Widths option improves the appearance of proportionally spaced fonts (most PostScript and TrueType fonts) on the printed page, but most of the time it does just the opposite with on-screen text. In Word 4, Fractional Widths was turned off by default; you had to turn it on when you needed it. With Word 5, selecting the LaserWriter driver in the Chooser turns on Fractional Widths by default. (Fractional Widths is off by default if you select a non-PostScript printer.) For more readable on-screen text, you might want to turn off Fractional Widths. Turn it back on after you’ve done most text-intensive work but before you format and hyphenate your document (since Fractional Widths can change line endings and page breaks). To avoid having to turn off Fractional Widths in each new document, turn it off and turn on the Use As Default option in any Page Setup dialog box. Whenever you turn Fractional Widths back on for a particular document, be sure to turn off the Use As Default option, too, or you’ll revert to the old default.

Special Preferences
Word 5 has a number of new features that you control via the Preferences dialog box.

One such feature is the File menu’s list of the last four documents you’ve worked on; this list makes it easy to return to your most recent work. Those who are already conscious about adding important documents to the Work menu (by pressing ~option-plus sign [+], then clicking on the document’s title bar or name in the Open dialog box) may find the File menu list redundant; they can turn it off in the View section of the Preferences dialog box (opened with the Preferences command, now near the bottom of the Tools menu.

Memos and Letters Suitable for Framing
Word’s Frame commands (described in “Custom Framing”) are most useful when creating complex layouts, but you also can apply them to an age-old formatting problem common in simple documents: how to vertically center the text in a one-page document such as a letter or memo. Here’s how. Simply select all the text, and then choose Frame from the Format menu. When the Frame dialog box appears, configure the Vertical pop-up menus to read “center relative to page.” Word then places equal amounts of space above and below the text—and it adjusts the space if you edit or reformat the document.

More to Come
If you’ve got a valuable Word 5 tip, technique, or shortcut, share it with other Macworld readers by sending it to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. See Where to Buy for contact information.

"Then, just as I was surrounded on all sides, I got called to dinner."

And it was only meat loaf. But after dinner I jumped right back in the middle of the fight. And I may play straight till breakfast!

**Mission: Thunderbolt**
Cassidy & Greene's NEW role-playing adventure game – definitely not your everyday, shoot-em-up arcade game! Through trial, error, and luck you'll make your way through underground corridors, battling creatures and gathering weapons. You'll need every advantage in your struggle to find the working prototype of an anti-matter bomb in the possession of hostile aliens, bent on the destruction of Earth. Mission: Thunderbolt is a 7+ megabyte surrealistic world, 5 years in the making, which will entertain and hold you captive for months! Dinner not included.

$49.95

**Glider 4.0**
Macworld Game Hall of Fame Award Just try to keep this paper airplane flying through the eerie mansion without being blazed by the weirdest set of obstacles ever! Room Editor included!

$49.95

**Aqua Blooper Piper**
4-Mice – MacUser Magazine No bloopers allowed! Fit the pipe pieces together just right – before the basement floods! One wet and wild game!

$49.95

**Sky Shadow**
Macworld Game Hall of Fame Award, 5-Mice – MacUser Magazine Only your audacious, white-knuckled bombing raids over enemy territory can save your home planet from the dreaded Razoropers! Wild and crazy! Great sounds!

$49.95

**Mission Starlight**
4-Mice – MacUser Magazine Starlight pilot, go forth and free your people from the evil empire of Aalgery. Explosive, realistic flight action and incredible graphics! Quitting Mission Starlight is Mission Impossible.

$49.95

**Crystal Quest with CritterEditor**
MacUser Eddy Award winner, Macworld Game Hall of Fame Award, 3-Mice – MacUser Magazine Quick – collect all the crystals, avoiding mines, bullets and 12 sorts of nasties! Change over 1000 game parts with the Editor. A fast-moving, adrenaline boiling game!

$49.95

To order, call your favorite dealer, or contact:

**CASADY & GREENE**
22734 Portola Drive, Salinas, CA 93908-1119
Info. and Sales – 800-359-4920 Technical Support – (408) 484-9228 Fax – (408) 484-9218

Circle 32 on reader service card
Macworld Guide to Microsoft Word 5
Jim Heid, Macworld magazine’s “Getting Started” columnist, helps you master Microsoft Word 5 quickly and easily.
$22.95 US/$29.95 Canada, 448 pages, Available Now
Also by Jim Heid, the critically acclaimed Macworld Complete Mac® Handbook.
$29.95 US/$35.95 Canada, 578 pages, Available Now

Macworld Guide to Microsoft Works
Put Works to work for you with this complete guide to the latest version. Bestselling Mac author Barrie Sosinsky shows you the ins and outs of each Works module: word processing, database, spreadsheet, communications, and graphics.
$22.95 US/$29.95 Canada, 338 pages, Available June

Macworld Guide to Microsoft Excel
David Maguiness, a bestselling computer book author who specializes in spreadsheet programs, helps you build spreadsheets fast with this indispensable guide to Excel. Step-by-step insights, tips, and tricks boost your number-crunching power instantly.
$22.95 US/$29.95 Canada, 338 pages, Available June

Macworld Networking Handbook
Networking expert and Macworld magazine Contributing Editor David Kostur teaches you how to design, install, and manage AppleTalk networks in this easy-to-understand guide. Advanced sections cover more complex networking design, Ethernet, and connecting Macs to other platforms.
$29.95 US/$39.95 Canada, 800 pages, Available May

Macworld Guide to System 7
Optimize System 7 with this critically acclaimed guide by Lon Poole, bestselling Mac author and Macworld magazine’s “Quick Tips” columnist. Scores of undocumented tips and secrets. Includes free Quick Reference Card and two free System 7 updates.
$24.95 US/$30.95 Canada, 384 pages, Available Now

Macworld Music & Sound Bible
Finally, the definitive guide to music, sound, and multimedia by renowned Mac music guru and Macworld magazine contributor Christopher Yavelow. Extensive coverage of the latest hardware, software, and techniques plus dozens of interviews with industry notables including Herbie Hancock, Craig Anderton, and more.
$37.95 US/$47.95 Canada, 1024 pgs, Available April

Ask for Macworld Books by name at a bookstore near you. Or to order today, call 1-800-762-2974.

Macworld Books are authorized by Macworld—the world’s leading Macintosh® magazine.
And Here's Where To Go To Find Them

Look for Official Macworld Books nationwide at:

B. DALTON
BARNES & NOBLE
BOOKSTOP/BOOKSTAR
CROWN/SUPERCROWN
ENCORE
SOFTWARE ETC.
WALDEN'S SOFTWARE
WALDENBOOKS

District of Columbia
Quantum Books
Washington

Florida
Hollywood Bookstore
Hollywood

Georgia
Motor News Center
Birmingham

Hawaii
Honolulu Book Stores
Honolulu

Illinois
Page For All Ages
Chicago

Indiana
Horizon Books
Indianapolis

Iowa
University Bookstore
Ames

Kansas
Crossroads
Hutchinson

Kentucky
University Bookstore
Lexington

Louisiana
New Orleans Book Store
New Orleans

Maine
Barnes & Noble
Portland

Maryland
Maryland Book Store
Baltimore

Massachusetts
Woods Worth
Cambridge

Michigan
Metro News Center
Birmingham

Minnesota
University of Minnesota
Minneapolis

Mississippi
Oxford
Oxford

Missouri
University of Missouri
Columbia

Montana
Missoula
Missoula

Nebraska
University Bookstore
Lincoln

Ohio
Columbus State University
Columbus

Oklahoma
Blue City Books
Oklahoma City

Oregon
Oregon State University
Corvallis

Pennsylvania
Carnegie Mellon University
Pittsburgh

South Carolina
University of South Carolina
Columbia

South Dakota
Black Hills State University
Bismarck

Tennessee
University of Tennessee
Knoxville

Texas
Prairie View Bookstore
New York City

Virginia
Virginia Commonwealth University
Richmond

Washington
University of Washington
Seattle

West Virginia
West Virginia University
Morgantown

Wisconsin
University of Wisconsin
Madison

Wyoming
University of Wyoming
Laramie

Look for Official Macworld Books nationwide at:

And Here's Where To Go To Find Them

Look for Official Macworld Books nationwide at:

B. DALTON
BARNES & NOBLE
BOOKSTOP/BOOKSTAR
CROWN/SUPERCROWN
ENCORE
SOFTWARE ETC.
WALDEN'S SOFTWARE
WALDENBOOKS

District of Columbia
Quantum Books
Washington

Florida
Hollywood Bookstore
Hollywood

Georgia
Motor News Center
Birmingham

Hawaii
Honolulu Book Stores
Honolulu

Illinois
Page For All Ages
Chicago

Indiana
Horizon Books
Indianapolis

Iowa
University Bookstore
Ames

Kansas
Crossroads
Hutchinson

Kentucky
University Bookstore
Lexington

Louisiana
New Orleans Book Store
New Orleans

Maine
Barnes & Noble
Portland

Maryland
Maryland Book Store
Baltimore

Massachusetts
Woods Worth
Cambridge

Michigan
Metro News Center
Birmingham

Minnesota
University of Minnesota
Minneapolis

Mississippi
Oxford
Oxford

Missouri
University of Missouri
Columbia

Montana
Missoula
Missoula

Nebraska
University Bookstore
Lincoln

Ohio
Columbus State University
Columbus

Oklahoma
Blue City Books
Oklahoma City

Oregon
Oregon State University
Corvallis

Pennsylvania
Carnegie Mellon University
Pittsburgh

South Carolina
University of South Carolina
Columbia

South Dakota
Black Hills State University
Bismarck

Tennessee
University of Tennessee
Knoxville

Texas
Prairie View Bookstore
New York City

Virginia
Virginia Commonwealth University
Richmond

West Virginia
West Virginia University
Morgantown

Wisconsin
University of Wisconsin
Madison

Wyoming
University of Wyoming
Laramie

Look for Official Macworld Books nationwide at:

And Here's Where To Go To Find Them

Look for Official Macworld Books nationwide at:

B. DALTON
BARNES & NOBLE
BOOKSTOP/BOOKSTAR
CROWN/SUPERCROWN
ENCORE
SOFTWARE ETC.
WALDEN'S SOFTWARE
WALDENBOOKS

District of Columbia
Quantum Books
Washington

Florida
Hollywood Bookstore
Hollywood

Georgia
Motor News Center
Birmingham

Hawaii
Honolulu Book Stores
Honolulu

Illinois
Page For All Ages
Chicago

Indiana
Horizon Books
Indianapolis

Iowa
University Bookstore
Ames

Kansas
Crossroads
Hutchinson

Kentucky
University Bookstore
Lexington

Louisiana
New Orleans Book Store
New Orleans

Maine
Barnes & Noble
Portland

Maryland
Maryland Book Store
Baltimore

Massachusetts
Woods Worth
Cambridge

Michigan
Metro News Center
Birmingham

Minnesota
University of Minnesota
Minneapolis

Mississippi
Oxford
Oxford

Missouri
University of Missouri
Columbia

Montana
Missoula
Missoula

Nebraska
University Bookstore
Lincoln

Ohio
Columbus State University
Columbus

Oklahoma
Blue City Books
Oklahoma City

Oregon
Oregon State University
Corvallis

Pennsylvania
Carnegie Mellon University
Pittsburgh

South Carolina
University of South Carolina
Columbia

South Dakota
Black Hills State University
Bismarck

Tennessee
University of Tennessee
Knoxville

Texas
Prairie View Bookstore
New York City

Virginia
Virginia Commonwealth University
Richmond

West Virginia
West Virginia University
Morgantown

Wisconsin
University of Wisconsin
Madison

Wyoming
University of Wyoming
Laramie

Look for Official Macworld Books nationwide at:

And Here's Where To Go To Find Them

Look for Official Macworld Books nationwide at:

B. DALTON
BARNES & NOBLE
BOOKSTOP/BOOKSTAR
CROWN/SUPERCROWN
ENCORE
SOFTWARE ETC.
WALDEN'S SOFTWARE
WALDENBOOKS

District of Columbia
Quantum Books
Washington

Florida
Hollywood Bookstore
Hollywood

Georgia
Motor News Center
Birmingham

Hawaii
Honolulu Book Stores
Honolulu

Illinois
Page For All Ages
Chicago

Indiana
Horizon Books
Indianapolis

Iowa
University Bookstore
Ames

Kansas
Crossroads
Hutchinson

Kentucky
University Bookstore
Lexington

Louisiana
New Orleans Book Store
New Orleans

Maine
Barnes & Noble
Portland

Maryland
Maryland Book Store
Baltimore

Massachusetts
Woods Worth
Cambridge

Michigan
Metro News Center
Birmingham

Minnesota
University of Minnesota
Minneapolis

Mississippi
Oxford
Oxford

Missouri
University of Missouri
Columbia

Montana
Missoula
Missoula

Nebraska
University Bookstore
Lincoln

Ohio
Columbus State University
Columbus

Oklahoma
Blue City Books
Oklahoma City

Oregon
Oregon State University
Corvallis

Pennsylvania
Carnegie Mellon University
Pittsburgh

South Carolina
University of South Carolina
Columbia

South Dakota
Black Hills State University
Bismarck

Tennessee
University of Tennessee
Knoxville

Texas
Prairie View Bookstore
New York City

Virginia
Virginia Commonwealth University
Richmond

West Virginia
West Virginia University
Morgantown

Wisconsin
University of Wisconsin
Madison

Wyoming
University of Wyoming
Laramie

Look for Official Macworld Books nationwide at:
Why Buy a Quadra?!

PowerCards are:
• 100% Compatible With All Standard Software
• Available for Mac II, IIX, IIXx, IIci, SE/30

SALE!
• Available with 68882 Math Coprocessor
• System 7 & A/UX Compatible

Limited Supply!
40 MHz PowerCard 030
306% Faster than a Macintosh II!
$649

50 MHz PowerCard 030
370% Faster than a Macintosh II!
$999

All Star Power cards are brand new, in original boxes.

Limited Supply!

40 MHz PowerCard 030
306% Faster than a Macintosh II!
$649

50 MHz PowerCard 030
370% Faster than a Macintosh II!
$999

Drives are SCSI-2, System 7 & A/UX compatible, carry a five-year warranty, include brackets or metal cases, universal power supplies, cables and 15-MB of slackware. MacCenter™ also carries: TechLink, Iomega, Iomega, Seagate and SpinDrive.

Thirty-Day Money Back Guarantee!
Illustrator® and Freehand® artists:
Add 3D impact to your art!

Today's competitive business environment demands fresh, new desktop graphic ideas to keep your clients — or boss — interested. Satellite 3D™ is an inexpensive, easy-to-use Macintosh® program that adds an exciting new dimension to your FreeHand or Illustrator graphics, putting them into true 3D perspectives — specifying depth, lighting, viewing angle, color, rotation, and translation. It takes minutes to learn, minutes to compute perspectives, and runs on any Mac with 4 Megs and System 6.0.5 or higher.

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

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

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

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

CALLISCO™

Mountain View, California. Tel. 415-964-8550 / Fax 415-964-8336
In Europe, call France: (33) 67223555 / Fax (33) 67224847

Call 1-800-645-8550 today
Circle 82 on reader service card

Add 3D impact to your art!
WHERE TO BUY

MACINTOSH SECURITY PRODUCTS

COMPLETE LINE OF PROVEN AND EASY TO INSTALL SECURITY PRODUCTS FOR MACINTOSH COMPUTERS.

PREVENT COMPUTER THEFT!

MacKabi™ Security System
This system allows you to secure all your computer components: CPU, monitor, keyboard, printer. Internal component security: Kabit fasteners secure the rear panel of CPU protecting internal boards and hard drives. Fasteners available for all applications. List price $39.95.

Disk Drive Lock™

Order your free catalog of these and many other security products. Purchase orders accepted. Quantity pricing available. Shipping not included. MC/VISA accepted. Dealer inquiries invited.

Secure-It, Inc.
18 Maple Court
East Longmeadow, MA 01028 1-800-451-7592

Circle 239 on reader service card.

THE QUADRA 950

Alysis Software Corp.
415/566-2263, 800/825-9747; fax 415/566-9692.

Apple Computer
408/996-1010.

E-Machines
503/646-6699, 800/344-7274; fax 503/641-0946.

Impulse Technology
404/889-8294; fax 404/781-8738.

Radius
408/434-1010, 800/227-2795; fax 408/434-0127.

Spreadsheets That Count

Claris Corp.
408/727-8227.

Lotus Development
Corp. 800/343-5414.

Microsoft Corp.
206/882-8080, 800/426-9100; fax 206/883-8101.

When Words Aren't Enough

Aldus Corp.
206/628-2320;

A Sequel Without Equal
Volume Two Now Available

Digital Color Prepress—Volume Two is the second book in Agfa's educational series on color prepress. Containing all new information, Volume Two is identical in approach to its highly successful companion book, An Introduction to Digital Color Prepress (now over 200,000 copies in print in six languages.) Filled with comparative halftone images, illustrations, and charts, the new book is 32 pages of the latest information on scanners, color correction, calibration, file formats, screen angles, proofing systems, and more. And it's available now for $10.00, plus $2.50 shipping and handling (and applicable sales tax).

To order, call 1-800-395-7007
Or send payment to: Agfa Prepress Education Resources P.O. Box 7917 Mt. Prospect, IL 60056-7917 Please allow 10-14 days for delivery.
NEW LC II 4mb 40mb, 12" RGB Monitor, Standard Keyboard, Mouse Pad
$1799.00

From one extreme,
QUADRA 700, MacPro Plus Keyboard, NEC 3FGX Monitor
4mb ram $4749.99
8mb ram 240mb $5699.99
20mb 400mb $6649.99

to the other.
Whether you're a first time user or the experienced professional, we'll build a system that's right for you.

(800) 530-5050
International (818) 741-6587 Fax (818) 741-5847
2631 NE Vegas, Suite 17, Dallas, TX 75211

COMPUTERS
MAC BEST
CDS welcome
MAC CLASSIC II 4MB 40MB $1249.00
MAC CLASSIC II 8MB 80MB $1349.00
MAC CLASSIC II 16MB 160MB $1599.00
MAC II 3MB 30MB $1999.00
MAC II 5MB 50MB $2299.00
MAC II 6MB 60MB $2399.00
MAC II 8MB 80MB $2499.00
MAC II 12MB 120MB $3149.00
MAC II L 1MB 10MB $3599.00
MAC II B 3MB 30MB $3599.00
QUADRA 700 4MB 40MB $4999.00
QUADRA 900 4MB 40MB $5999.00
QUADRA 950 8MB 80MB $6399.00
PI 160 1MB 10MB $6999.00
PI 170 4MB 40MB $7999.00
PI 170 8MB 80MB $8999.00
MONITORS
APPLE 13" RGB $479.00
APPLE 12" RGB $1199.00
NEC 36X 15" $659.00
NEC 36T 15" $1359.00
NEC 36T 17" $2959.00
SIGMA POWER PORTRAIT $699.00
SIGMA PAGEVIEW 15" GS $849.00
SIGMA VIEWVIEW 19" MONO $849.00
SIGMA VIEWVIEW 21" GS $1199.00
SEIKO QM165 14" $569.00
SONY 1304 14" $659.00

MONITOR OPTIONS
radius $59.00
Rester Opt $39.00

PRINTERS
STYLewriter $399.00
PERSONAL LASER LS $899.00
PERSONAL LASER NT $1399.00
PERSONAL LASER NTX $1699.00
LASER WRITER IIIF $2749.00
LASER WRITER HE $3499.00
CANNON COLOR BUBBLE JET $1899.00

PERIPHERALS
APPLE ONE SCANNER $989.00
MICROTEX 6000Z w/Photoshop $1399.00
APPLE STANDARD KEY $89.95
APPLE EXTENDED KEYBOARD $159.95
MACPRO PLUS KEYBOARD $199.95
SUPRA (Canadian 1/25) $349.95
APPLIED ENGINEERING Formbox for Classic II $149.95
MAYTECH
Cordless Fax 34 w/18882 $279.00
FARFAXON Ethernet IC $199.00
NEC CD Gallery/CDR 36 $349.00
KENNINGTON
Netbook Keyboard for Powerbook $109.00
I/O DESIGN Powerbook case EX $99.00

Monday - Friday 9:00 to 7:00 CDT Saturday 10:00 to 4:00 CDT - Toll free technical support - Free Federal Express shipping on Apple warranty repairs. Prices are subject to change without notice. Always call for the most current info. Tuesday and Thursdays we are closed. SHIPMENT TIMES: 48 states $150.00, AK and HI $160.00. Orders are shipped via Federal Express only and subject to a $20.00 minimum. Orders over $200 are shipped free. Sales tax is charged on sales to Illinois residents. Discount codes are non-transferable, non-refundable and do not apply to any other offers or discounts. Photos copyright Educational Resources. All rights reserved. E-mail: circ-text@edres.com

Circle 98 on reader service card

USA/Canada In Illinois Call
800-624-2926 708-888-8300

EDUCATIONAL RESOURCES
YOUR SINGLE SOURCE SUPPLIER FOR COMPUTER SOFTWARE • DISKETTES • ACCESSORIES

America's LARGEST Supplier of Educational Technology!

Call Now For The ONLY Educational Macintosh Catalog!
FREE Circle 28 on reader service card

MACWORLD July 1992 267
We Take Care Of You

Lowest Prices • Overnight Delivery only $3 • Money Back Guarantees*

We Take Care Of You

Accessories

ACSCON
CARRY CASE CL.CK.. BIIMICR WTR
CARRY CASE SE PLUS EXTR2 EXTAND
POWER BOOK CASE
ARTICULATE SYSTEM
VOICE NAVIGATOR III
VOICE IMPACT
VOICE IMPACT PRO
KEYTANICS
MACMICRONS
ORANGE MICRO
CRIPPLER LS
CRIPPLER LS II
NOODLE CASE
10" X 12" ELECTRIC/STANDARD TABLET
12" X 12" STANDARD TABLET
6" X 9" STANDARD
6" X 9" STENCIL

Communications

OPTIMA 24 FOR THE MAC
Best buy! V.42/V.42bis and NMP 5
compatible with data compression
9600 bps throughout Mac, SBC
modem supports 2400 , 9600 bps throughput, Mac-to
error-control and data compression,
software can't. WordScan even reads
technology. The Preview Window lets
WordScan read pages other OCR
recognized. Built-in dictionaries help
WORDS CAN
POCKETHAMMER 200 MEG
POCKETHAMMER 50 MEG
FAX PRO II
ULTRA 9600 MODEM & SMARTCOM
MICROPHONE II 4.0
OOVEFAX PLUS
VIVA 24-2400TOWER DESIGN
VIVA 244 EF-2400/9600 SEND/REC V.42.

Storage

CHINON
DPC-431 CD ROM REMOTE DRIVE
FNB
POCKETHAMMER 50 MEG
POCKETHAMMER 100 MEG
POCKETHAMMER 200 MEG

Printers/Scanners

CAI
TYPEFIST PLUS
CAIERS
WORDSCAN.
WORDSCAN PLUS
MACMICRONS
CS 5009 COLOR SCANNER
DEST
PERSONAL SCAN & RECOGNIZE
MACSCANNER 3009

ALDIS GALLERY EFFECTS
Get Gallery Effects free with your purchase of any of these popular
Aldus products.
PAGEMAKER .......... $489
FREEHAND ......... $388
PERUSSION .......... $319

Business

VISE INNOVATION
COMMUNITY SOFTWARE VENTURES
SIMPOW
MICROTEC
DATAPAC 88 REMOVEABLE HD
DIAMOND PORTABLE 2" 210MB
DATAPAC 45 REMOVEABLE HD

Graphics & Publishing

ABSTRACT DATA
DESIGN Interior/Landscape, Architecture ...

We Take Care Of You

We Take Care Of You

We Take Care Of You
Corporate Accounts:
• Call our Toll Free Corporate Number 1-800-283-7622 (1-800-28 DR MAC)
• Open an account within 24 hours
• Volume discount pricing (Fed. ID# 95-4183196)

International Dealer Program
• We ship worldwide. Call (818) 504-1800
• Call about our special pricing & services

Circle 147 on reader service card
To purchase products advertised in this issue call the phone numbers below or use the reader service number for our FastFacts Product Information Card located on the next page.
There's no cost; no obligation. Simply fill out the form and circle the numbers on the card below for the products which interest you.

Mail the card. We pay the postage!

Numbers for advertised products can be found in the ad and in both the Product Index and the Advertiser Index.
FREE PRODUCT INFORMATION. Get valuable information about the products that interest you. There’s no cost; no obligation. Just fill out this FASTFACTS Information form. Circle the numbers for the desired products. Then mail the card. We pay the postage! For even faster results fill out and send the card via our FASTFAX.
Now fast...get the facts, the competition’s gaining on you.

MACWORLD

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 215 PITTSFIELD, MA
POSTAGE WILL BE PAID BY ADDRESSEE
MACWORLD
Reader Service Department
P.O. Box 5299
Pittsfield, MA 01203-9906
## Software

### Utilities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>Central Point Software</td>
<td>275</td>
<td>26</td>
<td>Diskit Development</td>
<td>130</td>
</tr>
<tr>
<td>64</td>
<td>Dantz Development</td>
<td>26</td>
<td>16-17</td>
<td>Fifth Generation Systems</td>
<td>135</td>
</tr>
<tr>
<td>206</td>
<td>Fifth Generation Systems</td>
<td>135</td>
<td>75</td>
<td>Fifth Generation Systems</td>
<td>151</td>
</tr>
<tr>
<td>14</td>
<td>Icon Simulations</td>
<td>17</td>
<td>14</td>
<td>Icon Simulations</td>
<td>17</td>
</tr>
<tr>
<td>265</td>
<td>Insignia Solutions</td>
<td>235</td>
<td>67</td>
<td>Maxx Corporation</td>
<td>237</td>
</tr>
<tr>
<td>74</td>
<td>Microcom</td>
<td>41</td>
<td>16</td>
<td>Multi-AI Services</td>
<td>115</td>
</tr>
<tr>
<td>207</td>
<td>New Software</td>
<td>13</td>
<td>86-87</td>
<td>Salient</td>
<td>39</td>
</tr>
<tr>
<td>44</td>
<td>Thought I Could</td>
<td>173</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### HARD Disks/Storage

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>286</td>
<td>APS</td>
<td></td>
<td>97</td>
<td>Contemporary Cybermetics</td>
<td>188</td>
</tr>
<tr>
<td>275</td>
<td>DGR Technologies</td>
<td>53</td>
<td>203</td>
<td>GCC Technologies</td>
<td>212/221</td>
</tr>
<tr>
<td>124</td>
<td>Imaginga</td>
<td>240</td>
<td>31-38</td>
<td>Le Cie</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>MacFriends</td>
<td>58</td>
<td>294-295</td>
<td>MacLand</td>
<td>40</td>
</tr>
<tr>
<td>284-285</td>
<td>MacProducts USA</td>
<td>175</td>
<td>132</td>
<td>Microsoft Technology, Inc.</td>
<td>113</td>
</tr>
<tr>
<td>29</td>
<td>Mirror Technologies</td>
<td>129</td>
<td>29</td>
<td>Mirror Technologies</td>
<td>234</td>
</tr>
<tr>
<td>39</td>
<td>Neover Technologies</td>
<td>146</td>
<td>46</td>
<td>O.C.E.A.N. Microsystems</td>
<td>131</td>
</tr>
<tr>
<td>240</td>
<td>PLI</td>
<td></td>
<td>161</td>
<td>PLI</td>
<td></td>
</tr>
<tr>
<td>315-1289</td>
<td>Sony Corporation</td>
<td>282-283</td>
<td>136</td>
<td>Logitco Technology, Inc.</td>
<td>221</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>138</td>
<td>Logitco Technology, Inc.</td>
<td>221</td>
</tr>
</tbody>
</table>

## Hardware

### Boards

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>8-9</td>
<td>Agp Engineering</td>
<td>167</td>
<td>41</td>
<td>Lapis</td>
<td>202/204</td>
</tr>
<tr>
<td>20</td>
<td>Radios</td>
<td>178</td>
<td>58</td>
<td>SuperMac</td>
<td>132</td>
</tr>
</tbody>
</table>

### Computer Systems

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>80-91</td>
<td>Apple</td>
<td></td>
<td>230-291</td>
<td>BottomLine Distribution</td>
<td>—</td>
</tr>
<tr>
<td>276-277</td>
<td>Express Direct</td>
<td>224</td>
<td>225</td>
<td>MacFriends</td>
<td>118</td>
</tr>
<tr>
<td>238-283</td>
<td>MacNews</td>
<td>230</td>
<td>250</td>
<td>MacProducts USA</td>
<td>—</td>
</tr>
<tr>
<td>274</td>
<td>Mass Now</td>
<td>171</td>
<td>293</td>
<td>MacSource</td>
<td>48</td>
</tr>
<tr>
<td>94</td>
<td>Outbound Systems</td>
<td>30</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Printers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>325</td>
<td>Bicier Systems, Inc.</td>
<td>247</td>
<td>237-277</td>
<td>Express Direct</td>
<td>224</td>
</tr>
<tr>
<td>219</td>
<td>Canon</td>
<td>110</td>
<td>228-229</td>
<td>Texas Instruments</td>
<td>313</td>
</tr>
<tr>
<td>122</td>
<td>Laserjet</td>
<td>162</td>
<td>101</td>
<td>RasterOps</td>
<td>—</td>
</tr>
<tr>
<td>168</td>
<td>Macintosh</td>
<td>171</td>
<td>47</td>
<td>TeXtopeX</td>
<td>143</td>
</tr>
<tr>
<td>92</td>
<td>MacSource</td>
<td>171</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>183</td>
<td>Express Direct</td>
<td>224</td>
<td>138-147</td>
<td>Macwarehouse</td>
<td>270</td>
</tr>
<tr>
<td>114</td>
<td>MacLease</td>
<td>171</td>
<td>278</td>
<td>Quality Computers</td>
<td>257</td>
</tr>
</tbody>
</table>

### Video

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Radios</td>
<td>178</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Miscellaneous

### Input Devices

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>26</td>
<td>Curtis Manufacturing</td>
<td>20</td>
<td>26</td>
<td>Kensington MicroWave</td>
<td>20</td>
</tr>
</tbody>
</table>

### Modems

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>135</td>
<td>Logitco Technology, Inc.</td>
<td>—</td>
<td>254</td>
<td>Logitco Technology, Inc.</td>
<td>221</td>
</tr>
</tbody>
</table>

### Printers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>236</td>
<td>Educorporation</td>
<td>167</td>
<td>43</td>
<td>Hunt Manufacturing</td>
<td>199</td>
</tr>
</tbody>
</table>

## Services

### Mail Order

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>281</td>
<td>Advanced Business Center</td>
<td>227</td>
<td>286</td>
<td>Agfa</td>
<td>—</td>
</tr>
<tr>
<td>286</td>
<td>Agfa</td>
<td>—</td>
<td>290-291</td>
<td>Bottomline Distribution</td>
<td>—</td>
</tr>
<tr>
<td>286-289</td>
<td>Dr. Mac</td>
<td>147</td>
<td>296</td>
<td>Educorporation</td>
<td>157</td>
</tr>
<tr>
<td>275</td>
<td>Express Direct</td>
<td>222</td>
<td>232</td>
<td>Mac and More</td>
<td>55</td>
</tr>
<tr>
<td>276</td>
<td>Mac and More</td>
<td>70</td>
<td>222-229</td>
<td>Mac's Place</td>
<td>239</td>
</tr>
<tr>
<td>264</td>
<td>MacCenter</td>
<td>253</td>
<td>48-57</td>
<td>MacConnection</td>
<td>—</td>
</tr>
<tr>
<td>294-295</td>
<td>MacDepot</td>
<td>144</td>
<td>284-285</td>
<td>MacProducts USA</td>
<td>176</td>
</tr>
<tr>
<td>296</td>
<td>MacProducts USA</td>
<td>256</td>
<td>274</td>
<td>Mac's Now</td>
<td>258</td>
</tr>
<tr>
<td>208</td>
<td>Mac's Now</td>
<td>171</td>
<td>293</td>
<td>MacSource</td>
<td>48</td>
</tr>
<tr>
<td>278</td>
<td>MacSource</td>
<td>48</td>
<td>288-289</td>
<td>Printer Connection</td>
<td>95</td>
</tr>
<tr>
<td>290</td>
<td>Quality Computers</td>
<td>257</td>
<td>282-283</td>
<td>Printer/scan</td>
<td>156</td>
</tr>
<tr>
<td>287</td>
<td>Printer/scan</td>
<td>156</td>
<td>102-121</td>
<td>TriStar</td>
<td>114</td>
</tr>
</tbody>
</table>

## Accessories

### Floppy Disks/holders

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>126A-126B</td>
<td>Sony Corporation</td>
<td>—</td>
<td>18</td>
<td>MacTable/Scanco</td>
<td>—</td>
</tr>
</tbody>
</table>

### Furniture

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>MacTable/Scanco</td>
<td>—</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Macs 4 Less

1-800-475-6227
Free Shipping on prepaid orders!
All systems fully tested & ready to RUN!
/terms apply: call for details

Call if you want your Mac 4 Less!

Hours:
M-F 8:00 to 7:00 cst
Sat. 10:00 to 4:00 cst

Macs 4 Less
12407 mopac Expwy N #100-302
Austin, Texas 78766-9700
1-800-475-6227

The Classic II
includes: Apple mouse, keyboard and microphone.
4MB RAM 40 MB hard drive $1.249
6MB RAM 105 MB hard drive $1.649
10MB RAM 105 MB hard drive $1.899

The II LC
includes: Apple mouse, microphone, standard keyboard (extended add $50) and 14" Hi-Res Color Monitor.
4MB RAM 40 MB hard drive $1.975
6MB RAM 105 MB hard drive $2.249
10MB RAM 105 MB hard drive $2.475

The II Si
includes: Apple mouse, microphone, MacPro extended keyboard and 14" Hi-Res Color Monitor.
3MB RAM 40 MB hard drive $2.549
5MB RAM 80 MB hard drive $3.875
9MB RAM 80 MB hard drive $3.075
17MB RAM 240 MB hard drive $3.675

The II Ci
includes: Apple mouse, microphone, MacPro extended keyboard and 14" Hi-Res Color Monitor.
5MB RAM 80 MB hard drive $3.649
5MB RAM 105 MB hard drive $3.875
8MB RAM 80 MB hard drive $3.789
8MB RAM 105 MB hard drive $3.815
8MB RAM 240MB hard drive $4.125
16MB RAM 240MB hard drive $4.575
20MB RAM 425MB hard drive $5.175

The Powerbooks
PB140 2/40 CALL!
PB140 4/40 CALL!
PB170 4/80 CALL!
PB170 8/80 CALL!

Call for prices on Macintosh
Items which are not listed!

Prices are subject to change. Please call for current pricing. Returns are subject to a restocking fee.

For the Best Price on your Custom Package
Call our knowledgeable staff.

MacsNOW keeps most advertised systems in stock.

Macsnow prices are constantly changing, please call us for our most current prices.

8am - 5pm CST Weekdays
10am - 5pm CST Saturday

MacsNOW
9705 Burnet Road, Suite 201
Austin, Texas 78758
(512) 837-9722
FAX (512) 837-2609

Terms and Conditions: American Express, Visa, MasterCard Cashiers Check and COD accepted. Returns require an RMA #. All returned or refused orders will be charged a minimum 15% restocking fee. Returns must be in original packing with software seals unbroken. All warranties on Apple or Macintosh products sold by MacsNOW will be honored by MacsNOW only. Prices do not include shipping and are subject to change.

*PowerBooks include 1 Battery, Power Adapter and Microphone.
Mac Systems
WE SPECIALIZE IN BUILDING
COMPLETE SYSTEMS

CLASSIC II, 2/40 ..........$1,195
MAC LC II, 4/40 ..........CALL
MAC IIe, 3/40 ..........$1,995
MAC IIci, 50 ..........$2,795
QUADRA 700/900 ..........CALL

E-MACHINES DISPLAYS

NEW & IMPROVED!
SPECIAL PRICE

E-Machines ColorPage E16
16" Multi-Resolution
Color Display

$895

E-Machines ColorPage T16
16" Full-Page Sony
Trinitron Display

$1,195

E-Machines ColorPage T16 II
16" Full-Page Sony
Trinitron Display

$2,595

E-Machines ColorPage T16 II
19" Two-Page Sony
Trinitron Display

$1,195

NEW! $1,445

E-MACHINES

E-Machines ColorPage T16 II
- 16" Color Display
- Sony Trinitron
- Dual Resolution
- Full-Page 832 x 624
- Two-Page 1024 x 768
- Reduced magnetic emissions

NEW E-MACHINES
COLOR CARDS
E-Machines Interface cards
work with Apple, RasterOps,
Radius, Sony and virtually any
display from 12" to 24"

from only $319

#1 WORLDWIDE
RETAILER
Nobody sells more E-Machines
than Express Direct. So nobody
can give you better advice, better
support or a better price!

WORLDWIDE
RETAILER
Nobody sells more E-Machines
than Express Direct. So nobody
can give you better advice, better
support or a better price!

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

Circle 222 on reader service card

Ref: 27
Make the Right Connections with Asante

LET US HELP.
At Express Direct we understand Ethernet. Let us help you connect your Macs, PCs and other workstations to a high-speed 10BaseT network.

10 BASE T HUBS
Asante 10T Hub 8 $259
9 ports: 8UTP, 1 BNC
Asante 10T Hub 12 $539
14 ports: 12 8UTP, 1 AUI, 1 BNC

ETHERNET CARDS
MacCon 3NB $229
For Mac IIx, thick, thin & 10BaseT with 64K
MacCon 3 for IIsi (& se/30) $249
Thick, thin & 10BaseT with 64K
MacCon+ LC $229
Thick, thin & 10BaseT

ETHERNET SCSI DEVICE
EN/SC $339
SCSI Ethernet for Classic & Plus, thick, thin & 10BaseT
EN/SCPB $389
SCSI Ethernet for PowerBook; thick, thin & 10BaseT
EN/SC10TPB $319
SCSI Ethernet for PowerBook; 10BaseT

PERSON TO PERSON
Twin Pack $129
10-User Pack $329
Zone Pack $499
Personal messaging software with live network chatting, QuickSend mailbox, voice messaging, built-in calender & electronic Post-it note

We're Only Going to Go Over this Once

SHARP

$1,395
with purchase of transparency option

Sharp JX-320 Color Scanner
One-Pass Scanner with variable resolution from 30 to 600 dpi • Scans in 24-bit color, grayscale or black and white • OCR capability • Includes Photoshop 2.0

One Pass, 600 dpi Scanners at Express Direct Prices

WE CARRY THE FULL LINE OF SHARP SCANNERS

$1,095

Sharp JX-450 Color Scanner ...............Call 30 to 300 dpi with scanning area of 11.7" x 17" for reflective art and 8.25" x 11.7 for transparencies Includes Photoshop 2.0

Sharp JX-600 Color Scanner ...............Call Edco award-winner allows scanning of reflective art and transparencies up to 11" x 17"

BUY SHARP DIRECT. Now you can get the complete line of quality Sharp scanners at direct prices. Express Direct has them in stock and priced to move. So, before you buy from just anybody, call us for the direct price.

BUY SHARP DIRECT

Easy Payment Options & Leasing Terms We accept money orders, cashier checks and Visa/ MasterCard with no surcharge and your card will not be charged until product ships. Purchase order are also accepted for those who qualify. Leasing terms available on most products.

Prices and are subject to change without notice. All warranties on Macintosh / Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agent only. All other manufacturers’ warranties still apply.
Pull a Fast One for Just $1,995

Texas Instruments

TI microLaser TURBO
- Fast 9ppm engine
- Postscript Level 2
- RISC processor • 300 dpi • 35 PostScript fonts and 2.5 MB RAM standard

Get Texas Instruments Speed at Express Direct Prices

WE STOCK ALL TI ACCESSORIES
Free AppleTalk Interface Included on Every Model

TI microLaser Plus $1,565
9ppm engine, 300 dpi, 35 PostScript fonts

TI microLaser TURBO XL $1,245
16 ppm Turbo microLaser PS/35 XL

TURBO Upgrade Kit $299
Upgrade microLaser or microLaser XL to Turbo

Buy Texas Instruments Direct. Now you can get the complete line of quality TI laser printers at direct prices. Express Direct has them in stock and priced to move. So before you buy from just anybody, call us for the direct price.

Express Hours (central time):
M-F 8am-7pm; Sat 10am-2pm
24hr Fax, 7 days/week

Ref: 27

Circle 224 on reader service card

International Orders Shipped Daily • FAX 312.549.6447
1801 W. Larchmont Ave. • Chicago, IL 60613 USA • 312.549.0030

1-800-535-3252

"The Mac Systems Company"
Here’s how...

By saving up to 60% on educational hardware and software, and taking advantage of the millions of dollars in available grants, they can!

All of this information—and more—is in Enhance, the free publication from Quality Computers that has been bringing teachers and technology together for over 5 years. Enhance is written by teachers for teachers. It gives you all the information you need to make your classroom computer a powerful teaching tool.

In Enhance, you’ll find out how to write and win grants to help you afford more classroom technology. You’ll read inspiring stories of how teachers across the country have successfully funded classroom technology and created an exciting learning environment for their students.

Enhance gives you valuable Technical Tips that will help you understand your computer better, and offers revealing reviews of the latest releases for Macintosh, Apple, and IBM.

Enhance also comes with Quality Computers’ complete catalog packed with educational software from top manufacturers like Broderbund, The Learning Company, Davidson, and Orange Cherry. You’ll also find modems, CD-ROMs, memory, printers, and more. Thousands of items, discounted as much as 60% off retail.

And best of all, Enhance is free! Just call us at 1-800-777-ENHANCE (1-800-777-3642) and ask for your free one-year subscription (4 issues). Or send in the reader service card. It’s that easy.

Check out the savings on these popular items

<table>
<thead>
<tr>
<th>Item</th>
<th>Retail</th>
<th>QC’s Price</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super Solvers</td>
<td>$59</td>
<td>$34</td>
<td>$25</td>
</tr>
<tr>
<td>Outnumbered</td>
<td>$20</td>
<td>$20</td>
<td>$0</td>
</tr>
<tr>
<td>Math Blaster Mystery</td>
<td>$49</td>
<td>$29</td>
<td>$20</td>
</tr>
<tr>
<td>Where in Time is Carmen Sandiego</td>
<td>$49</td>
<td>$29</td>
<td>$20</td>
</tr>
<tr>
<td>Kid Pix</td>
<td>$44</td>
<td>$29</td>
<td>$15</td>
</tr>
<tr>
<td>SuperMuncher</td>
<td>$35</td>
<td>$25</td>
<td>$10</td>
</tr>
<tr>
<td>The Writing Center</td>
<td>$44</td>
<td>$29</td>
<td>$15</td>
</tr>
</tbody>
</table>

Get Enhance FREE! Save on all your classroom computer needs! Call today!

School • Home • Hardware • Software • School Editions • Lab Packs • Networks • Discount Prices

Quality Computers
20200 Nine Mile Rd. • P.O. Box 665 • St. Clair Shores, MI 48080
Phone 313-774-7200 • Fax 313-774-2698
1-800-777-ENHANCE
(1-800-777-3642)

School P.O.’s accepted by phone, fax or mail
Circle 267 on reader service card

"Quality Computers was our most reliable vendor for our Apple IIe lab. Now that we have a new Mac LC lab, Quality is still there for us. By the way, your grant writing tips helped us win two grants—one for a scanner and one for a printer. Your excellent prices helped that money go further. Thanks again."

John Darovitz, Principal
Wilcox Elementary
128 megabytes of removable, erasable optical storage on fast, ultra-reliable 3.5" disks. Optical storage spells reliability: No more head crashes and no more magnetic data corruption.

Above all, the 128REM™ is built to perform. 9 millisecond short seek time and a built-in 128K buffer translate into significant improvements over current removable standards. The 128REM™ is built for the future, conforming to both ANSI and ISO standards, ensuring upward compatibility.

DGR Price. DGR Performance. DGR Reliability. The DGR Technologies 128REM™

$1,299

To Order Call TOLL FREE Monday-Friday 9am to 6pm CST
DGR Technologies accepts MC, Visa, Discover, Pre-Paid, COD, & Wire Transfer Orders.
DGR Technologies • 1219 West Sixth, Suite 200 • Austin, Texas 78703 • 512/476-6850 • Fax 512/476-6399

Order Direct 800-235-9748

Circle 53 on reader service card
<table>
<thead>
<tr>
<th>SYSTEMS</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac LC 4/40</td>
<td>1570</td>
</tr>
<tr>
<td>Mac IIfx - 4 meg</td>
<td>4179</td>
</tr>
<tr>
<td>Mac IICl - 5 meg</td>
<td>2749</td>
</tr>
<tr>
<td>Mac IIfx - 5/105 (Quantum)</td>
<td>3049</td>
</tr>
<tr>
<td>Mac IIfx 3/40</td>
<td>1999</td>
</tr>
<tr>
<td>Mac IIfx 5/80</td>
<td>2549</td>
</tr>
<tr>
<td>Extended Keyboard</td>
<td>170</td>
</tr>
<tr>
<td>Mac Quadra 700 - 4 meg</td>
<td>4399</td>
</tr>
<tr>
<td>Mac Quadra 700 - 4/105</td>
<td>4799</td>
</tr>
<tr>
<td>Mac Quadra 900 - 4 meg</td>
<td>5675</td>
</tr>
<tr>
<td>Mac Quadra 900 - 4/210</td>
<td>6385</td>
</tr>
<tr>
<td>Mac Powerbook 140 2/20</td>
<td>2223</td>
</tr>
<tr>
<td>Mac Powerbook 140 2/40</td>
<td>2479</td>
</tr>
<tr>
<td>Mac Powerbook 140 4/40</td>
<td>2749</td>
</tr>
<tr>
<td>Mac Powerbook 170</td>
<td>Call</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MONITORS</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microtek 600 ZS</td>
<td>$1269</td>
</tr>
<tr>
<td>Microtek Truelaser</td>
<td>$1299</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MONITORS (cont.)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony Trinitron</td>
<td>569</td>
</tr>
<tr>
<td>SuperMac Platinum 19&quot; Display</td>
<td>964</td>
</tr>
<tr>
<td>Super Mac Platinum Two-Page Display</td>
<td>1239</td>
</tr>
<tr>
<td>Super Mac Super Match 19&quot; Color</td>
<td>1929</td>
</tr>
<tr>
<td>Super Match 21&quot; Two-Page Color Display</td>
<td>2599</td>
</tr>
<tr>
<td>Dual-Mode Trinitron 19&quot; Thunder8</td>
<td>1159</td>
</tr>
<tr>
<td>Thunder24</td>
<td>2699</td>
</tr>
<tr>
<td>Spectrum 8.24 PDQ</td>
<td>899</td>
</tr>
<tr>
<td>Magnavox 14&quot; Color Monitor</td>
<td>499</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINTERS (cont.)</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Laserwriter Ill</td>
<td>3559</td>
</tr>
<tr>
<td>HP Deskwriter 699</td>
<td>1539</td>
</tr>
<tr>
<td>HP Deskwriter Color HP Ilp for Mac 1749</td>
<td>2339</td>
</tr>
<tr>
<td>HP Ils for Mac ILI for Mac 4639</td>
<td>1799</td>
</tr>
<tr>
<td>HP Ils for Mac</td>
<td>769</td>
</tr>
<tr>
<td>HP Deskwriter Ink Cartridge</td>
<td>2979</td>
</tr>
<tr>
<td>AppleTalk Connectors</td>
<td>2149</td>
</tr>
<tr>
<td>Color Printers NEC PS 40</td>
<td>4799</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCANNERS</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logitech ScanMan 32</td>
<td>2957</td>
</tr>
<tr>
<td>Microtek 600 ZS w/Photoshop</td>
<td>1269</td>
</tr>
<tr>
<td>Microtek 1850S Slide Scanner</td>
<td>1798</td>
</tr>
<tr>
<td>Umax UC-630 w/Photoshop</td>
<td>1332</td>
</tr>
<tr>
<td>Caere Typist</td>
<td>4297</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODEMS</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zoom F9624 Plus 2400 BPS</td>
<td>1299</td>
</tr>
<tr>
<td>Modem MX 2400S w/SendFax 9600 BPS</td>
<td>1699</td>
</tr>
<tr>
<td>v.32 Turbo w/ v.42bis w/MNP software</td>
<td>4497</td>
</tr>
<tr>
<td>Dove Fax Modem 9624</td>
<td>2979</td>
</tr>
<tr>
<td>Dove Fax Modem 0624 Plus With Voicemail</td>
<td>3597</td>
</tr>
<tr>
<td>PSI for Powerbook 140 &amp; 170 internal 9600/2400</td>
<td>2149</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCELERATORS</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daystar 40 MHz PowerCache</td>
<td>8094</td>
</tr>
<tr>
<td>50 MHz PowerCache</td>
<td>1139</td>
</tr>
<tr>
<td>50 MHz PowerCache w/68882</td>
<td>1599</td>
</tr>
<tr>
<td>Radius Rocket</td>
<td>1709</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MEMORY</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meg for LC/Cl/SI</td>
<td>1499</td>
</tr>
<tr>
<td>4 meg for LC/Cl/SI</td>
<td>2549</td>
</tr>
<tr>
<td>Powerbook 140 &amp; 170 4 meg</td>
<td>3049</td>
</tr>
<tr>
<td>Powerbook 140 &amp; 170 6 meg</td>
<td>2799</td>
</tr>
</tbody>
</table>

**Printer Connection**
(714) 758-8832
FAX (714) 635-1752
Overnight and Federal Express Shipping Available

Circle 55 on reader service card
YOUR ONE SOURCE
FOR COMPLETE MAC SOLUTIONS

1 (800) 7-ADVANCE • 1 (800) 723-8262

SERVICE
- Friendly, knowledgeable sales & support consultants ready to serve you, with Toll-Free Ordering and Tech Support
- Express Delivery Available anywhere in the world
- Once you place your order, your system will be configured to YOUR needs, then burned in and tested before shipped
- Education, Government & Institutional P.O.'s Accepted
- EXPRESS 2-DAY SERVICE on ALL SOFTWARE PACKAGES for only $6

SUPPORT
- All purchases are backed by our 30-day satisfaction money-back guarantee and 1 year limited warranty (see details at bottom)
- Express Service Plan Available - Offering 72-Hour Complete Turnaround (Repair or Replacement) on all Hardware (ask about 7-Year Plans, too)
- Buy with confidence, as ABC is a strong, rapidly growing company with both Mac & PC Experience

LEASING
- WE ARE THE MAC LEASING EXPERTS, FOR PERSONAL OR BUSINESS USES, CALL US FIRST
  1. LEARN THE ADVANTAGES
  2. LEASING PROTECTS YOU FROM TECHNICAL OBSOLESCENCE
  3. 24-HOUR APPROVALS IN MOST CASES

Monitors
E-MACHINES $2390
NEW! 116-116
or 193*
with Free 16
Resolution Trinitron 16.1 Monitor
Sale price/Lease price
24-Bit Accel. Card & 8MB Dual Resolution Trinitron 16.1 Monitor
E-MACHINES 14" TRINITRON 24-BIT SYSTEM "CALL / CALL" 119 Trinitron Monitor, Future MX Accelerated 24-bit Color Card
IKEGAMI 19" GRAY SCALE SYSTEM $1195 / 49 mo.*
SEIKO 14" COLOR MONITOR $155
Sony Trinitron Quality in 14" Mac Monitor
SIGMA FULL PAGE GRAY SCANNER $555
Sharp Image & Lower Emissions Portrait Monitor

Software
ADOBE ILLUSTRATOR $989
ADOBE PHOTOSHOP $485
ADOBE PAGE MAKER 4.2 (NEW) $486
CLARISS MAKER 4 (GREAT NEW PRICE) $95
CLARISS WORKS $195
CLARISS FILE MAKER PRO $99
QUARK EXPRESS 3.1 (NEW) $545
FRAME MAKER $565

Printers
QMS PS-815 MKII $3850
PS or $112
Laser Printer
QMS PS-410 $1599 / 59 mo.*
NEWGEN 400P (4000P) $1795 / 65 mo.*
HP COLOR DESKWRITER C $699
HP DESKWRITER $99
SEIKO PERSONAL COLORPOINT III $4595 / 139 mo.*
SEIKOSHA MAC PRINTER $195
ImageWriter Compatible

Apparels
APPLE MAC II 600 IPS $299
APPLE MAC III 600 IPS $399
APPLE MAC IV 600 IPS $499
APPLE MAC V 600 IPS $599

Powerbooks
APPLE MAC II SYSTEM $1199
SMR RAM/120MB HD, 14" Trinitron Monitor, Est. Keyboard
APPLE MAC III SYSTEM $3850 / 111 mo. on lease*
SMR RAM/120MB HD, 14" Trinitron Monitor, Est. Keyboard

PERIPHERALS
UMAX UC-630 $1199
24-BIT COLOR SCANNER $1295
or $147*
(4 mo. on lease)
MICROTEK 6025 24-BIT COLOR SCANNER $1395 / 152 mo.*
Full Color/Tinted Scanner w/Adobe Photoshop

Apple Mac Systems
APPLE MAC II SYSTEM $1199
SMR RAM/120MB HD, 14" Trinitron Monitor, Est. Keyboard
APPLE MAC III SYSTEM $3850 / 111 mo. on lease*
SMR RAM/120MB HD, 14" Trinitron Monitor, Est. Keyboard
MAC PowerBook 170 6/80 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 170 12/120 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 180 6/120 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 180 8/80 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer

LEASING SPECIALS
MAC II SUPER SYSTEM! $1999
Mac Plus 5/210 HD, Elves 310 19" Trinitron Monitor w/Future MX 24-4B Accl. Color Board, Est. Keyboard, Newn 400 DPI Laser Printer, UMAX UC-630 Color Scanner w/Adobe Photoshop, PDL 44 MB Ram, Cart, Drive, Adobe Illustrator, Quick Writer, Quark Xpress, 4 MB Work Station
MAC IV SUPER SYSTEM $1999
Mac Plus 5/210 HD, Elves 310 19" Trinitron Monitor w/Future MX 24-4B Accl. Color Board, Est. Keyboard, Newn 400 DPI Laser Printer, UMAX UC-630 Color Scanner w/Adobe Photoshop, PDL 44 MB Ram, Cart, Drive, Adobe Illustrator, Quick Writer, Quark Xpress, 4 MB Work Station

PERIPHERALS
UMAX UC-630 $1199
24-BIT COLOR SCANNER $1295
or $147*
(4 mo. on lease)
MICROTEK 6025 24-BIT COLOR SCANNER $1395 / 152 mo.*
Full Color/Tinted Scanner w/Adobe Photoshop

POWERBOOK DREAM DEAL
Mac PowerBook 170 6/80 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer

Mac Systems
APPLE MAC II SYSTEM $1199
SMR RAM/120MB HD, 14" Trinitron Monitor, Est. Keyboard
APPLE MAC III SYSTEM $3850 / 111 mo. on lease*
SMR RAM/120MB HD, 14" Trinitron Monitor, Est. Keyboard
MAC PowerBook 170 6/120 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 170 8/120 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 180 6/120 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 180 8/80 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer
MAC PowerBook 180 8/80 w/mir Accl. 8-bit Adapter, Apple II 16" Trinitron Monitor, 60 MB Hard Drive & 4000 DPI Laser Printer

C.O.D. ORDERS: Add $5.00 on Federal Express, UPS or Airmail orders & Check Orders Are Accepted; No Lipagey or personal checks please.
Shopping carts Toll Free for shipping methods and rates, California orders only and 8.25% for sales tax. All Prices Ordes and money orders or cashier’s check for lease service. Allow 10 days for personal checks to clear. All other credit cards, check expiration date and billing address.
Return Policy Call Customer Services at (800) 7-ADVANCE, 4001 N. Flanders, Suite 202.
Refunds are not returned without original receipt and packaging and must be sent back within 30 days of purchase date. 15 day Return Policy for new and used
Credit Cards: We accept Visa, Master Card, American Express and Discover
This offer is not applicable to telephone orders. All information is protected by federal law. No information is released without written notice.

ADVANCE BUSINESS CENTER
(800) 274-7747
(800) 723-8262 / (800) 274-7747
(310) 325-1422 / FAX: (310) 325-4073
23501 Tustin Ave, Tustin, CA 92680

Circle 227 on reader service card
Cache Cards, Accelerators, and CoProcessors

Cache cards from LogiCache speed up your III or IICI by 40 percent! The LogiCache III plugs into the III slot or into the LogiCache Dual Slot Adapter for use with SE30 or III expansion cards. LogiCache coprocessors for LC, Classic II, and III speed math calculations by over 100 percent. For maximum performance, choose '030 accelerators from Applied Engineering and Daystar, or '040 accelerators from Fusion Delta and Radius.

Rated Number One by MacUser

5 Year Warranty
- Thick/Thin or Thick/10T 199.00
- Thick/Thin/10T, 84K 229.00
- FriendlyNet/Thin or Thin 229.00
- 10T 12 port hub 529.00
- 10T 6 port hub 299.00
- Thick to 10T adapter 99.00
- SE30 Ethernet from 299.00
- Daystar Etherprint 335.00
- Daystar Etherprint Plus 655.00
- 10Mbit Ethernet 49.00
- 20Mbit Ethernet 89.00

Optidisk 128

The new removable standard!

128MB per cartridge at only 30% the media cost of Syquest Plus. The data reliability inherent in magneto-optical technology. Our Sony based drive is only $1499 and cartridges are only $59. Ask about our special offer for qualified service bureau.

ASANTE ETHERNET from $169

DISPLAY SYSTEMS


We are authorized resellers of Radius, RasterOps, and SuperMac. Call for latest prices on video.

International Orders call (512) 292-2222/FAX (512) 292-1933. We accept Visa, Mastercard, American Express, and Discover. Corporate, educational, and government purchase orders accepted. Most deliveries via Federal Express.
Adobe Photoshop only $449!

The latest version Adobe Photoshop 2.01! This is a special offer on the full, complete version—not a bundle or limited edition version.

**STORAGE SYSTEMS**

**Removable Media**

<table>
<thead>
<tr>
<th>Product</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>OptDisk 128</td>
<td>1299.00</td>
<td>1469.00</td>
</tr>
<tr>
<td>OptDisk 800</td>
<td>(SONY) 2865.00</td>
<td></td>
</tr>
<tr>
<td>OptDisk 1000</td>
<td>3865.00</td>
<td></td>
</tr>
<tr>
<td>45 SR (SyQuest) w/cartridge</td>
<td>475.00</td>
<td></td>
</tr>
<tr>
<td>88 SR (SyQuest) w/cartridge</td>
<td>689.00</td>
<td></td>
</tr>
<tr>
<td>DATdrive 26B</td>
<td>1395.00</td>
<td></td>
</tr>
<tr>
<td>DATdrive 50B</td>
<td>1585.00</td>
<td></td>
</tr>
<tr>
<td>DATdrive 85B</td>
<td>(five year warranty) 1695.00</td>
<td></td>
</tr>
</tbody>
</table>

**Disk Drives**

<table>
<thead>
<tr>
<th>Model</th>
<th>Size</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest, Optical, and DAT available internally for the Quadra 680i</td>
<td>120 MB</td>
<td>449.00</td>
</tr>
<tr>
<td></td>
<td>240 MB</td>
<td>719.00</td>
</tr>
<tr>
<td></td>
<td>520 MB</td>
<td>1299.00</td>
</tr>
<tr>
<td></td>
<td>650 MB</td>
<td>1399.00</td>
</tr>
<tr>
<td></td>
<td>1000 MB</td>
<td>1899.00</td>
</tr>
<tr>
<td></td>
<td>1300 MB</td>
<td>2399.00</td>
</tr>
<tr>
<td></td>
<td>1700 MB</td>
<td>CALL</td>
</tr>
</tbody>
</table>

**MEMORY UPGRADES**

Third Wave manufactures a complete line of memory products for all Macs—1, 2, 4, and 16MB SIMMs, including low profile 16 MB SIMMs for the Quadra 700.

We also manufacture pseudo-static PowerBook modules for 8 MB and VRAM for the LE and Quadra.

Prices change often—call for the latest!

**A SPECIAL OFFER FOR POWERBOOK OWNERS!**

Quantum 60-80 2.5 inch Internal drive with 16 MB pseudo-static RAM! Only $799.00!

A total of 68MB storage and 8MB pseudo-static RAM! Send us your PowerBook and we'll install it free!
In One Packt • includes 68030 Accelerators • All Magic Drives Include 1 or 2 year warranty and 30 day money back guarantee!

NEW! RailGun 030Pro System includes 68030 Accelerator & Display In One Package • Includes RAM-Disk capabilities & up to 16MB of RAM Expansion!

• "The Magic 45R is one of the best SyQuest drives available, offering high speed and high quality." —MacUser Magazine

• External drives include Magic Case with 40 watt power supply and two external outlets

• All Magic Drives include 1 or 2 year warranty and 30 day money back guarantee!

**FWB**

FWB Hard Disk Toolkit 
Like now included with Magic Hard Drives!

---

**Magic RAILGun 030**

68030 Accelerators for the Macintosh SE, Classic, & Plus

<table>
<thead>
<tr>
<th>RailGun 030 Pro Systems*</th>
<th>Price Without Moniotor</th>
<th>Add 99 for Classic or Plus Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>16MB: RAILGun PRO &amp; 19&quot;</td>
<td>$899</td>
<td>$999</td>
</tr>
<tr>
<td>25MB: RAILGun PRO &amp; 19&quot;</td>
<td>$999</td>
<td>$799</td>
</tr>
<tr>
<td>33MB: RAILGun PRO &amp; 19&quot;</td>
<td>$1299</td>
<td>$1099</td>
</tr>
</tbody>
</table>

New RailGun 030Pro Systems beat the competition! • Up to 4X faster video than Mohis Display Systems. • 30% more display area than Mohis Display Systems. • Available as a separate accelerator, accelerator with video, or the whole complete system including Monitor & Accelerator. • Compatible with Radius, E-Machines Sign9, 33MHz Accelerator, Mobius Drives, Mobius Mirror, Supremac RetroOps & more.

**Magic HARD Drives**

Fixed, Removable, Optical & Tape Mass Storage Solutions

Economy Internal Kit $29 • FWB Internal Kit $49 • External Kit with Cables and Case $99

Magic 40MB Hard Drive* $199 $6
Magic 52MB Quantum LL** $299 $7
Magic 100MB Hard Drive* $299 $9
Magic 105MB Quantum LL** $399 $11
Magic 240MB Quantum LL** $699 $21
Magic 425MB Quantum* $1299 $59
Magic 600MB Seagate* $1499 $45
Magic 600MB Win Runner* $1599 $48
Magic 1.2GB Seagate* $1999 $90

* One Year Warranty ** Two Year Warranty

**Magic 45R & 88R**

Includes External Case with 40 Watt of Power

Magic 45R SyQuest Drive* $449 $13
Magic 88R SyQuest Drive* $549 $16
SyQuest 45 & 88 Cartridges $50/$119 $2

**Magic Tape**

Includes Retrospect Automated Archiving

Magic 150MB Tape Backup* $699 $21
Magic 525MB Tape Backup* $999 $30
Magic 1.3GB DAT Backup* $1695 $51
Magic 2.0GB DAT Backup* $1695 $51
Magic 2.4GB 8mm Backup* $2895 $87

* One Year Warranty ** Two Year Warranty

---

Magic MATH 030

The Magic MATH 030 adds System 7 Virtual memory capabilities and built-in math coprocessor to your Macintosh LC and Classic II.

Magic LC 030 with CoProcessor $199 $6
Magic MATH LC CoProcessor $99 $3
Magic MATH Classic II CoProcessor $99 $3
Magic HSi Dual Slot Card with FPU ... $99 $3

---

**Check out the review of our Magic 128REM in the July issue of MacUser Magazine!**

Magic 128Optical

28ms access time • Indestructible media! • Includes FWB Hammer Hard Disk Toolkit Ltd! • Magic 128MB REM Optical* $1299 $14
Magic 128MB 3.5" Cartridges $99 $2

Drive Accelerator

Magic 128MB & Data Mirror Card $299 $11

**FWB**

FWB Hard Disk Toolkit 
Like now included with Magic Hard Drives!
**MagicView**

**Video Solutions**
Complete video solutions available from 15" Monochrome Systems to our full-blown 20" 24-bit Trinitron System with block-mode transfer for faster screen redraw.

**Magic VIEW 19" & 15" Monitor Special!**
Single or Double Page Displays with 1152 x 870 Resolution!
Fast 97Hz refresh rate means it's easy on your eyes! Built-in tilt & swivel stand. Includes one year warranty. Works with Macintosh SE/30, and all Mac II systems!

- **15" Panasonic Monochrome w/ Card**
  - $999
- **19" Panasonic Monochrome w/ Card**
  - $999
- **19" Panasonic 256 GreyScale w/ Card**
  - $799

**Magic VIEW Color Monitors**
Available as complete system or individual components.

- **Magic VIEW 20" Sony Trinitron**
  - $1999
- **Magic VIEW 20" Color Monitor**
  - $1350
- **Magic VIEW Color Video Cards**
  - $699

**RasterOps 8XLi/24XLi Upgrade Kit**
RasterOps 8XLi/24XLi Upgrade Kit available for all working 2XLi.

**Limited 8XLi Upgrade Kits**
Prices may vary. New low price! Up to 57600 baud fax transmission capabilities. Group 3 fax protocol.

**MagicNET**

**Networking Solutions**
Magic networking solutions available for any network situation!

- **Magic Ether -Thin/Thick/10baseT**
  - $199
- **Magic NET (localtalk node)**
  - $18
- **Magic NET (localtalk node) 12 Pak**
  - $10
- **Magic NET (localtalk node) 48 Pak**
  - $9

**Macintosh Systems**

**Call for Latest Pricing!**
MacProducts USA offers Complete System Solutions to suit your specific computing needs. MacProducts also offers the option to buy or lease your system. Macintosh Classic II, Macintosh PowerBook 100, 140, 170, Macintosh LC, LC II, LC IIx, Quadra 700, Quadra 900.

**MacProducts also carries software, printers, scanners and more from all the major brands!**

---

**MagicModems**

**Magic 14400 Baud Modem**
Transmit at speeds up to 57600 Baud! One of the fastest modems you can buy. Includes software, V.32bis/V.42bis and MNP-5 error correction.

- **Magic 9600 Baud Modem**
  - Transmit at speeds up to 38400 Baud! The economical option!
  - Includes software, V.32/V.42bis and MNP-5 error correction.

**Magic 2400 Baud Modem**
Economical performance modem includes software, V.42bis and MNP-5 error correction.

**Magic Faxmodems**

**MagicFax 14400 FaxModem**
Transmit at speeds up to 57600 Baud! High speed communications and fax capabilities. Includes software, V.32bis/V.42bis and MNP-5 error correction.

**Magic Fax24/96 FaxModem**
2400 baud send and receive fax capabilities. Group 2 fax protocol.

**Magic Memory**

Each Magic Memory Unit is backed by the MacProducts USA lifetime guarantee. Our SIMMs are made of the highest quality components and are designed specifically for your hardware.

**Macintosh RAM**

- **1MB SIMMs**
  - Starting at $29
- **2MB SIMMs**
  - $79
- **4MB SIMMs**
  - $129
- **16MB SIMMs**
  - $575
- **2/4MB PowerBook SIMMs**
  - $169/$229
- **6MB PowerBook RAM**
  - $399
- **4MB Classic Upgrade**
  - $59
- **LC VRAM**
  - $89
- **Quadra VRAM**
  - $149

**Printer RAM**

- **GCC 1P/II 1MB**
  - $49
- **LZR960/Realtech/Quickor 8MB Kit**
  - $499
- **NEC Silentwriter 2 Model 90 2MB Upgrade**
  - $249
- **NEC Silentwriter Model 95 2MB Upgrade**
  - $199
- **QMS PS-110 4MB Upgrade**
  - $229
- **QMS PS-S15 4MB Upgrade**
  - $549
- **TI 1MB RAM Upgrade**
  - $79
- **TI Turbo RAM Upgrades**
  - Call

---

**Magic Faxmodems**

**Magic Fax 24/96 FaxModem**
2400 baud modem and 9600 baud send and receive fax capabilities. Group 2 fax protocol.

**Magic Fax 24/96 FaxModem**
2400 baud modem and 9600 baud fax transmission capabilities with 9600 baud fax receiving performance. Group 1 fax protocol.

---

**MacProducts USA**

1-800-MAC-USA1

Call for latest pricing.
Toshiba CD-ROM $699
Includes APS Reference and Entertainment Library
- Illustrated Encyclopedia
- World Atlas
- The Orient: InterOptica's Multimedia Travel Encyclopedia
- Time Table of History: Science & Innovation
- Macintosh Animation Showcase
- Nautilus: Intro
- Sherlock Holmes: Consulting Detective

Quantum
<table>
<thead>
<tr>
<th>MB</th>
<th>INTL</th>
<th>EXTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>$239</td>
<td>$299</td>
</tr>
<tr>
<td>Go•80</td>
<td>499</td>
<td>N/A</td>
</tr>
<tr>
<td>105</td>
<td>359</td>
<td>449</td>
</tr>
<tr>
<td>120</td>
<td>429</td>
<td>519</td>
</tr>
<tr>
<td>210</td>
<td>629</td>
<td>699</td>
</tr>
<tr>
<td>240</td>
<td>699</td>
<td>789</td>
</tr>
</tbody>
</table>

SyQuest
<table>
<thead>
<tr>
<th>Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ-555</td>
<td>$479</td>
</tr>
<tr>
<td>SQ-5110</td>
<td>599</td>
</tr>
<tr>
<td>Dual(44)</td>
<td>899</td>
</tr>
<tr>
<td>Dual(88)</td>
<td>1199</td>
</tr>
</tbody>
</table>

Maxtor
<table>
<thead>
<tr>
<th>MB</th>
<th>Intl</th>
<th>Extl</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>$359</td>
<td>$439</td>
</tr>
<tr>
<td>213</td>
<td>599</td>
<td>699</td>
</tr>
<tr>
<td>340</td>
<td>979</td>
<td>1079</td>
</tr>
<tr>
<td>535</td>
<td>1349</td>
<td>1449</td>
</tr>
<tr>
<td>760</td>
<td>1399</td>
<td>1549</td>
</tr>
<tr>
<td>1.2G</td>
<td>1999</td>
<td>12149</td>
</tr>
</tbody>
</table>

SyQuest
<table>
<thead>
<tr>
<th>Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SQ-555</td>
<td>$479</td>
</tr>
<tr>
<td>SQ-5110</td>
<td>599</td>
</tr>
<tr>
<td>Dual(44)</td>
<td>899</td>
</tr>
<tr>
<td>Dual(88)</td>
<td>1199</td>
</tr>
</tbody>
</table>

Maxtor
<table>
<thead>
<tr>
<th>MB</th>
<th>Intl</th>
<th>Extl</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>$359</td>
<td>$439</td>
</tr>
<tr>
<td>213</td>
<td>599</td>
<td>699</td>
</tr>
<tr>
<td>340</td>
<td>979</td>
<td>1079</td>
</tr>
<tr>
<td>535</td>
<td>1349</td>
<td>1449</td>
</tr>
<tr>
<td>760</td>
<td>1399</td>
<td>1549</td>
</tr>
<tr>
<td>1.2G</td>
<td>1999</td>
<td>12149</td>
</tr>
</tbody>
</table>

Toshiba
<table>
<thead>
<tr>
<th>CD ROM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3301B</td>
<td>$699</td>
</tr>
</tbody>
</table>

SyQuest
<table>
<thead>
<tr>
<th>Model</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>APSDAT</td>
<td>$1699</td>
</tr>
<tr>
<td>CD-ROM 2.6-5 GB</td>
<td>DAT</td>
</tr>
<tr>
<td>APSDAT 2.6 GB Compression DAT</td>
<td>$1499</td>
</tr>
<tr>
<td>APSDAT 2.6 GB Compression DAT</td>
<td>$1499</td>
</tr>
</tbody>
</table>

Maxtor
<table>
<thead>
<tr>
<th>MB</th>
<th>Intl</th>
<th>Extl</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>$359</td>
<td>$439</td>
</tr>
<tr>
<td>213</td>
<td>599</td>
<td>699</td>
</tr>
<tr>
<td>340</td>
<td>979</td>
<td>1079</td>
</tr>
<tr>
<td>535</td>
<td>1349</td>
<td>1449</td>
</tr>
<tr>
<td>760</td>
<td>1399</td>
<td>1549</td>
</tr>
<tr>
<td>1.2G</td>
<td>1999</td>
<td>12149</td>
</tr>
</tbody>
</table>

Fujitsu
<table>
<thead>
<tr>
<th>MB</th>
<th>Intl</th>
<th>Extl</th>
</tr>
</thead>
<tbody>
<tr>
<td>330</td>
<td>$1099</td>
<td>$1199</td>
</tr>
<tr>
<td>520</td>
<td>1249</td>
<td>1349</td>
</tr>
</tbody>
</table>

• 30-Day Money-Back Guarantee • All products carry a one-day money-back guarantee. Your risk in the transaction is the cost of shipping.
• Disk-for-Disk Replacement Warranty • Quantum, Maxtor, SyQuest and DAT drives carry a two-year "parts & labor" disk-for-disk replacement warranty. WREN, Tek, drives and SyQuest cartridges carry a one-year "parts & labor" disk-for-disk replacement warranty. Fujitsu drives carry Fujitsu's five-year warranty.
• Prices & Specifications Subject to Change Without Notice
## Hardware

### Price List

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DATAPAK 45</td>
<td></td>
<td>$550.00</td>
</tr>
<tr>
<td>FUSION DAM SYSTEMS (040 ACCELERATOR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS TOKAMA CE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS TOKAMAC CE 25</td>
<td></td>
<td>$899.00</td>
</tr>
<tr>
<td>NEC CURTIS TOKAMAC CE 25</td>
<td></td>
<td>$1199.00</td>
</tr>
<tr>
<td>NEC CURTIS HITCHHIKER 80 (POCKET SIZE)</td>
<td></td>
<td>$699.00</td>
</tr>
<tr>
<td>NEC CURTIS ROCKET 25</td>
<td></td>
<td>$1269.00</td>
</tr>
<tr>
<td>NEC CURTIS ROCKET 25</td>
<td></td>
<td>$1669.00</td>
</tr>
<tr>
<td>NEC CURTIS POWERCACHE 33 MHZ</td>
<td></td>
<td>$689.00</td>
</tr>
<tr>
<td>NEC CURTIS PLUS DRIVE</td>
<td></td>
<td>$319.00</td>
</tr>
<tr>
<td>NEC CURTIS MACINTOSH LC 16 MHZ FPU</td>
<td></td>
<td>$75.00</td>
</tr>
<tr>
<td>NEC CURTIS CD GALLERY CDR-36</td>
<td></td>
<td>$549.00</td>
</tr>
<tr>
<td>NEC CURTIS CD GALLERY CDR-73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS CD GALLERY CDR-73</td>
<td></td>
<td>$79.00</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-MACHINES E-Magination at work™</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HARDWARE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATAPAK 45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUSION DAM SYSTEMS (040 ACCELERATOR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other Products

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCELERATORS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATAPAK 45</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUSION DAM SYSTEMS (040 ACCELERATOR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NEC CURTIS NEC CURTIS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Miscellaneous

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RADIUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ROCKETS 25</td>
<td></td>
<td>$1269.00</td>
</tr>
</tbody>
</table>

### Contact Information

- **Call for Prices**
- **Hewlett-Packard**
- **UMAX UC-630**
- **Software**

### Additional Information

- **30-Day MBG**
- **Government Purchase**
- **orders accepted**
Monitors to

NEW Color Trinitron

Quadra-Ready 20"

$2,495

RasterOps 20" Sony Trinitron Color Display
Dual Scan • 1152 x 870 • 81 dpi • 1024 x 768 • 72 dpi
No card needed with Quadra on-board video

NEW 16" Color

$995

with purchase of card

RasterOps Sweet 16
16" Color display • 824 x 632 • 72 dpi

NEW PaintBoard 24

24-bit board • QuickDraw
acceleration • Supports 13" to 21" monitors

RAS TEROPS DIRECT FACTORY RESSELLER

Introducing New PaintBoard 19

only $895

Accelerated 24-bit Color Board for 19" Displays
Now RasterOps gives you Accelerated 24-bit Color at an 8-bit price! Works with virtually any 19" display.

RA STEROPS COLOR SYSTEMS

16" Accelerated 24-bit Color System ......$1,995
RasterOps 16" display with accelerated 24-bit card

19" Accelerated 8-bit Color System .........$2,295
RasterOps 19" display with accelerated 8-bit card

19" Accelerated 24-bit Color System .........$2,495
RasterOps 19" display with accelerated 24-bit card

20" Accelerated 24-bit ...............................$3,295
Color Trinitron System
RasterOps 20" Trinitron display with accelerated 24-bit card

NEW PaintBoard 24

8XL 8-bit color .............$455
8XLi Accelerated 8-bit color  ...Call
New ProColor 32 ..........Call
Accelerated 32-bit color board • CYMK to RGB conversion • RISC interface

24STV ..................$795
24-bit live video for 13"

24XL/TV ..........................$2,695
24-bit live video for large screens

24XLi SPECIAL

24-bit board • QuickDraw
acceleration • GWorld Ram expandable • Supports 13" to 21" monitors • Quantities are limited

Call

$1,845
the Macs!

LOW-COST DISPLAY SYSTEMS

14'' TRINITRON

17'' COLOR

19'' COLOR

Sony

$379

With Accelerated 24-bit Color Card $1,165

TFT

$895

With Accelerated 24-bit Color Card $1,595

Hitachi

$1,595

With Accelerated 24-bit Color Card $2,495

Over 17,000 Mac Products Available!

Mac Cpu's

Let us custom configure a complete system for you. Some quantities are limited and publication deadlines don't always allow us to advertise our latest price. So call for latest details!

Mac Classic II, 240 .............. $1,195
NEW Mac LC II, 440 ............. Call
Mac Ili, 340 ........................ $1,995
Mac Ii, 50 .......................... $2,795
Mac Quadra 700/900 ............. Call

Drives/Storage

PLI

PLI Infinity Floptical 21MB .... $499
PLI Infinity 44 Removable ...... $550
PLI Infinity 88 Removable ...... $799
PLI Quick SCSI .................. Call
PLI Infinity Optical 3.5'' ....... $1,595

Scanners

Sharp JX-320 Color Scanner $1,495
1 pass, 600 dpi, 24-bit color, with Photoshop 2.0
JX-320 Transparency Option $995
User installable option allows for scanning of film transparencies and 35mm slides

Umux UC 630 Color Scanner .... $1,245
600 dpi, 24-bit scanner with Photoshop 2.0
Umux 1200 Color Scanner ...... $4,395
1200 dpi, 30-bit color, with Photoshop 2.0
FREE Transparency Option This Month Only!

Printers

Texas Instruments

TI microLaser Plus PS/17 ..... $1,245
9 ppm engine, 300 dpi, 17 PostScript fonts
TI microLaser Plus PS/35 ..... $1,565
9 ppm engine, 300 dpi, 35 PostScript fonts
TI microLaser TURBO ..... $1,995
9 ppm, PostScript level 2, 25 fonts
TI microLaser TURBO XL .... Call
16 ppm, PostScript level 2, 35 fonts

Ili Color Graphics System

Mac Ili, SMB/40HD, E-Machines E16
16'' Color Display, MacPro Extended
Keyboard, Mouse, System 7, Norton Utilities & Hypercard

Complete Mac Systems

LC II Color System $1,995
Mac LC II, 4MB RAM/40HD,
Sony 1520 14'' Color Display, Apple
Keyboard, Mouse, System 7, Norton
Utilities & Hypercard

Ili Productivity System $2,695
Mac Ili, SMB/40HD/LaPIS 15''
Full-Page Display, MacPro Extended
Keyboard, Mouse, System 7, Norton
Utilities & Hypercard

$3,995

E-MACHINES

MacNews Hours:
M-F 8am-7pm (CT)
Sat 10am-2pm • 24hr fax

Ref: 27
NEW! Quark XPress 3.1 $511
Ask about our wide selection of Quark XTensions.

DGR 128MB Removable 3.5" Erasable Optical $1275
Erasable optical drive with 35ms access. 3.5" 128MB cartridges only $59

NEW! Xerox AccuText 3.0 OCR Software $465
Only $399 with purchase of any flatted scanner

Panasonic 19" Mono $499
19" Greyscale $699

NEW! & Quadra VRAM

Silentwriter Model 95 $1475
300 DPI Postscript Level 2 + Auto PC-ACII Switching
6 pages per minute + 35 Resident Fonts
NEC Silentwriter RAM Upgrade $199

Seiko CM-1445
14" Trinitron $539

JetLine Inkjet Refill Twin Pack $15.99
For HP Deskwriter & Apple StyleWriter

Sony 17" 1040 $1029
Sony 14" 1304 $609

QMS PS-410 2MB RAM 45 Resident Fonts $1475

Umix 630 24-bit Scanner with Photoshop $1229

Umix 1200 Scanner $3499
1200 DPI 24-bit Color with Photoshop

Bottom Line Distribution is committed to the needs of the international Macintosh user and reseller. We offer discounted rates with DHL, UPS International, or Federal Express. Delivery times to most countries is 2 to 3 days. We stock 220 versions of most hardware. Dealer inquiries are welcome. Language interpreters are available. Nous acceptons des commandes internationales. E-mail us at: BottomLine@thirdnet.com

Japanese service is also available. For more information or samples, please e-mail us.
<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touch Sensitive Tablets</td>
<td>$459</td>
</tr>
<tr>
<td>6x9 Standard</td>
<td>$459</td>
</tr>
<tr>
<td>12x12 Standard</td>
<td>$689</td>
</tr>
<tr>
<td>12x12 Electrostatic</td>
<td>$1025</td>
</tr>
<tr>
<td>Spectrum /8 Ilsi</td>
<td>$1225</td>
</tr>
<tr>
<td>Spectrum /Series 8.24 PDQ</td>
<td>$799</td>
</tr>
<tr>
<td>Spectrum /8 Ilsi /LC</td>
<td>$478</td>
</tr>
<tr>
<td>Thunder 8/34 Video Cards</td>
<td>$699</td>
</tr>
<tr>
<td>10&quot; Platinum Display</td>
<td>$882</td>
</tr>
<tr>
<td>21&quot; Platinum Two-Page</td>
<td>$1030</td>
</tr>
<tr>
<td>SuperMatch 20&quot; Dual Mode Trimmer</td>
<td>$2499</td>
</tr>
<tr>
<td>SuperMatch 20&quot; Color</td>
<td>$1625</td>
</tr>
<tr>
<td>Video Spigot starting at $399</td>
<td></td>
</tr>
<tr>
<td>Thunders Card - Call</td>
<td></td>
</tr>
<tr>
<td>Painter</td>
<td>$234</td>
</tr>
<tr>
<td>Wacom compatible Mac/iPS Bidi</td>
<td></td>
</tr>
<tr>
<td>Award Winner from Fractal Design</td>
<td></td>
</tr>
<tr>
<td><strong>1MB TI Printer Upgrade</strong> $59</td>
<td></td>
</tr>
</tbody>
</table>
SAVE UP TO $600 on a new Quadra

Our E-Machines Prices Can’t Be Beat. Call our knowledgeable staff for the best prices!

ColorPage T-16

Quadra Compatible!

E-Machines ColorPage T16 16-inch display. Works with the Macintosh Quadra Built in video! Displays 832x624 resolution at 72dpi. The T-16 Judges Best 3 years running by MacUser Magazine.

$7,099.

Please Call For Price

Color Displays

ColorPage T16 II Call
ColorPage T16 Call
E-Machines TX16 Call
E-Machines T198 Bit Call

Color Interface Cards

Futura EX special purchase Call

Zoom 9600 Modems

9600 V.32bis $269
9600 Baud, Cable, Software Included
Zoom 2400 Baud $75
Solecete Fax modem $199
Zoom 9600 v.32bis FAX $309
Courier HST Dual Standard $840
Sportster 2400 w/ MnPi-5 $159
All Other Modems Call

Input Devices

Keytronic MacPro Plus $129
DataDesk SwitchBoard $169
Apple Extended Keyboard $175
Curtis MVP Turbo Mouse $89

Wacom Graphic Tablets

6x9 Standard $489
12x12 Standard $695
12x12 Electrostatic $769
12x18 Standard $1049
Call For More Wacom Pricing

JetFill™ Ink Refill

JetFill ink refill two-packs are the perfect way to refill your HP DeskWriter and StyleWriter Ink Cartridges. Refills come in four colors and also come with a money back guarantee.

Macintosh Ilsi Special

Macintosh Ilsi, 5mb RAM, 105mb Hard Drive, 1.44mb Apple FDHD, Mouse, MacPro Keyboard, 14" Color Monitor, 8 Bit Color. With 24-bit Accellerated color add only $685.

High Speed, No Drag Pricing.

Compare our price against theirs. OurPrice only $2,910

QUADRA System

Quadrax 700, 8mb RAM, 240mb Hard Drive, 1.44mb Apple FDHD, Mouse, Extended Keyboard, 16" ColorPage T-16 Monitor, Futura SX Color Card, 832x624 resolution, 24-Bit Accelerated Color, Pan and Zoom, Virtual Screens and DiskMaker formatting software.

Was $7,699 now Only $7,099

Mac Ili System

Macintosh Ili, 5mb RAM, 105mb HD, 1.44mb Apple FDHD, Mouse, Extended Keyboard, 14" Color Monitor, 8-bit color.

Limited Quantity Available

Only $3,559 with accelerated 24-bit color only $489 more

Classic 2/40 $995
Classic II 2/40 $1159
Call For Other CPU configurations

Extras only from MacSource

Every Mac we sell includes Golden Triangle’s DiskMaker software. Plus our expert technical support staff is available for any hardware related questions you may have about your MacSource CPU purchase.

Prices subject to change without notice. 2% Surcharge on American Express

JetFill ink refill two-packs are the perfect way to refill your HP DeskWriter and StyleWriter Ink Cartridges. Refills come in four colors and also come with a money back guarantee.

BUY THREE 2-PACKS AND GET OVERNIGHT SHIPPING FREE

$16

OTHER JETFILL INK REFILL PRODUCTS

HP High Capacity Refill $25
PaintWriter 4 color refil $45
PaintWriter individual color $16
Kodak Diconix Ink Refill $29
Includes one new cartridge
HP 5pitch with new cartridge $59

MacSource™ 7801 North Lamar, Suite E-190 • Austin, Texas 78752 • (800) 285-2622
VISA, MasterCard & Discover Accepted with No Surcharge. Customers may deduct 1% for payment by Cashier’s Check

Toll Free 1-800-285-2622

Circle 48 on reader service card
Quantum

All MacLand Drives are pre-tested, pre-formatted, and come complete with our own installation and reference manual, DiskMaster Plus™ formatting and utility software, cables and two-year warranty. Internal hard drives also include bracket kits to fit your particular Mac.

<table>
<thead>
<tr>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>52MB</td>
<td>$239</td>
</tr>
<tr>
<td>105MB</td>
<td>$349</td>
</tr>
<tr>
<td>120MB</td>
<td>$419</td>
</tr>
<tr>
<td>240MB</td>
<td>$699</td>
</tr>
<tr>
<td>425MB</td>
<td>$1199</td>
</tr>
</tbody>
</table>

THE MACLAND GUARANTEE!

1— 30 Day Price Protection On All Advertised Items.
2— 30 Day Unconditional Money Back Guarantee On All Advertised Products. All You Pay For Is Freight.
3— Guaranteed In-Stock Policy. If We Don’t Have An Advertised Product In Stock The Day That You Place Your Order, We Will Pay For The Freight And Ship It To You Via 2 Day Air Express Service!

SyQuest

All MacLand Removable Hard Drives come with our own installation and reference manual, DiskMaster Plus™ formatting utility software, cables, and a one-year warranty. Cartridge not included.

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 Megabyte</td>
<td>$399</td>
</tr>
<tr>
<td>88 Megabyte</td>
<td>$499</td>
</tr>
</tbody>
</table>

Testing, Testing 1-2-3...

That’s right, when you purchase a MacLand hard disk drive or removable hard disk drive, you can be assured that your drive has passed our rigorous 10 point quality testing program. We have one of the lowest failure rates in the industry. If, in the unlikely event you do encounter a problem, we take care of you with our 24 hour Rapid Repair program, because we know how important it is for you to keep your system running. Nobody does it quicker or better than MacLand.

MEMORY

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1MB 80ns</td>
<td>$35</td>
</tr>
<tr>
<td>2MB 80ns</td>
<td>$73</td>
</tr>
<tr>
<td>4MB 80ns</td>
<td>$125</td>
</tr>
</tbody>
</table>
ORION TECHNOLOGIES

MacScan ULTRA
- 14" Color Monitor
  Monitor $369 (Ilx, Ilc, Ilcxl, Lcxl, Lcxlx, & Quadra)
- Monitor & 256 Color Card $669
  (Ilx, Ilcxl, Lcxl, Lcxlx, & Quadra)
- Monitor & Million Plus Color Card $799
  (Ilx, Ilcxl, Lcxl, Lcxlx, & Quadra)

Complete Page Display
- Crystal Clear Resolution!
- Front-Mounted Controls!
- Tilt-Swivel Base!
- 30-Day Money Back Guarantee!

Monitor $349 (Ilx, Ilcxl)
Monitor & Video Card $569
  (Ilx, Ilcxl, Lcxl, Lcxlx, & Quadra)

Orion Complete Page Display & Video Card $549
Orion Dual Page Display & Video Card $779
Orion MacScan Ultra Monitor with 256 Color Card $779
Orion MacScan Ultra Monitor with Million Plus Color Card $699

SE/30 Monitor Specials

ATTENTION: Businesses, Government, Educational Inst., Military
* Fax us your P.O. for same day shipment + P.O.s accepted on approved accounts. * All shipments are F.O.S origin.
* Prices do not include freight + favorable terms offered to established accounts. * LEASING option available. Call for details and pricing.

To Order Call 1-800-888-8779
MacLand, Inc. 4685 S. Ash Ave, Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217
MACPRODUCTS USA delivers the newest, hottest solutions for your Macintosh.

Our latest offering: The Magic RailGun 030Pro System - a super-fast 25MHz 68030 accelerator with onboard large-screen video that drives our included 19" two-page display. Check out the competition's package and you'll see why the Magic RailGun 030Pro System is best. We offer a 32-bit video address path. They've got 16. We support 3rd party displays, including Radius. The competition doesn't. Our RailGun video operates at the accelerator's clock speed - not locked into a paltry 8MHz like some. The RailGun 030Pro can also be upgraded all the way to 40MHz at need.

And our accelerator ships with a full Motorola 68030 including onboard FPU and PMMU - not an econo version like theirs. On top of all that, we include the standard Magic one-year warranty, 30-day money back guarantee, System 7 compatibility, and support for up to 16MB of RAM.

Now that you know what we've got, ask Mobius about their features. Then ask them about their price. Then call us for the RailGun 030Pro System - the system that makes sense.

$999
Includes 25MHz 68030 Accelerator, Built-in PMMU, 68882 FPU, & 19" Panasonic Display
## Billboard Advertisers Index

<table>
<thead>
<tr>
<th>Category</th>
<th>Company</th>
<th>Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peripherals</td>
<td>MacOutlet</td>
<td>800.622.6885 ............. 298</td>
</tr>
<tr>
<td>Input Devices</td>
<td>Infogrip, Inc.</td>
<td>504.766.8082 ............. 300</td>
</tr>
<tr>
<td>Accelerators</td>
<td>Aztech Micro Solutions</td>
<td>800.524.3500 ............. 299</td>
</tr>
<tr>
<td>Communications</td>
<td>SoftArc, Inc.</td>
<td>416.299.4723 ............. 300</td>
</tr>
<tr>
<td>Peripherals</td>
<td>Pilot Technologies</td>
<td>800.682.4987 ............. 299</td>
</tr>
<tr>
<td>Utilities</td>
<td>Microspot</td>
<td>800.622.7568 ............. 300</td>
</tr>
<tr>
<td>Optical/ Hard Drives</td>
<td>Bauk Research</td>
<td>800.854.2285 ............. 299</td>
</tr>
<tr>
<td>System Upgrades</td>
<td>MicroMac Tech</td>
<td>714.362.1000 ............. 300</td>
</tr>
<tr>
<td>Utilities</td>
<td>DGR Technologies</td>
<td>800.235.9748 ............. 301</td>
</tr>
<tr>
<td>Memory Upgrades</td>
<td>Athena Computers</td>
<td>800.580.9269 ............. 300</td>
</tr>
<tr>
<td>CD/ROM</td>
<td>ABCD ROM</td>
<td>416.222.3766 ............. 301</td>
</tr>
</tbody>
</table>

## Catalog Product Index

### Hardware

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerators</td>
<td>302</td>
</tr>
<tr>
<td>Bar Code</td>
<td>302</td>
</tr>
<tr>
<td>Computer Systems</td>
<td>302</td>
</tr>
<tr>
<td>Memory Upgrade</td>
<td>307</td>
</tr>
<tr>
<td>The LLB Co.</td>
<td>308</td>
</tr>
<tr>
<td>Peripherals</td>
<td>311</td>
</tr>
<tr>
<td>Relax Technology</td>
<td>312-313</td>
</tr>
<tr>
<td>Printers</td>
<td>314</td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astrology</td>
<td>314</td>
</tr>
<tr>
<td>Bar Code</td>
<td>314</td>
</tr>
<tr>
<td>Business</td>
<td>315</td>
</tr>
<tr>
<td>CAD/CAM</td>
<td>315</td>
</tr>
<tr>
<td>CD/ROM</td>
<td>315</td>
</tr>
<tr>
<td>Clip Art</td>
<td>315</td>
</tr>
<tr>
<td>Communications</td>
<td>316</td>
</tr>
<tr>
<td>Educational</td>
<td>317</td>
</tr>
<tr>
<td>Entertainment</td>
<td>317</td>
</tr>
<tr>
<td>Fonts</td>
<td>317</td>
</tr>
<tr>
<td>Genealogy</td>
<td>317</td>
</tr>
<tr>
<td>Graphics</td>
<td>317</td>
</tr>
<tr>
<td>Graphics Translators</td>
<td>318</td>
</tr>
<tr>
<td>Health</td>
<td>318</td>
</tr>
<tr>
<td>Human Resources</td>
<td>318</td>
</tr>
<tr>
<td>Hyper Card Stacks</td>
<td>318</td>
</tr>
<tr>
<td>Import/Export</td>
<td>318</td>
</tr>
<tr>
<td>Languages</td>
<td>318</td>
</tr>
</tbody>
</table>

### Services

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Insurance</td>
<td>321</td>
</tr>
<tr>
<td>Computer Repair</td>
<td>321</td>
</tr>
<tr>
<td>Data Conversion</td>
<td>321</td>
</tr>
<tr>
<td>Data Recovery</td>
<td>321</td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>322</td>
</tr>
<tr>
<td>Disk Duplication</td>
<td>322</td>
</tr>
<tr>
<td>Laser Recharge</td>
<td>322</td>
</tr>
<tr>
<td>Slides</td>
<td>322</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Category</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>322</td>
</tr>
<tr>
<td>Converters</td>
<td>323</td>
</tr>
<tr>
<td>Covers</td>
<td>323</td>
</tr>
<tr>
<td>Furniture</td>
<td>323</td>
</tr>
</tbody>
</table>

## Advertising Sales Staff

- **Niki Stranz**
  Account Manager, Billboard
  **415.978.3105**

- **Carol Johnstone**
  Eastern Account Manager, Catalog
  **415.978.3152**

- **Wendi Smith**
  Western Account Manager, Catalog
  **415.978.3117**

- **Beverly Schneider**
  Telemarketing Sales Manager, The Macworld Shopper
  **Call 800.888.8622**
## BILLBOARD

### Peripherals

- **SPECIALS!!**
  - **DAYSTAR**
  - PowerCache II, Ilci, I1cx, I1si, SE/30, I1x
  - 50MHz...$1049
  - Factory Fresh. Daystar Three-Year Warranty

### RasterOps

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEW !!! RasterOps PaintBoard L1</td>
<td>$849.00</td>
</tr>
<tr>
<td>24 Bit with acceleration for 19&quot; display</td>
<td></td>
</tr>
<tr>
<td>NEW !!! RasterOps PaintBoard 24 System</td>
<td>$3995.00</td>
</tr>
<tr>
<td>19&quot; RasterOps Trinitron with 24 bit accelerated video board</td>
<td></td>
</tr>
<tr>
<td>NEW !!! RasterOps MediaTime</td>
<td>CALL</td>
</tr>
<tr>
<td>24 bit board w/real time digital video and 16 bit digital audio.</td>
<td></td>
</tr>
<tr>
<td>NEW !!! RasterOps 16&quot; Color Monitor</td>
<td>CALL</td>
</tr>
<tr>
<td>RasterOps own technology. Made in USA</td>
<td></td>
</tr>
<tr>
<td>NEW !!! RasterOps 24mxQ</td>
<td>CALL</td>
</tr>
<tr>
<td>NEW !!! RasterOps MxTV</td>
<td>CALL</td>
</tr>
<tr>
<td>RasterOps New 24STV Board</td>
<td>$799.00</td>
</tr>
<tr>
<td>RasterOps 24XL1 2075 System</td>
<td>$4599.00</td>
</tr>
<tr>
<td>RasterOps 8XL 1960H System</td>
<td>$2139.00</td>
</tr>
<tr>
<td>RasterOps 8L24L 2075 System</td>
<td>$3100.00/$3495.00</td>
</tr>
<tr>
<td>RasterOps 264 30/24SX</td>
<td>$649.00</td>
</tr>
<tr>
<td>RasterOps 21&quot; Mono System</td>
<td>$1450.00</td>
</tr>
<tr>
<td>RasterOps 19&quot; Greyscale System</td>
<td>$1299.00</td>
</tr>
<tr>
<td>803 Accelerator for STV</td>
<td>$195.00</td>
</tr>
<tr>
<td>RasterOps Video Expander II</td>
<td>$499.00</td>
</tr>
<tr>
<td>RasterOps Expresso Slide Scanner</td>
<td>$749.00</td>
</tr>
</tbody>
</table>

### Daystar Digital

- **Universal PowerCache 40MHz** $895.00
- **Universal PowerCache 40MHz w/68882** $1049.00
- **Universal PowerCache 50MHz** $1299.00
- **Universal PowerCache 50MHz w/68882** $1549.00

### Fusion Data Systems

- **TokaMac CI**
  - 25 MHz 68040 PDS based Accelerator for Mac II ci.
  - CALL
- **TokaMac SX**
  - 25 MHz 68040 PDS based Accelerator for Mac II si and SC/30.
  - CALL
- **TokaMac LC**
  - 25 MHz 68040 PDS based Accelerator for Mac LC.
  - CALL

### Dove

- **DoveFax Desktop / DoveFax NuBus** $189.00/$229.00
  - 2400 bps data/9600 bps fax modem.
- **DoveFax +/DoveFax + NuBus** $259.00/$299.00
  - 2400 bps data/9600 bps fax modem plus voice mail.
- **DoveFax LAN / LAN NuBus** $369.00/$459.00
  - 2400 bps data/9600 bps fax network modem.

### NEC

- **NEW 4FG 15" MultiSync Monitor** CALL
- **NEW 3FGX 15" MultiSync Monitor** CALL
- **NEW 5FG 17" MultiSync Monitor** CALL

### SuperMac

Call for current pricing!

### E-Machines

- **E-Machines T-16 Trinitron**
  - With any board purchase
  - $1169.00
  - 16" monitor. Top rated three years running.
- **E-Machines NEW! T-16 II/SX24 Trin. Sys.**
  - $1999.00
  - 24 bit accelerated video board. Incredible Value!
- **NEW! E-Machines E-16 Monitor**
  - $899.00
  - New low price!
  - 16" color monitor for on board video. Quadra ready.

### TechWorks

- **NuBus 10 Base T, Ethernet Card**
  - $199.00
- **NuBus 10 T, Thin, AUI Ethernet Card**
  - $269.00
- **GraceLAN Std. 50 User Version 2.0**
  - $329.00

### GraceLAN Asset Manager

**GraceLAN Asset Manager** $559.00

### Seiko

- **CM1445 24 Bit Color Bundle**
  - $1229.00
  - 14" RGB monitor with RasterOps 24SX 24 bit color board.
- **CM1445 8 Bit Color Bundle**
  - $779.00

### Call for FREE CATALOG

CALL TOLL FREE 800-622-6885

For your ad to appear in The Macworld Shopper, please call 800.888.8622
More Than Just An Accelerator:

With upgrade kits and slot extenders Aztech Micro Solutions, Inc. offers you more than the standard accelerator fare.

More Slots and Power for LC, IIsi and SE30
Our Gelexa series of slot extenders enable you to add an accelerator plus video board, Ethernet, RAM and/or another card of your choice. In addition to more slots the Gelexa also adds two additional internal hard drive bays - even on an LC! From $695.

Upgrade Your Plus, SE or SE30
Build a modular style system from your Plus or SE with high speed accelerator and large screen display. Upgrades available with or without Mac logic boards and color options. Prices start at $955.

Aztech Micro Solutions, Inc.
800-524-3500
130 McCormick #103, Costa Mesa, CA 92626

Easy Access!

Great values are just a phone call away.

BAUK Research-Opticals and Flopticals

Are your programs and data scattered on hundreds of floppies - do you spend more time trying to find your work than actually doing it - or are you simply frustrated by inadequate hard drive capacity? At BAUK Research we specialize in providing the most advanced, reliable and affordable storage solutions for the Mac.

- BAUK OP121
  128mb Optical read/write drive, w/1 diskette
  $1329

- BAUK FLO21
  21mb Floptical drive, w/1 diskette
  $529

- 128 mb Diskette
  $59

- 21 mb Diskette
  $29

Prices include formatting, partitioning, password protection, diagnostics, A:UA & 7.01 compatible software, 30 day money back guarantee.

International Dealer Inquiries welcome!

BAUK Research
800-854-BAUK
Call for volume discounts.

BAUK Research Optical and Flopticals
11088 jellyville Road, Austin, TX 78759
Ph: 512-795-6215 FAX: 512-795-6216
The Micro Mac Upgrade System, used by some of the largest Mac sites, is a complete 68030-based enhancement for your older Mac that you can assemble in less than one hour.

You can upgrade your existing Plus, SE, or SE/30 for as little as $995 into a modular system with a large full page, dual page or color screen.

Call today for complete pricing and options!

MicroMac Technology
Phone: (714) 362-1000
or FAX: (714) 362-5428
2711 Aliso Creek Rd, Ste 145, Aliso Viejo, CA 92656

Input devices

**BAT and Mouse**
*The Perfect Couple - Together at Last*

Use one hand for your mouse, the other to enter data on the 7" x 7", seven-key Chord KeyPad™ which uses chord technology and ergonomics principles to emulate a complete Macintosh extended keyboard.

Wrist supported, fingers rest on five home keys while thumb controls two shift keys. Data is entered by "chording" or striking combinations of keys. No more looking from screen to keyboard.


Single Chord KeyPad™ $295,
Dual Chord KeyPad™ $495.

Infogrip, Inc.
5800 One Perkins Place, Suite 51 Baton Rouge, La 70808

Communications

**FirstClass: Corporate BBS**

"FirstClass from SoftArc, Inc. is robust software with well-thought-out conferencing, E-Mail, and superior file transfer. All wrapped in an exceptional user interface." - MacWorld Apr 4, '92

"Complete graphical user interface" - No TTY modem

"Easy installation and maintenance" - Honey installation and maintenance

SoftArc, Inc.
801 Middlefield Road, Suite 102
Stanford, Ontario, Canada M1V 1Z9

Phone: (416) 299-4723 Fax: (416) 754-1856 Modem: (416) 699-2250

Utilities

**MacPalettes II**

ImageWriter Color Printing

250,000 colors - from an ImageWriter II. Works with almost any software - quickly and easily from within the Chooser. And fully System 7.0 compatible.

Requirements: SE/30, Mac II series, Classic II, LC, Quadro series or PowerBook 140/170; an ImageWriter II and a standard four-color ribbon.

SoftArc, Inc.
801 Middlefield Road #102
Stanford, Ontario, Canada M1V 1Z9

Phone: (416) 299-4723 Fax: (416) 754-1856 Modem: (416) 699-2250
Challenge Yourself With TRISTAN

A digital pinball simulation for the Mac II series of computers.

TRISTAN features:
• Fabulous Sound
• Realistic Ball Action
• Tremendous Scoring Possibilities
• Superscore Contest
• Informative Manual

And Much More...

Colors Available: Black, Brown, Blue, Red, & Green

Antex Software Corporation
206 George Street
Belleville, Ontario, Canada K8N 3H4
613/967-7900 voice 613/967-7902 fax

Circle 584 on reader service card

Free AppleShare File Server!

The price/performance leader in AppleShare file servers is EasyServer from ShirtPocket Software. If you can find a faster and less expensive server we will give you a free EasyServer!

Copy 2 MB file to server 12.4 sec
Copy 2 MB file from server 6.6 sec
Suggested Retail Price $2900

EasyServers are dedicated servers that read and write standard Mac SCSI disks, CD-ROMs, etc. Just connect your Mac disk and network and turn on the power. Your files are instantly available to all on the network.

ShirtPocket Software
P.O. Box 40666, Mesa AZ 85274
602-894-1766 Fax 602-894-8136

AppleLink: SHIRTPOCKET
(contact us for info or free server details)

Circle 585 on reader service card

The Economical Inkjet Printer Refill.

Introducing JetInc."TM" from DGR Technologies
The refill unit for your Apple StyleWriter & Hewlett Packard DeskWriter inkjet printer

Colors Available: Black, Brown, Blue, Red, & Green

Black Refill Twin Pack
$15.99
1-800-235-9748
Tel (512) 476-9855 • Fax (512) 476-6399
DGR Technologies • 1215 West Sixth, Suite 205 • Austin, TX 78703

Circle 586 on reader service card

Direct Response. Direct Results.

"The Macworld Billboard has impressively increased the visibility of MacPalette II amongst users who want to print in FULL color."

Bryan Searing
Microspot

Circle 587 on reader service card

For your ad to appear in The Macworld Shopper, please call 800.888.8622
INCREDIBLE SPEED FOR YOUR LC/LCII

Your LC/LCII Can Exceed the Performance of a Mac IIci:
• 32 MHz MC68030 CPU/32K cache
• Optional 32 MHz FPU
• Supports System 7 virtual memory without additional software
• Independent control of internal/external caches
• Easy installation, no adapters required

Engineered and manufactured in the USA to be the highest performing, most integrated product for the dollar.

Bar Code

BAR CODE READERS
• Top rated by independent review!
• Optional Magstripe input
• 1 or 2 scanners per reader
• Complete with Laser Scanner - $1399
• Complete with Steel Wand - $299

FOR ALL MACINTOSH MODELS. EUROPEAN KEYBOARDS SUPPORTED
• Attaches through ADB as second keyboard
• Wand, CCD or Laser input
• 2 of 5, UPC/EAN, 128, MSI, Code 39

"The WDP Reader is highly reliable and easy to use." - Brett Fifeild, Bitstream Inc.

Call or write for more information, dealer inquiries welcome. MacBoard and Visa accepted.

1-800-995-2334
IN WA CALL 575-2334
FAX 216-375-3928 / APPELLEIEM EXTREME SYS
1305 INDUSTRY DR. TUKWILA, WA 98188

PORTABLE BAR CODE READERS
• Connects on keyboard or ADB
• Requires no additional program or port
• Does not affect keyboard or mouse
• Industrial quality, heavy-duty units

Also available:
SmartCard encoder/reader
Code 39 UPC & Printing Software
Portable Bar Code Reader

CIRCLE 460 ON READER SERVICE CARD

Computer Systems

ELITE COMPUTERS & SOFTWARE, INC.
Buy • Sell • Trade • Lease • Repair • Service
"Macintosh Remarketing Specialists Since 1987"

Lotus 1-2-3 / II Mac II 2-40 ...... $249 / $139
Mac Plus CPU / Mac SE-30 / Mac III 4-80 ...... $399 / $1849 / $219
Mac SE 2-20 / Mac SE FDHD 2-20 / IIcx 2-40 ...... $799 / $899 / $161
Mac Portable 1-40 / PowerBook all models available ...... $1199 / $1599 / $2499
Mac IIci / IIcx / QMS ColorScript 100 ...... $2499 / $3999 / $539
ImageWriter I / II WC / II LC
LaserWriter I Plus / IINT, INTX, III & 8 ...... $699 / $1199 / $2499

Costs, accessories, upgrades, warranty, and shipping rates, when using WOP portable bar code readers. Consult specifications, capacity, and weight allow you to calculate the costs that will vary with the work you need to do. Call ELITE Computers today for more information, to order, or to call 503-735-2666.

CIRCLE 441 ON READER SERVICE CARD

Fujitsu Drives

<table>
<thead>
<tr>
<th>Capacity/Sr.</th>
<th>330MB</th>
<th>425 MB</th>
<th>520 MB</th>
<th>680 MB</th>
<th>1.2 Gig</th>
<th>2.06 Gig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access</td>
<td>9s</td>
<td>9s</td>
<td>9s</td>
<td>16s</td>
<td>11.5s</td>
<td>11.5s</td>
</tr>
<tr>
<td>Warr.</td>
<td>5 Year</td>
<td>5 Year</td>
<td>5 Year</td>
<td>5 Year</td>
<td>5 Year</td>
<td>5 Year</td>
</tr>
<tr>
<td>Int.</td>
<td>$1099</td>
<td>$1149</td>
<td>$1229</td>
<td>$1259</td>
<td>$1899</td>
<td>$3199</td>
</tr>
<tr>
<td>Fat.</td>
<td>$1179</td>
<td>$1228</td>
<td>$1308</td>
<td>$1359</td>
<td>$1999</td>
<td>$3299</td>
</tr>
</tbody>
</table>

Call ProDirect 800-524-9952
International Orders Fax 612-935-8325 or Call 612-935-8201
30 Day Money Back Guarantee On All Drives

CIRCLE 443 ON READER SERVICE CARD

MacBYTE

Buy • Sell • Trade Macintosh Computers

Preowned Macs with Warranty
Cash For Your Mac or Peripheral
Low & High End Custom Setups

800-432-BYTE
Open Monday - Saturday
22775 PCH, Malibu, CA 90265

CIRCLE 428 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622
## CPU's

- **Silo 14** ThinLine... $379
- **E-Machines** T51... $399
- **RasterOps** 10/24... $1,199
- **NEC** SF60... $699
- **Sony** 14 "Thin Line... $699
- **RasterOps** 10" Color... $1,199
- **Radius** 20/24 Color... $1,099
- **Apple** II... $399
- **Claw II-400... $1,299

## MONITORS

- **Gotoh** BLP/etc... $8147
- **NewGen** F140P... $3,099
- **NewGen** F500.... $3,099
- **QMS PS-410... $1,149
- **NEC** Slicer Sr... $1,149
- **2500** 24 Bit PPA... $699
- **SuperMac** 17"... $3,999
- **Apple** II... $1,199

## PRINTERS

- Radius Printer 20... $799
- Parma 128 MB Critical... $399
- Panasonic 1 cc Optical... $399
- Epson 6.8 PowerPaint... $999
- E-Machines Future 24... $399
- E-Machines Future 24... $399
- PowerPoint 24 MB... $499
- Superhype 3 Series II... $1,499
- Radius Pric... $1,199

## STORAGE/MISC.

- Radius Robot 20... $799
- WordQuest II... CALL
- Radius Corp. MediaTime... $1,149
- Radius Corp. Print Board... $1,149
- Apple II... CALL
- Radius Corp. MediaTime... CALL

## DISPLAY CARDS

- **NEC**... $1,999
- **Sony** 14" Trinitron... $399
- **RasterOps** Trinitron... $5249
- **RasterOps** Trinitron... $5249
- **SuperMac** 17"... $1,999
- **SuperMac** 17"... $1,999
- **SuperMac** 17"... $1,999

## SCANNERS

- **UMAX** 2200... $799
- **800 X 600 DPI PostScript User... $2,499
- **Mueller** 16"... $999
- **RasterOps** Trinitron... $5249
- **600 X 600 DPI Postscript Laser... $2,499

---

**New Macintosh CPU's**

- **Sc. Sc30. Portatile**, Il. Cx. X. Cx. X.
- **Used & Demo Macintosh CPU's**
- **FastTrack 4 Ethernet Router... $1,199**
- **HP ScanJet 600 D1... $699**
- **Rasterizer Plus Upgrade ROM... $1,399**
- **Macs 600 me... $1,399**
- **Adobe** Type Manager... $34
- **MacDraw II... $279**

---

**T & J ENTERPRISES**

**PRESENTS**

**MAC MANIA**

Call for details.

**800...**

**WANTED: USED MAC's**

**WE BUY YOUR USED MAC EQUIPMENT FOR TOP DOLLAR, CASH WE SELL REFURBISHED**

**MAC'S AT DISCOUNT**

CALL FOR QUOTE.

**RENTEX INC.**

**CALL 800...**

---

**CRA**

**700 So. University Parks Dr.**

**Sausalito 350**

**Waco, TX 76706**

**NEW Macintosh CPU's**

- **Sc. Sc30. Portatile**, Il. Cx. X. Cx. X.

**USED & Demo Macintosh CPU's**

- **FastTrack 4 Ethernet Router... $1,199**
- **HP ScanJet 600 D1... $699**
- **Rasterizer Plus Upgrade ROM... $1,399**
- **Macs 600 me... $1,399**
- **Adobe** Type Manager... $34
- **MacDraw II... $279**

---

**Why Buy from Mac One?**

- **Family Owned & Operated Since 1987**
- **Top Value in Supplies & Hardware**
- **We Stand Behind Our Products**
- **Call for Free Consultation**

**mac One**

**The Latest Mac & Hardware!**

**Your #1 Export Source!**

**CALL 800...**

---

**For your ad to appear in The Macworld Shopper, please call 800.888.8622**
Let Mac•In•Stock Satisfy It!

Our competitively low prices include:

1. Service
   Work with a Mac pro, not an order taker. Expert help ensures the right choices for your needs and budget.

2. Selection
   Classic or Quadra. Custom or standard. Apple or third party. We'll help you build your system, your way.

3. Safety
   Mac•In•Stock is the only dealer who will bench test your system, and use double boxes for safe shipment.

4. Support
   Tech support is toll free. Repairs or replacements are handled via Federal Express (in and out at our expense).

Craving a Quadra?
We do more than just take your order. Ask for our Quadra Specialists.

800-944-6227
Fax: 305/321-0905  Int'l: 305/321-0904

Mac•In•Stock

For your ad to appear in The Macworld Shopper, please call 800.888.8622
Entire Macintosh Line
New and Used, Bought and Sold
Latest models in stock!

1-800-729-7031
Compare Our Prices, Quality & Service.

We'll pay cash for your Macintosh Equipment.

Call for Monthly Specials

We also offer

TI
H.P.
SONY
SYQuest
DAYSTAR
HARRIS LABS - "PERFORMER"

H.P.
NEC
RADIUS
QUANTUM
GCC TECH

QMS
RadiusOps
SUPERMAC
MASS MICRO

E-MACHINES
APPLIED ENG.

Used Mac Truckload Sale!

Mac Plus Upgrades

Upgrade your 128/512 for Mac Plus CPU only $399.
Upgrade 512k enhanced - Only $199.

LaserWriter Plus

LaserWriter Plus with 6-Meg 600 D.P.I. Xante Upgrade $1999.
Tech. Support 318-742-0546
FAX 318-742-2799

SE 1-20
$649.

(new in box)

(keyboard extra)

New Macs & Upgrades

Blowout Parts & Stuff!

Ilc to Quadra 700.......................... $1999.
Ilcx to Quadra 700........................ 2499.
Mac II to IIx....................... 2199.
Mac IIx to IIfx.......................... 1999.

8-bit video board $149.
IBM LocalTalk Interface board...49.
(everybody needs at least one)
Ilc or cache card....................... 99.
Portrait Monitor (gray-scale) 549.
LaserWriter II engine......... 1295.
Fujitsu 800k external floppy 79.

Mac Parts!

Shreve Systems 800-227-3971

CIRCLE 425 ON READER SERVICE CARD

CIRCLE 401 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622
## Catalog

### Computer Systems

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
<th>Memory Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>140/170</td>
<td>$137</td>
<td>CALL FOR LATEST PRICES</td>
</tr>
<tr>
<td>2MB</td>
<td>$232</td>
<td>CALL FOR LATEST PRICES</td>
</tr>
<tr>
<td>4MB</td>
<td>$333</td>
<td>CALL FOR LATEST PRICES</td>
</tr>
</tbody>
</table>

### Memory Upgrade

- **Memory Prices Slashed!**
- **Also Available:** Power Protection • SIMMs • Hardware & Software • Custom Design

- **PowerBook**
  - Model 140/170 compatible
  - 2MB $137
  - 4MB $232
  - 6MB $333

### Additional Information

- **Cache Card**
- **Accelerator Card**
- **Mac Portable RAM**

### Contact Information

- **Computer Revelations Inc.**
  - 1461 Lakeland Ave
  - Suite 5
  - Bohemia, NY 11716
  - Phone: 516-244-8590
  - Fax: 516-244-8594

- **Data Computer Center**
  - Tel: (310) 398-3300
  - Fax: (310) 391-2488
  - 3847 Grandview Blvd, LA CA 90066

### Offerings

- **New and Used**
- **Bought and Sold**
- **Data Computer Center**
- **Memory Prices Slashed!**
- **Cache Card**
- **Accelerator Card**
- **Mac Portable RAM**

---

**Mail order** can save you time—and money! For your ad to appear in The Macworld Shopper, please call 800.888.8622.
# SIMPLY THE BEST

**Service • Quality • Prices from the LLB Co.**

## Memory Upgrade

### Applied Engineering

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickSilver IIi</td>
<td>$219</td>
</tr>
<tr>
<td>QuickSilver IIi with FPU</td>
<td>$279</td>
</tr>
<tr>
<td>Transwarp SE</td>
<td>$799</td>
</tr>
<tr>
<td>Transwarp LC 33MHz</td>
<td>$919</td>
</tr>
<tr>
<td>Transwarp LC 40MHz</td>
<td>$1299</td>
</tr>
<tr>
<td>Transwarp LC 50MHz</td>
<td>$1399</td>
</tr>
<tr>
<td>Transwarp Accelerator 40</td>
<td>$1759</td>
</tr>
<tr>
<td>FastMath IIi</td>
<td>$119</td>
</tr>
<tr>
<td>FastMath Classic II</td>
<td>$1299</td>
</tr>
</tbody>
</table>

### NewLife

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>NewLife 16MHz Mac Classic Accelerator</td>
<td>$699</td>
</tr>
</tbody>
</table>

### Computer Care

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Rescue</td>
<td>$219</td>
</tr>
</tbody>
</table>

### Technology Works

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CacheCard 64K IIi</td>
<td>$145</td>
</tr>
<tr>
<td>MacIIi Adapter - 20MHz</td>
<td>$95</td>
</tr>
<tr>
<td>LC 512K VRAM</td>
<td>$95</td>
</tr>
</tbody>
</table>

### Bernoulli Disks

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>44MB Disk 3-pack</td>
<td>$265</td>
</tr>
<tr>
<td>90MB Disk 3-pack</td>
<td>$35</td>
</tr>
</tbody>
</table>

### CD ROM Drives

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toshiba CD ROM with Kit</td>
<td>$695</td>
</tr>
<tr>
<td>CD ROM Gallery NEC 36</td>
<td>$495</td>
</tr>
<tr>
<td>CD ROM Gallery NEC 73</td>
<td>$735</td>
</tr>
</tbody>
</table>

### Daystar

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal PowerCache 33mhz</td>
<td>$649</td>
</tr>
<tr>
<td>40mhz</td>
<td>$839</td>
</tr>
<tr>
<td>50mhz</td>
<td>$1049</td>
</tr>
<tr>
<td>FastCache IIi &amp; $64k</td>
<td>$299</td>
</tr>
<tr>
<td>FastCache IIi &amp; $64k w/FPU</td>
<td>$359</td>
</tr>
</tbody>
</table>

### Newquest Cartridges

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>44MB</td>
<td>$65</td>
</tr>
<tr>
<td>88MB</td>
<td>$115</td>
</tr>
</tbody>
</table>

### Miscellaneous

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quadralink</td>
<td>$182</td>
</tr>
<tr>
<td>Optima 32/Software</td>
<td>$149</td>
</tr>
<tr>
<td>LC 16MHz Math Co-processor</td>
<td>$75</td>
</tr>
<tr>
<td>Classic II 16MHz Math Co-processor</td>
<td>$75</td>
</tr>
</tbody>
</table>

### SIMMS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1x8x80</td>
<td>$35</td>
</tr>
<tr>
<td>1x8x100</td>
<td>$31</td>
</tr>
<tr>
<td>1x8x70</td>
<td>$35</td>
</tr>
<tr>
<td>4x8x70</td>
<td>$251</td>
</tr>
<tr>
<td>4x8x100</td>
<td>$106</td>
</tr>
<tr>
<td>4x8x80 Macl/Ix</td>
<td>$399</td>
</tr>
</tbody>
</table>

### Powerbook

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PB100-2MB</td>
<td>$199</td>
</tr>
<tr>
<td>PB140/170-2MB</td>
<td>$279</td>
</tr>
<tr>
<td>PB100-4MB</td>
<td>$369</td>
</tr>
<tr>
<td>PB140/170-4MB</td>
<td>$369</td>
</tr>
</tbody>
</table>

### MODEMS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quicktel Xebra Send/Rec Fax Modem</td>
<td>$195</td>
</tr>
<tr>
<td>Applied Engineering Mac LC Modem With V.42 Send/Rec Fax</td>
<td>$369</td>
</tr>
<tr>
<td>Lexus Turbo Modem</td>
<td>$888</td>
</tr>
<tr>
<td>Global Village Powerport Full Fax</td>
<td>$214</td>
</tr>
<tr>
<td>Global Village Teleport Full Fax</td>
<td>$214</td>
</tr>
</tbody>
</table>

### Fax Your Order 24 Hours A Day (206) 454-7302

### Compare Our Low Shipping Prices:

1. **$6** And up Overnight shipping by Airborne Express.
2. **$4** And up ground shipping by UPS.

- Orders received before 5:30 PM Eastern Time weekdays ship the same day.
- We export to most countries in the world.
- Prices subject to change.

### For your ad to appear in The Macworld Shopper, please call 800.888.8622
## Memory Upgrade

<table>
<thead>
<tr>
<th>SIMMs</th>
<th>Cache Cards, etc.</th>
<th>68030 25mhz Accelerators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 meg 70ns $37</td>
<td>68882 FPUs</td>
<td>Novy's Quik30 for Mac SE, Plus, and 512Ke</td>
</tr>
<tr>
<td>1 meg 80ns $33</td>
<td>16mhz/Mac LC $69</td>
<td>• Runs the speed of Mac IIci</td>
</tr>
<tr>
<td>1 meg 100ns $32</td>
<td>50mhz/Mac LC $199</td>
<td>• System 7/Virtual compatible</td>
</tr>
<tr>
<td>2 meg 80ns $69</td>
<td>Ilisi 64K Cache Card $159</td>
<td>• Add up to 16 Megs of RAM</td>
</tr>
<tr>
<td>4 meg 80ns $115</td>
<td>Ilisi 64K Cache Card $149</td>
<td>• $529 for 25mhz version!!</td>
</tr>
<tr>
<td>16 meg 80ns CALL</td>
<td>Ilisi 2-slot card &amp; 68882 $119</td>
<td></td>
</tr>
</tbody>
</table>

### Video Upgrades

- 4 bit to 8 bit Upgrade $24
- 256K Quadra VRAM $39
- 512K Mac LC VRAM $59

### Printer Upgrades

- T.I. MicroLaser 1 meg $59
- HP 2 Meg Upgrade $99
- HP 4 Meg Upgrade $199

### 68030 25mhz Accelerators

- Novy’s Quik30 for Mac SE, Plus, and 512Ke
- Runs the speed of Mac IIci
- System 7/Virtual compatible
- Add up to 16 Megs of RAM
- $529 for 25mhz version!!

### Accelerator/Video Combo

- Novy’s ImagePro for Classic, SE, Plus, 512Ke
- Unbelievably fast!!!
- System 7/Virtual compatible
- Add up to 16 Megs of RAM
- Optional Display: 15, 19, 21"
- • 16, 25, 33mhz speeds

### SYQUEST CARTRIDGES

**16 MEG SIMMS!**

<table>
<thead>
<tr>
<th>CARTRIDGES</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 MEG</td>
<td>$64</td>
</tr>
<tr>
<td>88 MEG</td>
<td>$116</td>
</tr>
</tbody>
</table>

### MACINTOSH

- 1 Meg SIMM $35
- 2 Meg SIMM $69
- 4 Meg SIMM $114
- 8 Meg SIMM $349
- 16 Meg SIMM $625

### QUADRA

- 4 Meg SIMMS $114
- 8 Meg SIMMS $349
- 16 Meg SIMMS $625

### POWERBOOK

- 2 Meg Card $175
- 4 Meg Card $299
- 6 Meg Card $369

### HARD DRIVES

- Quantum Internal $235
- 52 LPS $235
- 106 LPS $345
- 240 LPS $725
- 425 Pro $1275
- Maxtor Internal $299
- 80 Meg $299
- 120 Cheyenne $365
- 213 LXT $595
- 335 LXT $1299

### NewLife™

- 16 MH Accelerator Plus $569
- 16 MH Accelerator Classic $569
- 16 MH Accelerator SE $469

**WE WILL NOT BE UNDERSOLD!**

**800-486-2447**

Fax (714) 847-5043

7911 Professional • Huntington Beach, CA 92648

**For your ad to appear in The Macworld Shopper, please call 800.888.8622**
Memory Upgrade

Big Screen Color Video Display for the Mac PowerBooks.

Use standard color displays. BookView Imperial provides up to 19" color display from the PowerBook 140 or 170. Drives most standard and full page VGA, Apple monitors, NTSC and overhead projectors. Full choice of mono display monitors for the PowerBook 100.

Color yourself bold. Put your work on a big monitor, on the wall or on a conference room TV. Variety of connecting cables available.

Neat & tidy. BookView Imperial fits inside your PowerBook case, no external boxes or bags. The Apple 2 meg RAM card piggybacks on top. Provides 4 megs of RAM on board for total of 8 megs system RAM.

BookRam. Pick from 2, 4 or 6 meg RAM cards for the PowerBook. One card fits all.

Call for prices on 1 meg, 2 meg and 4 meg SIMMs, Softstep® and Two Step™ memory expansion modules, Pac RAM™ for the Portable, Video Mac Poc for the Portable, and Mac Rescue™ upgrade board for Enhanced 128K & 512K Macs.

Computer Care
Ford Centre, Suite 1180
420 North Fifth St.
Minneapolis, MN 55401
(612) 371-0061
(800) 950-CARE (2273)
Fax: (612) 371-9342
AppleLink: ComCare

Computer Care
Dealer Inquiries Welcome. Visa, MC, AMEX, Discover Accepted.

CIRCLE 565 ON READER SERVICE CARD

Mail order can save you time—and money!
The Macworld Catalog makes it easy to buy the products you need TODAY!

Pi n n a cl e  M i c r o. S on y. Ricoh  M icron  c l . Sy Qu es t. u nd l'LI  

**ZOOM Modems for Macs**
- Made in U.S.A. Fully Hayes*-compatible
- Free S/W, Cable & Shipping!

- 2400 bps modem AMX $179
- Fax modem 56K/64K 19.2K 2400 $299
- V.42bis Fax 7B/96 2400 EM 19.2K $169
- V.32bis Fax V.42b 19.2K/33.6K $399

**14" Color Monitor**
- Excellent quality
- For all Mac 1.2 with VIDEO $359

**HWH Microsystems**
- 800-673-0586
- Mac & User Welcome

For your ad to appear in The Macworld Shopper, please call 800.888.8622
17 Inch
256 Grayscale
$649

Includes monitor, video board, & cable!

20 Inch
C/N 20 Color
$1,499

Package!
Includes 30" Cinegag, C/N 20 monitor, video board, & cable!

20 Inch
Trinitron
$1,999

256 Color!
Includes Trinitron, video board, & cable!

20 Inch
Trinitron
$1,999

- 256 Colors
- Emergency
- Miscellaneous

24-Bit Color Scanner
$999

Color Displays with purchase of color boards:
NEW "Sweet 16" (m/256k/m324k/q)
20" RasterOps Color - Hi-Z
20" RasterOps Color - Dual Mode
21" RasterOps GrayScale
21" RasterOps Color - Hi-Z
RasterOps video boards & more!
NEW! RasterOps Prints/Board 24
RasterOps 24X1

RasterOps 3411
979
RasterOps 3411
479
RasterOps 34C
559
RasterOps 24M/34k
1,199
RasterOps 24S
629
RasterOps 24SY - Multi Media
789
RasterOps ColorCardboard 20M/34k
699
RasterOps ClearView/GSM
479
RasterOps Expresso Side Scanners 749
RasterOps TV Tuner
299
RasterOps ImagePack Still Compression 319

Color Engine
$999

As available with Color Studio LE and Scan Do software.
In million colors: Color engine $999 - B/W $499

Toshiba CD-ROM Players

$5,999 Complete

Color Optical Jukebox

- 3.5 Gigabyte Capacity per Laser Cartridge/Center
- Macintosh & IBM Compatible
- Solitaire Architecture Extra Library Software

Optical Interface allows this drive to interface with a large array of computers and other peripheral devices. Includes a choice of center: Laser Cartridge or Optical Drive. The Laser Cartridge also includes the CD-ROM CD-ROM Vista - Toshiba XM1321B 399
CD-ROM Vista - Toshiba XM1321B 579

24-Bit Color Scanner (100 VAC) 999
24-Bit Color Scanner (200 VAC) 1,099
Software Bundle 149

Special Purpose Scanner: For a limited number of the Toshiba XM1321B

A limited number of the Toshiba XM1321B is available for this scanner. The Toshiba XM1321B is compatible with all the features of the CD-ROM Vista.

$5,999

CD-ROM Vista - Toshiba XM1321B 579

RacerOps 3411
979
RacerOps 3411
479
RacerOps 34C
559
RacerOps 24M/34k
1,199
RacerOps 24S
629
RacerOps 24SY - Multi Media
789
RacerOps ColorCardboard 20M/34k
699
RacerOps ClearView/GSM
479
RacerOps Expresso Side Scanners 749
RacerOps TV Tuner
299
RacerOps ImagePack Still Compression 319

Color Engine
$999

As available with Color Studio LE and Scan Do software.
In million colors: Color engine $999 - B/W $499

Toshiba CD-ROM Players

$5,999 Complete

Color Optical Jukebox

- 3.5 Gigabyte Capacity per Laser Cartridge/Center
- Macintosh & IBM Compatible
- Solitaire Architecture Extra Library Software

Optical Interface allows this drive to interface with a large array of computers and other peripheral devices. Includes a choice of center: Laser Cartridge or Optical Drive. The Laser Cartridge also includes the CD-ROM CD-ROM Vista - Toshiba XM1321B 399
CD-ROM Vista - Toshiba XM1321B 579

24-Bit Color Scanner (100 VAC) 999
24-Bit Color Scanner (200 VAC) 1,099
Software Bundle 149

Special Purpose Scanner: For a limited number of the Toshiba XM1321B

A limited number of the Toshiba XM1321B is available for this scanner. The Toshiba XM1321B is compatible with all the features of the CD-ROM Vista.

$5,999

CD-ROM Vista - Toshiba XM1321B 579

RacerOps 3411
979
RacerOps 3411
479
RacerOps 34C
559
RacerOps 24M/34k
1,199
RacerOps 24S
629
RacerOps 24SY - Multi Media
789
RacerOps ColorCardboard 20M/34k
699
RacerOps ClearView/GSM
479
RacerOps Expresso Side Scanners 749
RacerOps TV Tuner
299
RacerOps ImagePack Still Compression 319

Color Engine
$999

As available with Color Studio LE and Scan Do software.
In million colors: Color engine $999 - B/W $499

Toshiba CD-ROM Players

$5,999 Complete

Color Optical Jukebox

- 3.5 Gigabyte Capacity per Laser Cartridge/Center
- Macintosh & IBM Compatible
- Solitaire Architecture Extra Library Software

Optical Interface allows this drive to interface with a large array of computers and other peripheral devices. Includes a choice of center: Laser Cartridge or Optical Drive. The Laser Cartridge also includes the CD-ROM CD-ROM Vista - Toshiba XM1321B 399
CD-ROM Vista - Toshiba XM1321B 579

24-Bit Color Scanner (100 VAC) 999
24-Bit Color Scanner (200 VAC) 1,099
Software Bundle 149

Special Purpose Scanner: For a limited number of the Toshiba XM1321B

A limited number of the Toshiba XM1321B is available for this scanner. The Toshiba XM1321B is compatible with all the features of the CD-ROM Vista.
### SyQuest Drives

**2-Year Warranty**

**Seagate 1.1**

| Model | Description | Price
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>44 MB SyQuest Cartridge</td>
<td>104 MB SyQuest Cartridge</td>
<td>109 99</td>
</tr>
</tbody>
</table>

**Fujitsu**

| 32 MB | 139 19 |
| 64 MB | 189 29 |

**MaxOptix**

| 80 MB | 199 99 |

**RICOH**

| 120 MB | 239 99 |

### Cartridges & Tapes

| Model | Description | Price
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>44 MB SyQuest Cartridge</td>
<td>88 MB SyQuest Cartridge</td>
<td>109 99</td>
</tr>
<tr>
<td>60 MB True Compatible Tape</td>
<td>109 99</td>
<td></td>
</tr>
<tr>
<td>160 MB True Compatible Tape</td>
<td>169 99</td>
<td></td>
</tr>
<tr>
<td>250 MB DC-6250 Tape</td>
<td>119 29</td>
<td></td>
</tr>
<tr>
<td>600 MB True Compatible Tape</td>
<td>169 99</td>
<td></td>
</tr>
</tbody>
</table>

**1.2 GB DAT 4 mm - Data Grade**

- 22 MB Gigabyte 44 Cartridge: 129 99
- 53 MB Gigabyte 34 Cartridge: 139 19
- 1.2 MB Gigabyte 32 Cartridge: 149 99
- 2.2 GB Gigabyte 32 Cartridge: 199 99

**5.25" Optical Plastic Single**

- 60 MB Gigabyte 32 Cartridge: 229 29
- 60 MB Gigabyte 52 Cartridge: 339 99
- 60 MB Gigabyte 52 Cartridge: 399 59
- 260 MB Gigabyte 32 Cartridge: 499 29

**600 MB Gigabyte 32 Optical Glass Sphere**

- 109 99

**1.0 GB Optical - Glass, Maxoptix**

- 229 29

**600 MB Optical - Plastic, Pioneer**

- 199 19

### Pocket Portable & Transportable Drives

**105 MB Sierra Portable**

- 105 MB Sierra - Quantum, 25 ms., 119 99
- 105 MB Sierra - Maxtor, 17 ms., 109 99
- 240 MB Sierra - Quantum, 10 ms., 179 99

**Vista**

- The Vista is a must-have for regular and rapid data transfer. Simple, rugged, and compatible, and it transfers all you need. Vista is a perfect fit for the Quantum HPN drives.

### Hard Disk Drives - Internal & External

**Seagate**

- 90 MB Pocket Portable: 999 99
- 120 MB Pocket Portable: 539 99
- 150 MB Pocket Portable: 739 99
- 240 MB Pocket Portable: 1199 99

**Fujitsu**

- 226 MB Portable: 139 99

**Maxtor**

- 70805, 139 99

**Quantum**

- 60 GB - EPS 52, 9 ms.: 229 99
- 105 GB - EPS 105, 9 ms.: 349 49
- 120 GB - EPS 120, 10 ms.: 429 99
- 220 MB - EPS 240, 10 ms.: 669 79

**MicroScience**

- 64 GB - EPS 52 LP, 10 ms.: 299 29

**IBM**

- 80 GB - Archive DAT: 599 99

### Archive DAT, Exabyte & Teac Tape Drives

**2.0 Gig. Transportable Backup Solution**

- 600 MB Tape Drive - TEAC: 799 99
- 250 MB Tape Drive - Archive: 599 99

**1.359**

- 2.0 GB Tape Drive - Exabyte: 1,359 99

**Price, Service, Performance, Selection and Quality**

**Quality**

- We offer more than 500 different products for the IBM, Macintosh and SUN. From 120 Megabyte portable hard disk to 24-bit Trinitron video packages, we have it all for what you need. Call for 1992 catalog.

**Call or FAX for Fast Service!**

We will BEAT any competitor's price for comparable product - call for details!

### Relax Technology, Inc.

**1101 Whipple Road Union City, CA 94587**

**FAX:** 510-471-6267

"Providing exceptional value and an extra measure of service - since 1978!"
CRA Systems

600 x 600 dpl LIQUIDATION
PostScript
$2495

- 7 megs of Ram
- Canon 8ppm Laser Printer Engine
- Advanced AMD 29000 RISC Processor
- Up to 100 times faster than the INT
- LSI (synchronous PC or MAC Printing)
- AppleTalk, RS232, MC68010 Interface
- Dual Page Processing
- $2495
- 1-800-755-9000
- 1-817-754-2120
- See our other ad under Computer Systems

CRA Systems

Wherever the market goes, Macworld is there first!

Software

Astrology

McHoroscope

Be your own astrologer, for fun or profit.

Produce amazing astrological reports for friends and family. $199.50

McHoroscope Chart interpreter produces beautiful natal charts plus 15- to 17 page interpretations. Professional astrologers charge $50.00 and more for similar reports. Excellent study guide for students and great fun for parties and get-togethers.

- Astrology for the Macintosh from Time Cycles Research
- Write or call for free brochure
- Time Cycles Research 27 Dummer Rd Waterford, CT 06385
- (203) 444-6641

CIRCLE 447 ON READER SERVICE CARD

Bar Code

Mac-Barcode


$149

Version 1.4 for Apple Macintosh

1-800-733-7592
DATA CAPTURE INSTITUTE - Fax 617-682-5012
10 Old Newport, Rehoboth, MA 02769

CIRCLE 562 ON READER SERVICE CARD

Bar Code Generation Software

The best software application available in the market today allows you to create high precision, quality film masters. Unique quality control features include output adjustment and a film master verifier. Call BCS, the bar code experts, today to find out why our customers say our package is the most sophisticated; yet, the easiest to use.

800-334-0343
Fax 404-334-0343
INT'L 404-399-7837

CIRCLE 479 ON READER SERVICE CARD

Bar Code Fonts

...the people at Bear Rock are flatt-out experts on the topic of bar codes and produce products of exceptionally high quality." - Personal Publishing Magazine, 5/91

- Code 39 • UPC/EAN • ISBN • Interleaved 2 of 5 • POSTNET/FIM
- Compatible with almost any application • $95-$525
- CodeScan 3000 bar code readers • 5 year warranty • $395

Call
1-800-BEAROCK
916-622-4640
Fax
916-622-4775

BearRock

099 Enterprise Drive • Diamond Springs, CA 95619

CIRCLE 563 ON READER SERVICE CARD

Reach your audience when it counts.

Catalog readers are ready to buy!

For your ad to appear in The Macworld Shopper, please call 800.888.8622
Build a Winning Business Plan
Proven with Bankers, SBA, Investors and Senior Management:
It's easier to edit than to write from scratch.
Over 90 pages of headlines, started sentences and fill-in-the-blank paragraphs are already organized and typed for you -- simply edit using any Mac+ (or larger) and your favorite wordprocessor. Financials, pre-formatted in Excel, contain the formulas for easy calculation. Hints and suggestions throughout guide you to completing your plan. • NOT a Hypertext Application • Comprehensive, 120+ Page Business Primer • Complete 5-year financial projections • Over 55,000 Sold! • 30 Day Money Back

Get MacMechanic™
Detailed & accurate 2-D components for engineers, drafters & illustrators. Save hours of drafting time. Thrust gears, timing belts & pulleys, roller chain & sprockets. Recycle to change D.P. & create with Primitives™. Library of ball bearings, ret. rings, screw heads, thds, set screw, etc. Over 600 views. 4 HD disks. $128 ppd + NY 7% Sales Tax. Checks or P.O.'s only. Specify Claris CAD™, MacDraw II or Pro™. Bare Hill Software Co. 97 Eastern Blvd. #254 Canandaigua, NY 14424-2220 716/534-5440 Phone 716/534-4223 Fax

"WETLANDS" - CD-ROM
Wetlands Clip Art: 350 MB Nature CD-ROM showing the unbelievable beauty of Wetlands! 1,111 Animals (Amphibia, birds, insects...), plants and 55 animal sounds! PICT, 8-bit and 24-bit JPEG images. All this catalogued into one high speed environment, Mariah, the first true multimedia organizer! Search and Retrieval in 5 languages (Eng., Fr., Ger., It., Lat.). Photos: Felix Labhart $299.
Clip Art

PostScript Art

Wide topic range of more than 500 versatile images and symbols in PostScript file format for use with Illustrator, FreeHand or compatible drawing programs. Use to create logos, illustrations, or as clip-art. Includes handy reference catalog for easy previewing and selecting. All for only $95-

PLUS-FREE BONUS DISK OF TYPE 1 PICT FONTS

Check M.O. / MC/Visa / 100% Money Back Guarantee

ZETAGRAFIX (415) 433-9261

100 FIFTH STREET, SAN FRANCISCO, CA 94111

CIRCLE 417 ON READER SERVICE CARD

MAPS!

Professional Quality Maps for Graphic Design

Professional, Reproducible, High Detail, Water Resistant, World, Continental, Major City Maps, Major Airports, Major Highways, Railroads, Oil Pipelines, Business, and more...

For FREE maps or symbols in PICT, PostScript, or Windows 3.1 for use with QuarkXPress, Adobe PageMaker, or Microsoft Word, request our free catalog.

Fireworks

For FREE catalog with Sample Maps

800-334-4281

CIRCLE 417 ON READER SERVICE CARD

Perfect Body Parts
99¢ Each.

They're yours for the asking with MediClip, the first complete medical anatomy and art library for your computer.

- The most flexible Medical Clip Art available
- Reduce or enlarge images with no loss of clarity
- Effortlessly crop, cut and eliminate any part of any image
- Easy to use with virtually any word processing, desktop publishing, and graphics software
- Images cover all major anatomical systems and organs
- All 300 images produced by top medical illustrators

Order now and receive each volume of 100 images for only $99.95

Choose from: Anatomy Volume 1, Anatomy Volume 2 or Medical Art & Instruments Volume 1

Save even more by buying 2 or 3 volumes at once.

Call 1-800-998-8703

TeleFinder™

The leading Macintosh Bulletin Board System in business and education. First in quality and performance. "The most useful BBS we've seen" MacUser (49). • Multi-user, E-mail, ZMODEM file transfers, conferences, find file, and graphic user interface • Use modem or AppleTalk with NetConnect • Supports Mac and PC users • Comm Toolbox and System 7 savvy • TeleFinder is $425.95 for unlimited users includes host and user communication software. Call for free demo

Spider Island Software

4790 Irvine Blvd #105, Irvine, CA 92720
tel (714) 556-0200 fax (714) 669-1303

bbs (714) 331-1255

CIRCLE 542 ON READER SERVICE CARD

Communications

Direct Response.
Direct Results.
The Macworld Shopper

For your ad to appear in The Macworld Shopper, please call 800.888.8622

For your ad to appear in The Macworld Shopper, please call 800.888.8622
EDUCATIONAL

THE ABSOLUTE BEST IN TESTING!

LXR-TEST™ 4.1 is the most advanced and complete testing system available for your Mac. It includes:
- Item banking
- Test generation
- Character styling
- Scoring & analysis
- Paper & interactive
- Mark reader support
- Commercial banks
- Spelling checker

Highest rated software available in various editions to match your testing needs. Fully guaranteed. Pricing from $148. For complete brochure & free preview disk, call, write, or fax: Logic Xlension Resources, 9851-G Business Center Drive, Rancho Cucamonga, CA 91730

(714) 980-0046 Fax: (714) 987-8706

CIRCLE 407 ON READER SERVICE CARD

SAVE $200+ ON SITE LICENSES

Until July 15, 1992

MAKETEST™ organizes your questions and prints tests and answer keys easily. CLASSMASTER makes grading and attendance simple.

ALGEBRA I HOMEWORK TUTOR helps students master algebra by checking their work and providing hints as needed.

CIRCLE 470 ON READER SERVICE CARD

ENTERTAINMENT

For the Businessman on the "Go"!

"Learning to play Go well is tantamount to a senior-level course in strategic thinking. "

Greg Janose, United Picture Syndrome 12/1/92

(800) TOYOGO-9

P.O. Box 27729

Hollywood, CA 90027

(888) 666-6519

See your AEC/Apple Dealer or call 1-800-669-6574

OR FAX 415.752.6506

255 Fouth Avenue, N

San Francisco, CA 94118

CIRCLE 475 ON READER SERVICE CARD

GENEALOGY

Family Heritage File™

Most powerful and easy genealogy program on Mac. Rated "BEST" by Macworld. Designed by genealogy profs.
- Enhanced • Fully Relational • Graphic Pedigree, Family Group, Individual, Marriage, Surname • Unlimited History

Call for special Family Heritage Bundle.

Star-Com Microsystems

Windsor Park East

25 West 1480 North

Orem, UT 84057

801/225-1480

Family Roots™

Do it YOUR way! Huge variety and capacity for your family history. Make pedigree charts, descendants charts, person sheets, group sheets, indexes and much more. Customize to your own preferences. Standard Mac interface. Call for FREE information. Satisfaction guaranteed. MC/Visa/AE.

Quinsept

Box 216

Lexington MA 02173

617/661-2930

800/637-ROOT

GRAPHICS

FREE CLIP ART & FONTs

TRY US! Get 274 of our best-selling clip art images, or 56 of our best fonts - FREE! 6/3.5" disks per pack. Credit Cards only!

PAY $5.00 SHIPPING / PACKAGE

SMC SOFTWARE PUBLISHERS

819 931-8111 EXT 511

CIRCLE 488 ON READER SERVICE CARD
CADMOVER®

ACCURATELY TRANSLATES

Bezier Curves, Bezier Surfaces, B-Spline Curves, B-Spline Surfaces, Circles, Circular Arcs, Ellipses, Elliptical Arcs, Parabolic Arcs, Hyperbolic Arcs, Composit Curves, Straight Lines, Hatch Patterns, Arrowheads, Leaders, Dimentioning, Line Weights, Pen Colors, Fill Patterns, Hatch Patterns, Plane Surfaces, Hermit Curves, Hermit Surfaces, HSL Colors, RGB Colors, CMYK Colors, Dashing Styles, Polycurves, Subfigure Definitions, Subfigure Instances, Subfigure Arrays (circular), Subfigure Arrays (rectangular), Witness Lines, Planes, Points, Ruled Surfaces, Surfaces of Revolution, Tabulated Cylinders, CSG Spheres, CSG Torii, Mesh Entities, UCS Data, Die Cut Bridges, Mirror Attributes, Flip Attributes, Stroke Attributes, Text, Freehand Curves, Rectangles, Round Rectangles, Polygons and Many More...

USING THESE FORMATS

• IMPORT
  IGES
  CGM*
  DXF
  HPGL*
  PICT
  Adobe Illustrator
  EPSF
  DREAMS
  MacDRAF
  MiniCAD
  MiniCAD+
  MACDRAW
  Super 3D
  Sculpt 3D
  3DG
  MacConcept
  DDES2/T8.6*
  FOCUS
  ZOOM
  STL*
  Archirion II
  Gerber Plotter*
  MACDRAW II

• EXPORT
  IGES
  CGM*
  DXF
  HPGL*
  PICT
  Adobe Illustrator
  EPSF
  DREAMS
  MacDRAF
  MiniCAD
  MiniCAD+
  MACDRAW
  Super 3D
  Sculpt 3D
  3DG
  MacConcept
  DDES2/T8.6*
  FOCUS
  ZOOM
  STL*
  Archirion II
  Gerber Plotter*
  MACDRAW II

*Add-on to CADMOVER

KANDU Software Corporation
703.532.0213

MACCLAIMCHEK™

Health Insurance Tracker

• Claim status by person, plan, or item
• Multiple coverage multiple persons
• Reports audit trail for claimed, unclaimed & paid: unpaid items
• Multiple plan carry-over
• Add-on modules for claim form pruning

$44.99

Developers of software for

CIRCLE 449 ON READER SERVICE CARD

MACTRAN PLUS Ver. 4.0


DCM Data Products
610 One Tandy Center
Fort Worth, TX 76102
817/870-2202
817/336-2416 Fax

For your ad to appear in The Macworld Shopper, please call 800.888.8622
**Languages**

**ORTRAN on Your Desktop**

No need to wait for time on the "big" computer any longer. Language Systems ORTRAN lets you run the same high performance FORTRAN programs at your desk. Full integration with System 7, VAX-compatible extensions, built-in user interface, automatic backgrounding, and direct code generation for the Mac II family make this compiler the most powerful FORTRAN for the Mac.

Language Systems Corp.
141 Carlisle Drive
Alexandria, VA 22070-4802
703/478-0181
703/689-9593 Fax
800/2LANGSY

---

**Medical**

**Medical Office Mgmt.**

TessSystem™ software for insurance and billing. Our $1295 package out-performs software selling at three times that price. Expandable line to grow with your needs. Call for product literature and DEMO software today! New modules include electronic claims and multi-user for Mac networks.

Wabash Medical Resources, Inc.
8335 Allison Pointe Trail, Suite 310
Indianapolis, IN 46250
317/579-3900

**CareTracker™**

• Patient Care Support System
• $529 comprehensive package featuring a robust clinical database, powerful search and report, progress notes, Artificial Intelligence for "due" status and drug interactions, flow sheets, problem lists, decision analysis, remote modem access, medical literature database and much more. Highly intuitive. Computerize your PRACTICE, not just your office.

Med4th Systems, Ltd.
716 East Carlisle Avenue
Milwaukee, WI 53217
414/963-1985 Voice/Fax

---

**Music/MIDI**

**MacAnatomy™ MacSurgery™**

...an electronic atlas of Anatomy in 4 vol. on disk in MacPaint™ format. Easily altered & copied to any program via the clipboard. Ideal for students of Anatomy in all the health & legal professions.

...is a HyperCard™ stack w/multi-choice quest & ans. Detailed discussions & documents are provided. Ideal for continuing education & board prep.

MacMedic Publications
5805 Westheimer
Houston, TX 77057
713/977-2655
800/477-0717
713/784-3759 Fax

**The Macworld Shopper Catalog**

Lottery

'Hitting the MacJackpot!!!'

-MacLotto® NOW in its 3rd year! With over $8.2 Million already won...
-MacLotto® the most successful Lotto gaming system avail. Over 1500 built-in, expert system rules increase YOUR chances of Winning Millions More! Numbers up to 604% MORE likely to be elected. Patented Odds Improvement engine works with all Lotteros, All Keno's & All MacINTOSHI MC/VISA $99.

J.S. Math Labs (YES! System 7.0)
18 Main Street
Concord, MA 01742
800/PLAY-SIX • All Lotteros
508/653-9193 Fax
517/431-5922 Direct

**Multimedia**

**THE MULTIPLE MEDIA TOUR**

Over 1500 high quality multi-media resources on one CD-ROM! Save time and money! A must for serious developers!

Audio Visual Group
398 Columbus Ave. Ste. 315
Call or write for free demo disk
Boston, MA 02116-6008
(617) 381-1699

**Music/MIDI**

**Compose yourself $99,-**

Complete "How To" Composing Package
•8 Track Sequencer • Chord Computer • Composer Strategies HyperCard Stack • Cassette Tape • Complete Composition Manual • Call for Details

800-MAC-BEAT
505-473-4929 PAX 505-473-4927

**DIGITAL**

Call Now! DIGITAL

Hard Disk Recording • DAT Machines • MIDI Instruments
Cod: Mark of the Unicorn Passport • Dr.T's Detective Digitiser Roland • J.L. Cooper and more...

800-MAC-BEAT
505-473-4929

CIRCLE 412 ON READER SERVICE CARD

---

For your ad to appear in The Macworld Shopper, please call 800.888.8622
Music/MIDI

Interactive MIDI Tutor
800-824-4788
$119

Quality Assurance

SoftPolish
Quality Assurance for Macintosh developers!

- Avoid Embarrassing Errors
- Spell Check Resources
- Detect Interface Problems
- Generate Audit Logs
- Improve Software Quality

Language Systems Corp.
(800) 2-LANGSYS
(703) 689-9593 fax

CIRCLE 445 ON READER SERVICE CARD

Nutrition

MacDINE® Perfect for a Good Diet
Which fast food burger has more fat?
How many calories are in your chocolate chip cookie recipe?
Is there enough fiber in your diet?
What foods have calcium besides milk products?

DINE Systems, Inc.
716/688-2492

CIRCLE 446 ON READER SERVICE CARD

Property Management

Property Management
Comprehensive software for managing residential, commercial properties and condo associations. Includes check writing, recurring expenses, financial statements, complete management reporting and a full general ledger for $1,195.

Yardi Systems, Inc.
813 Redrick St.
Santa Barbara, CA 93103
805/966-3666

Mac Landlord
Easiest-to-use property management software for only $399. Designed by property managers for all kinds of rental properties. Includes recurring income and expenses, check writing, account balancing, transaction ledgers, maintenance records, printing tenant notices, full menu of management reports. Password protection. Free telephone support. Demo available for $25, credited to purchase.

Labana Management Company
P.O. Box 2037
Dearborn, MI 48123
313/562-6247

CIRCLE 465 ON READER SERVICE CARD

Programming Tools

Macintosh

Cross Assemblers

μASM™ Cross Assemblers for the Macintosh™

- Text Editor, Cross-Macro Assembler and Communications Facility in a Complete Integrated Development Environment
- Cross-Assemble, Link, and Generate OBJ Files on a PC
- FREE 30-DAY TRIAL

$149.95 ea
plus S&H

Available for most 8-bit microprocessors.

P.O. Box 2088
Lake Oswego, OR 97035
(503) 620-3001

CIRCLE 448 ON READER SERVICE CARD

Public Domain

6/3.5" DISKS FULL OF VIRUS FREE SOFTWARE

Games • Religion • Utilities
- Education • Hypercard
- Fonts • Graphics and more!
- Credit Cards only!
- Satisfaction Guaranteed

Pay $5.00 Shipping / Package
Keep Your Macintosh Virus Free!!

SMC Software Publishers
819 931-8111 EXT 511

CIRCLE 447 ON READER SERVICE CARD

Religion

Church Data Master Plus

Real Estate

REAL ESTATE SOFTWARE

MBEK Corporation, the nation's leader in Real Estate Software for the Mac is offering: THE TEN MINUTE PROPERTY MANAGER ($395/$595), PRO ANALYSIS, investment analysis ($295) & THE REAL ESTATE EDGE, client database, marketing, farming ($395) Check/MC/VISA. MIBEK CORPORATION 31 Parker Way Santa Barbara, CA 93101 805/963-7181 805/963-7178 FAX

CIRCLE 449 ON READER SERVICE CARD

Sales/Marketing

Sell More, Work Less!!!

MARKET MASTER AUTOMATES the sales follow up you don’t have time for and keeps the contacts happening! More than a mere contact manager, it’s a SALES LEAD HANDLER! You get unmatched simplicity and maximum control. Version available for one rep or a whole sales force! Six years on the market — everything works. 30-Day money-back guarantee. Demo Disk $10.00.

Breakthrough Productions
210 Park Avenue
Nevada City, CA 95959
916/265-0911
916/265-8036 Fax

CIRCLE 450 ON READER SERVICE CARD

Scientific

The Mathematician's Assistant

- Unlimited data length
- Extensive analysis
- Incremental fast
- S$23, VISA & MC
- High resolution printing
- 30-Day guarantee

WaveMetrics
(503) 650-3001
P.O. Box 2038
Lake Oswego, OR 97035

CIRCLE 432 ON READER SERVICE CARD

For your ad to appear in The Macworld Shopper, please call 800.888.8622
Scientific

MacPhase®

Unlimited 1D and 2D data size
Many Plot Types such as 3D Wireframe/Surface
Import/Export many file types
1D & 2D FFTs
Windowing & Filtering
Color Editor
Supports Plug-Ins

The Otter Solution

10 Limklin Rd., Whitesboro, NY 13492
(315) 768-6221

Full Application $159.00
10 day guarantee
(315) 768-6221

CIRCLE 470 ON READER SERVICE CARD

Computer Repair

MAC REPAIR
Mac Shop Northwest

Apple™ Certified Technicians
One-Day Service Turnaround
Hard Disk Repair & Data Recovery
Up to 75% below Dealer Rates
Component-Level Repairs
Expert Advice and Prices by Phone
Power Supplies & Logic Boards
Lifelong Repair Warranty

On many repairs. VISA/MAX. Fast: edition. Limited availability. We can upgrade Apple™ products.

1-800-MAC-SHOP

CIRCLE 515 ON READER SERVICE CARD

Sign Making

"OVERNITE" US YOUR "Mac" DESIGNS...

...AND WE WILL SEND YOU ONE "LARGE" 4 COLOR PRESENTATION BLOW-UP THE NEXT DAY!

Order today and we will send you an 8" x 10" 4 COLOR "HANDOUT" FREE!

For more information, check us and fax back to:
1-708-392-3989
SEND ME A BROCHURE

NAME
COMPANY
ADDRESS
PHONE

SCANGRAFICS 1-708-392-3989

CIRCLE 406 ON READER SERVICE CARD

Data Recovery

"Data Crash! ... We're Going In!!!"

7595 S. E. Blvd. 1, Ste. B
Hyattsville, MD 20782

800-765-9292
407.586.0111

CIRCLE 452 ON READER SERVICE CARD

Data Conversion

DriveSavers™

Macintosh Data Recovery
Repair any Mac Hard Drive
Optical/SyQuest Recovery
Fast Nationwide Service

30-D Pamarin Way
Novato, CA 94949

415.883.4232

CIRCLE 516 ON READER SERVICE CARD

Continued...
Data Conversion

Convert UNIX from/to Mac & DOS
OPTS™, an easy-to-use application, translates documents from UNIX troff, nroff or mm macro format into Mac or DOS RTF...and vice-versa. No more time wasted in hand conversion! Yes, OPTS does tables. The cost? Only $179 + S&H. AM/EX accepted. 30-day money back. Call today.

Systems Design Associates
1465 Route 31
Annandale, NJ 08801
908/730-7627
908/730-6966 Fax

Slides

Slide Imagers
Any Output, Any Format, Any Software, 24-hour service: Only $4.95

Slide Imagers, Inc.
1900 Littlefield Ave.
Dallas, TX 75228

Laser Recharge

TONER cartridges!
BETTER THAN NEW!
• 20% MORE TONER
• DURABLE PRINT
• 100% GUARANTEED
Wilpon Products Corp.
2057 Willow Ave., P.O. Box 4244
Palo Alto, CA 94303

Accessories

Cases

Powerbook Protection!

MacLuggage™ is also available for the Macintosh LC, IIsi, Classic and others. Sold through Fine Dealers Worldwide. 1-800-241-2122

Diverseied Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

Desktop Publishing

YOU CAN CREATE & MARKET YOUR OWN MAGAZINE!

Here's a book that explains step by step how to get into the publication business. A Boston U. journalism professor tells how he started a monthly magazine that paid for itself in less than a year. Written in easily understood language, the well-illustrated book also details the basic hard/softwares required and shows how to use them. Publish Magazines & Newspapers With A Macintosh Computer, ISBN 0-89630669-3 $4.49

Harriss Smith

Disk Duplication

DUPLICATION FROM $.59
HIGHEST QUALITY MEDIA

MSDOS duplication from $.59(5.25) and $.85(3.5). Prices go even lower as you continue to order:

• Duplication + 100% Verification
• Custom Labels/Sleeves/Maties
• Custom Packaging & Assembly
• Colored Media Available
• Special Rates For Demo Software & Site Licensing
• Educational Discounts Available
• 24 Hour Turn-Around
• Guaranteed Products

800-255-3142

Diverseied Systems Group, Inc.
PO Box 1114, Issaquah WA 98027

For your ad to appear in The Macworld Shopper, please call 800.888.8622
Cases

MacSac

MacSac PowerBook, Classic, SE, LC, Stylewriter, and others.

For a dealer nearest you call:
508-674-0860 or 800-343-3388

CIRCLE 423 ON READER SERVICE CARD

Converters

TAKING MAC OVERSEAS?
We've Got
220V/115V Converters
All Wattages

Your Converter &
Cable Connection
Source!

Cables • Books • Computer Batteries
No. California's Largest "In-Stock"
Computer Supplies & Parts Inventory

(800) 321-4524 (CA)
(800) 548-7135 (US/Can)

CIRCLE 427 ON READER SERVICE CARD

Covers

DUST COVERS
100%
COTTON CANVAS

MAC, SE, II, & PRINTERS
Belgian w/ Grey Trim Breathable Static-Free!

NEW! Seal-Skins
For Keyboards

1-(800) 826-5761
Int'l:(415) 759-1466 Fax: (415) 564-0506
Contemporary ComputerWor 1320-36th San Francisco 94122

CIRCLE 407 ON READER SERVICE CARD

Furniture

NEW!

“The Best Mac Desk Ever”
MacFriends 1992

• Ergonomic
• Space Saving
• Strong
• Many Configurations

FREE CATALOG! 800-688-2446

CIRCLE 402 ON READER SERVICE CARD

Expand your memory—buy through The Macworld Catalog.

For your ad to appear in The Macworld Shopper, please call 800.888.8622
Release Your Imagination

Experience the Power of Multimedia Computing at the 6th Annual CD-ROM Expo

September 30 - October 2, 1992 • World Trade Center • Boston

Release yourself from the limits of conventional computing. Discover new ways of managing information with unprecedented ease and efficiency. From indexing and retrieval to developing and publishing, to the multimedia mix of text, image and sound, CD-ROM gives you the power and the ability to reach new markets, and do more in less time.

Find out how at CD-ROM Expo.

You'll see the advantages of optical technology, whatever the environment you work in. The versatility and ease of CD-ROM allows you to cruise through complicated tasks of researching, editing and presenting information. You have complete control over publishing, engineering, manufacturing, and many other mission critical applications.

At CD-ROM Expo you can see how optical technology can work for you by visiting these exhibitors: 3M Optical Recording, Dataware, EDUCORP, Fulcrum, Hitachi, IBM, Meridian Data, NEC Technologies, Northern Telecom, Pioneer, Sony, Toshiba, and many more. You'll experience first hand the wide range of applications available, as well as the hardware, software, development systems, and multimedia platforms that makes them possible. Plus, our outstanding conference program offers unique insights on the latest technologies and markets, with experts in the field sharing their knowledge and experience. Find out more about CD-ROM Expo and get a FREE Exhibits-only ticket by returning the coupon below. And make your plans now to experience the technology that's as unlimited as your imagination.

MACWORLD  MPC WORLD ETA
In association with Macworld magazine, MPC World and Emerging Technology Applications.
Turn to the Product Launch Section of Macworld for information on the new products in the Macintosh industry.

This is the premiere showcase for new product launches or relaunches. Look to the Macworld Product Launch section—your source for the newest Macintosh products.

Call your account executive for more details on advertising in the Macworld Product Launch section! (415) 243-0505

**BÉZIER BP3670**

C-Size PostScript™ Language Compatible Printer

- Up to 17-by-22 inch printing
- Ledger, letter, legal and continuous form paper handling
- High resolution at 360 x 360 dpi for crisp quality
- Prints from any application
- Connects directly to SCSI port
- Mac®, PC® and Unix® versions available

Bézier Systems, Inc.  
1190 Saratoga Avenue  
San Jose, California 95129  
(408) 345-0345

All brand or product names are trademarks or registered trademarks of their respective companies.
These NEC bundles include hardware, driver software, cables, amplified stereo speakers, and educational CD-ROM titles.

Your choice of NEC drive, 8 educational CDs, and stereo speakers as low as $499!

NEC CD Gallery - Get the illustrated Encyclopedia, Time Table of History, World Atlas, Shakespeare, Sherlock Holmes, Birds of America, and Mammals with:

NEC CD-ROM #36 $1977, $575 or with NEC CD-R 73 #1978, $549

12 CDs, speakers, and an NEC drive $575

NEC CD Gallery Plus - includes all of the CD-ROMs above PLUS Shakespeare, Sherlock Holmes, Birds of America, and Mammals for just $199.99.

Save over 5720! $159.99

DTM Bundle - Save $400
Get Ocean Imagery, People at Leisure, International Graphics Library, and The Desktop Publishing CD-ROM for only $199 when you purchase any CD-ROM drive or drive bundle in this ad.

7 CDs with any drive purchase for $199.

Choose from any of the CD-ROM drives below and get the illustrated Encyclopedia, Time Table of History, World Atlas, Shakespeare, Sherlock Holmes, Birds of America, and Mammals for just $199.99. Save over 5720! $159.99
Other Paint Programs Pail by Comparison

Fractal Design Painter™ duplicates traditional tools and textures in 24-bit color for expressive, natural results. Use one of Painter's dozens of drawing and painting tools, like charcoal, felt pens, crayons, pencils and oil brushes. Choose cotton bond, canvas or others from its palettes of paper. Paint immediately with the brushes provided, or design your own, by changing size, angle and thickness of stroke. Painter is the ideal program for fine artists venturing into color desktop graphics, for business professionals to add artistic flair to slides and presentations, for designers to create original artwork on their computer, or for anyone to clone an existing image in outrageous new styles (that's how we made the four colorful cans above; pretty nifty, eh?). Painter runs on the Macintosh® and under Windows™ 3.0. Painter supports Wacom, Kurta and CalComp pressure-sensitive styluses. Just look for the paint can.
Best-Sellers

JULY 1992

Business Software

77 1 1 Microsoft Excel
Microsoft Corporation
86 2 2 Microsoft Word
Microsoft Corporation
8 3 3 Microsoft Office
Microsoft Corporation
7 8 4 MacDraw Pro
Claris Corporation
34 4 5 Quicken
Intuit
38 12 6 WordPerfect
for the Macintosh
WordPerfect Corporation
1 — 7 1-2-3 for Macintosh
Lotus Development Corporation
73 5 8 Aldus PageMaker
Aldus Corporation
7 7 9 Aldus Persuasion
Aldus Corporation
62 15 10 MacWrite II
Clarisa Corporation
64 6 11 Microsoft Works
Microsoft Corporation
62 10 12 MacDraw II
Clarisa Corporation
19 14 13 Aldus FreeHand
Aldus Corporation
38 13 14 FileMaker Pro
Clarisa Corporation
4 — 15 Calendar Creator
Power Up Software Corporation

Entertainment Software

26 1 1 Tetris
Spectrum HoloByte
30 3 2 SimCity
Maxis
51 2 3 Microsoft Flight Simulator
Microsoft Corporation
15 — 4 Crystal Quest
Casady & Greene
29 5 5 Falcon
Spectrum HoloByte

Network/Data Communications

32 1 1 PhoneNet
Farallon Computing
55 2 2 AppleShare
Apple Computer
18 3 3 MacLink Plus
DataViz
1 — 4 AppleTalk Remote Access
Apple Computer
17 — 5 White Knight II
Freecosft Corporation

Education Software

39 1 1 Where in the World
Is Carmen Sandiego?
Broderbund Software
53 4 2 Reader Rabbit
The Learning Company
64 5 3 Math Blaster
Davidson & Associates
13 — 4 Math Rabbit
The Learning Company
20 2 5 Where in Time
Is Carmen Sandiego?
Broderbund Software

Utility Software

14 1 1 After Dark
Berkeley Systems
25 5 2 SAM
Symantec Corporation
4 2 3 More After Dark
Berkeley Systems
15 4 4 Virex
Microcom
20 — 5 The Norton Utilities
for the Macintosh
Symantec Corporation

The AmCoEx Index of Used Mac Prices

<table>
<thead>
<tr>
<th>Machine/RAM/ Hard Drive</th>
<th>Average Sale</th>
<th>Monthly Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Plus/1MB/none</td>
<td>$350</td>
<td>-100</td>
</tr>
<tr>
<td>Mac Plus/2MB/20MB</td>
<td>$550</td>
<td>-150</td>
</tr>
<tr>
<td>Mac SE/2MB/20MB</td>
<td>$850</td>
<td>+25</td>
</tr>
<tr>
<td>Mac Portable/1MB/40MB</td>
<td>$1200</td>
<td>-100</td>
</tr>
<tr>
<td>Mac Classic/2MB/40MB</td>
<td>$800</td>
<td>0</td>
</tr>
<tr>
<td>Mac SE/30/2MB/40MB</td>
<td>$1675</td>
<td>-125</td>
</tr>
<tr>
<td>Mac LC/2MB/40MB</td>
<td>$1100</td>
<td>0</td>
</tr>
<tr>
<td>Mac II/3MB/40MB</td>
<td>$1800</td>
<td>+75</td>
</tr>
<tr>
<td>Mac IIci/3MB/40MB</td>
<td>$1900</td>
<td>0</td>
</tr>
<tr>
<td>Mac IIcx/4MB/80MB</td>
<td>$2325</td>
<td>+25</td>
</tr>
<tr>
<td>Mac IIci/4MB/80MB</td>
<td>$3000</td>
<td>+100</td>
</tr>
<tr>
<td>Mac IIci/4MB/80MB</td>
<td>$4000</td>
<td>-200</td>
</tr>
<tr>
<td>Apple 12-inch B&amp;W display/board</td>
<td>$250</td>
<td>0</td>
</tr>
<tr>
<td>Apple 13-inch RGB display/board</td>
<td>$675</td>
<td>+50</td>
</tr>
<tr>
<td>LaserWriter Plus</td>
<td>$1100</td>
<td>0</td>
</tr>
<tr>
<td>LaserWriter INT</td>
<td>$1750</td>
<td>-50</td>
</tr>
</tbody>
</table>

Index provided by the American Computer Exchange of Atlanta, Georgia. It reflects sales during week of April 21. Configurations include keyboard and exclude monitor and display board for non-compact models.

Source: Exclusive Audits & Surveys research from more than 250 Macintosh retailers and selected mail-order vendors. Covers sales during March 1992.
If You Think You Already Know About Mirror Peripherals...

"We thought the Mirror ProView/24, a 20-inch Trinitron, with excellent software, was a real bargain."
MacUser, May 1991

"...razor-sharp standout."
MacUser, June 1991

"...our performance leader, the Mirror CD-ROM."
"...excellent performance, solid construction, and convenient features..."
"...the fastest drive."
MacUser, June 1991

"...the quality of the hardware is excellent. The Mirror Scanner comes competitively priced."
MacUser, December 1991

"...excellent features at a very competitive price."
MacWorld, January 27, 1992

"Fast and accurate; inexpensive."
MacWorld, April 1992

"...the Mirror 600 the best value around."
MacWorld, April 1992

"...an excellent combination of value, speed, service and package. The Mirror 105 is inexpensive, well-packaged...with good service and warranty."
MacUser, November 1991

"Editor's Choice. The overall best buy is the Mirror 210 hard drive."
"Fast and inexpensive, this 210 MB drive has some of the best documentation, disk utilities and public domain software..."
MacWorld, February 1992

"...[Mirror] offers better support...you'll get more with the Mirror 210."
MacUser, April 1992

"The Mirror 1 GB Hard Drive "includes excellent software."
MacWorld, May 1992
MirrorImage 415

$4,499

Seen The Fine Print.

The smallest 11 x 17 printer available. True 400 dpi resolution and a rugged 15 page-per-minute print engine.

Automatic switching between three interface ports (AppleTalk, parallel and serial).

4 MB of RAM, upgradable to 16 MB.

RISC processor and genuine Adobe PostScript Level 2; handles the toughest jobs with ease. Your work will look great and print fast.

35 Adobe fonts built in, plus SCSI port for connecting font drives.

Manual feed tray

Two high capacity paper trays. Easy to use tray selector software lets you keep tabloid and letter size paper loaded all the time.

MirrorImage 415 is the smallest tabloid size printer available, so it fits small offices as well as small budgets.

And of course, both MirrorImage printers come with our 30-day “Love it or return it guarantee”, and they are backed by Mirror, famous for outstanding customer service.

Call today, and you could be printing faster tomorrow.
Introducing the MirrorImage Laser Printers. High performance you can afford.

Mirror's philosophy is simple: build high quality products and sell them at a great price. No product illustrates this better than the new MirrorImage Laser Printers. Both the MirrorImage 309 and the MirrorImage 415 give you more features, more functionality and higher performance than printers costing hundreds or thousands more.

We started with the state-of-the-art Wietek RISC processor, for the best possible throughput. Then we added Adobe's PostScript 2 to print even complex documents effortlessly. We chose high speed print engines that deliver hundreds of thousands of pages at the lowest cost-per-page. And because you don't have time to waste, we designed the most flexible and convenient paper handling of any laser printer. Our optional second paper tray and Mirror's sophisticated tray selector software help eliminate those trips to the printer to change trays! Both printers come with 35 genuine Adobe typefaces, and a built in SCSI port so you can add a hard drive for convenient storage of hundreds of fonts. The MirrorImage Laser Printers are perfect for mixed computer environments.

Laser Printer Price/Performance Ratio

<table>
<thead>
<tr>
<th>Laser Printer</th>
<th>Price/Performance Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>MirrorImage 309</td>
<td>$1,699</td>
</tr>
<tr>
<td>Personal LW NT</td>
<td>$2,000</td>
</tr>
<tr>
<td>LaserWriter Ilg</td>
<td>$4,000</td>
</tr>
<tr>
<td>LaserWriter IINT</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

*We measured the average time to print one 24-point text page from a LaserJet 1100 connected directly to each printer. All printers were in standard configuration, with no font drivers or additional software. The performance rating was calculated by taking the average of 20 pages of text printed in standard mode.
How do you design the ultimate trackball?

With Turbo Mouse®, we start with a large, comfortable ball. A large-diameter ball means more surface area to work with. Greater cursor control. Less fatigue at end of day.

It is the difference between driving a luxury sedan versus a compact.

For ultrasmooth movement, the ball rests on the highest quality bearings. For durability, everything is housed in heavy duty ABS Plastic.

Next, the special touches. Like custom software that adjusts both acceleration and double-click speed. Like a time-saving chording feature that performs one of seven useful commands. Like well positioned buttons with a light, responsive click.

Did we succeed in designing the ultimate trackball?

The readers of *Macworld* say we did. They voted us Best Input Device four years in a row. The readers of *Publish!* say we did. They voted us Number One three years in a row. The editors of *MacUser* say we did. They gave us the coveted Five Mice rating.

And the story doesn't end here. Recently, we introduced an exciting new input device — the Kensington NoteBook KeyPad. This external keypad adds full keyboard performance (including 15 function keys) to Macintosh® PowerBook™ and other ADB compatible computers.

Turbo Mouse and NoteBook KeyPad are both System 7 compatible. For more information about our complete line of accessories, ask your dealer or call 800-535-4242. Outside the U.S. 415-572-2700.