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# MACWORLD

The Macintosh® Magazine

April 1991 \$3.95 Canada \$4.95

*Special:*

# MAC CLONES

*After  
7 years  
Apple has  
competition  
for the  
Mac,  
page 116*

# The largest word history got there





# processor in Mac by thinking small.



When we introduced Microsoft® Word six years ago, we weren't planning on making history.

We had just one goal, and a fairly simple one at that: to make a word processor that suited people's needs.

Then again, we knew that the people we wanted to suit were a wildly diverse, independent lot: Mac® users. So it made sense to let them tell us exactly what to put into Word.

Which they did.

First, there were some folks who didn't like tabbing much. Fair enough. For them, we developed Tables—an easier way to set up side-by-side paragraphs, columns of numbers, even forms. No tabs. No hassle.

Then we heard from a few more people. "Love the Tables gig," they said. "Now, about this text-numbers-graphics combo all in one document..."

We made that simple with "warm links." Once you've linked Microsoft Excel data to a document, keeping that document updated with the latest Microsoft Excel figures is easy. Just click your mouse.

Then there were those senders of mail, who didn't want to click-click-click-click-click.

So we built support for Microsoft Mail right into Word. Now, with just a click, everyone stays in the loop. And work in progress *stays* in progress.

As it happens, listening to what Mac users want is a pretty good way to design software.

How else can we explain Word version 4.0 being the most popular word processor in Mac history?

And those cards and letters are still coming. "Listen," someone'll say. "In case you're working on the next Word..."

Which we are. In fact, if you've got some input for us, feel free to drop us a line. Or if you'd like to find out more about Word, call us at (800) 541-1261, Department N24.

Our goal is still simple: to make Word the best word processor around. With the latest technology—translated into human terms, of course.

After all, we're only making history because we make word processors the way you like 'em.

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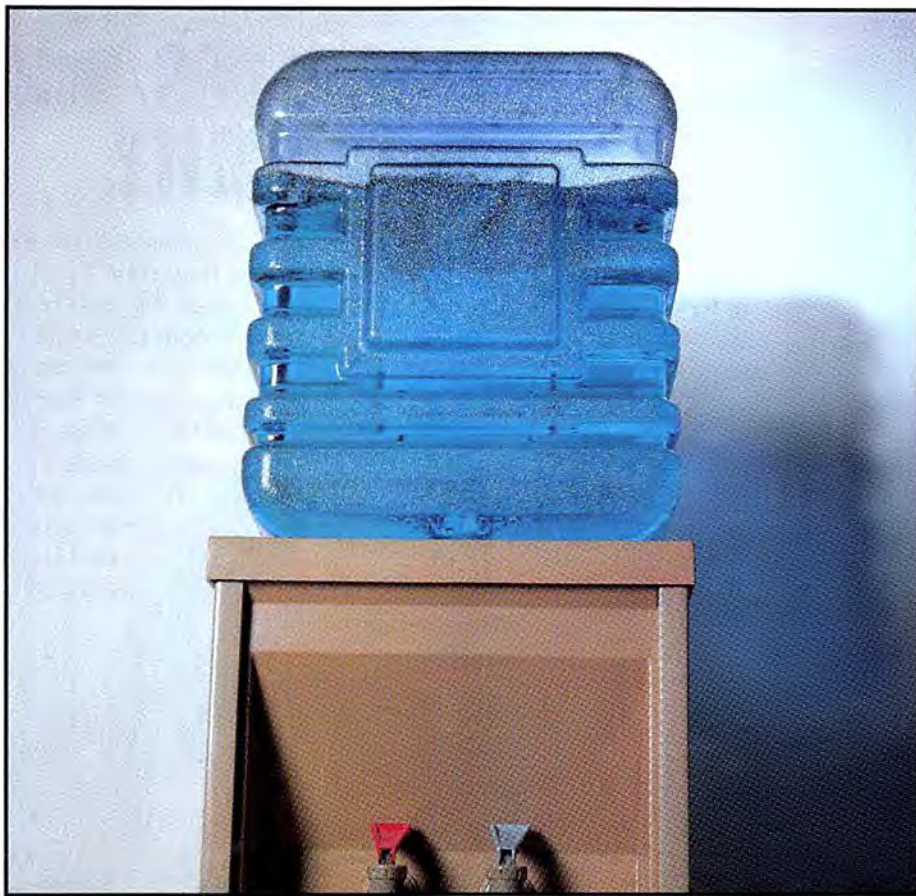
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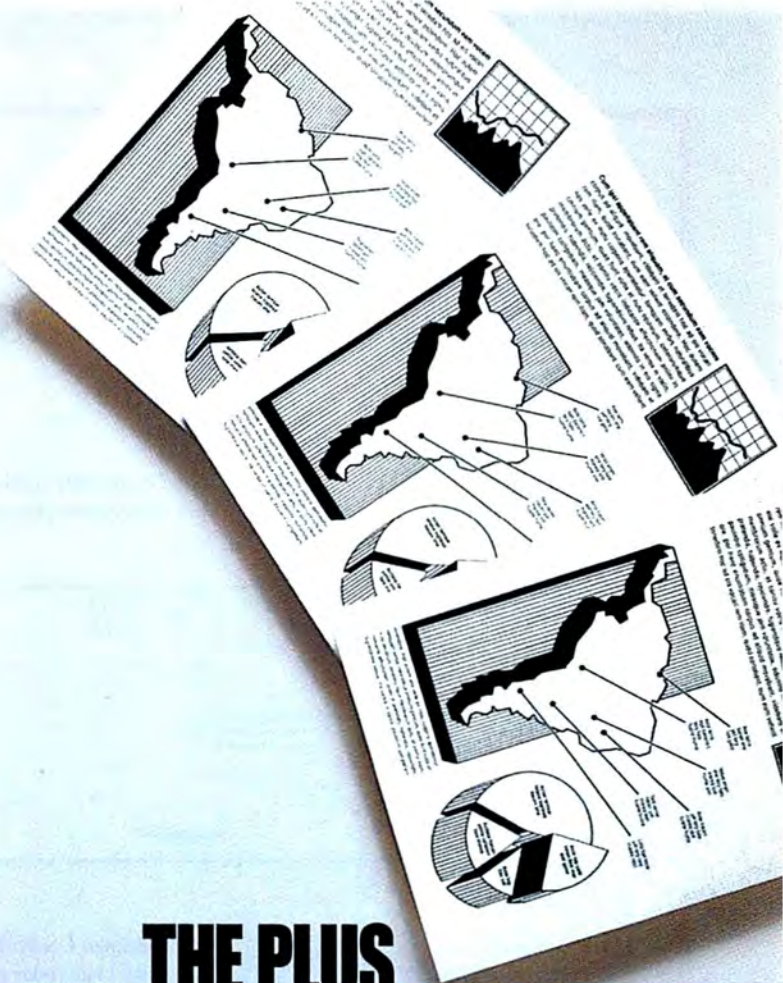
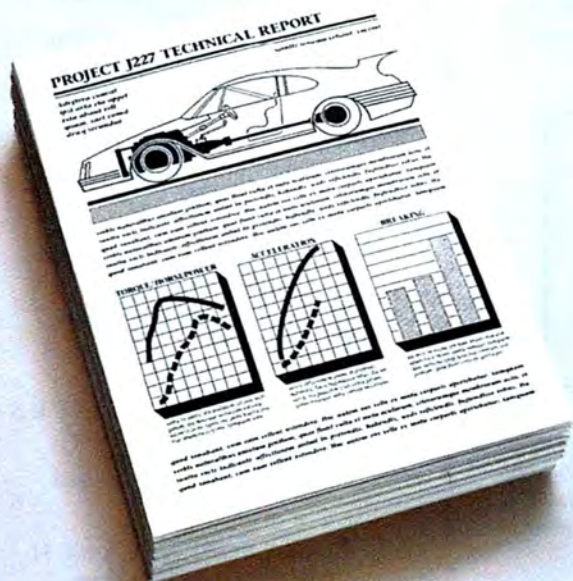
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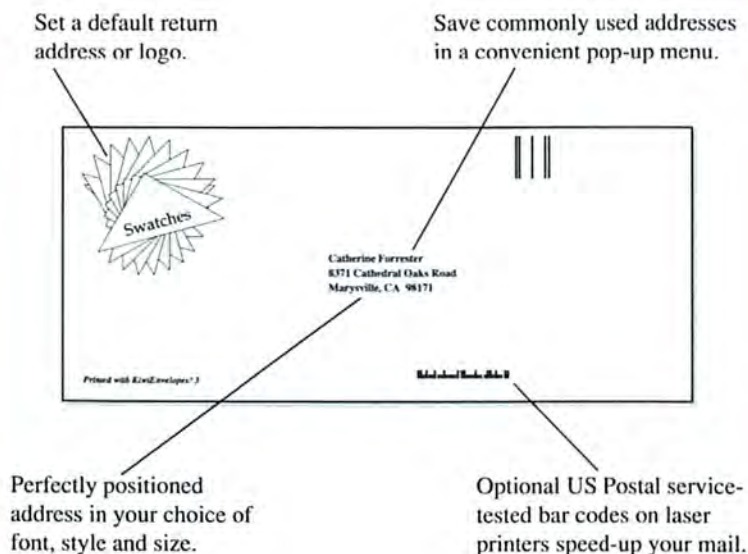
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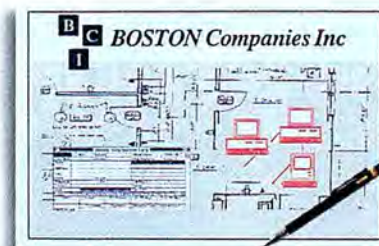
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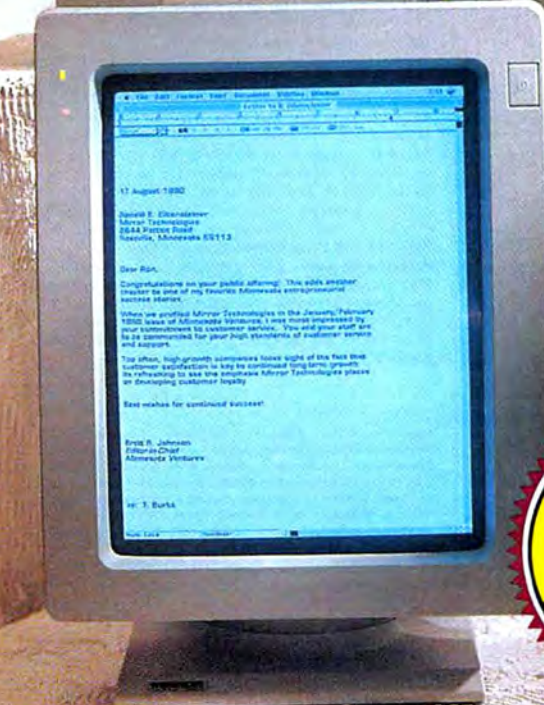
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Resolution (dpi)	80	72	72	72
Vertical refresh	75	78	75	74
Pop-up menus	Yes	Yes	Yes	Yes
Enlarged menubar	Yes	Yes	Yes	Yes
Enlarged cursor	Yes	Yes	Yes	Yes
Screen saver	Yes	Yes	Yes	Yes
Screen copy	Yes	Yes	Yes	Yes
Full year warranty	Yes	Yes	Yes	Yes
VideoPaint	No	No	Yes	Yes
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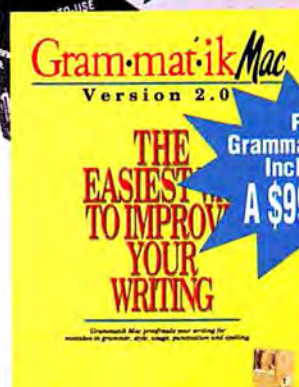
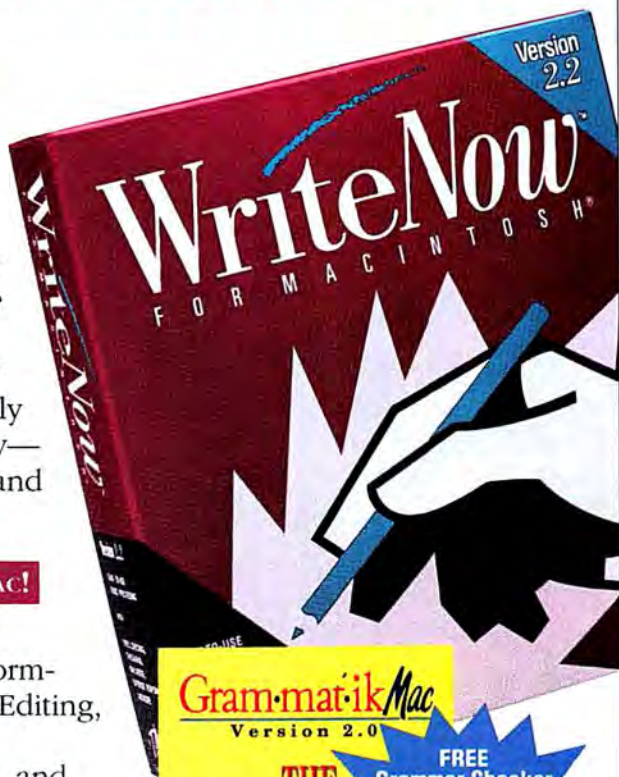
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### ■ Library B - "WordProcessing"

**WriteNow** from T/maker: WriteNow the fastest. Best pure-writing program available. Has an excellent spelling checker, mail merge, graphics inclusion, footnote and header/footer control. "Wonderful interface and support RTF". *Macuser Magazine*.

**Business Letters** from Lightning Word Corp.: More than 385 persuasive business letters with interactive personalized editing and also standard legal agreements such as leases, liens and many others.

**Sales Letters** from Lightning Word: More than 259 professionally written letters to help boost your sales.

Libraries may change without notice.

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# MAC BULLETIN

## **Apple Decides to Ship Backlit Portable**

Apple has solved the memory-addressing problems that delayed the backlit-LCD version of the Macintosh Portable and will announce and ship the machine soon, an Apple representative said. The backlit Portable will replace the existing version, will cost about \$1800 less, and will be able to address 8MB of RAM and work with third-party RAM boards. A model with 2MB of RAM and an internal 40MB hard drive will list for \$4199, while a model with 4MB of RAM and the same hard drive will list for \$4699. Apple will charge owners of the original Mac Portable about \$1050 to add the backlighting feature to their machines if they choose to upgrade.

## **No Market for Lotus MarketPlace**

Saying that Lotus MarketPlace is "at the apex of an emotional fire storm of public concern about consumer privacy," Lotus president Jim Manzi announced plans to cancel publication of CD ROMs containing marketing information about 120 million U.S. consumers, and to discontinue a similar database of marketing information about 7 million U.S. businesses. The MarketPlace information was to be supplied by Equifax and TRW, two large credit bureaus that compile and sell information on businesses and consumers to private companies.

## **Apple Seeks FCC Approval for Radio Networks**

Apple has filed a petition with the Federal Communications Commission asking it to allocate a part of the radio spectrum for high-speed computer communications. If this is approved, Macs could soon be using radio waves—instead of wire-based networks—to communicate.

## **Radius, Fusion Introduce 68040-Based Accelerators**

With Motorola finally shipping production quantities of its 68040 microprocessors, several vendors have announced accelerators using the new chip. Radius recently demonstrated a prototype 68040 accelerator for NuBus Macs and said it expects to announce a final version in the first quarter of 1991. The accelerator is designed to work with Radius's line of graphics products, integrating with its existing calibration, compression, and image-capture offerings. The price, ship date, and name of the product were not set at press time. Also, Fusion Data Systems announced the TokaMac LC, a 68040 accelerator that fits in the Processor Direct Slot of

the Macintosh LC. Fusion is planning versions for the IIxi, the IIci, and the SE/30. The TokaMac LC lists for \$2995 and was slated to ship in late February. For more information, contact Radius at 408/434-1010, or Fusion's distributor, Quantum Leap Systems, at 619/457-0781.

## **At the ACIUS Supermarket**

ACIUS has grown from a one-product shop to one-stop shopping. Hard on the heels of 4DWrite, 4DCalc, and other 4th Dimension add-ons, ACIUS has announced a database server that it claims runs 30 to 100 times faster than multiuser 4D. Several people can modify a database structure simultaneously, even while clients are changing the database's contents. 4D Server has features common on minicomputers, such as priority levels for clients. ACIUS is also developing a tool kit for using MacroMind Director, RadiusTV, Bright Star's InterFACE, and several other multimedia products inside 4D, and externals to communicate with Northern Telecom digital telephone switches. Pricing was not set at press time. For more information, contact ACIUS at 408/252-4444.

## **The Color of Control**

Astral Development's first Mac product, the grayscale image editing package Picture Publisher, emphasizes scanner and output-device calibration, even providing calibrator strips to scan in and output files to test with a densitometer. Astral's next product for the Mac, Picture Publisher Plus, is a color photo-editing package that will support color separation, blends, color masking, transparency, and other features appropriate for 32-bit color. It will provide tools for calibrating color scanners, and controls for four-color printing, including undercolor removal, gray-component boost, and dot-gain and ink-contamination settings. Picture Publisher lists for \$295, and Plus will list for \$695 or \$795. Astral Development is at 603/432-6800.

## **Oracle Does Buttons**

Oracle has licensed the HyperCard work-alike Plus from Spinnaker Software to incorporate in Oracle Card, a point-and-click application-development system and front end to Oracle servers. Oracle Card will support standard Plus features such as color picture fields, buttons that trigger scripts, and

*(continues)*





XCMDs. Macintosh and Windows versions, which can share Oracle Card applications, will list for \$299 (documentation for programmers will cost extra); Oracle plans to develop a similar product for OS/2, OpenLook, Motif, and Nextstep. For more information, call Oracle at 415/506-7000.

#### **New Master for the Finder**

Tactic Software is launching its first home-grown product, MasterFinder, which combines most features of DiskTop, On Cue, and HandOff. It can search for files by name, type and creator, and so on, and you can batch-catalog volumes and search them when they are offline. It can show four open volumes or folders in side-by-side scrolling windows, so you can move files around easily, and it can show an outline of all nodes on a network, even across bridges. You can assign frequently used folders or files to a launch menu, and specify an application to open files that were created by an application you don't have. MasterFinder comes in both DA and application form and lists for \$99. For more information, contact Tactic at 305/378-4110.

#### **New Vitamins for Virex**

Virex 3.0 users can key in codes supplied by Microcom each time a new virus is discovered, to update the utility's detection capability. With previous versions you had to wait for Microcom to ship an update. Version 3.0's INIT can now repair as well as detect virus-affected files, and the new version can batch-search folders and ignore nonexecutable files. Virex 3.0 lists for \$99.95. For more information, contact Microcom at 919/490-1277.

#### **Worlds of Information**

Educational software developer PC Globe is preparing Mac USA, a collection of demographic, economic, and many other kinds of information about the United States that does simple thematic mapping and bar charting. For example, you could chart average income in all the major cities in Texas, or create a colored map showing percent of voter turnout in the last election. Mac USA will list for \$69. Future products will have data and maps for the whole world and provide a way to add your own data to the database. For more information, contact PC Globe at 602/730-9000.

#### **Reset Preferences**

Preferred Software appears to be emerging from its time of trouble, after passing through two management purges. Preferred still publishes Database, Vantage, Exposure (now Exposure Pro), and several other products, and is working on new products. FlashCrypt is intended to be a convenient, high-speed encryption tool. DoubleTalk is a full-featured telecommunications program with a scripting language. DoubleTalk can be used to build a BBS, can be driven from inside HyperCard, and

has a proprietary Zmodem protocol that Preferred claims is faster than standard Zmodem. Later, DoubleTalk will have a run-time and a Windows version, and support modemless communications over Ethernet (and maybe AppleTalk); the modemless version could be a platform to build an electronic-mail package on. DoubleTalk 1.1 is shipping now at \$149.95 (\$249.95 for two copies). Pricing and ship dates for FlashCrypt and later versions of DoubleTalk have not been set. For more information, call Preferred at 901/683-3383.

#### **16-ppm Kodak Printer Is Also a Copier**

Eastman Kodak has begun shipping the Ektaplus 7016PS, a network printer that produces 16 pages per minute and can double as a 6-ppm convenience copier. The printer can also connect to as many as four networks. The Ektaplus 7016PS comes with one serial and one parallel port but can be upgraded to four ports, including a LocalTalk connector. It comes with a PostScript controller with 4MB of RAM and also includes IBM Proprinter, HP-PCL, HPGL, and Epson and Diablo printer emulations. The Ektaplus 7016PS lists for \$6995. For more information, contact Kodak at 800/344-0006.

#### **NEC Ships Monitor with Reduced Magnetic Fields**

NEC Technologies is offering a 14-inch color monitor designed to reduce the emission of possibly hazardous VLF and ELF magnetic fields. The NEC MultiSync 3DS works with a wide variety of personal computers, including the Mac II series. The monitor's design includes extra shielding, a cancellation yoke, and grounding wires to reduce the magnetic fields. Its suggested retail price is \$1099. For more information, call NEC at 708/860-9500.

#### **The Virtual Vise**

SuperDisk, from new kid on the block Alysia, automatically compresses files every time you save to fit more files on a hard disk with no loss of data. SuperDisk is an INIT-cdev combo that compresses any file or the contents of any folder or volume that has .s following the name, and it has optional password-protection as well. Alysia claims that SuperDisk will run about four to five times faster than DiskDoubler, and about as fast as hardware-based DoubleUp. SuperDisk will list for \$89. For more information, contact Alysia at 415/566-2263.

#### **Macintosh LC Supports VGA Monitors**

Apple recently revealed that the Macintosh LC can support the VGA monitors common in the IBM PC market, giving users access to less expensive color displays of somewhat lower than Macintosh quality. Apple said that the LC supports the VGA standard's different scan rate and that the only requirement is a cable specifically designed to make the connection. Apple said it expects such cables to be available from third-party vendors. ■

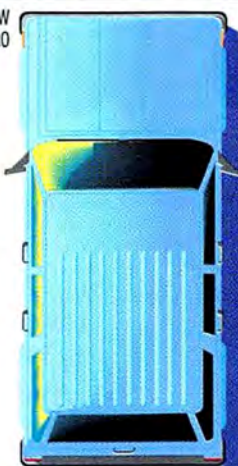


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THE NEW  
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Another new model year. And Canvas is still miles ahead. Lucky you. With brand new models of both the world's top-ranked drawing programs to choose from. Simultaneously.

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**Let's take a look under the hoods.** Canvas 3.0 gives you more high-end text handling features. Like binding to curves. Slanted margins. Text-wrapping outside — and/or inside — irregular objects, and full kerning & tracking control. Even conversion of PostScript® Type 1 fonts to customizable Bézier outlines.

MacDraw Pro doesn't.

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MacDraw Pro doesn't.

Canvas 3.0 gives you more design/illustration features. Including unparalleled Bézier curve editing power—from multi-point selection & editing to automatic object conversion, combining and blending. Magnetic guidelines. Center line auto tracing of scanned images. And full bitmap editing in 24-bit color.

MacDraw Pro doesn't.

Canvas 3.0 also gives you new built-in translators for important multi-platform formats like CGM, IGES and DXF™. And Open Architecture technology — allowing new tools, effects and translators to be added with ease at any time.

MacDraw Pro doesn't.

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#### Note to Canvas Users:

Registered users who purchase Canvas 2.1 between Jan 1, 1991 and May 31, 1991 qualify for a free upgrade to Canvas 3.0. All Canvas 2.1 users who purchased prior to Jan 1, 1991 can upgrade to the new version for only \$99 US. Canvas 1.0 or 2.0 users may upgrade for only \$129 US. Prices valid through Aug 1, 1991. Allow 4-6 weeks for delivery. All orders add \$10 shipping & handling.

**International Users:** Please contact your local authorized

distributor for availability details.

#### Trading up's so easy to do. But only for a limited time.

MacDraw users: Trade up now to the new Canvas 3.0 for just \$149 US. Just call 1-305-594-6965 and ask for Dept. M. (Have your MasterCard, VISA or American Express card number & expiration date ready!) Or mail your MacDraw® program disk to the address below, along with your credit card information or check drawn in US dollars on a US bank. Offer limited to the US and Canada, and ends Aug 1, 1991.

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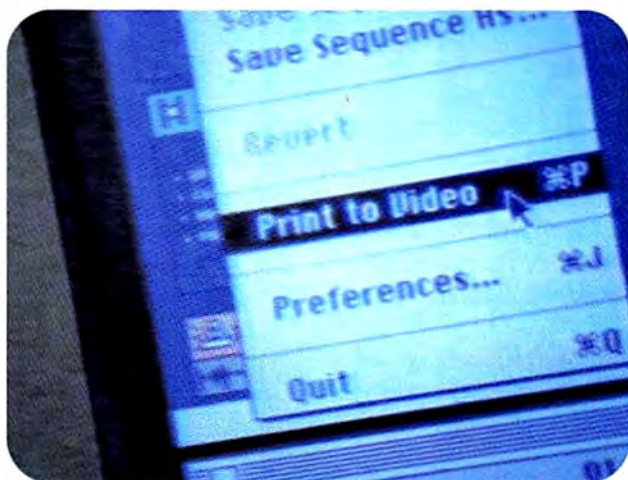
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- MacGuide Golden Gavel Award, 1988.
- Byte, Award of Distinction, 1988.

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# S O F T V I E W



# Macworld Expo '91

WORLD'S LARGEST COMPUTER FLEA MARKET

F

BY JERRY BORRELL

or a week last January, San Francisco had the feeling of the world's largest computer flea market. Not since the heyday of Jim Warren's Computer Faire (where Steve and Steve first introduced the Apple 1 to the public) has the City by the Bay been so dominated by one event.

There was no sign of an economic recession at the exposition as visitors thronged the two major exhibit halls, gawking at the latest products and purchasing enough computer equipment to outfit a small city. Throughout the four days there were lines at Dr. Mac, ComputerWare, Educorp, Computer Selection, and at other booths where Mac products were actually sold. And no wonder—at ComputerWare you could buy a 100MB hard drive for \$699, a 195MB model for \$999, Adobe Photoshop for \$475, T/Maker's SmartBundle for \$199. A festive atmosphere prevailed. People waddled out with shopping bags full of products. Marketeers barked carnival style at passersby. Microsoft cheerleaders had visitors chanting enthusiastically for product giveaways. Several companies offered product training to groups of attendees on the show floor. There were even some Classics and LCs in evidence. Developers forgot to curse the exposition's organizers. And Apple, once the center of the Macworld exhibits, seemed lost in the crowd of developers seeking to support the Macintosh. More people than we have ever seen at a Macworld.

## Video Products Lead

Announcements made in San Francisco, and those that will precede the August Macworld Expo, show that

video is taking a dramatic lead in cutting-edge technology for the Macintosh. Light Source demonstrated its video editing system. Electric Image was showing software (now shipping after kicking around for a couple of years) that's designed to do titling in 3-D for video. Digital F/X announced its intention to produce a software-only version of its award-winning video software. Bravo—selling turnkey systems for more than \$20,000 is antithetical to current Mac trends.

SuperMac showed SuperSqueeze, video compression based upon the C-Cube Microsystems microprocessor. E-Machines also announced real-time compression-decompression. A host of smaller developers, led by Com-motion, challenged larger companies' leadership in this area with software that accomplishes the same result without a hardware assist. Apple was mum about its video software but demonstrated a Sony product with a built-in video interface that hinted at a future relationship in the video product arena. RasterOps pushed its technology further by introducing a \$1000 24-bit board with acceleration and video overlay. The old pioneer, Mass Microsystems, introduced a 24-bit video overlay board with a really neat interface, but one that's a little behind the technology of products from RasterOps and Radius.

RasterOps also stole SuperMac's



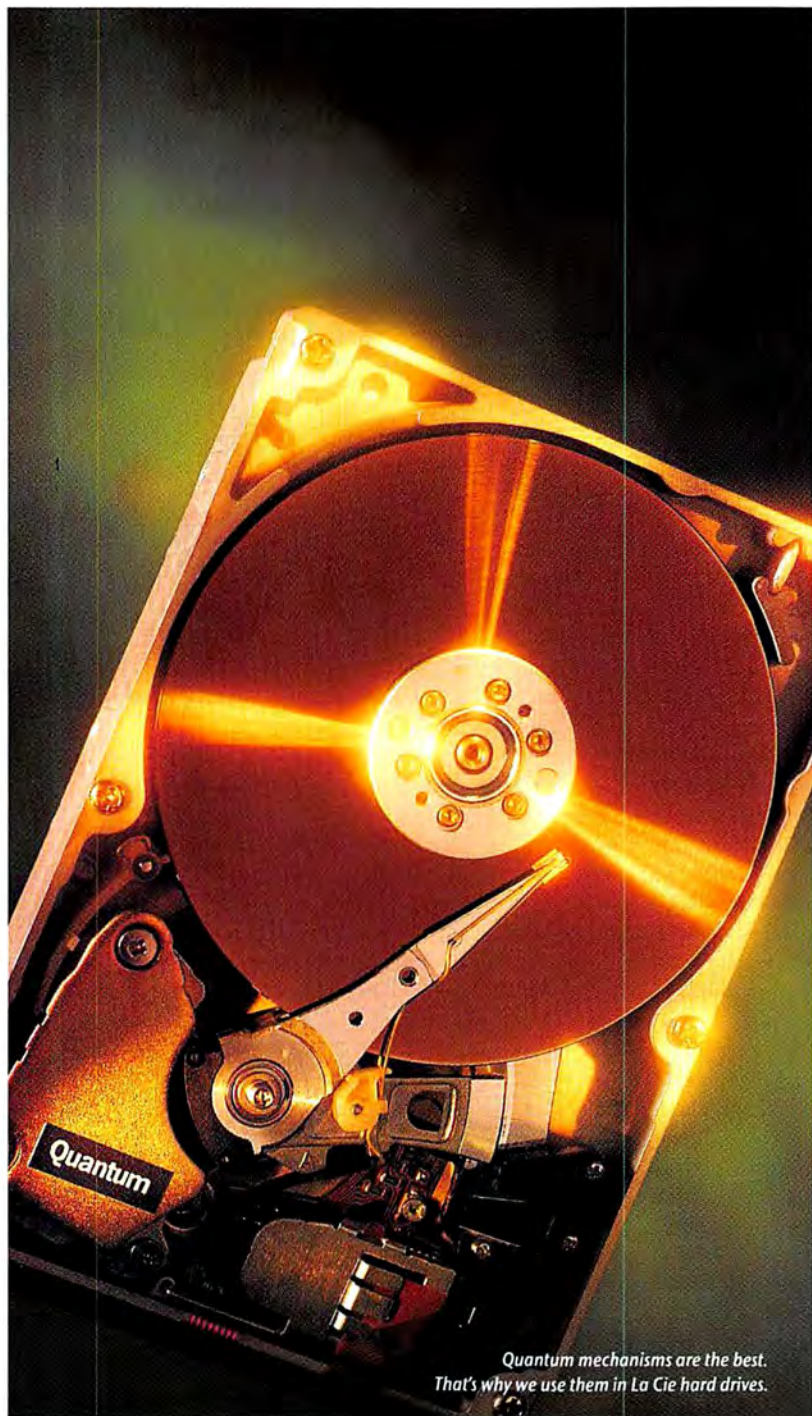
thunder by showing a wall of Barco display monitors organized to act individually or to work together in monolithic, single-display fashion. The first shipping products to expand the display capacity of the LC, Classic, and si were shown. Lapis, Mirror, and Ehman had monochrome displays for the Classic. NEC offered a color display for the si—a real problem, given that machine's poor power supply. Radius offered a connection for the Pivot monitor to the LC, but no two-page displays for the newest Macs. SuperMac showed its 8-bit processor direct slot-based board.

Dynamac showed a flat panel LCD screen for the si that, for some, makes that computer a portable (so did John Sculley, in a cheap shot at his own portable). In Focus Systems showed its latest LCD for overhead projectors.

## Vertical Markets

One of the subtle but rewarding aspects of the show was the richness of products—the breadth of the offerings (continues)





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That's why we use them in La Cie hard drives.

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1

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\*Typical application access time using 64KB DisCache<sup>®</sup>.

\*\*Seagate drive mechanisms also available (capacities from 300MB to 1.2GB).



2

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Every La Cie drive includes a FREE copy of Silverlining, the #1-rated hard drive management utilities program.

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## A Company You Can Count On.

La Cie is a Plus Development Company (makers of the Hardcard® XL), backed by \$400 million in assets. That means you can trust La Cie to provide a constant source of high-quality mechanisms and components. And you can be certain that we'll be around to help you with service and support. For a long, long time.

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6

## Rave Reviews from Critics and Customers.

Frankly, there's been a lot of talk about La Cie hard drives. Leading Macintosh consumer magazines praise us.

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"...the cream of the crop." —Macworld

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"This is an excellent drive and Silverlining is great!" —D. Jordan  
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in vertical markets. On Technology and ASD Software showed multiuser calendaring products that work over networks that are the first generation of System 7.0-related products. Mitch Kapor's (On) product looks like a real hit. Psybron and PMC Telesystems had new versions of their single-user calendars (CalenDAR, Rendezvous Plus) while Pastel Development

showed a new calendar cum database (Manager).

#### Ethernet Products Proliferate

A reflection of the fact that almost all networked Macintosh users are beginning to suffer from network slowdowns is that many companies offered Ethernet connections to AppleTalk, including National Semiconductor,

Asanté, Tri-Data (with some of the first third-party Ethernet boards for the si and LC), Shiva, Dove, Everex, Dayna, and Cayman. These companies rightfully divine that users are demanding more from a network, even if it is only an improvement in printing and sharing electronic mail.

And speaking of mail, Microsoft took the lead at the show with a new version of Microsoft Mail that recaptures some ground from QuickMail and adds a host of network-analysis features rivaled only by Farallon (in the LocalTalk world).

I also saw two new network-analysis products for LocalTalk: LocalPeek from The AG Group and Network SuperVisor from CSG Technologies. A related product from Pharos Technologies is Status Mac, a software product that enables a network administrator to check, for example, all the version numbers of applications on those machines. It's really useful.

A lot of companies—Orchid, Dove, and Cypress Research, for example—are still trying to overcome the prejudice left in the market by Apple's faulty entry into desktop fax (and subsequent abandonment of its product).

#### Accelerators Aplenty

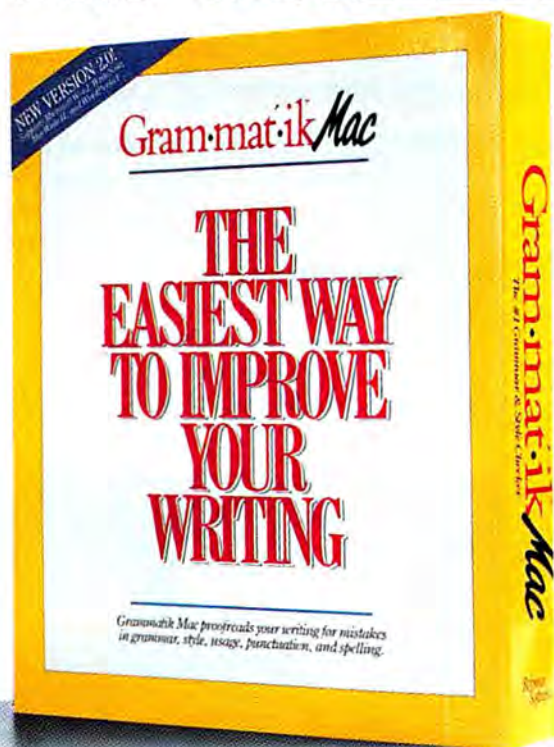
Now that we have Macs with 68030s, naturally some people will want to have Motorola's just-shipping 68040 processor. Radius, Quantum Leap Systems, and Total Systems are glad to oblige. Additional accelerators were shown by Newer Technology (RAM disks, caches), Atto (a SCSI II accelerator for overworked printers and scanners), Rodime, and others.

#### Laser and Color Printers

It's clear from the show that the price for color and PostScript is now \$9995 or less. QMS, Seiko (showing products with both A- and B-size output), Tektronix, Lasergraphics, General Parametrics, and CalComp all have such offerings. Seiko's product, at the lowest price, is reported to be back-ordered for several months. Kodak showed a 35mm-quality thermal printer for \$25,000.

Prices have also tumbled for laser printers. Printers offering better speed (continues)

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# Survival of the fittest.

Which color scanner is the natural selection?



**Microtek Scan** Original: 8 x 10 B&W print  
Brightness level: default Input resolution: 150 dpi  
File Size: 486K Output Resolution: 300 dpi  
Line Screen: 133 lpi Gamma Correction: None



**Microtek Scan** Original: 8 x 10 color print  
Brightness level: default Input resolution: 150 dpi  
File Size: 1,506K Output Resolution: 300 dpi  
Line Screen: 160 lpi Color Correction: None

When it comes to selecting the right scanner, be forewarned. It's a jungle out there. You may not get the quality you were promised.

The La Cie Silverscanner has evolved beyond all that. Just look at this comparison between the Microtek 300ZS and the La Cie Silverscanner. Each image was scanned at default settings with no corrections. This entire ad was then created and separated using Adobe Photoshop, QuarkXPress 3.0 and a Linotronic 330.

As you can see, Silverscanner is a more advanced species of scanner which provides superior color, gray scale and line art over other similar scanners. La Cie gives you more with OCR compatibility, fast color previews, versatile scanning controls, and up to 1200 dpi.

As a bonus, Adobe Photoshop Limited Edition, Aldus PrePrint and La Cie's exclusive plug-in scanning modules are included FREE with every Silverscanner purchase.

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**LaCie Scan** Original: 8 x 10 B&W print  
Brightness level: default Input resolution: 150 dpi  
File Size: 484K Output Resolution: 300 dpi  
Line Screen: 133 lpi Gamma Correction: None



**LaCie Scan** Original: 8 x 10 color print  
Brightness level: default Input resolution: 150 dpi  
File Size: 1,502K Output Resolution: 300 dpi  
Line Screen: 160 lpi Color Correction: None



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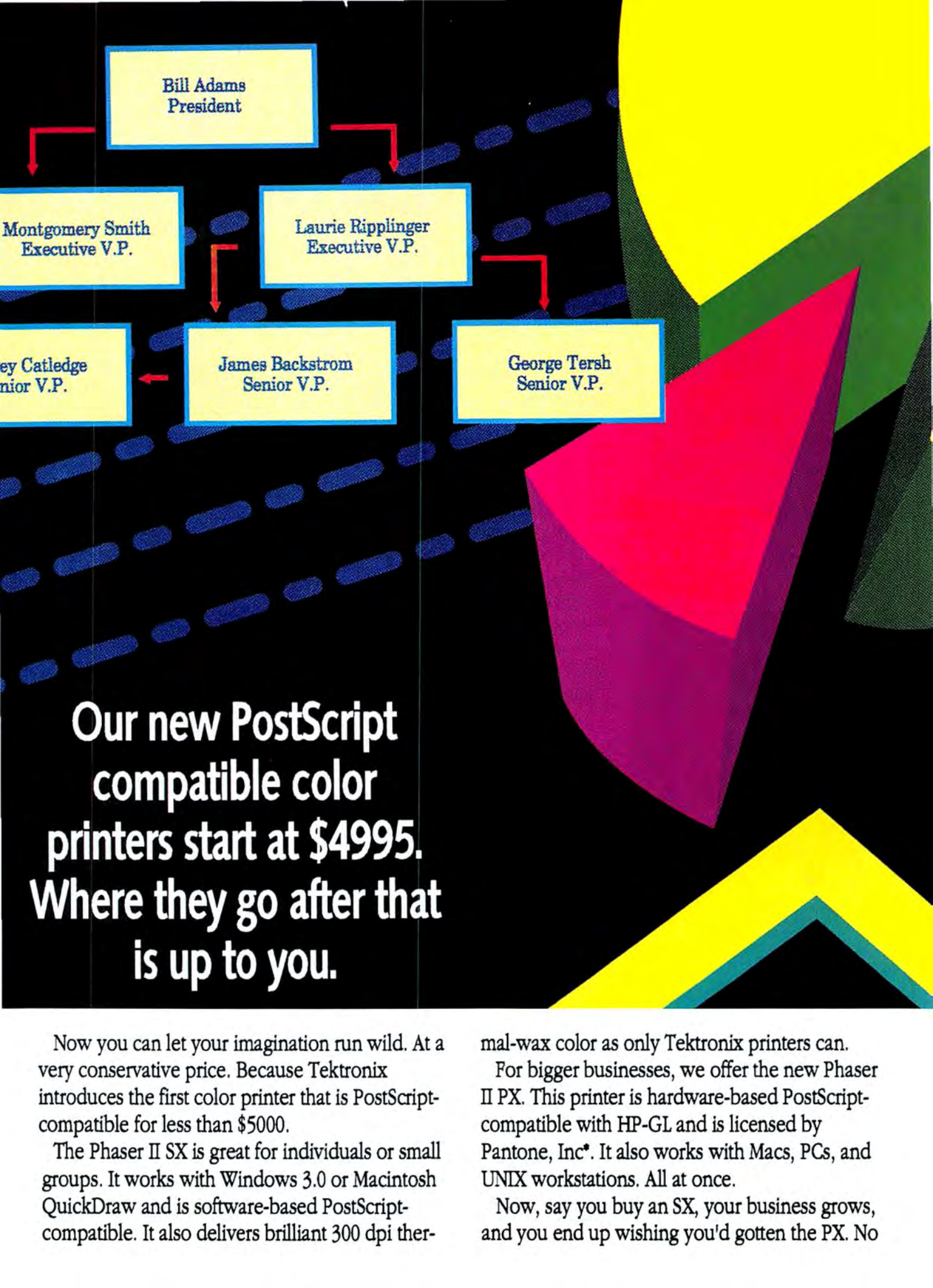
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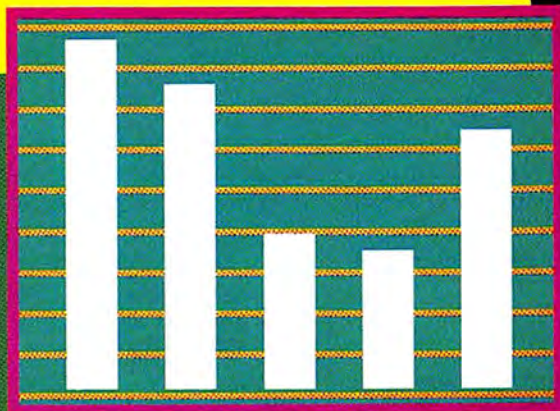
The Phaser II SX is great for individuals or small groups. It works with Windows 3.0 or Macintosh QuickDraw and is software-based PostScript-compatible. It also delivers brilliant 300 dpi ther-

mal-wax color as only Tektronix printers can.

For bigger businesses, we offer the new Phaser II PX. This printer is hardware-based PostScript-compatible with HP-GL and is licensed by Pantone, Inc\*. It also works with Macs, PCs, and UNIX workstations. All at once.

Now, say you buy an SX, your business grows, and you end up wishing you'd gotten the PX. No





80  
60  
40  
20

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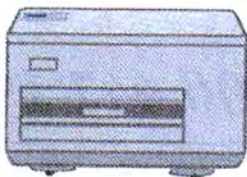
need to worry because all Tektronix printers are upgradable so you'll never outgrow them.

And in case you didn't notice, this entire ad was created by one of our printers. That includes the brilliant graphics you see above and the crisp type you're reading now. Because we have so much faith in our color printers, we let them do their own ads. No one else

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and B-size output were announced by several companies, including LaserMax and QMS. Dataproducts has a new product in the wings.

#### Input of Color Images

Howtek and Kodak showed reworked models of their 35mm scanners, while Abaton, Umax, XRS, and Howtek had new color flatbed scanners. Nisca

showed a small color scanner similar to the small Sharp scanner. Koala announced new technology for video-camera input via the SCSI port. Truvel has a new owner and a simplified product line.

#### Utilities

Capture from Mainstay is now in release 4.0 (saves TIFF files). MarkUp

(also from Mainstay) with voice annotation is soon to ship. DiskExpress II, from AlSoft, is out. Aladdin Systems has brought out a new version of StuffIt Deluxe. Affinity Microsystems announced Tempo II+, and Central Point Software announced a new version of MacTools Deluxe.

#### CAD

Despite the somewhat disastrous experience of both Autodesk and VersaCAD Corporation in the Mac market (and their absence from the show), other companies continue to forge ahead. In architectural CAD, Graphisoft has taken a strong lead in the United States. There's a new version of Innovative Data Design's MacDraft. Schlumberger's MacBravo looks ever better. VIDI's Presenter Professional makes Pixar's Mac-RenderMan rendering routines easily usable—a boon to all of us who would like to make use of RenderMan's exquisite rendering techniques.

Virtus showed 3-D modeling software aimed at architectural markets. DesignCAD, GraphSoft, and Engineered Software presented new versions of their CAD products. ModacAD was showing a stereo 3-D version of its product for garment fabrication and design.

#### 3-D Design

Swivel 3-D Professional 2.0 has become the dominant 3-D product for the Mac. Byte by Byte's Sculpt 3D, a perennial favorite (and nonshipping product) of mine at trade shows, is finally shipping at the price of (groan) \$2500. Levco has been sitting on a 3-D modeler written by Duane Maxwell for too long—there is a question as to whether that company will be able to publish the product. Specular International officially announced Infini-D, a 3-D modeler.

#### Paint, Draw, Illustration

PixelPaint Professional 2.0, the leader in the color paint market, has suffered in market share due to competition from Adobe Photoshop and has new competitors in Strata's StrataVision and Electronic Arts' Studio/32. PixelPaint 2.1 is now shipping and with a lower price. Time Arts' Oasis paint (continues)

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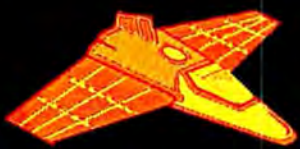
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program for the Mac was downplayed at the show but is apparently shipping.

Deneba's Canvas, which has taken over the realm of SuperPaint and MacDraw, was shown in version 3.0, a great improvement. Claris announced MacDraw Pro, with many new features, intended to retake its traditional market. MediaLab Technologies announced PictureAccess, which the company says competes effectively with Photoshop and has unique features, such as compression and communications functions.

### Animation

FilmMaker, the French product at last brought to the U.S. market by Paracom, is the leader on the Macintosh. Two other animation entries were at the show: Motion Works' AddMotion for HyperCard users, and Gold Disk's Animation Works, a more powerful general-purpose animation package.

### Image Compression

There is a race between several vendors for image-compression products. Storm Technology has a software-hardware combination that leads the available solutions. But if Radius succeeds with its ImpressIt software-only product, Storm may suffer the usual slings of a pioneer. Pinnacle Micro was also showing a hardware compression/decompression board, but no software interface. Kodak showed Color-squeeze, another software image-compression product.

One of the greatest problems we have is how to access the various types of graphics files. Computer Friends and Radius both have software that works with their hardware systems that present viewers of various file formats with thumbnail-size representations of files, software that should be rewritten as stand-alone applications. Alternatively, Adobe should write this ability into the next version of Photoshop. Symmetry demonstrated Mariah, a picture database with a similar capability, off the show floor.

### Games

My picks of the show include Vette (driving at high speed through 3-D representations of the streets of San Francisco) from Spectrum HoloByte; (continues)



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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 machine? Do they know what to do when it goes down? How many programs are each of your people using? Have they really mastered the programs they're using? Do they know the short-cuts and valuable techniques that will save you time, money, and increase your professionalism?

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Word 4.0 Part #1 .....	<input type="checkbox"/>
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Cells 08/10/07	10	\$5.00	\$240.00	\$50,240.00	08/29/07	\$2.69	\$236.390	\$27,365.35
Cells 09/09/07	10	\$4.00	\$209.25	\$40,209.25	09/26/07	\$3.63	\$306.00	\$36,040.75
Cells 10/08/07	10	\$4.00	\$209.25	\$40,209.25	10/24/07	\$3.75	\$309.25	\$37,393.25
Cells 11/09/07	10	\$5.00	\$240.00	\$50,240.00	11/07/07	\$2.38	\$236.603	\$26,356.08
Cells 11/13/07	10	\$5.00	\$240.00	\$50,240.00	12/04/07	\$2.38	\$236.603	\$26,356.08
Cells 01/02/08	10	\$2.00	\$209.25	\$20,209.25	01/24/08	\$2.00	\$209.25	\$27,990.75
Cells 02/12/08	10	\$2.13	\$209.25	\$21,209.25	03/25/08	\$2.50	\$250.00	\$33,000.00
Cells 02/11/08	10	\$2.25	\$209.25	\$22,209.25	03/25/08	\$2.50	\$250.00	\$33,000.00
Cells 03/11/08	10	\$2.50	\$209.25	\$25,209.25	04/01/08	\$2.50	\$250.00	\$33,000.00
Cells 05/16/08	10	\$4.63	\$237.50	\$46,287.50	05/21/08	\$5.63	\$309.25	\$55,902.50
Cells 05/26/08	10	\$4.25	\$237.50	\$42,287.50	06/27/08	\$15.00	\$548.75	\$154,451.25
Cells 06/10/08	10	\$4.00	\$209.25	\$40,209.25	06/27/08	\$15.00	\$548.75	\$154,451.25
Cells 06/10/08	10	\$4.00	\$209.25	\$40,209.25	08/24/08	\$2.00	\$209.25	\$27,990.75
Cells 06/10/08	10	\$4.00	\$209.25	\$40,209.25	10/02/08	\$2.00	\$209.25	\$27,990.75
Cells 01/09/08	10	\$9.13	\$312.50	\$91,250.00	02/11/08	\$8.25	\$379.25	\$107,998.75
Cells 02/17/08	10	\$6.25	\$286.25	\$62,562.50	03/28/08	\$7.25	\$354.25	\$101,943.75
Cells 03/22/08	10	\$6.00	\$286.25	\$60,562.50	04/18/08	\$8.25	\$379.25	\$107,998.75
Cells 03/06/08	10	\$5.63	\$267.50	\$56,287.50	04/18/08	\$8.25	\$379.25	\$107,998.75
Cells 03/29/08	10	\$6.38	\$279.00	\$63,857.00	05/12/08	\$7.25	\$354.25	\$101,943.75
Cells 05/02/08	10	\$5.63	\$267.50	\$56,287.50	05/23/08	\$6.25	\$312.50	\$93,750.00
Cells 07/06/08	10	\$5.75	\$271.25	\$57,712.50	08/29/08	\$2.00	\$209.25	\$27,990.75
Cells 08/24/08	10	\$3.63	\$209.25	\$36,492.25	09/26/08	\$1.38	\$138.00	\$13,800.00
Cells 09/16/08	10	\$4.00	\$209.25	\$40,209.25	10/24/08	\$2.00	\$209.25	\$27,990.75
Cells 12/29/08	10	\$4.13	\$222.50	\$41,472.50	01/03/09	\$8.25	\$346.25	\$82,153.75
Cells 01/09/09	10	\$5.50	\$263.75	\$55,375.00	01/15/09	\$13.00	\$400.75	\$129,511.25
Cells 02/19/09	10	\$5.00	\$240.00	\$50,240.00	02/19/09	\$13.00	\$400.75	\$129,511.25
Cells 02/19/09	10	\$4.25	\$226.25	\$42,726.25	02/26/09	\$2.94	\$106.00	\$29,100.00
Cells 03/16/09	10	\$6.63	\$297.50	\$66,347.50	03/26/09	\$10.00	\$398.75	\$99,601.25
Cells 05/19/09	10	\$5.00	\$240.00	\$50,240.00	06/02/09	\$10.00	\$398.75	\$99,601.25
Cells 04/19/09	10	\$5.00	\$240.00	\$50,240.00	04/27/09	\$10.00	\$398.75	\$99,601.25
Cells 06/30/09	10	\$4.75	\$241.25	\$47,741.25	05/14/09	\$10.00	\$398.75	\$99,601.25
Cells 06/30/09	10	\$4.00	\$209.25	\$40,209.25	06/23/09	\$3.63	\$267.50	\$31,737.50
Cells 08/07/09	10	\$7.88	\$335.00	\$79,085.00	08/24/09	\$22.25	\$766.25	\$221,733.75
Cells 01/17/10	10	\$12.88	\$405.00	\$129,225.00	01/18/10	\$19.00	\$668.75	\$199,231.25

**76.79% Accurate:** Above is a chart of OEX trades from December 28, 1984 to January 18, 1991, based on the signals generated by the **Right Time-Index Program™**. By following the signals generated by the program, the rules in the manual and starting with just a small amount of capital (\$30,209.25) your profits would have been over \$3,100,000.00.

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

Not only is **The Right Time™** the best decision support system ever devised for traders, it's the only software that analyzes volume/price, support/demand, and global market trends – all at the same time.

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All programs not available for all computers

Riddler from Threshold Publishing for the toddler with a yen to compute; Tesseract from Inline Design for those addicted to geometric puzzles on the Mac; and SpaceShip Warlock, a CD game from Mike Saenz. (Just buy this disk, will you? Let's all support Mike so that he can develop the masterpiece that is simmering away in his active imagination.) Also a new CD ROM version of Cosmic Osmo, with about 100MB of new stuff and planets from Mediagenic. PC Globe, a PC software company, was showing early versions of mapping and educational games for the Mac that have great promise.

## CD Authoring

Meridian Data announced a Mac-based CD ROM mastering system for about \$30,000, while Authorware has a new version of its authoring software in the works. Highlighted Data, producer of several works on CD ROM, is shipping a new CD ROM disc called *Who Owns What*, a guide to ownership of rights to movies and video for the current century. As far as laser discs go, The Voyager Company, Robert Stein's hobby and working concern, launched four new discs: on Eadweard Muybridge, Igor Stravinsky (CD ROM only), Michelangelo, and the Louvre.

## Desktop Publishing

Aldus has finally published Silicon Beach's Personal Press software. Timeworks has a new version of Publish It called Publish It Easy, which competes with Personal Press and has a richer feature set at a lower price.

Aldus has recognized the speed problems of PageMaker 4.0 and is preparing a faster version. Ventura Publisher Macintosh Edition is at long last shipping, and Frame Technology told me about an update to FrameMaker 2.0 for the Mac.

QuarkXPress, the spoiler for Aldus, has increased its competitive drive and is actively taking PageMaker market share. Letraset, jammed into a tiny booth, drew crowds of faithful users to see its Studio line of products, with ColorStudio the most successful. The company has reorganized yet again and announced its firm intent to support the Macintosh. *An-*  
*(continues)*



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# Not every Tom,

There's nothing we like better than seeing some old friends get the recognition they deserve. Which is the way we feel about all the honorable mentions and winners of the 6th annual *MacUser* Editors' Choice (Eddy) Awards. So this month, to highlight their achievement, we're featuring plenty of Eddy (Eddy) award winners and Eddy Honorable Mentions (Eddy H.M.) along with our other winning products.

## MONEY BACK GUARANTEE

The majority of products we carry are offered under a 30 or 60 day Money Back Guarantee. The companies participating in this program are highlighted in red. If you are not satisfied with your purchase of any of these products, call us for an authorization and return it with all of the original packaging within the guarantee period for a refund check (or credit on your credit card). We reserve the right to limit quantities on such returns.

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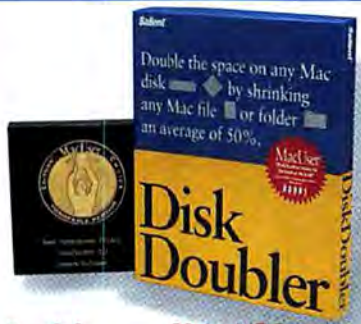
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**Letraset**  
6301 *ColorStudio 1.1*—1990 MacUser Editors' Choice Award for Best Color Prepress Software. Proven color imaging and retouching software which includes Shapes—a unique PostScript drawing annex at no additional charge. . \$649.

## DAILY BUSINESS

- ★ **Aatrix Software ... 30 day MBG**  
5872 Checkwriter II 3.1 ..... 32.  
8053 Aatrix Ultimate Payroll 4.0 ..... 179.
- Abacus Concepts**  
8937 MacSpin 3.01 ..... 169.  
4482 StatView SE+ Graphics 1.03 ..... 199.  
4481 StatView II 1.03 ..... 279.  
SuperANOVA 1.1 (for Plus/SE or II) ea. 309.  
5907 Statview II/SuperANOVA Bundle. . 569.



**Salient Software ... 30 day MBG**  
7404 *DiskDoubler 3.1*—Honorable Mention—1990 MacUser Editors' Choice Award for Best Compression Product. Expands disk drive capacity. Fast, easy and safe, and dramatically increases the storage capacity of any Mac drive. . . \$45.

- ★ **Acius ... 30 day MBG**  
6948 File Force 1.0.1 ..... 249.  
5618 4th Dimension 2.1 ..... 489.  
4024 4th Dimension Runtime (4 user) . . 249.  
7838 4D Compiler 1.0 ..... 895.  
4D Write 1.0.1 or 4D Calc. . . . ea. 229.
- ★ **Advanced Software ... 30 day MBG**  
5608 DocuComp 1.5 ..... 89.
- A Lasting Impression**  
5465 ResumExpert ..... 48.  
5749 Cover Letters ..... 48.
- ★ **ASD Software ... 30 day MBG**  
7619 Planisoft (1 user) ..... 195.
- Ashton-Tate**  
8961 Full Impact 2.0 ..... 159.  
Eddy H.M. - Best Data Management
- ★ **Avery ... 60 day MBG**  
7446 MacLabel Pro 1.0 ..... 49.
- ★ **Baseline Publishing ... 30 day MBG**  
8882 1 Shot Worksheet ..... 57.  
8881 Thunder 7 ..... 57.
- ★ **Chang Labs ... 30 day MBG**  
1611 C.A.T. 3.0 ..... special 249.
- ★ **Checkfree Corp. ... 30 day MBG**  
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7622 *Darwin's Dilemma 1.0*—The captivating conundrum everyone's talking about ..... 32.

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5861 CashLedger 1.3 ..... \$115.  
5862 Payroll 4.5 ..... 175.  
5863 MultiLedger 1.3 ..... 235.
- ★ **Chipsoft ... 30 day MBG**  
8059 TurboTax Personal/1040 1.0 ..... 50.
- Claris**  
1129 MacWrite II 1.1 ..... 142.  
8216 FileMaker Pro 1.0 ..... 218.  
1125 MacProject II 2.1V3 ..... 365.
- ★ **Deneba Software ... 30 day MBG**  
4700 BigThesaurus 1.0 ..... 64.  
1768 Coach Professional 3.1 ..... 124.
- ★ **DeltaPoint ... 60 day MBG**  
8967 Taste 1.0 ..... 84.
- ★ **Fox Software ... 30 day MBG**  
5572 FoxBASE II/Mac 2.01 ..... 292.
- ★ **Franklin Software ... 30 day MBG**  
7070 Language Master 2.0 ..... 45.
- Informix**  
4955 Wingz 1.1A ..... 245.
- ★ **Intuit ... 30 day MBG**  
2425 Quicken 1.5 ..... 38.



**Abacus Concepts**  
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- ★ **Lifetree Software ... 30 day MBG**  
6984 Correct Grammar 2.0 ..... 55.
- ★ **Mainstay ... 30 day MBG**  
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8613 MacSchedule Plus 1.0 ..... 199.
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6500 Excel Money Mgr. Book (incl. disk) . 25.  
5454 The Microsoft Office ..... 525.
- ★ **Niles & Associates ... 30 day MBG**  
5048 EndLink 1.1.3 ..... 58.  
4602 EndNote 1.3 ..... 85.  
8010 EndNote Plus 1.0 ..... 145.
- ★ **Nolo Press ... 60 day MBG**  
4228 For the Record 2.0 ..... 31.  
2981 WillMaker 4.0 (not valid in LA.) ..... 37.



# Dick, and Fred



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5683 *Nisus 3.04*... 245.

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*DynoPage 1.0* or *Dynodex 2.0*. ea. 72.

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7696 *Calendar Creator 1.0*... 35.  
7694 *Address Book Plus 2.0*... 57.  
7698 *Fast Forms 2.0*... 105.

## ★Preferred Publishers ... 30 day MBG

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## ★Que Corp./RightSoft ... 30 day MBG

7482 *RightWriter for the Mac*... 54.

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## ★Sensible Software ... 30 day MBG

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8810 *Informed Manager 1.0*... 99.

7692 *Informed Designer v. 1.0.4*... 159.

## ★Softstream Int'l. ... 30 day MBG

8175 *HyperTax Tutor 1.0*... 62.

8279 *HyperTax Tutor/MacInTax Bundle*... 99.

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7129 *Accountant, Inc. 2.0*... 345.

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3470 *MacInTax Personal Edition 1990*... 59.

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## ★Survivor Software ... 30 day MBG

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## ★Teleware ... 30 day MBG

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2986 *Timeslips III 2.0*... 195.

## ★T/Maker ... 30 day MBG

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8206 *SmartBundle*... 215.

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## Adobe Systems

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6957 *Adobe Type Reunion 1.0*... 38.

5750 *Adobe Type Manager 2.0*... 55.

8794 *Adobe Type On Call*... 59.

6053 *Adobe Plus Pack*... 109.

6156 *Adobe Plus Pack/ATM*... 159.

6098 *TypeAlign for ATM 1.0.4*... 59.

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8171 *Adobe Illustrator 3.0 (w/ATM)*... 349.

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6644 *Adobe Photoshop 1.07*... 499.

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5001 *StreamLine 2.0*... 125.

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8811 *SuperPaint/Personal Press Bundle*... 279.

3980 *Digital Darkroom 2.0*... 259.

3507 *Super3D 2.1*... 279.

*Persuasion, PrePrint or FreeHand*... ea. 329.

7088 *PageMaker 4.0*... 499.

8054 *Design Team (PM, FH & PrePrint)*... 889.

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5425 *Art Importer 2.0*... 89.

6499 *Metamorphosis 1.5*... 89.

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6281 *TypeStyler 1.5.2* . . . . . 115.  
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8879 *Fluent Font Library 4.0* . . . . . 105.

## Claris

1123 *MacPaint II 2.0* . . . . . 92.  
1117 *MacDraw II 1.1V2* . . . . . 289.  
8007 *Claris CAD 2.0* . . . . . 649.

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6645 *Easy Color Paint 2.0* . . . . . 45.

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8037 *Freedom of Press Light 3.0 (17 fonts)* 56.  
6517 *Freedom of Press 3.0* . . . . . 255.

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## \*Deneba Software ... 30 day MBG

6365 *UltraPaint 1.01* . . . . . 125.  
1769 *Canvas 2.1.1* . . . . . 189.

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6770 *MacRecorder Voice Digitizer* . . . . . 89.  
2199 *MacRecorder Sound System 2.02* 159.

## \*Foundation Publishing ... 60 day MBG

6728 *Comic Strip Factory 1.6* . . . . . 37.

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2417 *MacDraft 2.1* . . . . . 279.  
4707 *Dreams 1.1* . . . . . 349.

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2621 *Ready Set Go! 4.5A* . . . . . 165.  
6300 *FontStudio 1.0* . . . . . 359.  
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Eddy H.M. - Best Multimedia Software

## \*Mainstay ... 30 day MBG

7714 *Capture 3.0* . . . . . 45.

## \*MediaLab Tech. ... 30 day MBG

8218 *Picture Link 1.1* . . . . . 225.

## \*MicroFrontier ... 30 day MBG

7886 *ENHANCE 1.2* . . . . . 239.

## \*MicroMaps ... 30 day MBG

7554 *MapArt (Paint)* . . . . . 41.  
*MapArt (EPS) or MapArt (PICT)* ea. 99.

## \*Microsoft ... 30 day MBG

2878 *PowerPoint 2.01* . . . . . 245.

## Multi-Ad Services

8767 *Multi-Ad Creator 2.5* . . . . . 695.

## PANTONE

7466 *Process Color Imaging Guide* . . . . . 49.

## Paracomp

7728 *SwivelArt 1.0* . . . . . 82.  
7441 *Swivel 3D Professional 1.0* . . . . . 439.  
8957 *Swivel Pro/MacRenderMan Bundle* 949.



## Paracomp

7839 *FilmMaker 1.0*—1990 MacUser Editors' Choice Award for Best Animation Program. The ultimate animation & multimedia graphics program. Quickly create professional quality presentations & animations with ease . \$439.

7839 *FilmMaker 1.0* . . . . . 439.  
Eddy - Best Animation Program

## Pixar

8965 *Pixar Showplace 1.0* . . . . . 469.  
8966 *MacRenderMan* . . . . . 549.  
Eddy H.M. - Best 3D Modeling/Rendering

## \*Preferred Publishers ... 30 day MBG

8055 *Screenshot 1.2* . . . . . 31.  
8872 *MasterPaint 1.0* . . . . . 51.  
7828 *Exposure Pro 1.1* . . . . . 69.

## Quark

7612 *Quark XPress 3.0* . . . . . 519.

## \*Solutions, Inc. ... 60 day MBG

3446 *The Curator 1.05* . . . . . 87.

## \*Springboard ... 30 day MBG

3530 *Certificate Maker 2.02* . . . . . 22.

## Strata

7773 *Stratavision 3D 1.5.5* . . . . . 369.  
Eddy H.M. - Best 3D Modeling/Rendering  
7772 *Stratavision 3D/Renderman Bundle* 999.

## Strategic Mapping

6518 *ATLAS-MapMaker 4.5* . . . . . 369.

## \*SuperMac Tech. ... 60 day MBG

3380 *PixelPaint 2.1* . . . . . 149.  
5625 *PixelPaint Professional 2.0* . . . . . 465.

## \*Symmetry ... 30 day MBG

8172 *Mariah 1.0* . . . . . 94.

## \*Tactic Software ... 30 day MBG

8251 *Icon It! 2.1* . . . . . 45.  
*Magic Typist, Art Fonts, Sound Clips or Art Clips 1* . . . . . ea. 50.  
8261 *Art Clips 2* . . . . . 65.  
8248 *Font Share 2.2* . . . . . 129.

## 3G Graphics

3942 *Images with Impact: Graphics 1* . . . 50.  
4583 *Images with Impact: Business 1* . . . 65.  
6379 *Accents & Borders I* . . . . . 65.  
Eddy - Best Data Resource

## \*Timeworks ... 30 day MBG

7115 *Publish It! Easy 2.0* . . . . . 145.  
Eddy - Best Design Program

## Ventura Software

8962 *Ventura Publisher 3.0* . . . . . 499.

## \*Wildflower ... 30 day MBG


6512 *SnapJot 3.0* . . . . . 32.

## \*Zedcor ... 60 day MBG

3986 *DeskPaint & DeskDraw 3.03* . . . . . 115.  
Eddy H.M. - Best Graphics Program



# to earn the name Ed.



**Adobe Systems**  
6644 Adobe Photoshop 1.07-1990 MacUser Editors' Choice Award for Software Product of the Year. A photo-editing and production tool. Produce halftones, adjust brightness and contrast, even colorize them. .... \$499.

## PROGRAMMING & UTILITIES

- ★ **Abbott Systems** ... 30 day MBG
- 5236 CanOpener 1.1 ..... 63.
- ★ **Advanced Software** ... 30 day MBG
- 8051 In touch 1.0 ..... 40.
- ★ **Affinity Microsystems** ... 60 day MBG
- 7835 Tempo II Plus ..... 105.
- ★ **Aladdin Systems** ... 30 day MBG
- 6169 Shortcut 1.0.1 ..... 46.
- 6740 StuffIt Deluxe 2.0 ..... 63.
- ★ **Aldus/Silicon Beach** ... 30 day MBG
- 5100 SuperCard 1.5 ..... 199.
- ★ **ASD Software** ... 30 day MBG
- 7085 FileGuard Extended 2.5.2 (1 user) 139.
- 7422 FileGuard Extended 2.5.2 (5 user) 349.
- 7423 FileGuard Extended 2.5.2 (10 user) 579.
- ★ **Baseline Publishing** ... 30 day MBG
- 7783 INIT Manager ..... 35.
- ★ **Berkeley Systems** ... 30 day MBG
- 5737 After Dark 2.0T ..... 22.
- 1541 Stepping Out II 2.02 ..... 49.
- ★ **Casady & Greene** ... 60 day MBG
- 2269 QuickDEX 1.4D ..... 34.
- 7443 A.M.E. 1.1.2 ..... 159.
- ★ **CE Software** ... 60 day MBG
- 4689 MockPackage Plus Utilities 4.4 ..... 31.
- 1727 CalendarMaker 3.0 ..... 31.
- 6278 DiskTop 4.0 ..... 63.
- 7518 Alarming Events 1.01 ..... 85.
- 8024 QuickKeys 2.0.1 ..... 94.
- ★ **Central Point** ... 30 day MBG
- 5040 Copy II Mac 7.2 ..... 25.
- 5041 Mac Tools Deluxe 1.0 ..... 79.
- ★ **Connectix** ... 30 day MBG
- 7830 Maxima 1.0 ..... 45.
- 6123 Virtual 2.04 (for SE/30, Ilcx, Ilx, & Ilci) 115.
- 6122 Virtual 2.02 (for Mac II, incl. PMMU) 188.
- 6647 HandOff II 1.1.3 ..... 57.
- Eddy H.M. - Best Utility

- ★ **Dantz Development** ... 30 day MBG
- 5255 Retrospect 1.2 ..... \$148.
- 7945 Retrospect Remote 1.2 ..... 265.
- Eddy H.M. - Best Connectivity Software
- 7946 Remote (10 Pack of inits) ..... 148.
- ★ **Design Science** ... 30 day MBG
- 7887 MathType 2.0 ..... 89.
- ★ **DigitalTalk** ... 60 day MBG
- 5166 SmallTalk/V Mac 1.1 ..... 124.
- Dubl-Click Software**
- 7974 ClickChange 1.04 ..... 41.
- 1824 Calculator Construction Set 2.09.6 ..... 45.
- ★ **Fifth Generation** ... 30 day MBG
- 4287 PYRO! 4.0 ..... 25.
- 3955 Suitcase II 1.2.6 ..... 49.
- FastBack II 2.5 or DiskLock 2.0 ..... 118.
- 8284 SuperSpool 5.0 ..... 62.
- 8286 SuperLaserSpool 2.02 ..... 93.
- ICOM Simulations**
- 4084 On Cue 1.3 ..... 35.
- 4085 TMON 2.8.4 ..... 86.



**Penton Overseas** ... 30 day MBG  
VocabuLearn/ce—Building blocks of language. New version features: type answers, user modifiable options, create personal data stacks, keep statistics, and more. 3 hours of sound. Includes free HyperCard 2.0 .. see line listing.

- ★ **Insight Development** ... 30 day MBG
- 6171 MacPrint 1.23 ..... 94.
- ★ **JAM Software** ... 30 day MBG
- 6089 Smart Alarms 3.0 w/Appt. Diary 3.1 63.
- 6088 Smart Alarms 3.0 (1-4 users) ..... 125.
- ★ **Kent Marsh Ltd.** ... 30 day MBG
- 5457 QuickLock 2.0 ..... 34.
- 2591 The NightWatch 1.03 ..... 85.
- 6134 MacSafe II ..... 107.
- ★ **Kiwi Software** ... 60 day MBG
- 6267 KiwiEnvelopes! 3.1 ..... 33.
- ★ **Loop Software** ... 30 day MBG
- 5442 PictureBook 3.2 ..... 39.
- ★ **Magic Software** ... 30 day MBG
- 7267 AutoSave II 2.0 ..... 27.
- 7270 Backmatic 2.0 ..... 50.
- ★ **Microcom** ... 30 day MBG
- 8562 Complete Undelete ..... 48.
- 4803 Virex 3.0 ..... 57.
- 8561 911 Utilities ..... 89.



**JAM Software** ... 30 day MBG  
6089 Smart Alarms 3.0 with Appointment Diary 3.1—A Macintosh reminder and calendar system featuring: auto backup, variable snooze, multiple reminders, weekly and monthly views, and zoom. Multiple users available. .... \$63.

- ★ **Microseeds Pub.** ... 60 day MBG
- 7068 INITPicker 2.0 ..... 35.
- Redux 1.63 or Rival 1.1.4 ..... ea. 49.
- ★ **Microsoft** ... 30 day MBG
- 4471 QuickBasic 1.0 ..... 64.
- ★ **Millenium Software** ... 30 day MBG
- 6105 HyperX 4.0 ..... 99.
- Multi-Ad Services**
- 8850 Multi-Ad Search 1.0 ..... 129.
- ★ **Now Software** ... 30 day MBG
- 6925 Now Utilities 2.0 ..... 75.
- 6739 Prototyper 3.0 ..... 184.
- Olduvai**
- 4503 MultiClip 2.0 ..... 72.
- ★ **ON Technology** ... 1 year MBG
- 6385 On Location 1.02 ..... 75.
- ★ **Palomar Software** ... 30 day MBG
- 8210 Plottergeist 1.1 ..... 199.



**ASD Software** ... 30 day MBG  
7085 FileGuard Extended 2.5.2—Protect your hard drives, applications, files/folders (including system folder) from unauthorized access, deletion, and/or illegal copying. Now with system usage audit trail. 5 & 10 user also available. .... \$139.

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- ★ **Preferred Publishers ... 30 day MBG**
- 6656 Personality 1.1 ..... \$49.
- ★ **Salient Software ... 30 day MBG**
- 7404 DiskDoubler 3.1 ..... 45.
- Eddy H.M. - Best Compression Product
- ★ **Solutions, Inc. ... 60 day MBG**
- 3448 SmartScrap & The Clipper 2.1 ..... 56.
- 3449 SuperGlue II 2.01 ..... 75.
- ★ **SuperMac Tech. ... 60 day MBG**
- 3377 DiskFit 2.0 ..... 58.
- ★ **Symantec ... 30 day MBG**
- 5176 Symantec AntiVirus for Mac (SAM) . 65.
- 5724 Symantec Utilities for Mac (SUM II) . 96.
- 6748 Norton Utilities for the Mac 1.0 .... 84.
- Eddy - Best Utility
- 3421 THINK Pascal 3.0 ..... 165.
- Eddy - Best Development Tool
- 3420 THINK C 4.0 ..... 165.
- ★ **Synex ... 30 day MBG**
- 7147 MacEnvelope 5.02 ..... 57.
- ★ **Systems Compatibility ... 30 day MBG**
- 7872 Software Bridge 1.0 ..... 79.



**Timeworks ... 30 day MBG**  
7115 Publish It! Easy 2.0—1990 MacUser Editors' Choice Award for Best Page Design Program. "Its combination of word processing, graphics, and page-layout capabilities work speedily on any Mac." ..... \$145.

- ★ **Tactic Software ... 30 day MBG**
- 8964 MasterFinder 1.0 ..... 50.
- ★ **Teletypesetting ... 30 day MBG**
- 8601 TScript Basic ..... 54.
- 8058 TScript 1.3 ..... 92.
- ★ **TGS Systems ... 60 day MBG**
- 6667 Prograph 2.0 Compiler Version. . . 245.
- ★ **Williams & Macias ... 30 day MBG**
- 3781 LaserWriter Label Pack (Qty. 216) . 18.
- 6926 myDiskLabeler III 3.0 ..... 42.
- 4976 StickyBusiness 1.4 ..... 51.
- Wolfram Research**
- 8273 Mathematica Enhanced 1.2 ..... 699.
- ★ **Zedcor ... 60 day MBG**
- 3985 ZBasic 5.0 ..... 99.

## CD-ROM

- Activision**
- 8125 Cosmic Osmo (CD-ROM) ..... 46.
- Eddy - Best Recreation Program
- CD Technology**
- 8057 CD-ROM Porta Drive ..... 649.
- 7686 Porta Drive & MS Office CD-ROM . 999.
- Chinon**
- 8813 CDA-431 CD-ROM Drive. .... 639.



**Pixar**  
8965 Pixar Showplace 1.0—Complete picture-making tool. Alter conditions to achieve any scene you wish. Automatically processes your scene into a full-color picture. Imports into other presentation/desktop publishing applications .... \$469.

- ★ **Farallon Computing ... 30 day MBG**
- 6767 MediaTracks Multimedia CD Pack . 319.
- ★ **Highlighted Data ... 30 day MBG**
- 7771 Webster's Dictionary (CD-ROM) . . 159.
- ★ **HyperGlot ... 30 day MBG**
- 7473 Learn to Speak French (CD-ROM) . 159.
- 7829 Learn to Speak Spanish (CD-ROM) 159.
- ★ **MacroMind ... 30 day MBG**
- 7712 MacroMind CD-ROM ..... 125.
- ★ **Microsoft ... 30 day MBG**
- 6382 The Microsoft Office (CD-ROM) . . 599.
- Multi-Ad Services**
- ProArt Trilogy (CD-ROM series) ea. 259.
- NEC**
- Image Gallery, Type Gallery PS, Photo Gallery or Clip-Art 3D ..... ea. 246.
- 6744 CDR35 CD-ROM Portable Drive . . 349.
- 6743 Mac Driver Kit. .... 64.
- Passport Designs**
- 8255 Desktop Music Creativity (CD-ROM) 189.
- 8607 Music Production Kit (CD-ROM) . 1259.
- ★ **Somak Software ... 30 day MBG**
- LaserArt CD-ROM Vol. 1 or 2 . . ea. 62.
- Toshiba**
- 6749 XM 3201 CD-ROM Drive. .... 779.



**Microcom ... 30 day MBG**  
4803 Virex 3.0—Comprehensive solution to the threat of computer viruses ..... \$56.  
8561 911 Utilities—Troubleshooting file/disk recovery, complete undelete, isolate bad sectors, & Virex. 89.  
8562 Complete Undelete—Recovers deleted files 48.

## EDUCATION & RECREATION

- Accolade**
- Stratego or Balance of the Planet ea. 29.
- 8217 Ishido: The Way of the Stones . . . . 32.
- 8220 Jack Nicklaus Greatest 18. .... 34.
- Activision**
- 4486 Manhole. .... 28.
- ★ **Aldus/Silicon Beach ... 30 day MBG**
- Dark Castle or Beyond Dark Castle ea. 32.
- ★ **Ars Nova ... 30 day MBG**
- 1215 Practica Musica 2.2 ..... 69.
- ★ **Baseline Publishing ... 30 day MBG**
- 7785 Talking Moose ..... 23.
- ★ **Beacon Technology ... 30 day MBG**
- Gems of The Word (KJ or NJ) . . . ea. 25.
- HyperBible 2.0 (KJ or NJ) . . . . ea. 125.
- ★ **Bogas Productions ... 60 day MBG**
- 6135 Super Studio Session w/Music Library 99.
- Bright Star Technology**
- 1402 Alphabet Blocks 1.0 ..... 30.



**Electronic Arts ... 30 day MBG**  
8056 Studio/32 1.0—1990 MacUser Editors' Choice Award for Best Graphics Program. The professional's tool for all aspects of design. \$449.  
4315 Studio/8 2.0—Now packed with more features and lower in price! ..... 189.

- Broderbund Software**
- 4314 Type! 1.0. .... 18.
- 6516 The Playroom 1.1 (CP) ..... 29.
- Eddy H.M. - Best Recreation Program
- Carmen Sandiego Series (CP) . . . ea. 29.
- 8266 SimEarth 1.0. .... 40.
- 4966 SimCity 1.2 (CP) ..... 29.
- 5871 SimCity Supreme 1.2C ..... 47.
- Geom., Physics, or Calc. (CP) . . . ea. 58.
- Bullseye**
- 4074 P51 Mustang (CP) ..... 36.
- Carina Software**
- 5726 Voyager 1.2 ..... 88.
- ★ **Casady & Greene ... 60 day MBG**
- 2268 Crystal Quest 2.2 ..... 29.
- Mission Starlight or Sky Shadow ea. 29.
- Centron Software**
- 8525 Casino Master (B&W) ..... 41.
- 8524 Casino Master (Color) ..... 45.
- Coda Music Systems**
- 8188 MusicProse 2.0. .... 299.
- 5604 Finale 2.5 ..... 549.
- Davidson & Associates**
- 1734 Math Blaster! 1.0 (CP) ..... 29.
- 6128 Math Blaster Mystery (CP) . . . . 29.
- 8278 Alge-Blaster Plus ..... 35.



# against all the rest



## Custom Applications ... 30 day MBG

6517 *Freedom of Press 3.0*—Brings PostScript printing capabilities to non-PostScript, black and white devices. New features include Adobe Type 1 support and compatibility with all Macs. \$255.  
8037 *Freedom of Press Light 3.0* (17 fonts) ... 56.

## ★ EARTHQUEST ... 30 day MBG

8050 EARTHQUEST 1.0 ... 48.

## ★ Electronic Arts ... 30 day MBG

6716 *Pipe Dreams 1.0* ... 17.  
8643 *Harpoon* ... 39.

## ★ Great Wave ... 30 day MBG

KidsTime, Amer. Discov., KidsMath ea. 26.  
4334 *NumberMaze (B&W)* 26. 8527 (Color) 36.  
*NumberMaze Decimals & Fractions*  
8043 (B&W) ... 26. 8044 (Color) ... 36.

## ★ HyperGlot Software ... 30 day MBG

*Word Torture - Beginner to Advanced*  
(Span., Fren., Germ., Ital. & Rus.) ea. 29.  
*Pronunciation Tutor - Beginner*  
(Span., Fren.) ... ea. 35. (Germ.) ... 39.  
*Verb Tutor - Intermediate*  
(Spanish, French, German) ... ea. 39.  
6611 *Kanjimaster - Beg. (Japanese)* ... 99.



## International Business Software

8581 *DataClub 4.1* (3 user)—Honorable Mention—  
1990 MacUser Editors' Choice Award for *Best Work-Group Product*. Parallel processing performance, centralized server access, & practically unlimited storage—needs no dedicated hardware ... \$199.

## Individual Software

Training for Word or PageMaker ea. \$35.

## ★ Inline Design ... 30 day MBG

5870 *Bomber 1.3* (includes headphones) 32.  
7622 *Darwin's Dilemma 1.0* ... 32.  
8809 *Tesseract 1.0* ... 32.

## ★ Learning Company ... 30 day MBG

2670 *Reader Rabbit 2.2 (CP)* (ages 4-7) ... 30.  
5453 *Talking Math Rabbit 2.0* (ages 4-7) ... 30.

## ★ Leister Productions ... 30 day MBG

7126 *Reunion 2.0* ... 95.

## ★ Microsoft ... 30 day MBG

2868 *Flight Simulator 1.02 (CP)* ... 32.

## ★ Mysterium Tremendum ... 30 day MBG

5841 *Morality Revenge (CP)* ... 32.

## ★ Nordic Software ... 30 day MBG

8258 *Turbo Math Facts 1.1* ... 26.  
8260 *Word Quest 1.0* ... 31.  
8257 *PreSchool Pack 1.0* ... 36.

## Passport Designs

8253 *TRAX 2.0* ... 59.  
8254 *Desktop Music Creativity Kit* ... 189.  
3117 *Master Tracks PRO 4 4.1.4* ... 319.  
8250 *Encore 1.3.1* ... 379.  
*Eddy H.M. - Best Music Product*

8880 *Alchemy* ... 439.

3115 *MIDI Interface* ... 85.

## ★ Penton Overseas ... 30 day MBG

*VocabuLearn/ce Levels I & II*  
(French, Italian, Spanish, German, Russian, Hebrew, & Japanese). ea. 35.

## ★ Personal Training Sys. ... 60 day MBG

We carry over 60 learning levels from beginner to advanced for Quark XPress, Excel, Persuasion, FileMaker II/Pro, PageMaker, Illustrator, FreeHand, Word, HyperCard, and the Mac ... ea. 52.

## Postcraft

6466 *Citadel* ... 26.

## Premier Technology

*Strategic Conquest or NetTrek* ... ea. 34.

## Sierra On-Line

3397 *Leisure Suit Larry (CP)* ... 23.

## Sir-Tech Software

8228 *Wizardry II (CP)* ... 29.

## ★ Software Toolworks ... 30 day MBG

4619 *Mavis Beacon Typing 1.3 (CP)* ... 32.  
4588 *Life & Death (CP)* ... 32.

## ★ Spectrum Holobyte ... 30 day MBG

3464 *Tetris 1.1* ... 22.  
6112 *Welltris 1.1* ... 22.  
*Eddy H.M. - Best Recreation Program*  
8180 *Faces* ... 24.  
*Vette! or Falcon 2.2* ... ea. 32.

## ★ Spinnaker ... 30 day MBG

2328 *Sargon IV (CP)* ... 28.

## ★ Strategic Studies ... 30 day MBG

8084 *Halls of Montezuma* ... 26.  
8085 *Panzer Battles* ... 26.

## StudyWare

ACT, GMAT, GRE, or SAT Prep ... ea. 29.  
8098 *LSAT Prep for the Mac* ... 35.

## ★ Terrace Software ... 30 day MBG

8192 *Mum's The Word (gardening)* ... 79.



## Symantec ... 30 day MBG

6748 *Norton Utilities for the Mac 1.0*—1990 MacUser Editors' Choice Award for *Best Utility*. "Has redefined the state of the art of data-recovery software. An excellent collection of tools that speed up disk-related work." ... \$84.

## ★ Toyogo ... 30 day MBG

7624 *Nemesis Go Master 4.7* ... 41.  
7623 *Nemesis Go Master Deluxe 4.7* ... 85.

## ★ XOR ... 30 day MBG

8061 *MacSki 1.01* ... 40.  
6040 *MacGolf Classic (CP)* ... 52.

## NETWORKS & COMMUNICATIONS

## ★ Abaton ... 30 day MBG

6266 *InterFax 24/96 Modem* ... 349.

## Applied Engineering

8365 *DataLink Express* ... 175.  
*DataLink/Mac or Mac Portable* ... ea. 209.  
8938 *DataLink LC* ... 265.  
8362 *QuadraLink* ... 209.

## ★ Beagle Bros. ... 30 day MBG

7691 *Flash 1.1* ... 127.



## Softsync/BLOC ... 30 day MBG

7129 *Accountant, Inc. 2.0*—Honorable Mention—  
1990 MacUser Editors' Choice Award for *Best Financial Management Pkg.* Integrates General Ledger, Payables, Receivables, Payroll, Inventory and Project Management. ... \$345.

270C

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# The Eddies have



## Berkeley Systems ... 30 day MBG

5737 *After Dark 2.0T-New!* Over 30 displays & SOUND. Ticking clocks, thunder, munching worms. Use company logo, messages. Great Fish, Flying Toasters, & MultiModule. Random display, & password sleep. .... \$22.

## ★CE Software ... 60 day MBG

5173 QuickMail 2.2.3 (10 user) .... 315.

## ★CompuServe ... 60 day MBG

1676 Macintosh Membership Kit 1.03 .... 23.  
1673 CompuServe Navigator 3.0 .... 49.  
1674 Membership Kit/Navigator Bundle .... 69.

## ★DataViz ... 60 day MBG

1823 MacLink Plus/PC 5.0 .... 117.  
4842 MacLink Plus/Translators 5.0 .... 98.

## Dayna Communications

8719 EtherPrint .... 349.  
Eddy - Best Connectivity Hardware  
8720 DaynaTALK (5 Pak) .... 389.  
8721 DaynaTALK (10 Pak) .... 695.

## ★Dove Computer ... 60 day MBG

6758 DoveFax Desktop 1.1.1 .... 299.

## ★Dow Jones ... 30 day MBG

5295 News/Retrieval Membership Package 24.

## EveryWare

8077 AllShare 1.0 .... 139.

## ★Farallon Computing ... 30 day MBG

5707 Timbuktu 3.1 .... 95.  
Eddy - Best Connectivity Software  
4867 Timbuktu 3.1 30-Pack .... 1285.  
4866 Timbuktu/Remote 2.0 .... 123.

6371 Timbuktu/Remote Access Pack .... 845.  
8707 Liaison 3.0 .... 259.

6273 PhoneNET StarConnector 10-Pack .... 129.  
4869 PhoneNET Connector 10-Pk (DIN-8) 198.

2206 PhoneNET StarController 300 .... 825.  
6687 PhoneNET StarController-EN .... 1589.

6766 MediaTracks .... 189.  
Eddy H.M. - Best Multimedia Software

6768 MediaTracks Multimedia Pack .... 319.

## ★FreeSoft ... 60 day MBG

6115 White Knight 11 .... 85.

## ★Global Village ... 30 day MBG

8946 TelePort A300 .... 129.  
Eddy - Best Communications Product

8945 TelePort/FAX .... 185.

## Hayes

2300 Smartcom II 3.2 .... 84.

2307 Smartmodem 2400 .... 349.

5991 V9600 Baud Modem .... 689.

## Insignia Solutions

7557 Access PC 1.0 .... 62.

7058 SoftPC-AT/EGA Module .... 125.

4089 SoftPC 1.3 .... 245.

## Intel Corporation

5119 2400EX Modem .... \$179.

6420 2400EX MNP Modem .... 229.

## International Business Software

8581 DataClub (3 user) 199. 8580 (10 user) 539.

Eddy H.M. - Best Work-Group Product

## ★Kennect Tech. ... 30 day MBG

5631 Rapport 1.3.4 .... 195.

7588 Drive 360 (5 1/4") .... 249.

7590 Drive 1200 (5 1/4") .... 249.

5632 Drive 2.4 (3 1/2") (incl. FastBack II) .... 325.

## ★Microcom ... 30 day MBG

7465 CarbonCopy Mac (Twin Pack) .... 169.

8027 MacModem V.32 .... 689.

## ★Nuvotech ... 60 day MBG

3000 TurboNet ST (DIN-8) .... 30.

6751 TurboNet ST (12-Pack) .... 279.

6272 NuvoLink SC .... 389.

## ★Orchid Technology ... 30 day MBG

6949 OrchidFAX Modem 1.06 .... 429.

## ★Practical Peripherals ... 30 day MBG

3102 2400 Baud External Modem .... 179.

5285 PM2400SA MNP Modem .... 209.

7934 PM9600SA Modem 1.26 .... 489.

3089 Mac Communications Pack 1.5 .... 225.



## Farallon Computing ... 30 day MBG

5707 *Timbuktu 3.1-1990 MacUser Editors' Choice Award for Best Connectivity Software.* Allows a Mac to view and control other Macs on a network simultaneously. A great brainstorming tool. .... \$95.

## ★Preferred Publishers ... 30 day MBG

8943 DoubleTalk (1 Pak) 79. 8942 (2 Pak) 129.

## ★Prometheus ... 30 day MBG

8762 Travel Modem .... 195.

8350 2400 Mini for Mac .... 149.

8348 24/96 Minifax .... 199.

8349 Maxfax .... 295.

8709 2400M Plus .... 219.

8738 9600M Plus .... 599.

Eddy H.M. - Best Communications Prod.

## ★Shiva ... 30 day MBG

3444 NetSerial 3.3 .... 275.

4347 NetBridge .... 409.

4942 TeleBridge .... 409.

3443 NetModem V2400 3.3 .... 339.

6917 NetModem V.32 (V.42 & V.42 bis) .... 1169.

Eddy H.M. - Best Connectivity Hardware

6519 EtherGate .... 1619.

8189 FastPath IV .... 1889.

## ★Sitka/TOPS ... 30 day MBG

4188 TOPS Teleconnector (DIN8) .... 23.

3720 TOPS Flashcard .... 155.

6264 TOPS Networking Bundle 3.0 .... 187.



MACRENDERMAN

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## ★Software Ventures ... 30 day MBG

3455 MicroPhone II 3.0 .... 215.

## ★Solutions, Inc. ... 60 day MBG

6720 FAXGATE Plus 1.1.2 .... 239.

## ★Synergy ... 30 day MBG

6618 VersaTerm 4.5 .... 88.

6619 VersaTerm-PRO 3.5 .... 174.

## ★Traveling Software ... 60 day MBG

3729 LapLink Mac III Connectivity Pac .... 93.

## INPUT/OUTPUT

## ★Abaton ... 30 day MBG

7432 Scan 300/GS (reqs. Scan Kit) .... 999.  
Includes free ProPoint (\$79 value).

## American Power

5895 UPS 110SE .... 209.

6686 UPS 370ci .... 329.

## Caere

8124 Typist .... 479.

4476 OmniPage 2.1 .... 495.

OmniSpell 1.0 or OmniDraft 1.0 ea. 69.

## Chinon

8814 DS-3000 Scanner w/Dig. Darkroom 699.

8815 DS-3000 Scanner w/OmniPage .... 1099.



## Kennect Technology ... 30 day MBG

*Drives*—Owners of any Macintosh (512e-IIci) can get complete compatibility with all IBM and Apple formats by plugging one or more of Kennect's 3 1/2" or 5 1/4" drives into Rapport. .... see line listing for prices.





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And I sure don't miss the “peanuts.”

*Diana Robinson*

Diana Robinson  
Diamond Bar, CA

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Just for the record, all the ads in this series feature photographs of real live MacConnection customers and the real live letters they wrote us. Really!



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**Global Village ... 30 day MBG**  
 TelePort A300—1990 MacUser Editors' Choice Award for Best Communications Product. 2400 bps/MNP-5 modem connects via ADB Port. SendFax (9600 baud) optional.  
 8946 Basic .. \$129. 8945 with FAX .. \$185.

**Quantum**  
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**SuperMac Tech.**  
 7451 Dataframe XP 200 Hard Drive ... 1399.  
 5451 Dataframe XP 330 Hard Drive ... 2249.  
**★Total Systems ... 30 day MBG**  
 32-bit RAM Exp. Module ..... call  
 68882 Math Coprocessors ..... call

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**★Sony ... 60 day MBG**  
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 6148 3 1/2" DS/DD Disks 3 Pak (30) ..... 29.  
 3298 3 1/2" HD Disks 1.44 Meg (10) ..... 19.  
 6375 3 1/2" HD Disks 3 Pak (30) ..... 49.  
**★MacConnection ... 60 day MBG**  
 6592 44 Meg Removable Cartridge ..... 75.  
**★MAXELL ... 60 day MBG**  
 2792 3 1/2" DS/DD Disks (10) ..... 13.  
 2793 3 1/2" HD Disks 1.44 Meg (10) ..... 21.  
**★3M ... 60 day MBG**  
 3943 DC2000 40 MB Data Cartridge ..... 19.



**Prometheus ... 30 day MBG**  
 8738 9600M Plus—Honorable Mention—1990 MacUser Editors' Choice Award for Best Communications Product. 9600 bps (V.32) modem w/9600 bps send/receive fax. Supports V.42 bis, MNP-5. Includes software & cable. .... \$599.


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**Apple Computer**  
 7748 Personal LaserWriter Toner Cart. . . \$89.  
 1115 LaserWriter II Toner Cartridge . . . 105.  
**★Avery ... 60 day MBG**  
 4807 Laser Labels 1" x 2 5/8" (Qty. 3000) . 24.  
 5392 Disk Labels 3 1/2" Laser (Qty. 630) . 29.  
 4865 Address Labels 3 1/2" x 1 5/16" (3750) . 15.  
 4811 Transparencies 8 1/2" x 11" (Qty. 50) . 22.  
**★Basic Needs ... 60 day MBG**  
 Dust Covers. . . . . 10. to 13.  
 7413 Mac IIcx/ci Monitor Stand . . . . . 48.  
**★Computer Coverup ... 60 day MBG**  
 1723 ImageWriter II Cover . . . . . 8.  
 1725 Mac SE Ext. Keyboard Cover set. . . 10.  
**★CoStar ... 30 day MBG**  
 7453 The Organizer Jr. . . . . 79.  
 6091 The Organizer. . . . . 199.  
**Curtis Manufacturing**  
 8046 MVP Mouse . . . . . 89.  
**★Goldstein & Blair ... 30 day MBG**  
 8198 "What Do I Do Now" Book. . . . . 9.  
 2267 The Macintosh Bible (3rd Ed.). . . . 19.



**TIMESLIPS ... 30 day MBG**  
 8939 Timeslips III Accounting Link 1.0—Extend the power of your Timeslips III package. Accounting Link provides customized income reports linking billing & payment data from Timeslips III to many accounting programs. .... \$52.

**★I/O Design ... 30 day MBG**  
 8812 Ultimate Classic Carrying Case. . . 79.  
 6129 Ultimate SE/Ext. Carrying Case. . . 79.  
**★Kensington ... 30 day MBG**  
 2559 Apple Security Kit . . . . . 33.  
 6763 SE Radiation/Anti-Glare Filter . . . 52.  
 2566 System Saver Mac (platinum) . . . 63.  
 5064 Apple Color Monitor Polarizing Filter . 63.  
**★MacConnection ... 60 day MBG**  
 4623 Solid Oak Disk Case (holds 90 disks) . 32.  
 8795 Switch Box (2 Pos.) 32. 8796 (4 Pos.) 49.  
**★Mobiis Technologies ... 60 day MBG**  
 4470 Fanny Mac QT (Platinum) . . . . . 55.  
**★Moustrak ... 60 day MBG**  
 2694 Moustrak Pad (standard 7" x 9") . . . 8.  
 2692 Moustrak Pad (large 9" x 11") . . . . 9.  
 2693 Moustrak Pad L/F (large 9" x 11") . . 10.  
**Ribbons**  
 3255 ImageWriter II Ribbon Black . . . . . 4.  
 3261 ImageWriter II Ribbon Multi-4-Color . 9.  
**★Sopris Softworks ... 60 day MBG**  
 4014 High Trek Mac SE & Ext. Kybd. Case . 69.  
 4861 SE Protection Pack (std. keyboard) . 65.  
 4862 SE Protection Pack (ext. keyboard) . 75.



**MegaGraphics**  
 19" Rival Monochrome System for SE, SE/30 or II—Macworld Editors' Choice in large screens. Also includes coupon book with over \$3000 in savings on special 3rd party products. ea. \$1199.

**★Targus ... 60 day MBG**  
 3617 Mac Plus/SE Carry Case. . . . . 55.  
 4015 Mac SE & Ext. Kybd. Carry Case . . 69.  
**★Tripp Lite ... 30 day MBG**  
 6200 Isobar 6 (surge suppressor, 6 outlets) 59.

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## Computer Friends

- 8271 ColorSnap 32+ ..... \$649.  
**★CoStar ... 30 day MBG**  
 6090 LabelWriter ..... 185.  
**★Datadesk ... 30 day MBG**  
 6901 Switchboard (modular keyboard) . 159.  
*Eddy H.M. - Best Input Device*  
 MAC-101 Keyboards ..... ea. 129.  
**★DayStar Digital ... 30 day MBG**  
 8556 FastCache for Mac IIci ..... 279.  
 8586 40 MHz PowerCache IIci ..... 949.  
 8585 50 MHz PowerCache IIci ..... 1689.  
 8583 SCSI PowerCard ..... 1095.  
 25 MHz PowerCard 030 (II, IIx, IIcx) ea. 1095.  
 40 MHz PowerCard 030 (II, IIx, IIcx) ea. 1389.  
 50 MHz PowerCard 030 (II, IIx, IIcx) ea. 1895.  
**GDT Softworks**  
 6256 PrintLink Collection 4.0 ..... 59.  
 6151 JetLink Express 2.0 ..... 89.  
 8960 ParaLink Express ..... 99.  
**Hewlett-Packard**  
 6514 HP DeskWriter Printer ..... 759.  
 6754 HP LaserJet III (with toner) ..... 1699.  
**★Kensington ... 30 day MBG**  
 Turbo Mouse 3.0 (Plus or ADB) ea. 109.



## Cutting Edge ... 30 day MBG

*Cutting Edge Hard Drives* are fast and reliable with access times as low as 23 milliseconds and a mean time between failure rating of up to 100,000 hours. An outstanding combination of quality and low price. .... see line listing.

## Kodak

- 6730 DICONIX M150 Plus Printer ..... 489.

## ★Kraft Systems ... 60 day MBG

- 7519 KM30 ADB Joystick ..... 42.

## ★Logitech ... 30 day MBG

- 5082 ScanMan Mac Model 32 ..... 299.

## Magnavox

- 6690 14" Color Monitor with Micron Xceed for SE/30 (640 x 480) .... special 849.

## MegaGraphics

- 16" 8-bit System for SE/30 or II ea. 2595.  
 7841 16" 24-bit Color System for Mac II 4895.  
 19" Rival Sys. SE, SE/30, or II ea. 1199.  
 19" 8-bit System for SE/30 or II ea. 4295.  
 7840 19" 24-bit Color System for Mac II 6395.  
 19" G/S System for SE/30 or II ea. 1895.

## ★Micron ... 30 day MBG

- 7149 Xceed IIci-128 Cache Card ..... 239.

- 6680 Xceed for SE/30 (640 x 480) ..... 329.

## ★MicroSpeed ... 30 day MBG

- 6620 MacTRAC ..... 62.

- Eddy H.M. - Best Input Device*

- 6621 MacTRAC ADB ..... 75.



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## ★Mouse Systems ... 30 day MBG

- 7560 Trackball ADB ..... 69.  
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## ★Nutmeg Systems ... 30 day MBG

- 15" Monitor: SE, SE/30, II or IIsi ea. 599.  
 19" Monitor: SE, SE/30, II or IIsi ea. 995.  
 19" Monitor: G-Scale SE/30, II ea. 1295.  
 8319 20" Color Trinitron: SE/30, II, IIsi ea. 2595.

## ★Orange Micro ... 30 day MBG

- 3036 Grappler 2.0 (9 pin) ..... 87.  
 6229 Grappler LX ..... 134.

## Pacific Data Products

- 7412 Pacific Page PE 4.0 for the Mac .. 529.

## RasterOps

- 8526 Video Expander ..... 529.  
 7469 ColorBoard 264 for SE/30 ..... 659.  
 7457 Video ColorBoard 364 ..... 975.  
*Eddy - Best Desktop Video Product*  
 7468 ClearVue/GS System for Mac II .. 1699.

## ★Sophisticated Circuits ... 30 day MBG

- 8009 PowerKey 65. 8008 Wake-Up Cable 32.

## TheComplete PC

- 6104 Half-Page Scanner/400 ..... 295.

## Thunderware

- 4994 LightningScan 400 ..... 385.



## Applied Engineering

8362 QuadraLink—Add four serial ports to your Mac. It's fully Communications ToolBox (CTB) & 7.0 compatible. QuadraLink's Control Panel Device provides a "Shadow Driver" so older software (non-CTB) can use the ports .. \$209.

## Total Systems

- 8653 Galileo I Video Board (for Mac SE) \$449.  
 7817 16 MHz Mercury 030 (for Mac SE) 369.  
 8624 16 MHz Mercury 030 (for Mac Plus) 499.  
 7816 20 MHz Gemini 030 ..... 799.  
 8708 25 MHz Gemini 030 w/o copro. .... 999.  
 7814 33 MHz Gemini II 030 ..... 1199.  
 8371 40 MHz Gemini II 030 ..... 1339.

## MEMORY & DRIVES

### SIMMs ... 2 year warranty

*Includes free instructional video tape (specify VHS or 8mm) and booklet.*

- 1107 1 Meg SIMMs (80ns) ..... 57.  
 8316 2 Meg SIMMs Set (80ns) ..... 99.  
 7497 1 Meg SIMMs for Mac IIcx (80ns) ... call

### Applied Engineering

- 8361 1.44 Meg High Density Drive .... 229.  
 8369 MacRam Portable with 1 MB. .... 399.  
 MacRam Classic with 0, 1, or 3 MB. call



## Shiva ... 30 day MBG

6917 NeuModem V.32—Honorable Mention—1990 MacUser Editors' Choice Award for *Best Connectivity Hardware*. This shared modem now includes V.42 and V.42 bis for higher performance, speed, and reliability .... \$1169.

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 5133 20+ Meg Hard Drive ..... 329.  
 3990 30+ Meg Hard Drive ..... 389.  
 3991 45+ Meg Hard Drive ..... 449.  
 5275 60+ Meg Hard Drive ..... 489.  
 5276 80+ Meg Hard Drive ..... 539.  
 5456 45 Meg Removable Drive ..... 649.  
 5736 45 Meg Removable Cartridge ..... 79.

## Dayna Communications

- 8723 DaynaFILE 360k Drive ..... 449.  
 8722 DaynaFILE 1.2 5¼" Drive ..... 449.  
 8927 DaynaFILE 1.44 MB ..... 629.  
 8725 DaynaFILE Dual 360k & 1.2 MB .. 669.  
 8724 DaynaFILE Dual 360k & 1.44 MB . 739.

## ★Dove Computer ... 60 day MBG

- MaraThon 030 Upgrades ..... ea. 529.  
 8186 MacSnap 524XE ..... 199.  
 8187 MacSnap 524XS (w/SCSI Port) .... 249.  
 8649 MacSnap 596XE (4 MB) ..... 299.  
 8652 MacSnap 596XS (4 MB w/SCSI Port) 365.

## Peripheral Land, Inc. (PLI)

- 8335 PLI TurboFloppy 1.4 ..... 309.  
 8334 PLI SuperFloppy 1.4 ..... 449.  
 8336 PLI DOS Floppy ..... 469.  
 8333 PLI Sony 40 Turbo Ext. Drive. .... 489.  
 8327 PLI Infinity 40 Turbo ..... 749.



# RETROSPECT

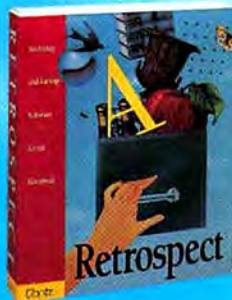
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On the Macintosh, creation and storage go hand-in-hand. You create. Then you store. Pretty soon, your hard disk is full of files--each one vulnerable to a hard disk crash. Retrospect will protect your creativity. And offers more than any other backup software: Archiving. Archive files to keep your storage needs in check. Retrospect supports almost any storage device and has compression, encryption, and full file selection. Run it automatically with a built-in calendar.

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other off-the-show-floor demo came from Ares Software, which showed FontMonger—the neatest type design and editing tool since Fontographer. Check it out.

### Word Processors

WordPerfect demonstrated version 2.0 for the Macintosh, the company's best effort and the most-anticipated word processor on the Mac at present. DeltaPoint showed its word processor with graphics, called Taste; awful name, great product.

### Spreadsheets

Microsoft announced a new version of Excel for the Macintosh with some features I personally appreciate, like the ability to more easily identify formulas or to invoke simple calculations more directly, and of course Wingz-style graphics. Sadly, the company introduced a richer feature set on its Windows version of the product. In fairness this is probably because Lotus Development Corporation is readying its Lotus 1-2-3 for the Mac at long last, and the product looks lean and mean.

Serius, the company producing developer tools, showed Serius Business, a new spreadsheet with built-in graphing capability that looks very interesting. Rather than focus on less-than-useful, 3-D, pretty pictures, the company tried to address the graphing needs of people who use a spreadsheet. It certainly is no competition for Excel in calculation capability, but if you want to work with text, lines, and formats in spreadsheet cells in combination with graphics, you should look at this product.

All of the major database companies had something to show, but databases seemed somewhat moribund. Microtech International announced a handsome group of memory peripherals for Next machines. And Everex showed a scanner.

### That's All, Folks

If you want the location of a company mentioned here, try looking it up in our product databases on AppleLink (international) or on the Macworld forum on America Online. And if all else fails, write me and I'll find it for you. **M**

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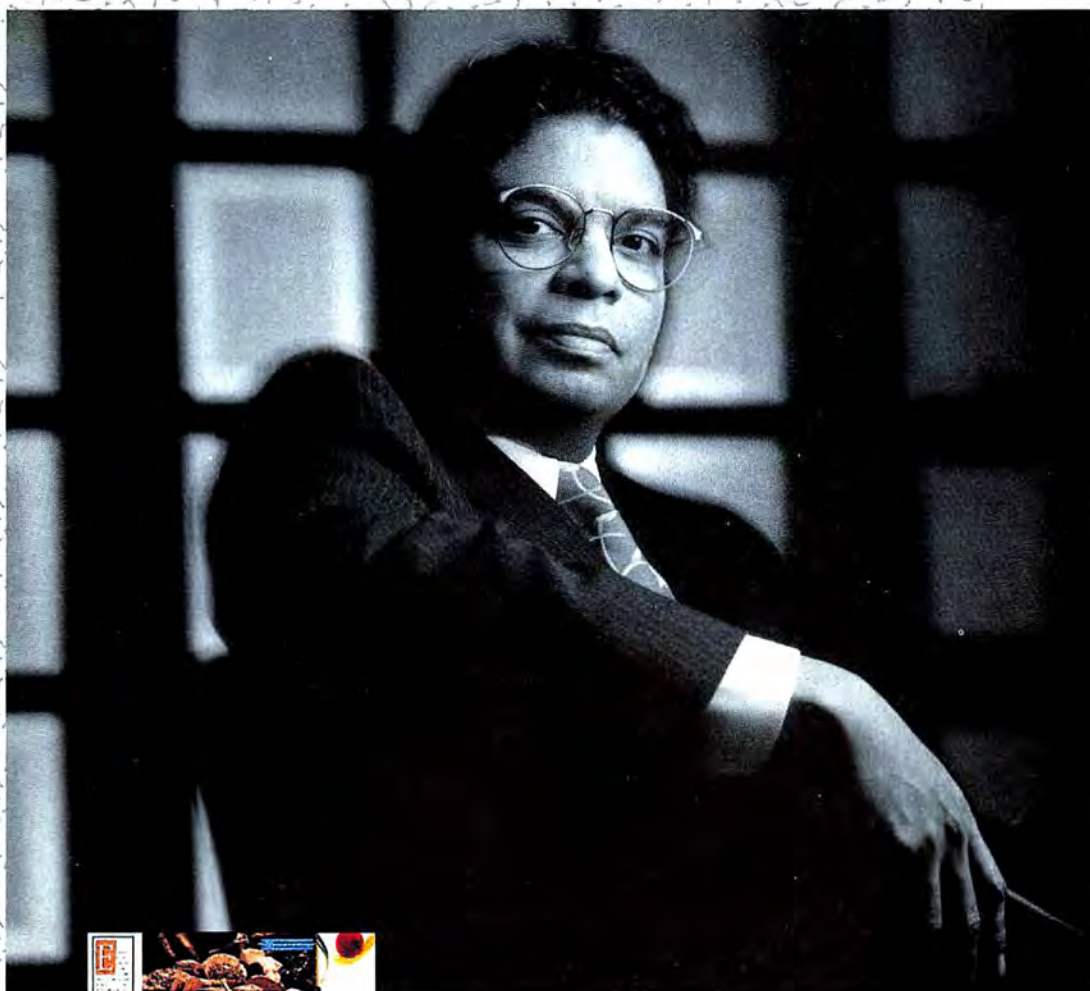
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**Too Small**  
13-INCH APPLE DISPLAY



# AFFORDABLE 16-INCH DISPLAYS

Turn your Macintosh into your own Personal Color Workstation with an E-Machines 16-inch display.  ColorPage T16, the full-page 16-inch Trinitron display judged best for two years running by *MacUser Labs*,  gives a whopping 70% more working space than you get on an Apple 13-inch RGB, one full-page including the margins.

That's room enough to view an entire year's budget or a complete presentation slide at a glance.  E-Machines' TX, the two-page 16-inch Trinitron display packs 19-inch

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# HOW MUCH IS YOUR USED APPLE WORTH?

As much as \$500 when you trade in one of the listed products for any 16-inch or 19-inch E-Machines color display system. See how much cash you can get for your Apple. Just take this card to your dealer, or for the name of your local E-Machines dealer, call 1-800-344-7274

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- Macintosh 12" Monochrome Display
- AppleColor 13" RGB Display
- Apple Macintosh Portrait Display
- Apple Two-Page Monochrome Display

## Apple Video Cards:

- Macintosh II 1-bit Video Card
- Macintosh II 4-bit Video Card
- Macintosh II Portrait Display Video Card
- Macintosh II Two-Page Monochrome Video Card
- Macintosh II 8-bit Video Card
- Macintosh Display Card 4 • 8
- Macintosh Display Card 8 • 24

## Third-Party Video Cards:

- RasterOps® ColorBoard 264
- SuperMac™ ColorCard/24™



1989 Eddy  
award-  
winner  
ColorPage T16



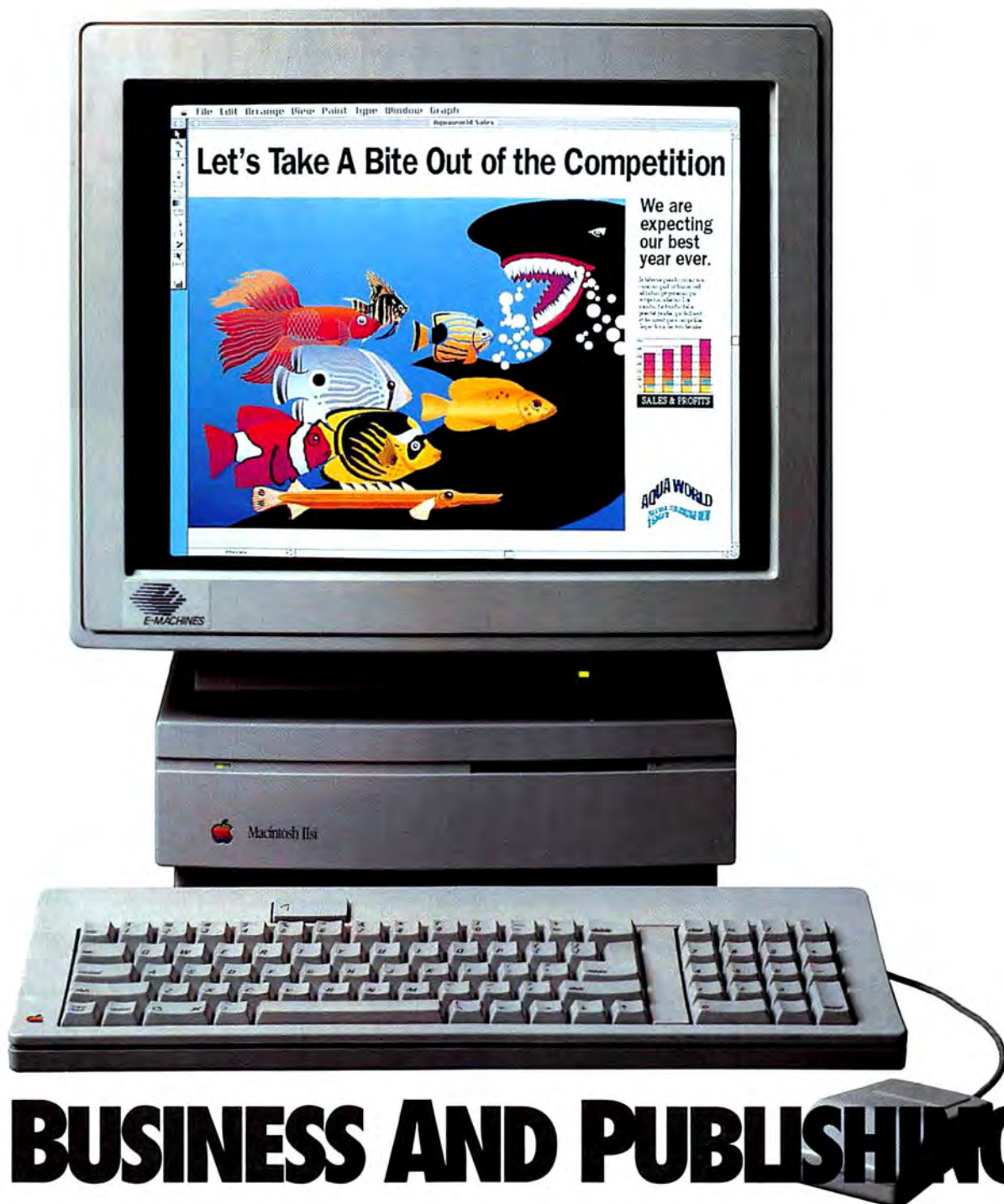
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You don't need to wait hours to change tapes.

You don't need to wait months for other storage technologies to catch up.

One 8mm tape drive will already deliver more than they promise.

It's the digital CY-8200, now with optional data compression. And you can get it exclusively from Contemporary Cybernetics Group.

With data compression, the CY-8200 can quadruple the amount of data you can load on an 8mm cassette that fits neatly in your shirt pocket. Meaning the already tremendous savings in man hours, media costs, storage and shipping are multiplied by four.

Until now, the best 8mm drive on the market stored an impressive 2.5 GB per tape at speeds up to 15 MB per minute.

## True "Plug-And-Play" Compatibility With:

Alliant	DEC 3100	IBM S/36	Pertec
Alpha Micro	DEC HSC	IBM AS/400	Plexus
Altos	DEC Q-Bus	Macintosh	Prime
Apollo	DEC TU/TA81	NCR	Pyramid
Arix	DEC Unibus	Novell	Sequent
AT&T	Gould	PC 386/ix	Sun
Convergent	HP	PC MS-DOS	Unisys
Data General	IBM RT	PC Xenix/Unix	Wang

and more...

Our data compression option allows you to write up to 10 GB per tape at up to 60 MB per minute. Completely unattended.

Of course, the data compression feature is switch-selectable, so you can turn off data compression to read and write standard 8mm tapes.

Plus it's a simple upgrade for the best tape drive built: our CY-8200. Offering a complete range of standard



interfaces, a 2-line, 40-column display option, and optional security card encryption. And assuring you of full support and

a 12-month warranty from the leader in advanced 8mm helical scan technology. The CY-8200 with data compression will remain the best value in data storage for a long time to come. So now you've got many good reasons for calling us today at (804) 873-0900 and no good reason for waiting.

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# LETTERS

## Ethical E-Mail

Prodigy's editorial control of E-mail is a blatant example of how corporations, by owning the means of communication, can stifle the free exchange of ideas [*The Iconoclast*, January 1991]. Prodigy should be boycotted by anyone who is uncomfortable with being told to shut up and shop.

Technological advances will be accountable to human needs only if humans make them accountable. Steven Levy deserves the highest praise for his sensitivity to the ethical issues involved in online services. *Macworld* deserves thanks for providing Levy with a national platform. Prodigy's censorship deserves greater public exposure and debate.

Eric Hebs  
Fort Worth, Texas

## Censored Comments

Regarding Steven Levy's January 1991 article, "In the Realm of the Censor," I would like to relate my experience with Prodigy. I am an assistant sysop on CompuServe, and help run a beer and home-brewing forum on CIS. We had an interesting thread going about Prodigy a while back. It seems that whenever anyone so much as mentioned anything with the word *CompuServe* in a Prodigy message, the censors would delete the message. These guys were sim-



WARD SCHUMAKER

ply explaining that there was a beer and home-brew forum on CompuServe. As it stands now, there is no way to even tell these poor sods that an alternative exists. Talk about trying to eliminate the competition.

Dan Fink  
via CompuServe

## Prodigy Has Its Say

Prodigy never intended to build a high-volume E-mail network, or a no-holds-barred bulletin board. There were plenty of those already. The Prodigy service was founded on three key marketing principles: give the service broad appeal, make it easy to use, and make it inexpensive. It's incredible that Steven Levy can say that compared to time-metered online ser-

vices and other modes of long-distance communication, 25 cents to send a four-page personal message is "prohibitive" and "onerous." Prodigy is simply recovering the costs incurred by a small minority so we can keep the cost to the majority a bargain at \$9.95 a month in the annual subscription.

Prodigy is a family-oriented electronic publisher. As such, we exercise editorial discretion over what appears in public areas of the service. Like *Macworld*, Prodigy does not guarantee publication of anyone's comments.

Here are some examples of member comments we've chosen not to publish: "Here's how to avoid paying for HBO: climb the

## Corrections

Nuvotech's TurboStar supports 16 ports, rather than the 12 we stated in the table "Other Network Products" ("Networking for the Novice," December 1990.)

Cactus Computer sells the following StarBurst products ("Networking for the Novice," December 1990): 16-port, 16-position RJ-11 connector panel \$549; 16-port, 64-position RJ-11 connector patch panel \$699; 32-port, 64-position RJ-11 connector patch panel \$1148; 48-port, 64-position RJ-11 connector patch panel \$1597; 64-port, 64-position RJ-11 connector patch panel \$2046; and 16-port, 12-position 50-pin connector and 4-position RJ-11 connector panel \$549.

telephone pole outside your house and . . ." "You can't get pregnant if you don't have an orgasm." Censorship? We don't think so. That's just caring about our customers.

Ultimately, the marketplace will decide what it wants. In the first 90 days after message charges were announced, the number of Prodigy service members mushroomed by a quarter million to more than 700,000.

Brian Ek  
Prodigy  
White Plains, New York  
(continues)





Steven Levy replies: Brian Ek's comments only confirm what I said the Prodigy service was—an online service that denies the promise of telecommunications by limiting the interactivity of its users. My column did note that when Prodigy was conceived, the communications services were consciously given short shrift. This is why the system architecture makes it fairly costly for users to send E-mail to each other. If the U.S. government can physically transport a first-class letter across the country for 25 or even 29 cents, isn't it reasonable that a computer system could move a few bits around for much less? Next, Prodigy costs not \$9.95, but \$12.95 a month unless users pay a year in advance. Finally, Prodigy's "editing" goes far beyond the extreme examples cited. Users report their comments have been quashed for political content, for instance. And even

G-rated comments that are deemed contrary to Prodigy's business interests are not permitted. That's not "caring about our customers" but censorship.

#### Silicon Valley Hamlet

**R**egarding your January 1991 cover picture of John Sculley, is that "Warrior King" or is it Hamlet?  
*F. A. Slattery  
Santa Monica, California*

#### Macworld Said What?

**W**hen I first read the "Year in Review" and came across those uncensored words, I laughed until my sides hurt. I think it is great that *Macworld* let the four-letter s-word by. It was appropriate and humorous. Besides, who at Apple does not say that word?  
*Sinistar  
via America Online*

#### Review Revolt

**H**ere is my review of your "Year in Review." Both of the subscriptions coming into my office will be canceled as a result of the profanity in the article.

*James E. Talmage  
Byron, Georgia*

#### Paper Chase

**I** am seriously concerned about the amount of wood that has to be cut down for the five or six renewal/subscription cards you put in each *Macworld* magazine. I recently discovered that you use roughly 809.4 square centimeters of card stock for these forms per month. If your circulation is indeed over 340,000 copies per month, that amounts to approximately 3,308,577,904 square centimeters, or more than 1485 metric tons, of

card stock just for the magazine's renewal/subscription forms.

This may mean nothing to you, but it means a lot to me. I suggest you think about what you are doing to our adulthood and to our children's future by this misuse of resources. Most people put these notices directly into the trash. I certainly hope you are not using Canadian trees, because we need our forests for more than garbage.

*Andrea MacNeish  
Vancouver,  
British Columbia*

As a magazine, we are very concerned about the environment and have recently founded a program we call *Macworld Earth Conservancy*, with the mission of promoting ecological responsibility. (continues)

## Turn Your Network Into a Work of Art

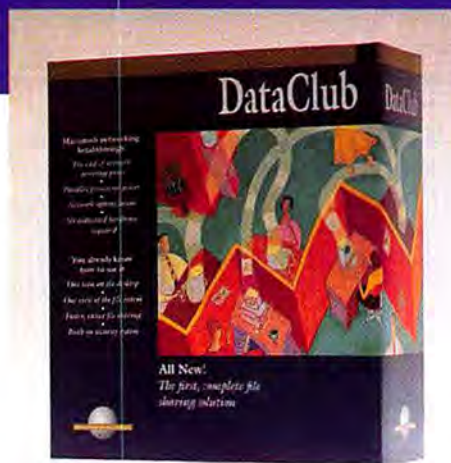
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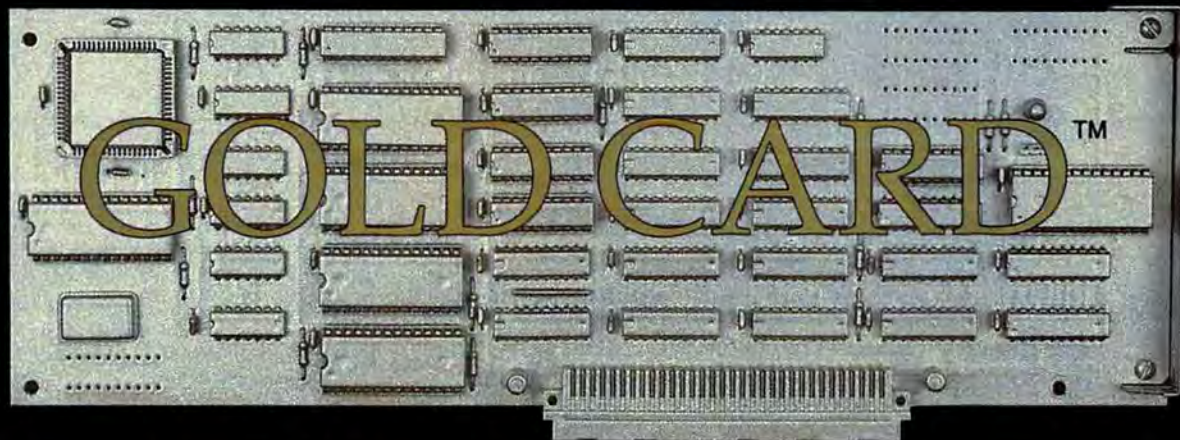
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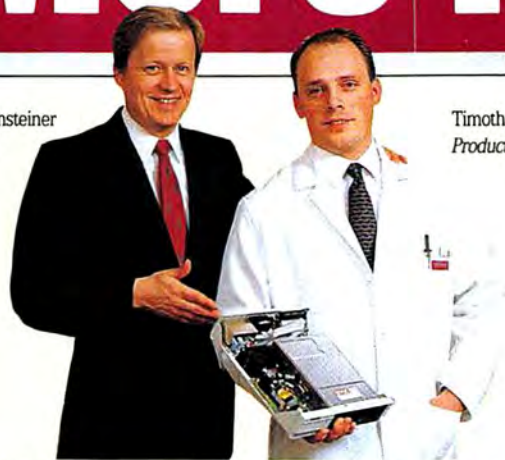
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Ronald E. Eibensteiner  
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Timothy R. Maroushek  
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*R. E. Eibensteiner*

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# The Price!"



4 Mice Rating — MacUser

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M130	130Mb	\$647	\$ 747
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MP designates a Quantum drive mechanism.

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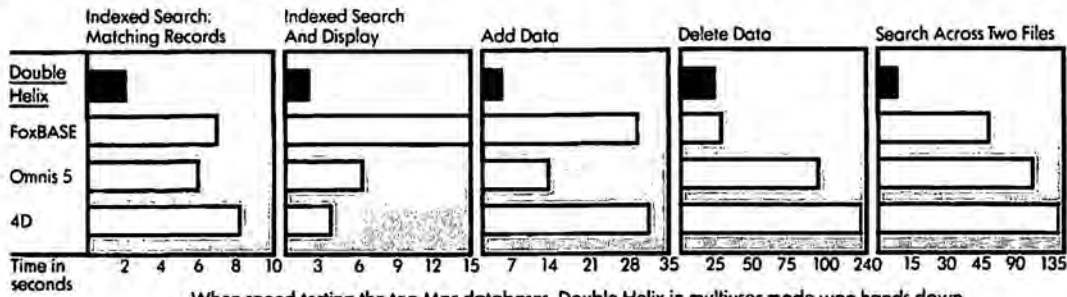
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When speed-testing the top Mac databases, Double Helix in multiuser mode won hands down.

the Macintosh.\* This, you should know, is not our personal assessment, but rather the conclusive results of MacUser magazine's June 1990 speed-test. And of the four top databases, in five key commands, Double Helix finished first. By considerable margins.

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# ART BEAT

by Cathy Abes

The tools and the talent behind Macworld's graphics and the techniques that make them possible

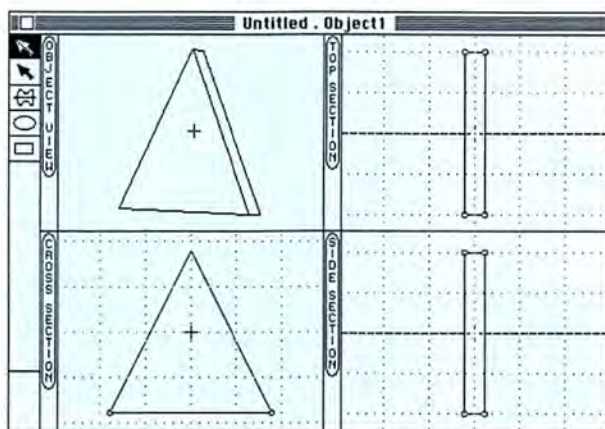
**Artist:** A veteran *Macworld* illustrator who has used PixelPaint Professional and SuperPaint extensively, Scott Baldwin decided to try using Paracomp's Swivel 3D Professional about six months ago and has since used it to produce four illustrations for *Macworld*.

**Hardware:** Mac IIcx with 8MB of RAM and a 105MB Cirrus internal hard drive, SuperMac ColorCard/24, Kurta 12-inch-by-12-inch graphics tablet, Jasmine Removable 45 (SyQuest) drive.

**Software:** Swivel 3D Professional; Adobe Photoshop; PixelPaint Professional.

**How It Was Done:** For the illustration that opens our "Getting Started with Hardware Upgrades" column, Baldwin began in Swivel 3D Professional by creating the red engine block. He used the Extruded Object tool to create an object that he could then edit into the shape he wanted. Once the object was created, he worked on it in each of the four views Swivel provides: Object View (a wire-frame representation showing the object's position in the real world); Top Section; Side Section; and Cross Section.

Baldwin used Swivel's ability to embed objects



These are the four Object Views the artist began with when he used Swivel 3D Professional's Extruded Object tool to create the engine block.



After editing the object in each of the Object Views and assigning it a color, he ended up with the finished engine block.



The chains were made by creating one link of the chain, then duplicating and rotating, and repeating the process until the chain was complete.

within other objects for making the fan that's attached to the engine block. After he created the fan's central cylinder, Baldwin created one blade and duplicated it three times. Then he dragged all four blades toward the cylinder until they intersected it. Once the blades were embedded in the central cylinder, Baldwin examined them from different views—front, side, and top—to see how they were positioned relative to one another

in three-dimensional space. After rotating each blade until it was accurately positioned, he used Swivel's Lock Link tool to lock the blades together so they would stay in the same position relative to one another when he moved them around—as if they were glued together.

Like the engine block itself, the circular air cleaner that sits on top of the engine block was also made using the Extruded Object tool. Baldwin edited the

Cross Section view by making it into a Q shape: starting with a circle, he pulled out a little piece of it to make the tail of the Q. The top and side sections were rectangles whose proportions he altered slightly. The smaller circular object that sits on top of the larger one was created as a circle in the Cross Section and as rectangles in the Top and Side views, which made it a cylinder. To attach the cylinder to the Q shape, Baldwin grabbed the cylinder and moved it sideways and up and down in space until it was in the right spot, and then he embedded it in the Q shape. Finally, he locked the two objects together as he had with the fan blades.

To create the chains, Baldwin first created one link of the chain, then duplicated that and rotated it 90 degrees relative to the first link and duplicated those two. He continued duplicating chain links and changing the angle of each link until the entire chain was created. Then he used Swivel's ability to link objects together to make all the chain links into one composite object—the entire chain. That enabled him to move the chain around without changing the individual links' shape, proportion, or position relative to one another. To wrap the chain around the engine block, he rotated (continues)



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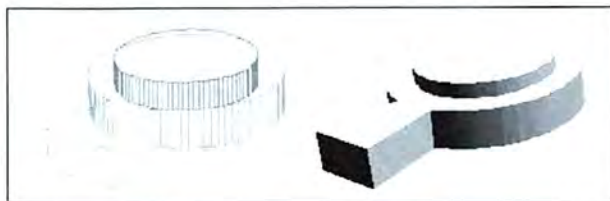
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ART BEAT



The air cleaner began as a cylinder from which a small extension was pulled out. The smaller cylinder was created separately and embedded in the larger one.

the three lowest links on the right side until they appeared to encircle the engine block. Once the chain was precisely positioned, he locked the links to one another and the entire chain to the engine block to eliminate any chance of their being moved accidentally.

After he had created all the objects, Baldwin used Swivel's six World Views (right, left, top, bottom, front, and back) to help position the objects accurately. To further fine-tune their positions, he then used Swivel's View Angles feature, which simulates different types of camera lenses: Wide, Very Wide, Moderate, Narrow, and Orthographic. Baldwin used this last view because it eliminates depth-of-field distortion, making it easier to align objects.

Once all the objects were properly positioned, Baldwin added color. In a Swivel file, you can use up to 16 different colors and a range of lighter tints and darker shades of each color. Each object can be assigned one color as well as what Swivel calls an environment map, which is actually a two-dimensional surface such as wood or chrome that is combined with the color and mapped onto the 3-D object.

The Macintosh shape started out as a cube in Swivel. Because he couldn't create the Mac's recessed screen and inside view in Swivel, Baldwin created them in PixelPaint Professional. Under Swivel's Effects

menu, he chose Anti-Alias to smooth out the edges of all the objects. Next he chose Paint-Type and 24bit PICT under Output Style (Edit menu), then Export File (File menu). As a result, the file was saved as a 24-bit PICT file with antialiasing.

In PixelPaint, Baldwin added the screen and the inside of the Mac, the background, the rivets on the engine block, and the black oil slick coming out of the engine. He also did the gradations on the fan blades and cleaned up various edges. Finally, he made a few minor color adjustments in Adobe Photoshop. **M**



The final Swivel image lacks a few details, most notably the Mac's screen and recessed interior. Also missing are the rivets on the engine block.



The final image after the missing elements were added in PixelPaint Professional and minor color adjustments were made in Photoshop.





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Ad produced on the Macintosh



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**Circle 313 on reader service card**





# Tea for Two

A TALE OF CORPORATE INTRIGUE INVOLVING SONY AND APPLE

BY STEVEN LEVY

**I**t was a lofty ethical struggle, all right, when I was offered an all-expenses-paid junket to Japan, courtesy of the Japanese Trade Ministry. Would I be compromised by the cushy first-class accommodations, and perhaps the stray geisha? After a

deep examination of my soul (which consumed somewhat less time than a font change on a 10-page Word file), I decided of course not! Even if I was, well, just a tad sullied by the proposition, could I really in good conscience deprive my readers of the opportunity to benefit from my newfound knowledge of the Land of the Rising Sun?

Certainly not! Oh, the sacrifices I make. And my instincts paid off. If I had taken the so-called high road and remained home, I would not be reporting the biggest scoop of my career.

How big? Read on.

This most extraordinary encounter occurred on the single free afternoon we reporters were allowed in Tokyo. I planned to spend it, like every other technology journalist who visits Japan, in the legendary Akihabara, the quarter of the city that specializes in electronics. I had heard that this was Wirehead Heaven, with every storefront brimming with esoteric and unspeakably cool items not yet rolled out in the United States. Indeed, it was everything I had hoped. I had already purchased a candy-apple-red IceMan—a pocket refrigerator powered by two AA batteries—and was pondering whether to purchase the

Digital Pen—a fountain pen that could input computer data and reformat it into illegible handwriting—when I received a gentle tap on the shoulder.

I turned to find three men in business suits smiling and bowing. “Are you Levy-san?” one asked.

I admitted as much.

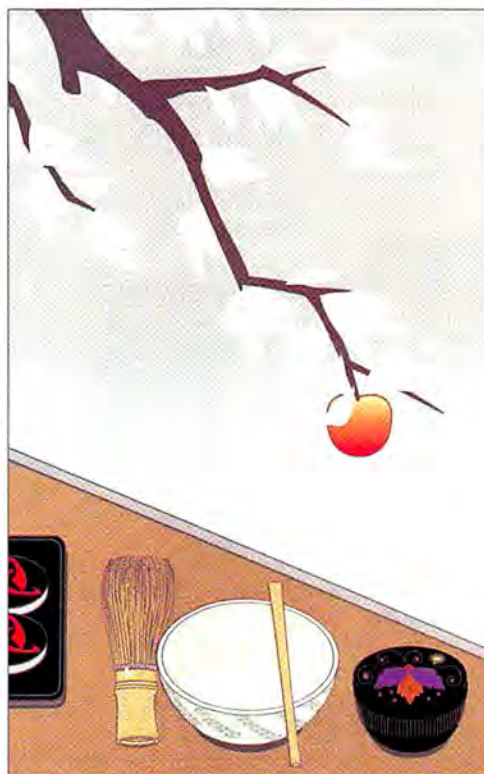
“Please accept an invitation to tea from Mr. Akio Morita.”

“You would not be referring,” I asked, “to the chairman of Sony?”

The three men nodded vigorously. They led me to a waiting limo, and after a brief ride I was escorted to a large glass-and-steel building and told to take the elevator to the 39th floor. To my astonishment, when the doors opened I found myself in a large, high-ceilinged space in which a traditional Japanese rock garden had been constructed many stories above the city. Kneeling in front of a tea bowl was the familiar figure of Morita, who had built the vast Sony empire. He looked up in welcome.

## The Art of Tea

Fortunately, I have been trained in the art of tea, and knew how to make my way across the room, kneel properly, and utter the appropriate praises about the setting. “That tea bowl,” I said, “is profound yet insouciant. Kind of luxuriously nonchalant.” He beamed his approval at my *(continues)*



MARK JASIN



grasp of the subtle contradictions inherent in his culture. After we executed the elaborate, centuries-old tea ritual—altered only by the fact that the tea-making apparatus, apparently a result of very-large-scale circuit integration, was the size of a postage stamp—we ceremoniously smacked our lips and talked business.

"What do you think," he asked, so softly I was straining to hear him,

"of Sony Corporation owning Apple Computer?"

In true Zen fashion, I responded to his question with a query of my own. "Are you planning a takeover of Apple?" I stammered. I held my breath anticipating his reply.

"No," he said.

I let my breath out. I sipped the tea.

"We already own it."

I spit out the tea.

"We have owned Apple Computer for several years now," said Morita. "It was a major stock transfer, executed secretly. The Apple executives cooperated, mainly because they realized that Apple would be unable to continue its executive salaries and perks indefinitely. After all, the cash reserve was only a billion dollars or so—and the way executives move in and out of Apple, who knows how long that would last? Since Apple very much valued its reputation as a company whose executive salaries are the envy of its more rational competitors, the officials decided that they would link with Sony. Also, they figured that if we owned them, they would never have to design their own disk drives and repeat the Lisa debacle.

"As far as Sony was concerned, we had long coveted the company. Besides, those of us who use a Macintosh couldn't figure out any other way to get customer support from Apple. Every time we called them with a problem, they said, 'Go to your dealer.' So we decided to buy them, and now the people in Cupertino are our employees. Now they not only help us when we have a system crash, but they accept our calls collect."

#### I've Got a Secret

"That is impressive," I said. "But why was the deal done in secret?"

"We very much feared the reaction of the American people. After all, Apple is a legend, as American as Rockefeller Center and Bruce Springsteen. The two Steves in a garage, and all that. If Americans felt that the Japanese owned its computer industry, there might be trouble. So we devised a scheme. We would clandestinely buy Apple but then arrange it so that the company would be so poorly managed that its value would sink. Only then would we appear as a white knight, saving American jobs."

I wanted to know what he meant by mismanagement.

"Take for instance Apple's marketing. Even a simpleton could understand that the main advantage of an Apple computer was its interface—its integration and its ease of use. All one would have to do was explain to

(continues)

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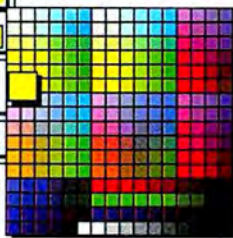
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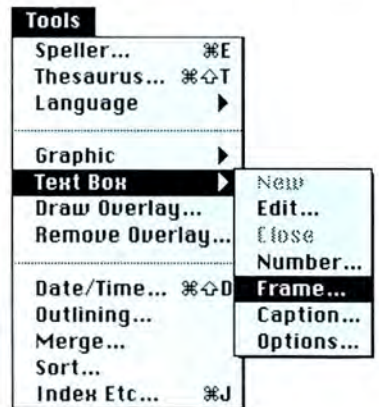
We built a graphics and drawing package right into the

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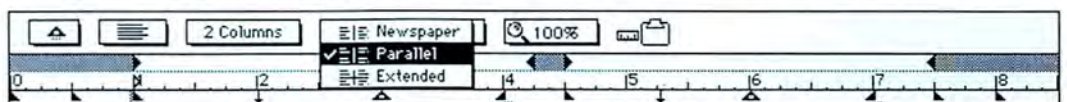
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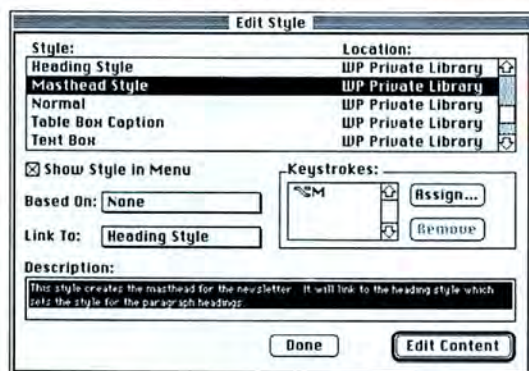
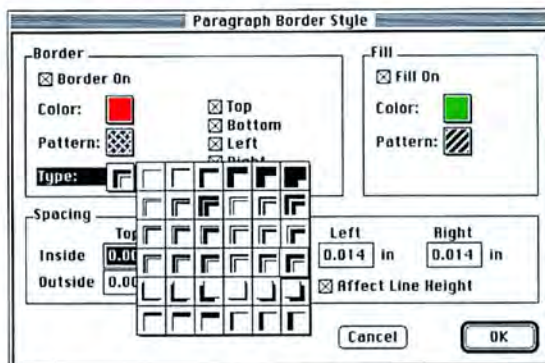
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the consumer why Macintoshes were superior. Then everybody would want one, and people in business who didn't use a Macintosh would suffer shame. But instead of that, Apple decided to show pictures of cars that flew."

"Gee," I said, "I thought the misguided advertising was just the kind of blunder that any big company could make."

Morita snorted. "Hah! Do you really think that a marketing genius like *John Sculley* would make such mistakes? He is the mastermind of the Pepsi generation! He approaches marketing as an art form, much the same way Leonardo painted. Haven't you read his book? It's all in there. Don't insult him by thinking that he could err so thoroughly in selling his computers."

I conceded the point. But I asked for more proof of this astonishing scheme.

"Surely. Every Japanese businessperson knows the major advantage we have over Americans. It's not that we

work harder—in fact, we have been constantly astonished at how Apple employees, at least those who actually work with computers, spend all their hours at work. No, American businesses suffer because of lawyers who draw managing and creative energy into meaningless legal battles. So at Apple, we simply let the lawyers run wild. They sue everyone in sight. And they insist on approving everything that happens at Apple. And with the lawyers dictating the security rules at Apple, we've managed to make the employees all paranoid!"

I agreed there was no better way to stop a company dead in its tracks than to unleash the lawyers.

"But you know what was really funny?" Morita said thoughtfully. "Some of the lawsuits were launched just to tangle things up—and to our surprise they weren't thrown out of court! Who would have thought that our copyright claims to the Mac interface would still be alive, when at the same time Xerox has been denied any claim to copyright—and Xerox

invented the interface! Really, your American legal system is remarkable."

#### Mysteries Resolved

The plan was indeed ingenious. "And if any of the executives figured out what was happening, it didn't matter," said Sony's Big Sushi. "They were gone in the biannual 'reorganization!'"

"So that's what happened to Gassée," I said. "But Akio-san, tell me, does the Macintosh Portable figure in this?"

"Naturally. Of course we had to lend Apple some of our expertise in devising small-scale technology. As novices in making portable computers, the Apple engineers couldn't have possibly figured out how to muck up a product so thoroughly without some guidance. So we concocted a plan for the ideal portable and had them do the opposite."

I thanked him for explaining that mystery; previously I had been unable to make head or tail of Apple's poor excuse for a portable computer.

(continues)

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"But wait a minute," I said. "What about the low-cost Macs? That seemed a pretty smart thing to do. How does that fit into your plan?"

Morita looked pained and fell silent for what seemed an eternity. Finally, he spoke. "Levy-san, you have correctly perceived what has turned out to be our chief difficulty. Explaining it will require a story." He poured more tea, took a deep draught, waited for me to follow suit, and continued.

"The beauty of our plan was to be total integration of all forms of software—now that Sony owns CBS Records and Columbia Pictures, we can merge those forms of entertainment with the information-processing power of personal computers. But then we learned that by owning Apple Computer, we were unable to participate in those areas. This time the lawyers worked against us."

"Are you referring to the lawsuit filed by Apple Records, the Beatles' former company?" I asked. "The one where Apple Computer, in exchange for continued use of the name, signed away its rights to process music on computers?"

"The same," said the venerable master. "It could have ruined all our efforts. The only way we could settle matters was to take on a partner. And this new player felt that our efforts to weaken Apple were excessive. She insisted that we abandon the linchpin of our plan—to keep Macintosh prices high and never attain healthy market share. In order to placate her, we acceded. And now it will be years before the company is sufficiently weak for us to announce our takeover. Even the silly commercials we ran when the new computers arrived—the one where the teacher invokes the Industrial Revolution and fails again to explain why a Macintosh is a good computer—didn't discourage people. They want Macintoshes."

I sighed in sympathy.

"That's not all. We have to cope with the constant interference from this partner. Phone calls all the time. Try this, change that . . . it drives me wild. Even dropping in unannounced."

### Double Fantasy

As if on cue, the elevator doors opened. Morita-san flinched. Through

the doors walked a well-known, diminutive figure with aviator sunglasses—Yoko Ono.

"Akio, you don't fool me," she said, not bothering with formalities. "The reason why you can't supply dealers with enough Mac Classics is that you're still trying to weaken the company. Forget it! Let's get Apple strong again!"

"See what I mean?" he said to me.

Yoko hardly stopped for breath. "And those stupid advertisements—they ruined the World Series for me! Well, don't worry, I have a new jingle for Apple that will turn things around. It was dictated to me last night by John."

"John Lennon came back from the dead and dictated an Apple jingle to you?" I asked.

"No, silly, John Sculley. He's a marketing genius—haven't you read his book?"

I admitted that I had.

She pulled out a small Casio keyboard and began singing in that unmistakable fractured soprano:

"Imagine there's no Windows,  
It's easy if you try . . ."

At that point Morita leapt to his feet, overturning the tea bowl. "Stop it!" he cried. "I said I would go along with the joke—but only if you didn't sing." He turned to me. "We don't own Apple. We never did. It's only an April Fools' joke! I'm sorry we had to put your readers through this."

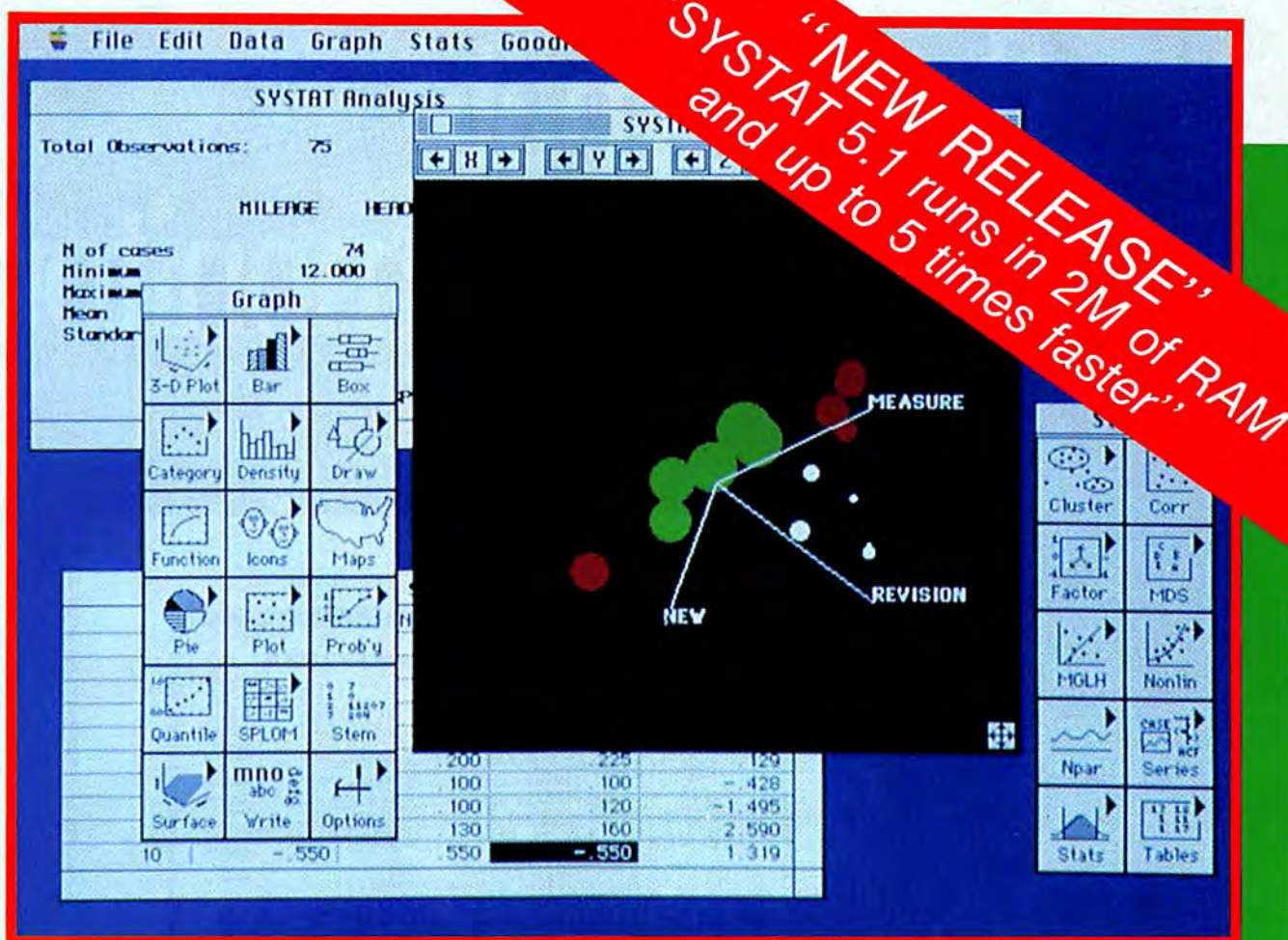
"We had you going there, though, didn't we?" said Yoko, grinning widely.

I admitted that they did. We all had a good laugh, as good a laugh as three people can share considering that we were really not together, and that the rock garden 39 stories over Tokyo was only a knee-slapping construct of my imagination. After promising my companions that I would inform my readers several times—this is an April Fools' joke, this is an April Fools' joke, this is an April Fools' joke—I got up to leave.

It was time to defrost my Ice-Man. ■

*Steven Levy, a Macworld columnist, is currently writing a book on artificial life.*





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## Jasmine One Year Later

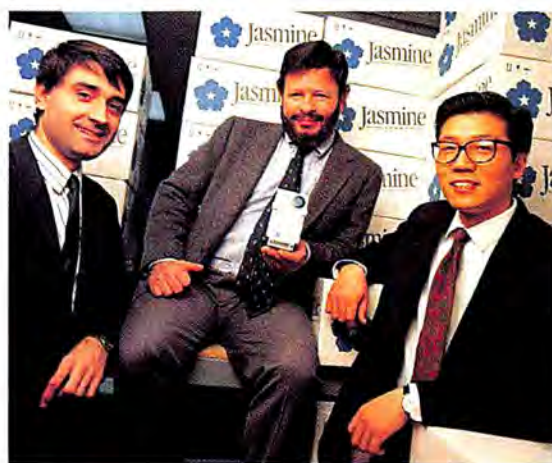
THE COMPANY'S MAKING MONEY BUT LOSING FRIENDS

BY DEBORAH BRANSCUM

**J**asmine officials say that the company is back on its feet, making a profit, answering its phones, and providing good products at good prices. But some Jasmine customers say the company refuses to honor its warranties and is still impossible to

reach. I met with Jasmine officials recently at their modest Sunnyvale, California, offices to get a progress report on the company and find out why consumer complaints continue to surface. The answer, at least in part, is that Jasmine Technologies is a different company, both legally and in practice, from the fat-cat vendor that was forced to file for protection from creditors nearly one year ago. The reorganized company moved from expensive new offices in San Francisco to more affordable space in Sunnyvale in October. The employees, some 125 before reorganization, have been trimmed over time to about a quarter of that number. And tech support and service have also been cut, all in an effort to bring Jasmine back to life.

In the process, Jasmine has essentially decided to cut its losses on old customers and concentrate on drumming up new business. During the reorganization proceedings in May, for example, new Jasmine officials pledged to honor the warranties on all existing Jasmine drives. But now the company says it can't do warranty work on its old 20MB model. Jasmine used a manufacturer's warranty from MiniScribe to cover repairs to its 20MB



Jasmine officials (from left) Marc Frouin, Nathan Schulhof, and David Guo show off the small Clipper drive.

drives, but then MiniScribe itself went into bankruptcy proceedings and declined to uphold its own warranties. That put Jasmine in a tight spot. The MiniScribe mechanisms are difficult to fix and often break promptly after repairs, according to David Guo, Jasmine's product director. And up until November, Jasmine was still losing money and could ill afford to put cash into MiniScribe repairs. It's a matter of survival, according to the company. "We had to concentrate on

new sales and new customers in order to break even," said CEO Marc Frouin.

That decision didn't endear it to *Macworld* readers like Rick Levine of Chicago. "I'm not asking for much," wrote Levine. "All I ask is they either

honor the warranty [or] replace the equipment . . . so I can feel that the \$1000 or so I've spent over the past three years with the company wasn't for nothing." After Levine wrote to several consumer agencies with his complaint, Jasmine repaired and returned his drive. But apparently some 220 other Jasmine customers won't be so lucky. According to Guo, about 30 percent of the 20MB model owners

have opted to upgrade their drives at a discount representing savings of \$70 to \$140, depending on the upgrade. Other owners are being referred to DriveSavers (415/883-4232) of Novato, California, and Mipro III (415/306-1100) of Redwood City, California, for repair service. (DriveSavers charges \$125 for the repair, with a 90-day warranty on the drive; Mipro charges \$145, with a 9-month warranty on the mechanism.)

(continues)



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Jasmine says this is a short-term issue because the remaining 20MB drive warranties should have expired by February of this year. But that's not the only problem readers have complained about. Why has it been so tough to get through to tech support? Why haven't drives been repaired quickly?

According to Jasmine, the move to Sunnyvale created a backlog, but of greater impact was a vicious cycle that kept the tech-support lines busy. The department was overwhelmed by people calling to get the status of their drives—250 calls were coming in per day. "If we can't fix the drives, people are going to call, but if people call, we can't fix the drives," said Guo, who was hired in October to help solve the problem. He said that people hired to do tech support were spending two-thirds of their time making repairs.

Guo established a new tech-support policy to answer every phone call, even if it meant slower service, in an effort to improve service overall. So Jasmine implemented a call-back service late last year in hopes of "eliminating phone-tag and having the wrong person call back... And people don't have to worry about additional long-distance charges, since Jasmine returns the phone call," said Guo. (This was not Levine's experience in November, but I had no problems getting through when I called in January.)

Another change is in the breadth of tech support. "Jasmine tech support used to provide a lot of tech support on non-Jasmine questions, such as questions about software INITs," said Frouin. "Ninety percent of the time it wasn't about the drive. We're not a Macintosh-support organization, we're a Jasmine-support organization." Frouin argues that the small profit margins of the drive business can't support greater service.

"I understand why people are upset," said Nathan Schulhof, vice president for sales and marketing. "If I were a user, I wouldn't accept Jasmine's answer." Schulhof said that the company tried to repair the drives at first, but the drives often failed again, making customers even angrier at Jasmine after waiting months for a repaired

drive. He told me that Jasmine officials do care about their customers, offer the best prices possible, and work hard to create new innovative products. With that, he showed me a prototype of Jasmine's nifty new pocket-size drive, which uses a 1-inch mechanism. He also discussed the inexpensive libraries of popular software that Jasmine will be offering as an option with its drives.

As I was writing this column, I called David Guo for an update. At that time there were 435 drives waiting for repair, not including the 20MB models—about a three-month backlog. Some 45 repaired drives had been returned to customers that day. On the same day I received a call from a reader who bought a portable drive from Jasmine. The drive arrived without a manual and with old Jasmine address and telephone information. "What's going on at Jasmine?" the reader asked.

Good question. Here's another one. Why did Jasmine quote different SIMM prices on the same day? Jasmine's supply of \$39.95 SIMMs disappeared rapidly, so many readers of the January and February issues were quoted a higher price than that advertised. When pressed, Frouin said Jasmine would honor the \$39.95 price until February 1. But when *Macworld* called to place an order on January 31, one salesman quoted a price of \$44.95 per SIMM; another said the price was \$54.95 per SIMM. (Current ads note that the price of memory may change.)

It's quite remarkable that Jasmine emerged from Chapter 11—few companies do. The new officials seem sincere, concerned, and determined; and none of them were part of the old Jasmine. They remind me again and again that this is a new company legally, a start-up, supporting a huge installed base, with very few resources but now making money to the tune of \$1 million in monthly sales. Fair enough. But they promised to honor all Jasmine warranties, and now they've broken part of that promise. So here's a reminder that products aren't enough—service counts, too, and consumers don't have the same patience with the new Jasmine that they had with the old.

(continues)

Circle 108 on reader service card



# The difference between our JPEG compression solution and theirs is obvious.



There's a big difference between our high performance compression/decompression solution and C-Cube's — ours is available now.

And that's not the only difference.

The Micron Xceed™ ICDP-II with Storm Technology's PicturePress™ software offers a variety of features you can't get with C-Cube's CL550™-based products. Like fully adjustable compression settings, thumbnail views, software easily upgraded to future JPEG versions, lossless compression and JPEG ++™ — an exclusive feature that allows you to compress different user-selected parts of the same image at different quality levels.

Now you can compress large files down to 1/80th their original size, saving disk storage space and speeding up transmission time. And you can compress and decompress up to 50 times faster with the PicturePress Accelerator than with software-only solutions.

Like all Micron products, the Xceed ICDP-II is backed by our extended five-year warranty and toll-free, technical support hotline.

So call us at 1-800-642-7661 for more information and the name of your nearest authorized dealer. And find out how, at \$995, the Xceed ICDP-II for the Mac® II family is obviously different, and obviously better.

Features	Micron ICDP-II	C-Cube CL550-Based Card
• True JPEG Implementation . . . . .	Yes	Yes
• Upgradable to Future JPEG Versions via Software Updates . . . . .	Yes	No
• JPEG ++ Support . . . . .	Yes	No
• Thumbnail Views . . . . .	Yes	No
• Lossless Support . . . . .	Yes	No
• Application Plug-ins (PhotoShop™) . . . . .	Yes	Yes
• Free Software-Based Decompression Module . . . . .	Yes	No
• 60 MIPS Programmable Processor . . . . .	Yes	No

Xceed is a trademark of Micron Technology, Inc. PicturePress, PicturePress Accelerator and JPEG ++ are trademarks of Storm Technology, Inc. All other registered and unregistered trademarks are the sole property of their respective companies.

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TECHNOLOGY, INC.

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Circle 161 on reader service card



# Our commitment to you:



## AfterHours Software TouchBASE

TouchBASE is a database to keep track of personal and business contacts. It's handy all the time because it is a desk accessory. TouchBASE can print envelopes, labels, address books, fax cover sheets, and reports. It's even a multi-user product so you can share your database on a network or use it all by yourself.

**TouchBASE .....\$85**

## Fuji Floppy Specials

**DS/DD 10 pk Rainbow ....\$9**

**DS/DD 10 pk .....\$7**

**HD Rainbow 10pk .....\$15**

While Supplies Last

## Fonts & Clip Art

### 3g Graphics -

Images w/Impact ..... 64.  
Accents & Borders ..... 64.  
Business ..... 49.  
Graphics & Symbols ..... 49.

### Adobe

ATM Plus Pack ..... 108.  
Typeset I or II ..... each 57.  
Typeset III ..... 115.  
Smart Art Vol. I - IV ..... each 59.

*The Mac Zone stocks the entire line of Adobe Postscript fonts. Call for our low prices.*

### T/Maker - Click Art

EPS Business Art ..... 82.  
EPS Illustrations ..... 82.

### T/Maker - Click Art

EPS Animals & Nature ..... 82.  
Business Cartoons ..... 31.  
Business Images ..... 31.  
Personal Graphics ..... 31.  
Publications ..... 31.  
Holidays ..... 31.  
Christian Images ..... 38.

### Dubl-Click

Wet Paint 1-18 ..... ea 39.  
World Class Fonts 1-8 ..... ea 39.

### Tactic Software

ArtClip 1st Ed ..... 49.  
ArtClip 2nd Ed ..... 64.  
ArtFonts Pak ..... 49.

## WORD PROCESSING

### A Lasting Impression

RésuméExpert ..... 47.  
Cover Letters ..... 47.

### Caere

OmniPage 2.1 ..... 494.  
The Typist ..... 478.

### Claris

MacWrite II 1.1 ..... 141.

### Lexpertise U.S.A. Inc.

MacProof 3.2.1 ..... 114.

### Deneba Software

BigThesaurus ..... 63.  
Spelling Coach Pro 3.1 ..... 123.  
Comment 2.0 ..... 63.

### Lifetree

Correct Grammar 2.0 ..... 54.

### Microsoft

Word 4.0 ..... 244.

### Paragon Concepts, Inc.

Nisus 3.0 ..... 244.

### Personal Bibliographic

ProCite ..... 195.

### Preferred Publishers

Vantage 1.5 ..... 51.

### SNA

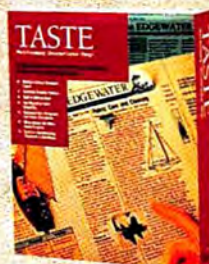
Stylist ..... 45.

### T/Maker

WriteNow 2.2 ..... 116.

### WordPerfect Corporation

WordPerfect 2.0 ..... 285.



## DeltaPoint TASTE

TASTE blends the best and most often used features of wordprocessing, page layout drawing, and personal data management; integrating them seamlessly into one elegant, easy-to-use package. With multiple stationery documents, you control the document types you use most frequently.

**TASTE .....\$85**

## GRAPHICS AND DESIGN

### Adobe

Illustrator 3.0 w/ATM ..... 348.  
Photoshop ..... 498.  
Streamline 3.0 ..... 115.  
True Form ..... 224.  
Type Manager 2.0 ..... 54.  
Type Reunion ..... 37.  
Type Align ..... 58.

### Aldus/Silicon Beach

Design Team ..... 888.  
(Incl. Freehand, PageMaker and Aldus Pre-Print)  
Digital Darkroom 2.0 ..... 258.  
Personal Press ..... 198.  
Freehand 2.02 ..... 328.  
PageMaker 4.0 ..... 498.  
Aldus Pre-Print ..... 328.  
Super 3D 2.1 ..... 338.  
SuperPaint 2.0 ..... 134.

### Brøderbund

Print Shop ..... 34.  
TypeStyler 1.5 ..... 114.  
BannerMania ..... 37.

### CE Software

CalendarMaker 3.0 ..... 30.  
Amazing Paint ..... 64.

### Claris

MacPaint 2.0 ..... 91.  
SmartForm Designer ..... 278.  
**Creative Software**  
Easy Color Paint ..... 44.

### Deneba Software

Canvas 3.0 ..... Call.  
UltraPaint ..... 124.

### Design Science, Inc.

Math Type ..... 88.  
Para Font ..... 58.

### Dynaware

DynaPerspective ..... 599.

### Electronic Arts

Studio 1 ..... 55.  
Studio 8 2.0 ..... 188.  
Studio 32 ..... 448.

### Frame Technology

Frame Maker ..... 795.

### Foundation Publishing

Comic Strip Factory ..... 36.  
#1 Office Days ..... 20.  
#2 Kid Stuff ..... 20.

### MicroFrontier

Enhance ..... 238.

### Letraset

ColorStudio ..... 644.  
DesignStudio ..... 488.  
FontStudio ..... 368.  
ImageStudio ..... 138.  
LetraStudio ..... 274.  
ReadySetGo! 4.5 ..... 164.

### Mainstay

ClickPaste ..... Call.

Capture 4.0 ..... Call.

### Pantone

Computer Color Book ..... 48.

### Quark

XPress 3.0 ..... 518.

### Salient

Partner 1.01 ..... 55.

### Paracomp

Film Maker ..... 438.  
ModelShop ..... 374.  
Swivel Art ..... 81.  
Swivel 3D 1.1 ..... 294.  
Swivel 3D Professional ..... 438.

### Solutions

Curator ..... 75.  
SmartScrap & Clipper ..... 55.

### SuperMac Technology

PixelPaint 2.0 ..... 224.  
PixelPaint Pro 2.0 ..... 465.

### Softview

it:X Forms Designer ..... 168.

### Tactic Software

FontShare ..... 138.  
Icon-It ..... 44.

### Preferred Publishers

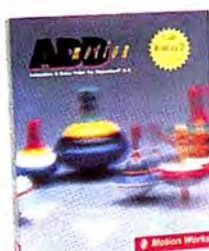
Exposure Pro ..... 68.  
Master Color ..... 102.  
Master Paint ..... 50.

### TimeWorks

Publish It! Easy 2.0 ..... 135.

### Zedcor Inc.

DeskPaint/DeskDraw 3.0 ..... 113.



## Motion Works

### ADDMotion

ADDMotion is the first animation and color paint program to be fully integrated with HyperCard 2.0. With ADDMotion you can quickly and easily add animation, color and sound to any HyperCard stack. It can be used by anyone who wants to create exciting presentations, develop interactive training

systems, or simply have fun. ADDMotion includes HyperCard 2.0

**ADDMotion .....\$182**

## LISI

### Sales & Marketing Manager

In this world of fast paced markets and even faster paced sales, you must have the marketing software to keep up with the world. Sales and Marketing Manager is a 5 part program that improves your control of all sales and marketing. It allows you to set up individual companies or divisions. Whether you are one sales person working for many companies or one company with many divisions... you can now keep full control. Retail for \$395.

**Sales & Marketing Manager .....\$295**



FREE with purchase of select CD-ROM players. Call for details

**Adobe Hotline  
1-800-258-1233**

### Adobe Systems

### Type On Call

### CD-ROM Disk

Type On Call offers over 800 Adobe Type 1 fonts on a single CD-ROM in a new accessible format. Get

new fonts with a simple phone call to the MacZone. Simply by purchasing

access codes over the phone, type users can

obtain new fonts from the disk. Initial purchase entitles you to two free fonts of your choice and includes Adobe Type Manager 2.0. Type On Call is the quickest and easiest way to buy fonts - once you have the disc, every font is a simple phone call away!

**Type-On-Call Introductory Price .....\$48**

Call us first for low prices

**1-800-248-0800**



# Shining stars for the 90's

1990 Eddy Award Winners

The Mac  
**Zone**  
Established 1986



Adobe  
**Photoshop**

## BEST SOFTWARE PACKAGE OF THE YEAR

### Adobe Photoshop 1.07

Adobe Photoshop is the affordable Macintosh image-processing program with enough power and versatility to be used as a paint, pre-press, color corrections and darkroom system. And it does it all in living 24-bit color. Whether you start with scanned photographs, slides, electronic art works or from scratch, Photoshop's full range of filters, painting, drawing and selection tools give you the artistic control and precision you've been missing.

**Photoshop 1.07 .....\$498**



## BEST CONNECTIVITY SOFTWARE

### Farallon Timbuktu

Timbuktu links all the Macs on a LocalTalk network (with password protection). The Desk Accessory opens and closes files, and actually operates the software on

another person's Mac. This makes Timbuktu especially good for training others on how to use an unfamiliar application. With version 3.1 you can now send files to others or let them copy to an from yours. And, you can operate files servers in distant rooms - from the comfort of your own Mac.

**Timbuktu .....\$92**



STATION  
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## 3.0, THINK Pascal 3.0 and Norton Utilities

These three winners this year. The first was MORE, which is the best presentation-software and as well as one of the premier outliners. THINK Pascal which has the most advanced development environment on the Mac, is the benchmark for today's developmental tools. And Norton Utilities which has redefined the state of the art of data-recovery speeds up disk-related work with an optimizer and a standard file-dialog box extender and file-finding capability. It can resurrect data from sick disks with its intelligent

.....\$259  
Pascal .....\$160  
Utilities .....\$83

## BEST CAD SOFTWARE

### Graphsoft MiniCad + 3.0

MiniCad+ is a product that integrates a spreadsheet and a relational database into a drawing so you can keep track of costs as the design evolves. Database information linked to a particular object stays with that object even when it is cut and pasted into another drawing. MiniCad+ also has a built-in programming language and a "smart cursor" to aid in the finer points of drafting.

**MiniCad+ 3.0 .....\$585**

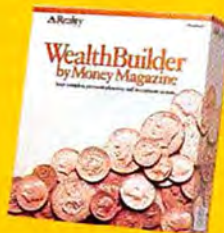


## BEST FINANCIAL MANAGEMENT PACKAGE

### Reality Technologies WealthBuilder

WealthBuilder can help you plan for the future, whether it's retirement, college education, or a big vacation. You create "what if?" scenarios based on different economic and personal assumptions, and WealthBuilder tells you how much you need to save. It can also suggest what portion of your savings should be in stocks, bonds, or pork bellies. A database of stocks and mutual funds contains information on ratings and performance for the past ten years, the information is updated quarterly.

**WealthBuilder .....\$144**

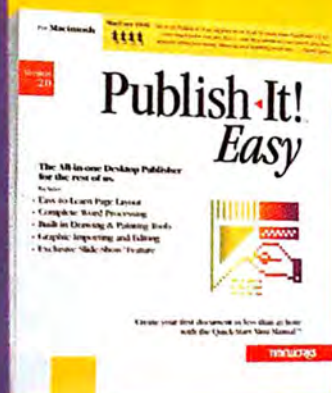


## ACCOUNTING & FINANCE

**Absolute Solutions**  
Computerized Classic Accounting ..... 223.  
**Check Mark Software**  
Cash Ledger ..... 114.  
MultiLedger 1.3A ..... 234.  
Payroll ..... 174.  
**Chipsoft**  
Turbo Tax Mac 1990 ..... 49.  
**Computer Associates**  
Simply Accounting 1.1 ..... 224.  
**In-House Software**  
In-House Accountant ..... 135.  
**Intuit**  
Quicken ..... 35.

**Peachtree/Layered**  
At Once! ..... 284.  
**MECA Ventures Inc.**  
Managing Your Money 4.0 134.  
**Nolo Press**  
For the Record 2.0 ..... 31.  
Will Maker 4.0 ..... 36.  
**Reality Technologies**  
WealthBuilder ..... 144.  
**SoftSync/Bloc**  
Accountant Inc. Pro 2.0 ..... 335.  
**Softview**  
Business, DOD & GSA  
Expense Reports ..... ea. 49.  
Personal Tax Analyst ..... 49.

**Softview**  
MacTax 1040 1990 ..... 58.  
State Supplements ..... 48.  
Tax View 1040 Pro ..... 335.  
it:X Payroll Tax Assistant ..... 85.  
it:X Personal Tax Analyst ..... 47.  
it:X Home Loan Assistant ..... 63.  
**Software Toolworks**  
Dollars & Sense 5.0 ..... 58.  
**Survivor Software**  
MacMoney 3.5 ..... 58.  
**Teleware**  
M.Y.O.B. .... 142.  
**Timeslips Corp.**  
Timeslips III 2.0 ..... 194.



## PAGE DESIGN SOFTWARE

### Works Publish-It! Easy 2.0

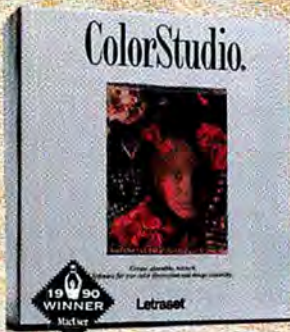
Publish-It! Easy integrates page layout, word processing (including checker and thesaurus) and drawing and so even beginners can produce attractive layouts. It includes most of the features of Publish-It!, many useful new functions. Dynamic Text Flow lets you adjust the size of text frames. Color palettes disappear when you need screen space. Multiple Undo Levels can remove changes five levels back. Editable Thumbnails let you see and edit the thumbnails.

**Publish-It! Easy .....\$135**



# Your call in 3 rings\*

\*or shipping is  
**FREE** with your purchase



**Best Color Prepress Letraset ColorStudio 1.1**  
With ColorStudio, you can retouch, merge, correct, and create color images with the precision and control you've always wanted. ColorStudio takes full advantage of Apple's new 32-bit Color Quickdraw software

though you'll need a video card and monitor capable of displaying 32-bit color. Also works in 8-bit mode. ColorStudio is compatible with most page layout software.

**Color Studio 1.1 .....\$644**

## Networking & Connectivity

### Asante

MacCon+II E & ILET	340.
MacCon+II E ET 64Kb	375.
MacCon SE E & ET	275.
MacCon SE/30 E & ET	340.
MacCon SE/30 64Kb	375.

### Cayman Systems

Gator Box	1,955.
Gator Share Software	1,350.
Gator Card E/II	ea. 458.
Gator Mail Q or M 10 user	675.

### CE Software

In/Out (1-5 user)	127.
In/Out (1-10 user)	186.
QuickMail 2.2	
1-5 users	207.
1-10 users	307.
1-50 users	1,567.

### DataViz

MacLink Translators	97.
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### DayStar Digital

Local Talk Board	
LT 200 MC	295.
LT 200 PC	185.

### Dayna Communications

EtherPrint	350.
DaynaPort E/SE, II & 030	355.
DaynaNET/4L	565.
Speed guard collision filter	52.
DaynaTalk for Macintosh	
Single	95.
5 Pack	380.
10 Pack	715.

### Dove

Ethernet	
FastNet SE, SE/30 or	
FastNet III	340.

### Farallon

LocalTalk -	
PhoneNET DIN-8	30.
PhoneNET DIN-8 (10 Pk)	195.
PhoneNET DB-9	30.
Star Connector (single)	17.
Star Connector (10 Pk)	125.
Star Controller 300	619.
Repeater	309.
PhoneNET/AppleTalk Adapt. 8.	
Ethernet - PhoneNET cards	
include Timbuktu & RJ45 cable	

### Farallon

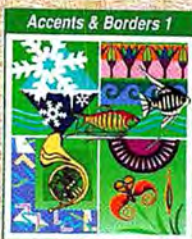
PhoneNET EN Mac II	350.
Mac II Card (10 Pk)	3,375.
PhoneNET EN SE/30	350.
Star Connector EN	120.
Star Controller EN	1,588.
Star Wiring Kits-	
Star Controller LT/EN	62.
Passive Star	62.
Harmonica Block LT	62.

**Timbuktu - One copy is required on every Mac**

Timbuktu (single user)	92.
Timbuktu (30 user pack)	1284.
Timbuktu Remote	122.
Remote Access Pack	848.
Remote Wakeup Cable	31.
Portable Pack	328.
MacRecorder Sound System	
Sound System 2.0	158.
Voice Digitizer	100.

### Int'l Business Software

DataClub 3 users	198.
DataClub 10 users	538.



## Best Data Resource 3G Graphics Accents & Borders 1

The numerous borders, ornaments, labels, and symbols in Accents and Borders are crisp

black & white and finely crafted. Unlike most clip-art offerings, all 3G images are opaque and most are strategically subgrouped for easy separation into more images or quick color changes. Bonus color disk for registered users.

**Accents & Borders 1 .....\$64**



## Best Communication Product Global Village TelePort

TelePort plugs into your ADB connector, like your mouse and keyboard, eliminating a power adaptor, trailing your serial ports, and enhancing portability. TelePort's 2400 baud Hayes compatible

modem incorporates MNP5 data compression/

**TelePort ADB .....\$128**  
**TelePort Send Fax .....\$185**

## Hyperware & CD's

### Activision

Cosmic Osmo CD ROM	45.
Manhole CD ROM	33.

### Addison Wesley

HyperCard Script Language	
Guide	18.

### DataDesk

Hyper Dialer	30.
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### Farallon

Media Tracks CD	318.
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### HyperPress Publishing

Script Library	56.
Script Expert	44.
ICON Factory	44.

### Motion Works

ADDMotion	182.
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### ICOM Simulations

Hyper TMON 2.8.4	57.
------------------	-----

### Individual Software

Power Macros - HyperCard	34.
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### MacroMind

Materials CD ROM	124.
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### Microsoft

Office CD ROM	598.
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### Silicon Beach Software

Super Card 1.5	198.
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### Wayzata Technologies

Seals in the US Gov't	49.
All of Mac Tutor	160.
Disc Tracy	75.
The USA Factbook	75.
The CIA Factbook	80.
The Middle East Diary	85.
Quickart	174.
Vietnam Remembered	69.
GEM- Public Domain	75.
Funhouse CD	37.



## Best Data-Management Product Fairfield Software ClearAccess

Utilizing a simple, graphical interface, ClearAccess allows a user to create SQL-type queries to most relational databases by just pointing and clicking on the data items they want. Queries can then be recorded as "Scripts" while they are being executed. ClearAccess makes host-based data access a natural and transparent part of the user's experience.

**ClearAccess .....\$405**

## Accessories

### Avery Labels

Mac Label Pro	48.
---------------	-----

### Casio

Casio B.O.S.S.	219.
CasioLink/Mac	98.

### CoStar

LabelWriter	184.
Organizer	195.
Organizer Jr.	68.

### I/O Designs

Carrying Cases - Blue or Black	
Imagewriter II	48.
MacLuggage Classic/SE	64.
MacLuggage II/IIx	98.
MacLuggage IIx-ci-ci	84.
Ultimate Classic Case	84.
The Ultimate SE	78.
Ultimate Neon Carrying Case	
Green - Pink - Yellow	88.

### Kensington Microware

Dust Cover SE XKB	9.
Dust Cover SE	9.
ImageWriter II Cover	8.
Anti-glare Filter	32.
SE Rad./Anti-Glare Filter	51.
Anti-glare Filter 13" Apple	63.
System Saver	63.
System Saver SE	52.
Universal Printer Stand	15.
Mac II Stand w/o cable	19.
Mac IIx Monitor Stand	54.
Mac II Monitor Stand	64.

### Kensington Microware

Mac II Mon. Cable Ext. Kit	32.
Masterpiece Mac II	108.
Extended ADB Cable	24.
Universal Copy Stand	24.
Printer Muffler 80	43.
Power Tree 10	19.
Power Tree 20	27.
Power Tree 50	54.
Apple Security Kit	34.
LaserWriter II Security Kit	33.
A-B Box (DIN-8)	63.
SuperBase	37.
PowerBaker 360	269.
PowerBaker 450	333.
PowerBaker 520	397.
PowerBaker 800	746.
PowerBaker 1200	946.
Pass Proof	70.
SideClip	6.

### Mac Packs - Linebacker

Navy, Wine or Gray	
ImageWriter Bag	48.
Mac Plus/SE Bag	55.
Mac SE Bag Xt	69.

### Smack-a-Mac

Smack-a-Mac Stuffed Mac	
Covers	
SE/Plus w/ext. keyboard	17.
SE/Plus w/std. keyboard	17.
Apple 13" monitor & ext. keyboard	18.

## Best Animation Program

### Paracomp FilmMaker

The Eddy Award winning FilmMaker is the masterful animation and multimedia graphics program. This amazing application allows the user to create professional quality presentations and animations quickly and easily! What takes hours to create in other applications can now be done in just minutes with FilmMaker. Whether you're a professional animator who wants to create stunning effects for video, or just someone who wants to put their ideas in motion - FilmMaker is the ultimate answer.

**FilmMaker .....\$438**



## Music

### Ars Nova

Practica Musica	68.
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### Bogas Productions

Super Studio Session 2.0	64.
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### Coda

Finale 2.0.1	557.
Mac Drums	30.
MusicProse1	86.
Perceive	49.

### Great Wave Software

Concertware+ MIDI 5.0	97.
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### Mark of the Unicorn

Professional Composer	375.
Professional Performer	375.

### OpCode

EZ Vision	99.
MIDI Translator	42.
MIDI Play	42.

### Passport Designs

MasterTracks Pro 4.0	315.
MIDI Interface	75.
Note Writer II	295.
Sound Exciter	46.

### PG Music

Band in a Box	57.
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### Tactic Software

Sound Clips 1-4	ea. 45.
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# Our MacAdvisors will answer

## ACCELERATORS & UPGRADE BOARDS

### Applied Engineering

Classic 1MB Upgrade .....	135.
Quadralink .....	204.
Mac Ram Portable 1MB .....	385.
Ram Portable 1MB SIMM .....	320.

### Connectix

Virtual - Mac II .....	124.
Virtual - Mac II w/PMU .....	187.
Virtual - SE/30, IIX, IICX .....	114.

### DayStar Digital

PowerCache 030 II ci	
40Mhz w/o FPU .....	995.
40Mhz w/FPU .....	1225.
50Mhz w/o FPU .....	1750.
50Mhz w/FPU .....	2050.
Fast Cache IICi .....	280.

### PowerCard 030

25Mhz II, IIX .....	1,115.
33Mhz II, IIX .....	1,495.
40Mhz II, IIX .....	1,650.
50Mhz II, IIX .....	2,245.

### DayStar Digital

SCSI Accelerator - w/o SIMMS	
SCSI PowerCard .....	1,025.
RAM Expansion - w/o SIMMS	
RAM PowerCard .....	625.

### Dove

MacSnap Upgrades	
524XE (512KE to 1MB) .....	195.
524XS (524XE w/SCSI) .....	260.
596XE (512KE to 4MB) .....	390.
596XS (596XE w/SCSI) .....	455.
Marathon 030 Upgrades -	
Bundled w/Virtual	
Mac Plus, SE, & II .....	524.

### SIMMS

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2mb Module for SI & CI .....	Call.
1mb 80NS for Fx qty 4 .....	Call.
4mb 80NS for Fx, 020, or 030	
Mac qty 4 .....	Call.

### Orange Micro

Mac 286 v.3.0 .....	1,078.
Mac 86 v.3.0 .....	444.
Orange 386 .....	1,695.

### Total Systems - Accelerators

Mercury 030	
16 Mhz for Plus .....	480.
16 Mhz for SE .....	360.

### Gemini II

20 Mhz for 030 .....	765.
25 Mhz 030 .....	965.
Gemini II	
33 Mhz 030 .....	1150.
46 Mhz 030 .....	1275.
Quicksane .....	45.
QuickCache IICi .....	315.

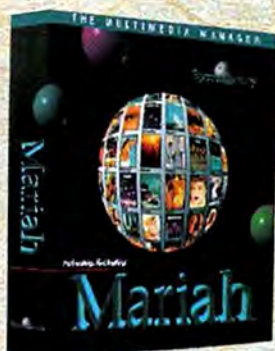
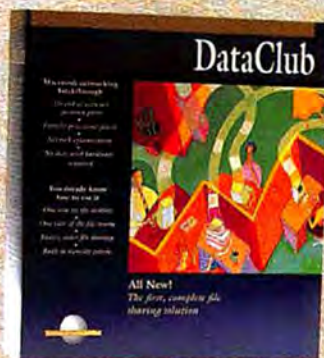
GemKit (Required to install the Gemini or Gemini II boards in any Mac below an SE model. Includes internal fan, SCSI port. Specify US or Int'l vers.) ... 125.

## International Business Software DataClub

How would you like a Macintosh network that runs astonishingly fast, becomes more powerful as it grows, and never goes down? You can have all this and more with DataClub - the breakthrough in file server

software. Instead of requiring dedicated hardware, DataClub utilizes every Mac on the network to create a powerful virtual server. The result is parallel processing with enables your network to perform with blinding speed.

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<b>10 Pack</b> .....	<b>538</b>



### Symmetry Mariah

Mariah is the first true multimedia organizer that lets you manage graphics, sounds, animation and text files together in one high-speed environment. Unlimited size and number of collections! Cut & Paste between collections and applications. Play sounds and animation. Record audio items directly. Import and export Sound and PICT resources to other applications or documents such as HyperCard.

<b>Mariah</b> .....	<b>\$93</b>
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### Insight Development MacPrint

Print any Macintosh application on many different printers. MacPrint is a chooser-level program, completely transparent in operation. MacPrint will display all your printer's resident fonts on your screen. If no resident font is found, MacPrint creates a printable font based on the Macintosh QuickDraw screen font, maintaining spacing, style, and word wrap. So what you see on the screen is what you'll see in print. Supports all internal fonts and font cartridges for HP printers from suppliers like Hewlett-Packard, Pacific Data Products, Everex, Anacom and Computer Peripherals.

<b>MacPrint</b> .....	<b>\$88</b>
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### Fuji Disks

DS/DD 10 pk Rainbow .....	9.
DS/DD 10 pk .....	7.
HD Rainbow 10pk .....	15.

### Sony Disks

DS 10pk .....	13.
Bulk DS/DD (50 pk) .....	39.
HD (1.44 mb) 10pk .....	22.
Bulk HD (50 pk) .....	90.

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## MODEMS & FAX

### Abaton

InterFax 12/48 .....	264.
InterFax 24/96 .....	417.
InterFax 24/96-220V .....	417.

### Applied Engineering

DataLink Express -2400	
MNP 5 .....	195.
MNP 5 w/Send FAX .....	225.
DataLink Mac II -2400	
MNP 5 .....	250.
MNP 5 w/Send FAX .....	275.
DataLink Mac Portable -2400	
MNP 5 w/Send FAX .....	275.

### CompuServe

Membership Kit .....	22.
Navigator 3.0 .....	48.

### Dove

DoveFax 24/96 .....	298.
DoveFax Plus .....	395.

### Everex

EMAC MD2400 MNP 5 .....	175.
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### FreeSoft

Second Sight .....	85.
White Knight 11 .....	84.

### Global Village

Teleport ADB .....	128.
Teleport SendFAX .....	185.

### Haves

Smartcom II 3.1 .....	84.
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### Shiva Corporation

NetModem V2400 .....	410.
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### Shiva Corporation

NetModem 9600V.32 .....	1150.
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### MicroCom

MacModem v.32 MNP 9 .....	675.
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### Orchid Technology

Orchid Fax Modem .....	425.
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### Prometheus

Modems come with cables & MacKnowledge

MacKnowledge .....	84.
MaxFax 24/96 .....	294.
MaxFax 9600 .....	698.
Travel Modem - Port. ....	194.
ProModem	
2400 Mini .....	138.
2400 SE Int.(MNP5) .....	245.
2400 II Int.(MNP5) .....	259.

### Prometheus

ProModem	
9600 V.32 .....	750.

### Software Ventures

Microphone II 3.0 .....	214.
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### Solutions

BackFax .....	152.
FAX Gate Plus 1.1 .....	238.

### Synergy Software

Versa Term 4.1 .....	87.
Versa Term Pro 3.0 .....	173.

### Supra Corp.

Supra 2400 .....	118.
Supra 2400 MacPac .....	178.

### U.S. Robotics - Courier

HST Std. V.42 9600 .....	675.
HST Dual Std. V.42 9600 .....	995.

## PROGRAMMING

### Digital

SmallTalk/VMAC .....	124.
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### Mainstay

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### Microsoft

Quick BASIC 1.0 .....	64.
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### Paragon Courseware

QUED-M .....	85.
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### Symantec

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Think Pascal 3.0 .....	164.
Think C 4.0 .....	164.

### Serius

Developer .....	339.
Programmer .....	210.
Animation & Communications	
Object .....	ea. 64.
<b>TGS Systems</b>	
Prograph	
w/ Compiler 2.0 .....	244.
<b>True BASIC, Inc.</b>	
True BASIC Language 2.02 ..	54.
<b>Zedcor</b>	
ZBasic .....	98.





## Quark XPress 3.0

XPress 3.0 boasts a more intuitive user interface, many new features, plus redesigned and reorganized documentation. New measurement and page palettes provide the user with interactive onscreen access. A library stores frequently used items, and a pasteboard provides a work area next to each page. You can group text and graphics as single elements, and rotate them a full 360 degrees in 0.001 degree increments. Color trapping ensures precise color printing. XPress was also awarded Honorable Mention in both Best Color PrePress and Best Page-Design categories in the MacUser Magazine Eddy Awards.

**XPress 3.0 .....\$518**



## Dantz

### Retrospect 1.2

With Retrospect, you can remove seldom-needed files to permanent storage, and free up space on your hard disk. It works with almost any media, from floppies to rewritable optical discs. Retrospect maintains a catalog on your hard disk so you always know where to look for your archives or back up files.

**Retrospect 1.2 w/10 Pk Remote .....\$264**  
**Retrospect 1.2 .....\$143**  
**Retrospect 10 Pk Remote .....\$149**

## EDUCATION

### Addison Wesley

Inside Macintosh, Vol. 1-5ea 18.  
Inside Macintosh, X-Ref ..... 8.  
Mac Programming Primer ..... 21.  
Mac Programming Secrets ..... 19.  
Programmers Online  
Companion 2.1 ..... 35.

### Bright Star

Alphabet Blocks ..... 29.  
Talking Tiles ..... 25.

### Goldstein & Blair

Macintosh Bible 3rd Ed. .... 23.  
Bible & What Do I Do Now?  
Book Combo ..... 31.  
Bible, What Do I Do Now?  
& Software Combo ..... 39.

### Braderbund

Calculus ..... 57.  
Geometry ..... 57.  
Physics ..... 57.  
Type! ..... 17.

### Carina

Voyager 1.2 ..... 86.

### Davidson & Associates

Math Blaster - Mystery ..... 29.

### Great Wave

KidsMath or Kids Time ..... 25.  
NumberMaze ..... 25.

### Learning Company

Math Rabbit ..... 30.  
Reader Rabbit 2.2 ..... 30.

### First Byte

The Dinosaur Discovery Kit ..... 25.  
Kid Talk or Math Talk ..... ea33.  
Math Talk Fractions ..... 26.  
Spell-A-Saurus ..... 30.  
The Puzzle Story Book ..... 26.

### Hyperglot

Russian  
Introduction ..... 28.  
Word Torture 3.0 ..... 28.  
Verbal Aspect - Inter. .... 41.  
Noun Tutor (Sound) ..... 58.  
Spanish  
Word Torture 3.0 ..... 28.  
Verb or Tense Tutor ..... 41.  
Pronunciation Tutor ..... 34.

### Hyperglot

French  
Word Torture 3.0 ..... 28.  
Pronunciation Tutor ..... 34.  
Verb or Tense Tutor ..... 41.  
German  
Word Torture 3.0 ..... 28.  
Pronunciation Tutor ..... 34.  
Verb Tutor ..... 41.  
Italian  
Word Torture 3.0 ..... 28.  
Japanese  
KanjiMaster ..... 97.  
EasyKana ..... 125.

### Earthquest, Inc.

Earthquest ..... 48.

### Individual Software

Training for PageMaker 4.0 ..... 29.  
Typing Encore 3.5 ..... 17.

### Personal Training Systems

MacZone carries the complete  
line of PTS programs ..... 51 ea.

### Nordic Software

MacKids PreSchool Pack ..... 34.  
Turbo Math Facts ..... 22.  
Word Quest ..... 29.

### Simon & Schuster

Typing Tutor IV ..... 28.

### Software ToolWorks

M. Beacon Teaches Typing ..... 31.  
Accu-Weather ..... 53.  
World Atlas ..... 40.

### True BASIC, Inc.

Algebra, Arithmetic, Calc. .... ea39.  
Discrete Mathematics ..... 39.  
Pre-Calculus/Trig. .... 39.  
Probability Theory ..... 39.  
True STAT ..... 39.

### Combo Packs w/Workbook

Algebra Combo Pack ..... 44.  
Calculus Combo Pack ..... 44.  
Pre-Calculus Combo Pack ..... 44.

### Visionary Software

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### Accolade

Ishido: Way of the Stones ..... 33.  
Stratego ..... 35.

### Activision

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### Braderbund

SimEarth ..... 41.  
SimCity 1.1 ..... 28.  
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The Playroom ..... 26.

### Inline Design

Bomber (w/Headphones) ..... 31.  
Darwin's Dilemma ..... 31.  
Tessare ..... 31.

### Mindscape

Balance of Power 1990 ..... 29.

### Casady & Greene

Crystal Quest 2.2 ..... 28.  
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Mission Starlight ..... 28.  
Sky Shadow ..... 28.

### Electronic Arts

Weaver Baseball ..... 33.  
Starlight ..... 39.

### Lucasfilm

Indiana Jones: The Last  
Crusade ..... 33.

### Mysterium Tremendum

Moriarty's Revenge ..... 31.

### Postcraft International

Citadel w/Secrets ..... 37.

### Sphere

Falcon 2.2 ..... 29.  
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Faces...Tris II ..... 20.

### Strategic Simulations, Inc.

AD&D: Pool of Radiance ..... 32.

### Three Sixty

Sands of Fire ..... 32.  
Harpoon ..... 40.

### Visionary Software

Synchronicity ..... 38.

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### Aapps Corporation

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### Symmetry

Mariah ..... 93.

### Digital Vision

Computer Eyes-Color ..... 348.  
Computer Eyes-B/W ..... 194.

### MacroMind

MacroMind Accelerator ..... 124.  
MacroMind Director 2.0 ..... 437.

### Farallon

Media Tracks ..... 188.  
Multimedia Pack ..... 318.  
Mac Recorder 2.0 ..... 158.  
Voice Digitizer ..... 109.

### RasterOps

Video Expander ..... 525.  
364 Board  
w/AudioMedia ..... 1525.  
364 Board w/Director ..... 1295.

## DRAFTING & CAD

### Claris

Claris Cad 2.0 ..... 624.  
MacDraw II ..... 288.

### Generic Software

CADD for the Macintosh ..... 374.  
Generic CADD Level 1 ..... 83.

### Graphsoft

Blueprint 2.0 ..... 218.  
MiniCad+ 3.0 ..... 585.

### Abacadata

Design Your Own Home  
Architecture, Interiors &  
Landscape ..... ea. 60.

### Innovative Data Design

Dreams ..... 348.  
Mac Draft 2.0 ..... 192.

### SoftStream International

Relational Objects ..... 148.

## Zedcor DeskPaint 3.03

DeskPaint is a 98K DA that works as well with black & white images on a Macintosh Plus or Classic as does with color images on a IIx or IIfx (even in 24-bit color). It reads and writes PICT, TIFF, and MacPaint files. It does smoothing, auto-trace, graduated fills, multiple windows, and a lot more. DeskDraw is a DA comparable to MacDraw. Some of its features include hairlines, rotated text and arrows. It reads and writes PICT files compatible with SuperPaint, MacDraw II and Canvas.

**DeskPaint 3.03 ....\$113**



**PicturePress .....\$120**

## Storm Technologies PicturePress

PicturePress compresses and decompresses 24-bit color images 10 to 60 times, using the emerging Joint Photographic Experts Group international still image compression standard. PicturePress operates alone or can be accelerated 20 to 50 times by the PicturePress Accelerator Card, a programmable 60 MIPS image processing NuBus Card.



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File Force 1.0 .....	248.
4th Dimension 2.1 .....	488.
Compiler ver. 2.1 .....	894.
<b>AEC Management Systems</b>	
FastTrack Schedule 1.5 .....	138.
<b>After Hours Software</b>	
Touch Base .....	85.
<b>AISB</b>	
How to Write a Bus. Plan .....	85.
<b>Aldus</b>	
Persuasion 2.0 .....	328.
<b>ASD</b>	
Planisoft- single .....	194.
<b>Avery</b>	
MacLabel Pro .....	48.
<b>Blyth Software</b>	
Omnis 5 .....	648.
<b>CE Software</b>	
Alarming Events .....	84.
<b>Chang Labs</b>	
C.A.T. III .....	288.

<b>Claris</b>	
FileMaker Pro .....	217.
MacProject II 2.0 .....	363.
<b>Delta Point</b>	
Delta Graph 1.5 .....	108.
<b>Fox Pro/Mac</b>	
FoxBASE+ 2.0 .....	291.
<b>High Performance Systems</b>	
IThink .....	395.
<b>HyperPress Publishing</b>	
Picture Link .....	215.
<b>Informix</b>	
WingZ 1.1A .....	244.
<b>Inman Software</b>	
Business Plan Toolkit .....	95.
<b>Jam Software</b>	
Smart Alarms single user .....	62.
<b>Kiwi Software</b>	
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<b>Lotus</b>	
Lotus Marketplace for Mac .....	550.

<b>Mainstay</b>	
MacFlow 3.5 .....	168.
MacSchedule 2.0 .....	138.
MacSchedule Plus .....	205.
<b>Microsoft</b>	
Excel 2.2 .....	244.
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PowerPoint 2.01 .....	244.
Works w/ Quicken .....	196.
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<b>Shana</b>	
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### Softsync Accountant, Inc. Professional

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Expressionist 2.03 .....	78.
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<b>Satori</b>	
Bulk Mailer .....	68.
Bulk Mailer Plus .....	165.
<b>Softview</b>	
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<b>Software Discoveries</b>	
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<b>Strategic Mapping INC.</b>	
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<b>Symantec</b>	
MORE 3.0 .....	258.
<b>Vertical Solutions</b>	
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<b>Westware Inc.</b>	
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<b>Wolfram Research, Inc.</b>	
Mathematica - Enhanced .....	698.
<b>Zedcor Inc.</b>	
Desk 3.03 .....	228.

### Meca Software, Inc. Managing Your Money 4.0

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Canopener 1.1 .....	62.
<b>Aladdin Systems</b>	
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Stuffit Deluxe .....	62.
<b>ALSoft</b>	
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Master Juggler .....	63.
<b>ASD Software</b>	
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Mac Cheese .....	58.
Thunder 7 .....	55.
<b>Beagle Bros. Inc.</b>	
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<b>Berkeley System Design</b>	
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<b>Casady &amp; Greene</b>	
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<b>Central Point Software</b>	
Copy II Mac 7.2 .....	25.
Mac Tools Deluxe .....	75.
<b>Custom Applications Inc.</b>	
Freedom of Press 3.0 .....	252.
Light .....	55.
<b>Dariana Technology</b>	
Mac Sleuth .....	85.
<b>Dubl-Click Software</b>	
Clickchange .....	39.
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On Cue 1.3 .....	34.
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Redux .....	48.
Screen Gems 1.0 .....	38.
Rival 1.0 .....	48.
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Disk Doubler 3.0 .....	44.
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<b>SuperMac Technology</b>	
Disk Fit 1.5 .....	57.
<b>Symantec</b>	
SAM. 2.0 .....	63.
S.U.M. II .....	91.
Norton Utilities .....	83.

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**UnMouse ..... \$180**



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Pro Point ADB .....	79.
<b>Altra</b>	
Felix .....	116.
<b>Articulate System Inc.</b>	
Voice Link .....	199.
Voice Navigator I .....	495.
<b>DataDesk</b>	
Mac 101 Keyboard .....	128.
Switchboard .....	170.
TrackBall .....	97.
Function Keys .....	Call.
<b>Kensington Microware</b>	
Turbo Mouse .....	107.
Turbo Mouse ADB .....	107.
<b>Keytronics Keyboard</b>	
Mac Pro Kb-105 ADB .....	115.
<b>Logitech</b>	
Scan Man 32 .....	336.
<b>Kurta - Is/ADB Tablets</b>	
Cordless 4 Button Cursor .....	64.
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12" x 12" .....	384.
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<b>MicroSpeed</b>	
MacTRAC ADB .....	70.
MacTRAC 512/+ .....	60.
<b>Microtek - Scanners</b>	
300GS .....	1,375.
300ZS .....	1,831.

<b>Microtouch</b>	
UnMouse .....	180.
<b>MSC Technologies</b>	
Little Mouse A+ 512k/Plus .....	69.
Little Mouse A+ ADB .....	74.
<b>Olduvai Software</b>	
Read-It! Personal 2.1 .....	Call
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Lightning Scan 400 .....	384.
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## E-Machine T-16 Color Display

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## Sigma L-View Multi-Mode Monitor

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**Multi-Mode Monitor .....\$1475**

## Mega Graphics Rival B & W Monitor

The officially acclaimed Mega Graphics Rival is now available for all Macintosh models. It gives you the most crisp, most clear, and brightest image in the business, with true 'What you see is what you get' / Because the 19" screen display two facing pages, it is ideal for use in desktop publishing, layout and word processing. The wide expanse of workspace is an enormous benefit when using CAD and spread sheet applications.

**Rival 2001 .....\$1199**



## VIDEO BOARDS & MONITORS

### Micron - 8 Bit Color Cards

Resolution 640 x 480  
Mac II or SE/30 ..... 345.  
Resolution 1024 x 768  
Mac II or SE/30 ..... 585.

### RasterOps

ClearVue/GS Gray Scale  
System Mac II & SE/30 .... 1692.

### ColorBoards

208 (II, IIX, IICX, IICI) ..... 290.  
264 (SE/30 - 13") ..... 525.  
264 (Mac II - 13") ..... 435.  
364 (Mac II - 13") ..... 955.

### RasterOps

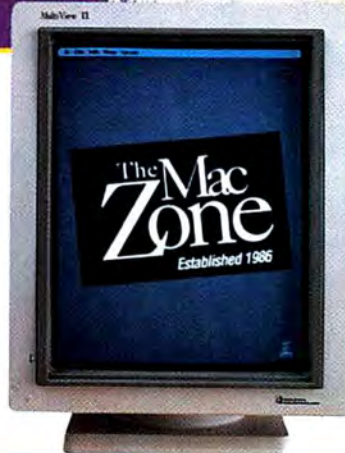
Multi Media  
364 w/AudioMedia ..... 1525.  
364 w/Director ..... 1295.

### Sigma Designs

L-View Multi Mode  
SE/30 or Mac II ..... 1475.  
Page View  
SE, SE/30 or MacII ..... 850.  
Silver View for Mac II ..... 1850.  
Color Max 24 ..... 4350.

### Sony - Color Multiscan

14" 1304 HG Color ..... 825.



## New Full Page Plus and Classic Monitors

Princeton full page display with Lapis video card for the Macintosh Plus and Classic. Apple phosphor and 75Hz Vertical Refresh. Includes \$25 Rebate coupon for dealer installation.

**Classic .....\$649**  
**Plus .....\$679**



\* Special shipping charges apply for monitors. Call for details. All returned monitors are subject to a 15% restocking fee.

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# Data storage from MacZone

that you can always depend on

The Mac  
**Zone**  
Established 1986



## Rodime R45 PLUS Removable Hard Drive

The R45 PLUS has a 44 megabyte removable capacity and a fully embedded SCSI controller. Because the cartridge is removable the R45 PLUS virtually offers unlimited storage. The half-height 5.25 inch drive has a average access time of 20 milliseconds and a disk transfer rate of 10 megabits per second. The transportable, rugged cartridge media assures user security and portability. The R45 PLUS offers users an expandable systems with limitless applications.

**R45 PLUS Removable Hard Drive ..... \$589**

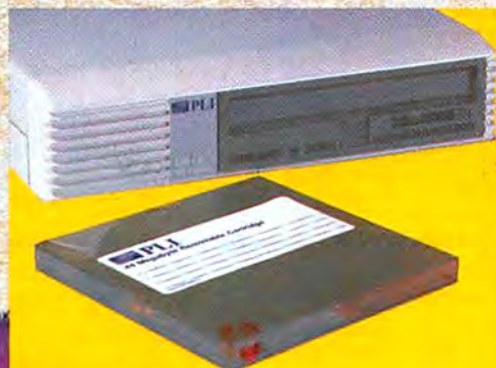


## Jasmine 40 mb Portable Hard Drive

Jasmine Technologies has consistently finished first in the MacUser Lab's Buyers Guide and we've been praised in every major Macintosh publication for the quality of our drives and for the

ease of use in DriveWare, our custom drive utility. DriveWare, provides the best SCSI partitioning, password protection, error correction, diagnostic and help software. And included with this drive is two award-winning utility software packages, Sum II and Virex plus over 10 megabytes of Shareware and Freeware programs.

**40 mb Hard Drive ..... \$299**



## PLI Infinity 40 Turbo Removable Hard Drive

The Infinity 40 Turbo uses PLI's turbocharged driver software to attain a 20ms access time, and with the TurboCache disk accelerator software and TurboBoost, you can achieve near zero effective average access times. This removable 45MB drive gives you infinite storage potential with removable cartridges. Each one holds 44MB and costs only slightly more per megabyte than floppy disks.

**40 Turbo Removable ..... \$750**



## LaCie Tsunami

Tsunami drives come initialized with SilverLining, the standard of hard disk utility software, and SilverPlatter, Apple's system, five megabytes of public domain software and Norton Utilities are also

included on the drive. Ask you MacAdvisor about the new 2 plus warranty on Tsunami drives.

**40 Mb Drive ..... \$550**

## Cutting Edge 20 Mb Drive

Cutting Edge hard drives represent the best value in Macintosh storage. Major enhancements include quieter fan, two power outlets and added surge protection.

**20 Mb Drive \$299**



## EMAC Impact Drive

The EMAC Impact hard drives pack all the power and convenience of a full-sized drive into a compact chassis. Now all your files and applications can be stored in one easily accessed location. Impact drives come in three capacities and are built with precision-engineered drive mechanisms for whisper-quiet, high-speed operation.

**80 mb Drive ..... \$805**



## DATA STORAGE DEVICES

### CD Technology

Toshiba Mechanisms  
Porta Drive CD ROM ..... 648.

### Cutting Edge

Seagate Mechanisms  
30MB External ..... 379.  
45MB External ..... 439.  
60MB External ..... 469.  
80MB External ..... 529.

### Dayna Communications

DOS Mounter ..... 53.

### EMAC - Impact

20MB External ..... 385.  
40MB External ..... 520.  
80MB External ..... 750.  
170MB External ..... 1,305.

### Jasmine - Portable

40MB ..... 299.

### Microtech

Seagate Mechanisms  
100MB External ..... 625.

### While supplies last

### La Cie - Tsunami

Quantum Mechanisms  
40MB External ..... 550.  
50MB PLS External ..... 630.

### La Cie - Tsunami

Quantum Mechanisms  
80MB External ..... 720.  
105MB External ..... 765.  
105MB PLS External ..... 815.  
170MB External ..... 1,115.  
210MB External ..... 1,210.

### NEC

CD-R35 Port. CD ROM ..... 458.  
CD-ROM-35 Battery Pack ..... 58.

### PLI - Turbos

250MB External ..... 1,725.  
300MB External ..... 1,975.  
600MB External ..... 2,850.  
600MB Optical Drive ..... 3,794.  
600MB Optical Cartridge ..... 235.  
CD ROM Drive ..... 875.

### SyQuest Removable

Infinity Twin ..... 1,475.  
Carrying Case ..... 60.

### Quantum External

40MB ..... 428.  
80MB ..... 598.  
105MB ..... 679.  
120MB ..... 768.  
170MB ..... 928.

### Quantum Internal

40MB ..... 349.  
80MB ..... 569.  
105MB ..... 599.  
120MB ..... 768.  
170MB ..... 869.

### Rodime

SyQuest Mechanism  
45MB Removable ..... 659.

### Rodime Plus

20MB External ..... 328.  
45MB External ..... 449.  
Rodime Cobra Series - Internal  
45MB Internal ..... 410.  
70MB Internal ..... 675.  
100MB Internal ..... 735.  
210MB Internal ..... 1,165.  
330MB Internal ..... 1,725.

### Rodime Cobra Series - External

45MB External ..... 550.  
70MB External ..... 795.  
100MB External ..... 860.  
210 MB ..... 1,295.  
330MB External ..... 1,895.  
650MB External ..... 2,775.

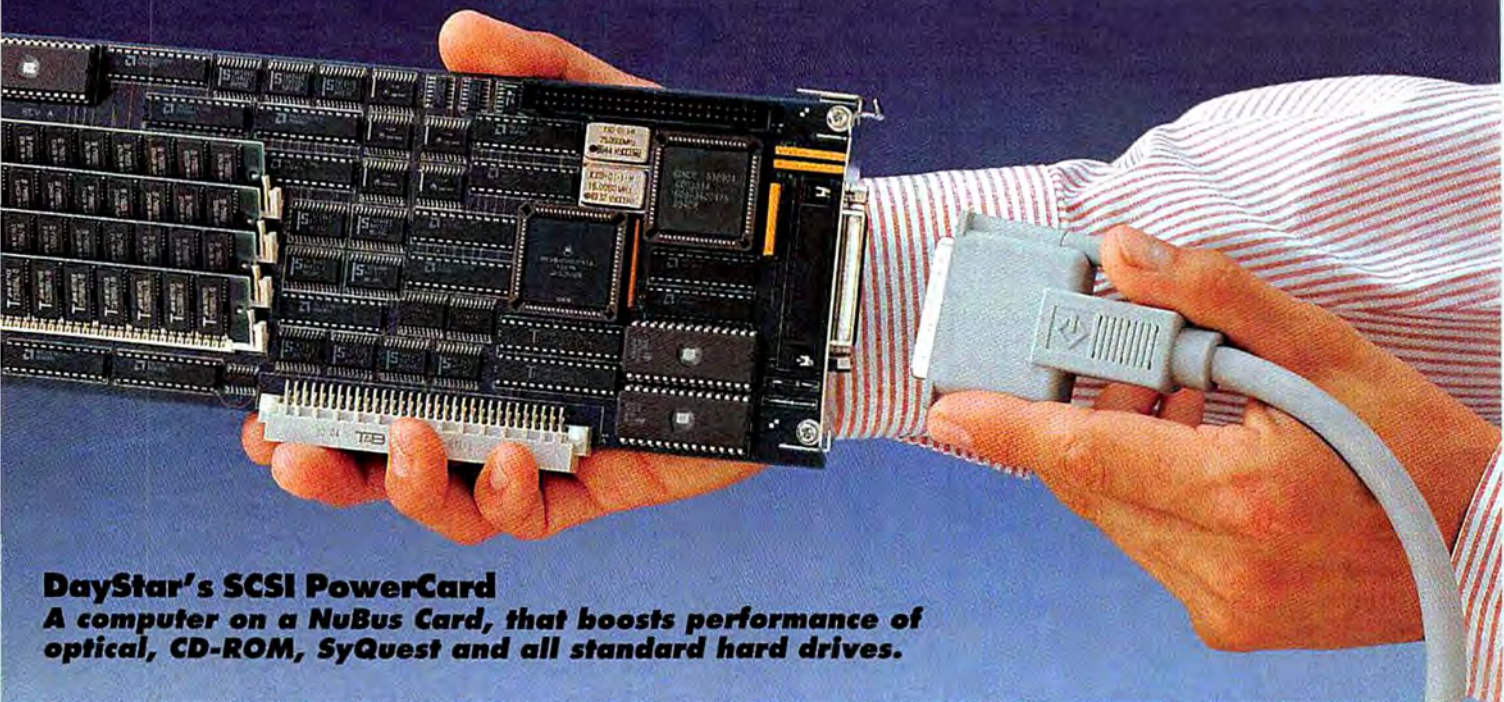
### SyQuest

44MB Cartridge ..... 74.

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# Plug this in... Supercharge all of your hard drives.



## DayStar's SCSI PowerCard

**A computer on a NuBus Card, that boosts performance of optical, CD-ROM, SyQuest and all standard hard drives.**

Hard drives are a major performance bottleneck – even Mac IIx users are suffering. DayStar's new SCSI PowerCard breaks the bottleneck by supercharging SCSI hard drive performance. The SCSI PowerCard™ gives all drives the ability to perform like superfast RAM disks – getting data to and from your applications at lightning fast speeds.

## World's Fastest Performance

The SCSI PowerCard works with all standard hard drives, including optical, SyQuest™ and CD-ROM. It's so powerful that even slow optical drives perform disk intensive tasks at double the speed of a WrenRunner II™ – the world's fastest hard drive. This is true whether you plug the SCSI PowerCard into a Mac II or IIx.

## A Computer On A NuBus Card

The SCSI PowerCard is much more than "just a fast SCSI chip" – it's a complete computer with processor, memory and special cache software. It has the ability to expertly cache megabytes of hard drive data in its large RAM buffer and instantly provide just what your application calls for.

## Applications Run Faster

The SCSI PowerCard boosts productivity within all applications. DTP and pre-press users can scroll, paint and modify images two to three times faster. Software developers can compile application code in half the time. Rendering is twice as fast. It even triples the speed of database searches and sorts. Or, plug it into a file server – multi-user applications will run up to four times faster.

## Easy, Quick Installation

It's as simple as plugging in a NuBus card. We give you an illustrated manual that takes you through step-by-step. Special software makes operation automatic, or you can custom tailor it to meet your needs. Have a problem? Call our tech support department. They know their stuff and want to help.

## Turn To DayStar Digital

When it comes to performance, we are the upgrade company. Things have never been easier.



### Call for these DayStar products from MacZone

<b>PowerCache 030 IIci</b>	<b>PowerCard 030</b>	<b>SCSI Accelerator - w/o SIMMS</b>
40Mhz w/o FPU ..... \$995.	25Mhz II, IIx IIcx ... 1,115.	SCSI PowerCard ..... 1,025.
40Mhz w/FPU ..... 1225.	33Mhz II, IIx ..... 1,495.	RAM Expansion - w/o SIMMS
50Mhz w/o FPU ..... 1750.	40Mhz II, IIx ..... 1,650.	RAM PowerCard ..... 625.
50Mhz w/FPU ..... 2050.	50Mhz II, IIx ..... 2,245.	
Fast Cache IIci ..... 280.		

**DAYSTAR**  
DIGITAL

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Zone**  
Established 1986

Circle 70 on reader service card

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### Grumbles about Ehman and Crate

As long as I'm calling companies to task for service problems, here's a quick note about Ehman Engineering. The company faced a rash of complaints about service last fall, many of them posted in its America Online forum. (My favorite exchange involved an irate customer and company head Michael Ehman, who suggested the customer was acting like "a horse's ass." But according to Ehman, that wasn't from him, but from an employee no longer with the company.) The company concedes there have been problems but seems to be working on it. "I think what happened is that we went through rapid growth and all of a sudden there was a huge base of users. Our tech support got overwhelmed," said Michael Ehman. "The bottom line is that we sell a huge amount of stuff. When you do that, you're going to have problems."

One planned improvement is a new computer system with bar-coding capacity to keep track of all the drives. Ehman has hired a consultant to work on problems. And the company hopes to do more remote troubleshooting.

In other news, Data Storage Development, the storage company that bought the assets of Crate Technology last year and is headed by Crate's former president, Chris Lemoine, has reneged on its promise to honor Crate warranties.

### Landmark VDT Legislation

The nation's most comprehensive ordinance governing the use of video display terminals (VDTs) was approved by the city of San Francisco in December. The regulations cover workers who use VDTs four hours or more per day in businesses with 15 or more employees (with some minor exceptions).

The main provisions of the ordinance make employers responsible for providing workers with adjustable chairs and adjustable monitors. Glare screens, wrist rests, footrests, and document holders will be available to workers upon request. Alternative work or rest breaks of 15 minutes are mandated after every two hours of keyboard work. And employers must provide information and training about the health and

safety concerns associated with VDT use.

This landmark ordinance was some four years in the making and faced stiff opposition initially from the business community. The VDT Coalition, which is made up of several union locals and a number of injured VDT operators not represented by labor, spearheaded the effort to pass the bill as the local Chamber of Commerce worked to defeat it. But a spirit of compromise reigned, and the Board of Supervisors adopted a three-phase schedule for implementation.

New workstation equipment purchased 12 months or more after the bill's approval must meet the new standards. Within 30 months, companies must spend up to \$250 per workstation upgrading existing equipment to meet the guidelines. If more than \$250 worth of improvements are required, companies have an additional 18 months in which to bring their VDT workstations into full compliance.

Originally the ordinance gave employers only two years to meet the VDT standards. "Basically the business community was saying to us that the normal computer life span is four years," said Barbara Kellogg, co-chair of the VDT Coalition and a representative of the Service Employees International Union Local 790. "Many of the companies were in the process of just upgrading their equipment." Businesses argued that if they had only two years to meet the standards, they would simply upgrade existing workstation equipment, but given four years they would buy new (and presumably more ergonomic) workstation products.

One provision dropped from the original bill mandated a 5-foot distance between workstations to protect VDT operators from electromagnetic emissions. "The whole issue was dropped for legal reasons," said Kellogg. "Our attorneys told us that existing documentation and existing language was not defensible in court." Instead, the advisory committee established by the ordinance is supposed to report back to the Board of Supervisors on the methods to protect VDT users and other workers from possible emissions, as well as the impact of VDT use (continues)

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*tic tic tic*

Circle 381 on reader service card.



## WE DIDN'T THINK IT COULD HAPPEN TO US.

### But why take a chance?

Sure, we'd heard about virus protection. But it was hard to believe our innocent little Mac could be a breeding ground for computer disease and disaster. Until we started sharing more data disks. And spending more time online. Suddenly it really made sense to protect ourselves.

### So we decided to play it safe.

The last thing we wanted was some complex paranoid program that kept interrupting us while it went on search

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and destroy missions. We wanted a program we could load and pretty much forget about.

That's why we chose Rival. It automatically checks all our files as they're opened (even INITs). If it finds any viruses it fixes them on the spot. And we can get new vaccines free from our user group or electronic bulletin board (or by subscription for a small fee).

So when it comes to virus protection, take our advice. Don't get scared. Get Rival.

"faster and easier to use..."

—MacWEEK, July 10, 1990

"...has replaced SAM as my preventer and checker of choice."

—MacUser, September 1990 (5 Mice)




Circle 228 on reader service card.

## SERVICE HERO

**R**osemary E. Britell of New Hartford, New York, writes that she was concerned about having her hard drive repaired during the Christmas rush. But Scott Chase of MacConnection assured her on December 17 that the company would repair and reship her hard drive the same day it was received. Sure enough, "I received my drive back on Wednesday, December 19th. . . . There was no charge to me, except for my end of the mailing, since the drive was under manufacturer's warranty."

on pregnancy and other health issues.

Even though the San Francisco legislation has passed, it may still be overruled. Similar legislation in Suffolk County, New York, was overturned by a court, and one of the supervisors who voted against the San Francisco bill is threatening a legal challenge. There's also the possibility that business interests may push for weak state legislation that would take precedence over San Francisco's VDT law. "I think the struggle at the state level will be over to what extent the state legislation can have teeth," said Kellogg. "So far [VDT] bills have been extremely watered down, and even then they've been vetoed."

The Los Angeles City Council is considering a similar ordinance, and officials from several states have also expressed interest in the bill. Contact San Francisco Board of Supervisors' office at 415/554-5184 for copies of ordinance number 405-90. 

(Research assistance by Carolyn Bickford.)

.....  
Send nominees for sainthood to Service Heroes, Macworld, 501 Second St., San Francisco, CA 94107 or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop Conspicuous Consumer a line if a company is ignoring you.



## Application

MacWrite II

FileMaker Pro

MacDraw II

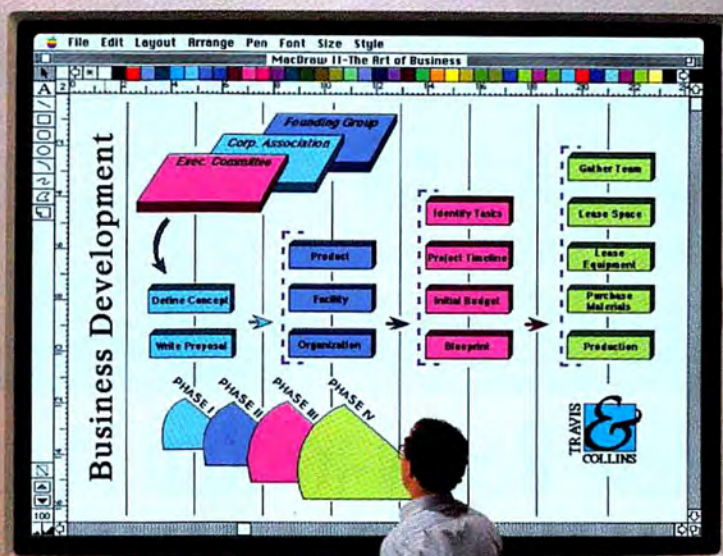
HyperCard 2.0

MacProject II 2.1

Claris CAD 2.0

SmartForm Series

MacPaint 2.0



## Story

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How they seem to make their reports and presentations come alive?

Chances are, they're using MacDraw® II software, the most popular drawing tool for the Macintosh.

With MacDraw II you can illustrate reports, design products, publish flyers, and present proposals in a way that makes people sit up and take notice. Even if you have never used a drawing tool before.

What's more, MacDraw II is advanced enough to keep you satisfied for years to come. Its power and depth have made it a standard for companies who need a tool that beginners can start with and expert designers can stay with.

So as you find more things to do with graphics, MacDraw II gives you plenty of power to draw from.

And don't be surprised if you advance quickly,

either. MacDraw II works like you think. So the feel is totally natural.

But why not see for yourself. Just ask a colleague to show you MacDraw II. Or stop by an authorized Claris dealer to find out how effective you can be at the art of business.

## Special Offer

### Free Upgrade.

Buy MacDraw II now and get a free upgrade this spring to MacDraw Pro. Plus, buy now, join our 500,000 other users, and you'll get free MacPaint and free clip art along with MacDraw II. See your Claris dealer today.

CLARIS®





# Complete Ready-to-Run Macintosh Systems

## Macintosh Classic 50Mb System

- Macintosh Classic w/Apples SuperDrive, Keyboard, Mouse, & 4 Mbs of RAM
- Microtech 50 Mb Internal Hard Drive
- HyperCard and MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- 10 High Density 3.5" Diskettes
- Diskette Storage Case
- Mouse Pad

Ask for Package #9102

CDA \$1,599 or \$45.<sup>26</sup>/month\*\*

Macintosh Classic system above with:

100 Mb Hard Drive ..... \$1,799

## Mac Classic Hard Drive / Memory Bundles

Europa 20 Mb Internal HD w/3 Mbs RAM .. \$479

Europa 50 Mb Internal HD w/3 Mbs RAM .. \$579

Europa 100 Mb Internal HD w/3 Mbs RAM \$809

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2 Megabyte Upgrade (Plus/SE) ..... \$118

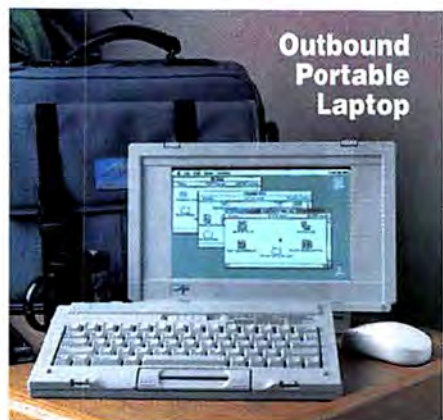
4 Megabyte Upgrade (SE/30/Mac II) ..... \$220

4 Megabyte Upgrade (IIfx) ..... \$299

16 Megabyte Upgrade (68030) ..... \$1099

1 Megabyte Upgrade (Mac Classic) ..... \$109

3 Megabyte Upgrade (Mac Classic) ..... \$179



**Outbound  
Portable  
Laptop**

Outbound w/o ROM, 40Mb HD, 2Mbs RAM  
(use your Plus, SE, or Classic's ROM) ..... \$2995

Outbound/Classic Bundle w/40Mb HD, 2Mbs  
RAM, and the Macintosh Classic CPU ..... \$3595

When you purchase your  
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## Macintosh LC 40Mb System

- Macintosh LC w/Apples 40Mb HD, Apple SuperDrive, 2 Mbs of RAM, Microphone, Keyboard and Mouse
- Apple 12" Color Monitor
- HyperCard and MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- Mouse Pad
- 10 High Density 3.5" Diskettes
- Diskette Storage Case

Ask for Package #9150

CDA \$2,569 or \$67.<sup>44</sup>/month\*\*

## Macintosh IIsi 40Mb System

- Mac IIsi w/Apples 40Mb HD, Apple SuperDrive, 2 Mbs RAM, Microphone
- MacPro Plus Keyboard w/Tempo II
- Magnavox 14" Color RGB Monitor
- HyperCard and MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager
- 6 Outlet Surge Protector
- Mouse Pad
- 10 High Density 3.5" Diskettes
- Diskette Storage Case

Ask for Package #9110

CDA \$3,699 or \$87.<sup>75</sup>/month\*\*

\*\*Based on 60 month FMV lease

## Macintosh IIfx Power System

- Macintosh IIfx w/built-in Video Card, Apple SuperDrive, 4 Mbs of RAM
- Microtech Nova 105 Mb Internal Hard Drive w/5 Year Warranty
- Magnavox 14" Color RGB Monitor
- MacPro Plus Keyboard w/Tempo II
- HyperCard & MultiFinder
- Virex Anti-virus Software
- Adobe Type Manager Software
- Norton Utilities, Total Recall and Loads of Free Shareware
- 6 Outlet Surge Protector
- Mouse Pad
- 10 High Density 3.5" Diskettes
- Diskette Storage Case

Ask for Package #9107

CDA \$5,869 or \$134.<sup>61</sup>/mo.\*\*

## ▶ The Rival 19" Monochrome Display by MegaGraphics (see photo above)

MacWorld Magazine rated the Rival the top performing WYSIWYG big screen — outranking dual-page displays costing much more.

**BONUS!** When you purchase a MegaGraphics monitor you'll receive a Coupon Book with over \$4,400 savings towards a variety of Mac products!  
Rival 19" Monochrome w/video card ..... \$1169  
Rival 19" Gray Scale (Mac II) w/video card \$1729  
Rival 19" Gray Scale (SE/30) w/video card \$1789

**▶ The MacPro Plus by Key Tronic**



No matter which Mac you use, old or new, the MacPro Plus keyboard gives you the ability to get you through your work faster and easier. The 105-key layout is similar to the Apple Extended Keyboard, but with more features. Also included is a free copy of Tempo II Software (\$99 value) ..... \$119



## Microtech Hard Drives

The Nova series hard drives feature the reliable Quantum mechanism, a 5 year warranty and come complete with software & bracket.

Microtech Nova 40 Mb Internal 19ms .....	\$449
Microtech Nova 80 Mb Internal 19ms .....	\$619
Microtech Nova 105 Mb Internal 19ms .....	\$679
Microtech Nova 120 Mb Internal 19ms .....	\$819
Microtech Nova 170 Mb Internal 19ms .....	\$999
Microtech Europa 20 Mb External .....	\$379
Microtech Europa 40 Mb External .....	\$409
Microtech Europa 80 Mb External .....	\$599
Microtech Europa 100 Mb External .....	\$729
Microtech Athena 50 Mb External .....	\$569
Microtech Athena 100 Mb External .....	\$849

## DataPak Cartridge Drives

All DataPak drives come with DiskDoubler software, a 45Mb cartridge & 2 year warranty.

DataPak (SE footprint) .....	\$729
DataPak Duet .....	\$1489
DataPak II (Mac II, IIx, IIcx footprint) .....	\$859
DataPak II Duet .....	\$1499
DataPak IIcx (Mac IIcx/ci footprint) .....	\$799



## Sigma Designs L\*View Multi-Mode

Now you can truly zoom in and out of your work. Zoom out to see 70% more of your job on screen. Zoom in to see a 200% close-up. No matter which software program you're working in you have the power to see your work in 6 sizes and resolutions. (for Mac II-19")

Sigma L*View MultiMode .....	\$1379
Sigma PageView GS (IICI/si) .....	\$689

## Monitors & Video Cards

Magnavox Mac Color 14" RGB .....	\$459
NEC MacSync 14" Color IIC .....	\$499
Apple High Resolution 13" RGB .....	\$799
E-Machines ColorPg T-16 w/video card .....	\$2149
E-Machines TXsi .....	\$3089
Radius Pivot IIsi/IICI .....	\$1199
Ikegami CT20 20" Trinitron w/8-bit card .....	\$2799
RasterOps 8LC System .....	\$2759
RasterOps ColorBoard 264 (Mac II) .....	\$539
RasterOps ColorBoard 364 (Mac II) .....	\$949
Micron 8-bit Video Card (Mac II, SE/30) .....	\$349

## Input / Output Devices

Kensington Turbo Mouse ADB .....	\$109
Kurta Tablet (8 1/2" x 11") ADB .....	\$369
Wacom Graphics Tablets .....	Please Call
QuickImage 24 Desktop Video Card .....	\$699

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## DEST Personal Scan



The DEST Personal Scan makes OCR scanning a breeze. This is the first scanner to combine full-page, one pass, hand-held scanning with ten-page capacity sheetfed scanning. Included is a free copy of Recognize! OCR software which uses only 1 Mb of memory (\$500 value) .....

DEST Scan 3000 .....	\$1159
Logitech ScanMan 32 .....	\$319
Thunderware ThunderScan .....	\$169
Microtek MS-II w/Omnitype OCR .....	\$839
Microtek MSF 300GS w/SCSI .....	\$1339
Microtek 3002S w/Image & Color Studio .....	\$1895
XRS 3C Transparency/Slide Upgrade .....	\$1799

## Scanners

LaserWriter IINT w/cable & toner .....	\$3395
Personal LaserWriter NT w/cable & toner .....	\$2475
TI microLaser PS 35 w/cable & toner .....	\$1999
HP DeskWriter w/cable .....	\$759
NEC SilentWriter 2 Model 90 w/cable .....	\$1845
Kodak Diconix M150 + w/ATM & cable .....	\$529
QMS PS-810 w/cable & toner .....	\$2995
QMS PS-410 w/cable & toner .....	\$2199

## Printers

Farallon PhoneNET StarController 300 .....	\$859
Farallon PhoneNET StarController EN .....	\$1599
Farallon PhoneNET Connector (DIN-8) .....	\$29
Farallon PhoneNET Repeater .....	\$315
Farallon Timbuktu 3.1 .....	\$95
Farallon Timbuktu/Remote 1.01 .....	\$123
Dayna Dos Mouter 2.0 .....	\$52
DaynaTalk PC .....	\$219
DaynaTalk Micro Channel .....	\$289
DaynaTalk Speed Guard Collision Filter .....	\$52

## Connectivity

### EtherNet Products from Dayna



DaynaPORT network interface cards let you connect your Mac to thick and thin cable and twisted pair Ethernet based AppleTalk network systems. With the DaynaPORT cards, you can share Ethernet system resources such as printer, modems, electronic mail, file servers and file transferring with other network hosts.

DaynaPORT E/30, E/SE, or E/II .....	\$289
EtherPrint is an easy to use, easy to afford way to connect your Ethernet network to any LocalTalk compatible printer. ....	\$349

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## NEW!

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Now you can get the entire Adobe Type Library on a Macintosh formatted CD-ROM. The fonts arrive locked; you can "unlock" as many as you wish to instantly obtain your new typeface. Simply call CDA to purchase and receive the access code necessary. Initial purchase includes the CD-ROM disc, Adobe Type Manager (including the base 13 fonts), bitmaps to all of the fonts included on the disc, and access to 2 typeface packages to be selected from a list of eight. Or purchase all eight and save over \$200!

Type On Call w/two fonts .....

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## Special Offer!

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## Modems

DoveFax Desktop Modem .....	\$289
AE DataLink Express 2400 External .....	\$169
AE DataLink Express w/MNP-5 External .....	\$199
AE DataLink Mac 2400 Internal (Mac II) .....	\$199
Zoom 2400 Baud w/cable & software .....	\$129
Zoom V.42 bis w/cable & software .....	\$199

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# MACWORLD NEWS

by Dan Littman and Tom Moran

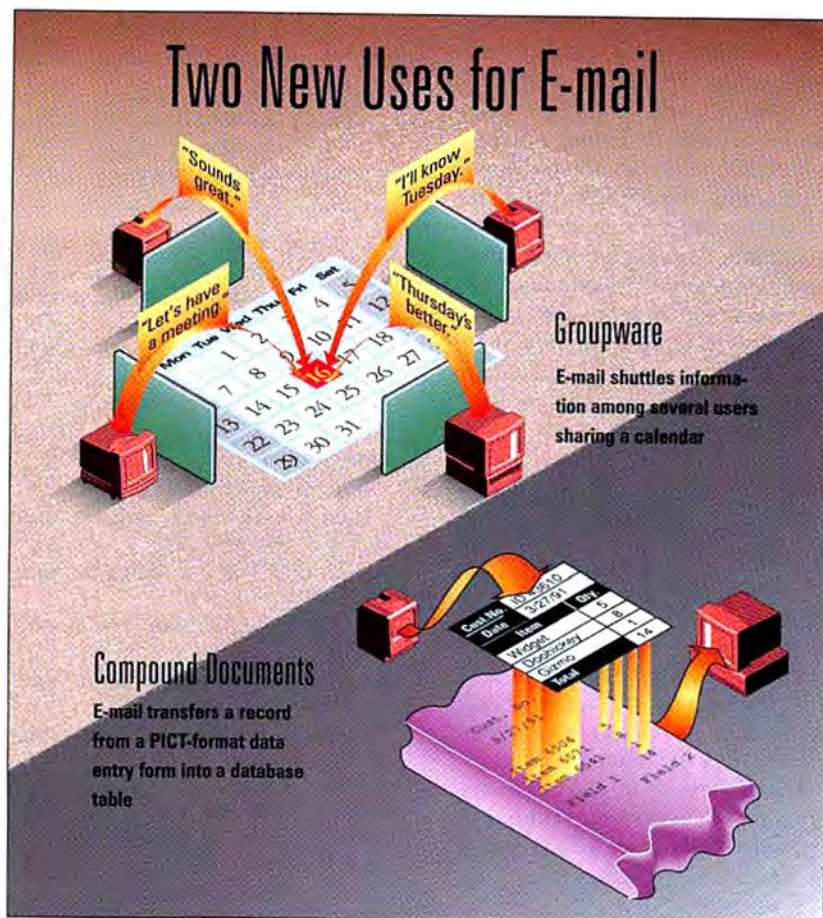
## Meta-Mail

 As fast as we've accepted electronic mail for sending phone messages and notes across a network, E-mail is changing faster. Microsoft wants its open-architecture E-mail to become the backbone of network-dependent applications—a kind of operating system for groupware. And cc:Mail, a leading electronic-mail package for IBM PCs and compatibles, is evolving into a transport mechanism for compound documents.

Version 3.0 of Microsoft Mail bears a fully packed feature set, including multiple attachments, user-definable address books and aliases, and support for batch-printing messages or appending message contents to text files. (Microsoft Mail lacks two good features that its rival, CE Software's QuickMail, has: a chat screen and an unsend capability.) Mail 2.0's database stored a single copy of messages addressed to more than one person on a local server; 3.0 propagates a single copy of messages going to remote servers as well, leaving each server to determine if the route diverges and requires duplicating a message.

Outside developers are already using Mail for transport services. For example, Status Mac compiles networkwide information using Mail messages, and Magnum's TFLX voice-mail system can attach voice notes to messages. Groupware applications are emerging, such as Syzygy, a low-end project-management package, and Microsoft is planning much more sophisticated network applications.

cc:Mail's first Macintosh product was for clients only, requiring a DOS network to run. Version 1.2 includes



Mac administration tools (remote dial-in and access to gateways still require a DOS server), but the Windows version, using Digital Data Exchange, will be the first with advanced compound-document features.

On the Mac a message with attachments appears as a folder full of files, shown with their proper icons. The server can receive faxes and deliver them as image files; under Windows, you can write on a fax and forward it. Later, you will be able to superimpose and write on transparent layers over a document. cc:Mail will incorporate support for voice and video, and will let you see and edit a

document's attachments without the creating applications—even across platforms. Also in the planning stages: more advanced ways to mix data types. For example, you might superimpose a data entry form in PICT format over someone else's database. Eventually, cc:Mail will have identical feature sets for the Mac, DOS, Microsoft Windows, OS/2, and UNIX environments.

Pricing for both products depends on network size. For more information, contact cc:Mail in Mountain View, California, at 415/961-8800; or Microsoft in Redmond, Washington, at 206/882-8080.—D.L.

(continues)



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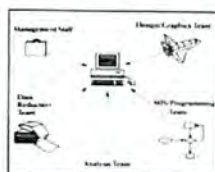
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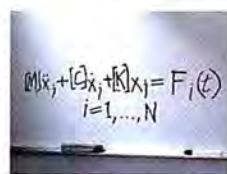
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scientific graphics program (Grapher) has essentially all the features of a stand-alone program. These include a completely interactive

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## Visions to Go



For peripatetic users who wish to take their data with them in an ultraportable form, Colby Systems has designed the Pocket Info Pac, a battery-powered device that weighs just over a pound yet can store thousands of monochrome screen images. Not itself a computer, the Pocket Info Pac downloads the screen images from a Mac via a serial port, stores them in RAM, and shows them on the innovative Private Eye miniature display designed by Reflection Technologies.

The 2¼-ounce Private Eye display, worn on a headband, positions a reflecting surface about six inches in front of one eye. A sophisticated optical system directs light onto the reflecting surface, and the perspective fools the eye into believing it sees a larger object that is farther away. The resulting image has a resolution of 720 by 280 and looks as if it measures about 12 inches diagonally. Currently that resolution shows about two-thirds of a standard Mac screen. Colby expects a higher-resolution display to ship sometime in 1991. In the meantime, users can select the desired part of a screen using the marquee, then download the selected part via a desk accessory. Colby is currently working on software that will support downloading the screens remotely via a pocket modem.

With the standard 1MB of RAM, the Pocket Info Pac stores about 150

screens, depending on the type of data the screens contain. With the maximum capacity of 16MB of RAM installed, as many as 2400 frames may be stored, again depending on the type of data. The Pocket Info Pac's rechargeable nickel-cadmium battery has an average life of 6 to 8 hours of use. The device can also use AA alkaline batteries, which last about 12 to 14 hours.

A Macintosh version of the Pocket Info Pac with 1MB of RAM is available now at a price of \$899; the price ranges up to \$2999 depending on the type and amount of memory. A version for IBM PCs and compatibles should begin shipping in the first quarter of 1991. For more information, contact Colby Systems in Palo Alto, California, at 415/941-9090.—T.M.

## Access to Knowledge



Say you just bought a CT scanner. Or an airliner. Or a supercomputer. What are you going to do with the 10,000—or 100,000—pages of documentation that came with it? If your documentation arrived on a CD ROM, you could find room for it on your desk. If the CD ROM came indexed with KnowledgeSet's Knowledge Retrieval System (KRS), you could even find the information in it.

KRS is an indexing- and search-engine designed for static data sets such as technical documentation and reference works. It can search using Booleans, proximity, adjacency, wild cards, and other criteria. If the document's SGML (Standard Generalized Markup Language) tags include hypertext tags, KRS automatically assigns hot buttons where they belong. (For use with KRS, documents must be tagged for SGML. SGML is part of a new federal requirement for contractors to deliver documentation to government agencies in a standardized format.)



BERND ROBERTS

**Bryan Preas helped the Association of Computing Machinery put 25 years of publications on a CD ROM with KRS indexing.**

KRS lets you assign bookmarks, study lists of cross-references, write yourself notes, or replace pages on the CD (new information goes on a hard drive that must accompany the CD ROM). With GraphicKRS, which recently shipped for the Mac, you can look at vector, PICT, and bitmapped images from the original documentation, zoom in on them, and arrange them in windows side by side with text. GraphicKRS incorporates KRSfax, a bitmap-compression utility that KnowledgeSet also sells separately.

KRS can share CDs across Mac, DOS, and UNIX systems. Later versions will search text in graphics, and a future product line will manage dynamic data sets. KnowledgeSet also makes HyperKRS and SuperKRS for indexing and searching HyperCard and SuperCard documents, and the new version 2.0 of HyperKRS supports almost unlimited stack size.

Prices depend on installation size. For more information, contact KnowledgeSet in Mountain View, California, at 415/968-9888.—D.L.

## Sigma Boards Speed Lossless Compression



For users whose storage devices runneth over, Sigma Designs has introduced two boards designed to accelerate lossless data compression in the Mac II family. The first board, called DoubleUp, uses a specialized Stac Electronics proces-  
(continues)



LUDWIG DELGADO

**The battery-powered Pocket Info Pac (lower right) storage device shows Mac screens on the Private Eye viewer.**





## Big screens for your Mac Classic

So you've got a Mac Classic. Good.

Inexpensive. That's good too. Of

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your Mac and presto, little price, big screen. Or very big

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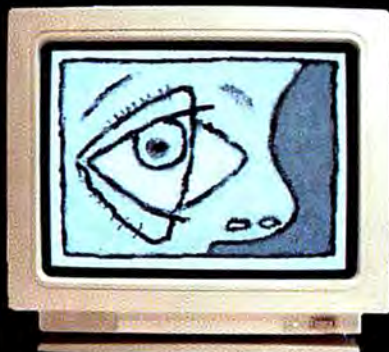
no way to make that

Portable Publisher.

member of the Mac

Your Macintosh with

business of any size



screen larger. Wrong.

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**Generation Systems, Inc.**

Circle 170 on reader service card



sor chip to compress and decompress images, sounds, data, and programs fast enough that the limiting factor will often be the speed of the Mac's hard drive, according to the company. The second board, called the Sigma Bullet 3040, includes the same specialized compression processor but adds a 40MHz 68030 for general CPU acceleration of the Mac IIcx or IIsi.

Both boards come with Disk Doubler 3.0, the lossless compression software package from Salient Software. Compression is nearly 10 times faster using the boards than it is using the software alone, according to Sigma Designs. On average, the boards and their software reduce files to about half their original size, effectively doubling the capacity of a hard drive.

JPEG and other lossy methods of compressing images or sound can have a much higher compression ratio; that is, the resulting compressed image file is much smaller than would be possible using DiskDoubler and the new boards. By definition, some data is lost in the process, which usually means that there's some acceptable and manageable loss of the quality of the original image. But however good lossy compression methods are for reducing large image files, they are not intended for programs or digital information, since in those cases the loss of even a single bit can lead to catastrophic crashes or data corruption.

DoubleUp for the Mac II series will be available in February at a suggested list price of \$229. Sigma Designs plans

to come out with an SE version of the board sometime in 1991. The Bullet 3040 for the IIcx and IIsi should begin shipping in March at a list price of \$1999. The Bullet 3040 for the Mac IIsi comes with an installation kit incorporating an add-in slot that accepts boards designed for an 030 Processor Direct Slot, allowing further expansion of the system. Also, a 20MHz 68882 math coprocessor can be added for \$199 list. On the Mac IIcx, the Bullet 3040 occupies the cache card slot. For more information, contact Sigma Designs in Fremont, California, at 415/770-0100.—T.M.

## Kodak Unveils Low-Cost Color Printer



Adding to its line of low-cost printers, Eastman Kodak has introduced the Kodak Diconix Color 4, an ink-jet printer that uses a custom chip to control the position of its four print heads and to regulate the amount of ink used. The Color 4 uses thermal ink-jet cartridges developed by Hewlett-Packard for HP's ink-jet printers, but Kodak designed the rest of the printer and formulated its own cyan, magenta, yellow, and black inks. The nonsmear inks are designed to blend together well when producing intermediate colors and to work with plain paper, according to Kodak.

The Color 4's print modes include draft and near-letter-quality, in either



The Kodak Diconix Color 4 ink-jet printer uses four nonsmear inks that were specially formulated to blend together well.

10 characters per inch (cps) or 12 cps. The typical print speed ranges from under 4 minutes for a full page of color graphics to about 30 to 40 seconds for a page of text in draft mode at 10 cps. A full page of color graphics takes 4 to 5 minutes to print on a transparency. The printer's resolution is 192 by 192 dpi.

The Color 4 includes an LCD control panel, and the Macintosh version includes a Control Panel device for regulating the proportions of the inks. The printer is currently available at a suggested retail price of \$1595. Cyan, magenta, and yellow ink cartridges retail for \$19.95 each, and black cartridges retail for \$13.95. For more information, contact Kodak at 800/344-0006.—T.M.

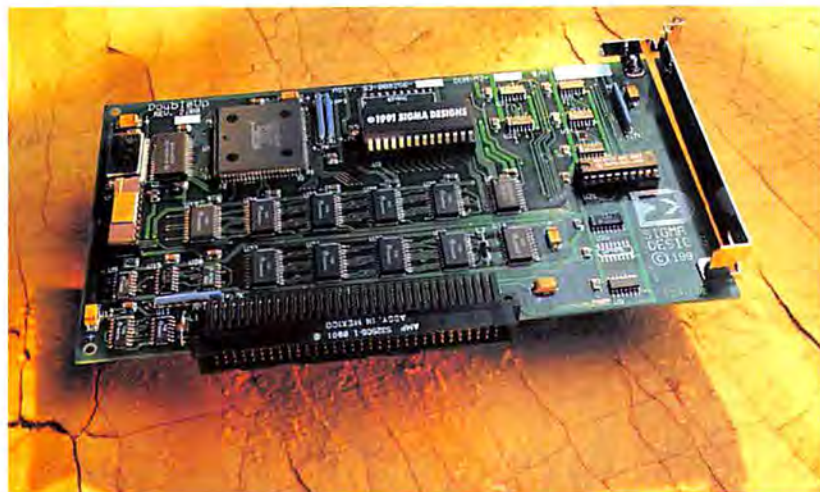
## The Littlest Mainframe



A tiny piece of software called HOPS began life as a utility to accelerate mainframe computers. Now it makes a Mac into a database server that, its developers claim, races past IBM and Amdahl heavyweights.

HOPS (Heuristic Optimized Processing System) is a database kernel, a database development environment, and a metal box (with a bounding rabbit painted on it) that contains a Mac IIcx and some hardware to keep prying eyes away from the kernel. HOPS executives claim HOPS typically requires a single disk access to complete a retrieval, even with enormous files, because it indexes a billion-record file in 1MB of memory.

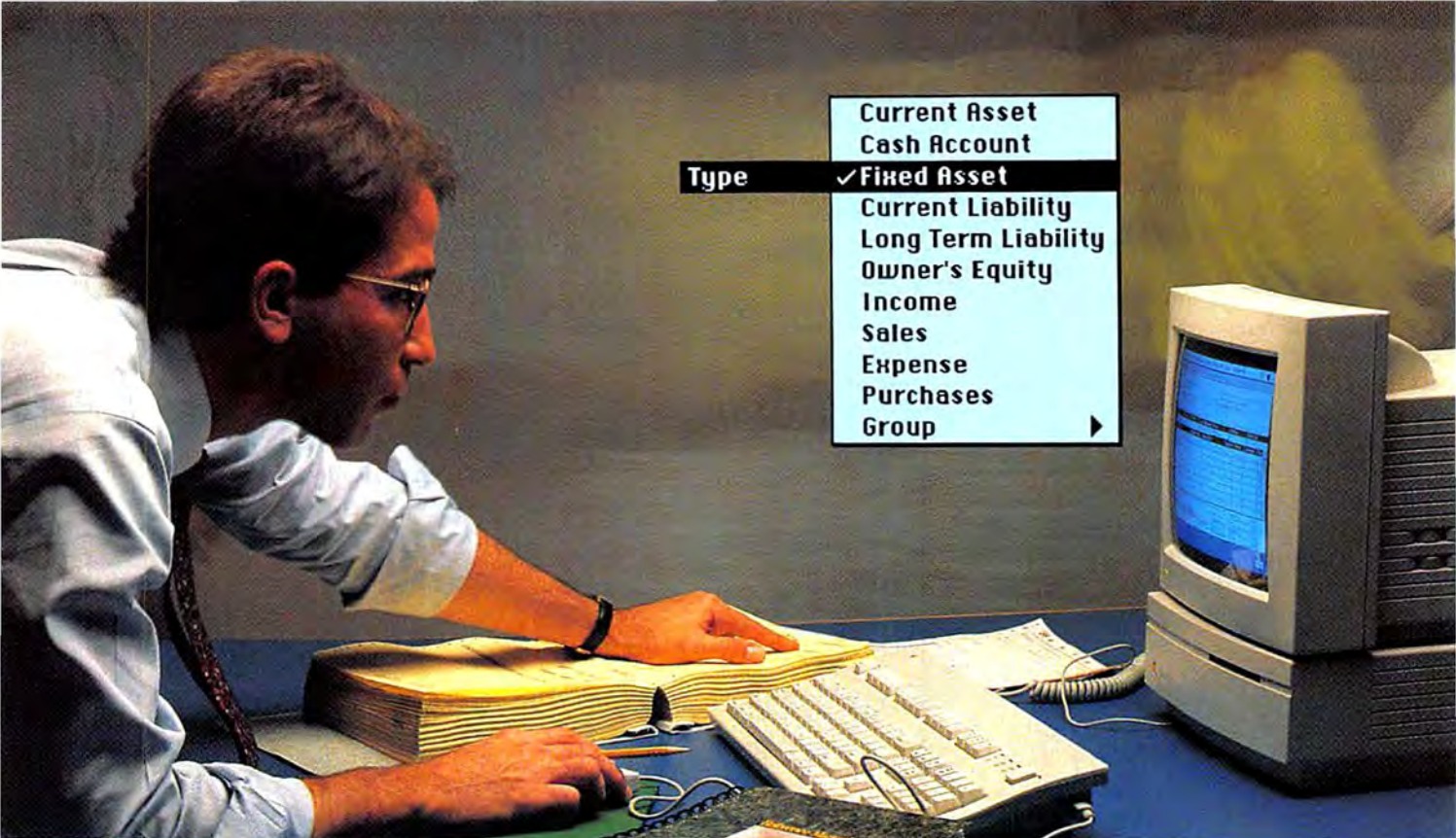
In informal tests, HOPS's random generator filled a four-field database (continues)



JOHN WILLIAMS LUND

Sigma Designs' DoubleUp board contains a specialized Stac Electronics chip that quickly compresses image and data files to about half their original size without any loss of data.





Type	Current Asset
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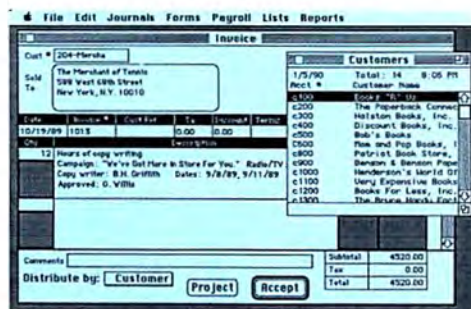
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*You can easily fill in forms, like an invoice, right on screen. Just click on a customer name and all the information appears in the form.*



with 1 million records in less than two minutes, and then ran multifield, multicriteria searches in less than half a second.

HOPS takes over the Mac, using the Mac's operating system for some functions but essentially running the Mac like a mainframe, providing such mainframe-like features as setting priority levels for users and automatically partitioning a query across multiple servers based on where data is stored. It also can manage other mainframe necessities such as fault tolerance (recovery from crashes or hardware failure) and communications.

HOPS provides tools for interface design, as well as a development language that HOPS president Harvey Goodman claims is very robust and extensible by skilled programmers. HOPS can handle any data type (for example, it can compare digitized fingerprints), but it lacks utilities for converting database structures to HOPS structures.

HOPS plans to sell its servers "at mainframe software prices," Goodman says, making the cost of the IIfx inside the HOPS box negligible. However, "Our policy is, Don't pay for it until you like it. We're willing to put our money where our mouth is." For more information, contact HOPS in Miami Beach, Florida, at 305/672-2361.—D.L.

## PostScript on Non-PostScript Printers

With PostScript cartridges available for the HP LaserJet and other "dumb" laser printers, it was only a matter of time before someone took the next step, the creation of a stand-alone box that enables a Macintosh to print PostScript files on virtually any printer.

So, upstart Pacific Rim Data Sciences has taken that step, announcing the shipment of its PageBlaster,



A hard day's work in Miami Beach: (left to right) Larry Fischell, Bob Gaston, and Harvey Goodman of HOPS.

PageBlaster Plus, and HappyBlaster products. These devices are variations on the same theme, the use of a processor board that sits between the Mac and a "dumb" printer and performs the rasterization process that is normally done by the PostScript part of a PostScript printer. In the PageBlaster products, the board also offers a doubling of the horizontal resolution to 600 by 300 dpi. All of the PostScript rasterization products come with Imagen's UltraScript interpreter, which enables the Mac to turn PostScript files into bitmapped images.

If you have an HP LaserJet IIP, there's the HappyBlaster Board (and enclosure), which takes the place of the back panel of the IIP that houses the parallel and serial connectors. The HappyBlaster receives its information from the Mac's SCSI port, then converts it to the parallel port on the IIP for decompression and printing. The \$649 version contains UltraScript and



PageBlaster and its UltraScript software rasterize PostScript files into bitmaps for output on a non-PostScript printer (rear).

the 35 LaserWriter fonts, while a cheaper version, at \$498, uses JetLink Express, a QuickDraw driver, instead of UltraScript. The version with both UltraScript and JetLink Express costs \$798.

The HappyBlaster does not have the dual resolution (600 by 300 dpi or 300 by 300 dpi) feature, but the PageBlaster does. PageBlaster also has the ability to translate the SCSI port's data directly into the video connector on any laser printer with a Canon engine, such as the HP LaserJet line, the Canon line, and the Fujitsu FX series. This process bypasses the printer's controller and allows data-transfer rates of up to 1.2MB per second, although the HP LaserJet Series II and III will require an optional video board priced at \$195 to receive the signal. The PageBlaster Plus system, which includes UltraScript, is priced at \$895.

If you have a dot matrix printer, there's a version of the PageBlaster that converts data from the Mac's SCSI port to the parallel port on the dot matrix printer. That version costs \$795, including UltraScript.

Using either the HappyBlaster or the PageBlaster, a Macintosh can act as a print server for any other systems on a LocalTalk or other network. For more information, contact Pacific Rim Data Sciences in Fremont, California, at 415/651-7935.—Martin Marshall

## CoStar Addresses Envelope Printing



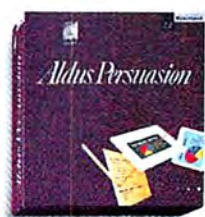
Designed to end the hassle of printing envelopes and to save money on mailings, AddressWriter is a compact printer that prints a logo, two addresses, a short message, and a postal bar code on up to 100 envelopes at a time. Although the basic AddressWriter handles only envelopes, its developer, CoStar, will offer an optional \$75 label-handling attachment. Under 1991 regulations, the U.S. Postal Service offers discounts of 10 percent or more on mail that is bar-coded by the sender.

The AddressWriter comes in two versions: a serial model for IBM PCs and compatibles, and a model with a (continues)





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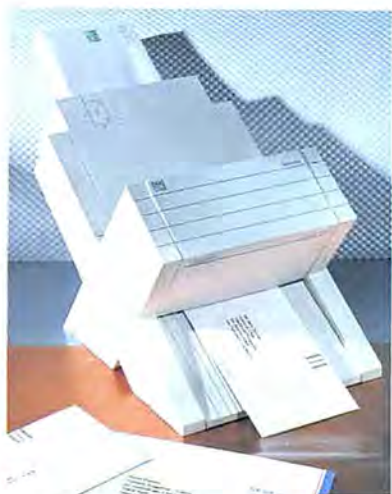
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ANNE NADLER

AddressWriter prints addresses, logos, and postal bar codes on envelopes, postcards, and labels (with optional label handler).

serial port for the Mac. Both serial versions will retail for \$595. The Mac model comes with a customized version of MacEnvelope, which can be accessed either as a stand-alone application or as a desk accessory. The software can handle multiple mailing lists of up to 1600 addresses each. It also supports different font sizes and styles, and it can import and export lists from most common applications. CoStar plans to introduce an AppleTalk version sometime in 1991.

When printing the addresses, a logo, a short message, and the postal

bar code, the AddressWriter takes about 20 seconds per envelope. When printing on stationery that already has one address and a logo, for instance, the printing time is considerably less. The printer accepts envelopes up to 4½ inches tall, and with the label-handling option attached, it can accept pin-fed labels that measure up to 5¼ inches from pin to pin.

At press time, CoStar expected to begin shipping both initial models of the AddressWriter in January. The label-printing option will have a list price of \$75. For more information, contact CoStar in Greenwich, Connecticut, at 203/661-9700 or 800/426-7827.—T.M.

## Blank Canvas



Is plain old drawing on the Macintosh dead? Between 32-bit paint programs, the merger of sketching and CAD, and the failure of most draw programs (Draw It Again, Sam; Drawing Table), basic drawing seems almost forgotten. Fortunately, Claris has written a big upgrade to MacDraw (see *Macworld News*, "MacDraw Goes Pro," February 1991), and now Deneba is getting Canvas 3.0 ready.

Canvas 3.0's new features include much stronger text-handling tools, drawing tools that look a lot like Free-

Hand's or Illustrator's, and smarter technical illustration.

Text blocks in Canvas 3.0 can have their own rulers, and support tab leaders, full justification, and leading or tracking by half-points (with only one setting per block). Text can align with independently slanted margins, bind to a curve, or wrap inside or outside an object, and Type 1-format text can be converted to editable curves.

You can add cusps (temporary points) to bezier curves, and select multiple points on a curve—or even on more than one curve—and manipulate them. Canvas now provides blends between objects just as Illustrator, FreeHand, and MacDraw Pro do. Also like the 3.0 versions of Illustrator and FreeHand, Canvas 3.0 can composite objects so that you can see through a hole in an object to the objects behind it.

For technical illustrators, Canvas has standard architecture hatching and a smart mouse. The mouse guesses what you're trying to select, and its icon changes to indicate when you get close—for example, if you are near a tangent or a corner.

An unusual feature in Canvas is its ability to search for objects by attributes—for example, to find all the gray rectangles in layers 10 through 50 and replace their fill with concrete hatching. Version 3.0 also reads and writes DXF, IGES, and Illustrator 88 formats, and it has a plug-in structure for adding new features easily.

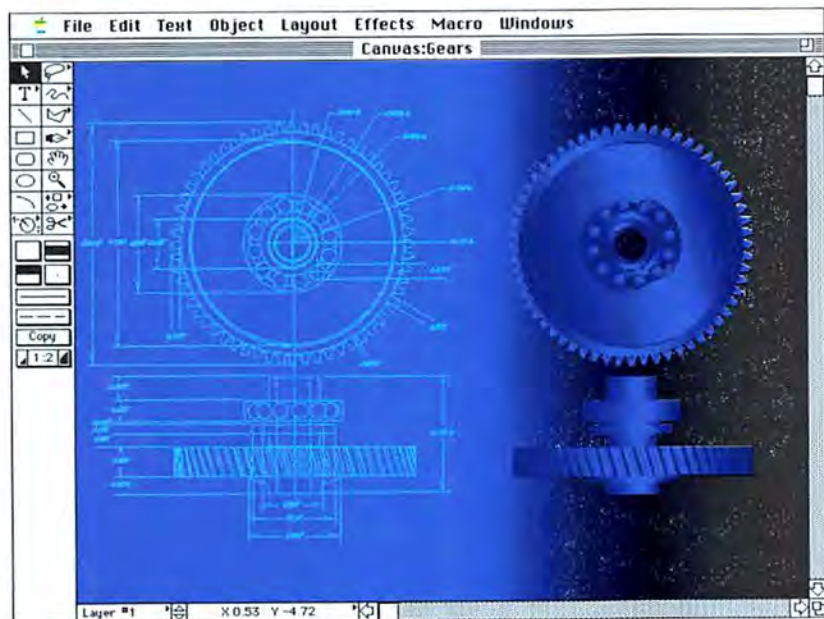
Canvas 3.0 will list for \$395. For more information, contact Deneba in Miami, Florida, at 305/594-6965.—D.L.

## CD ROM Preserves High-School Days



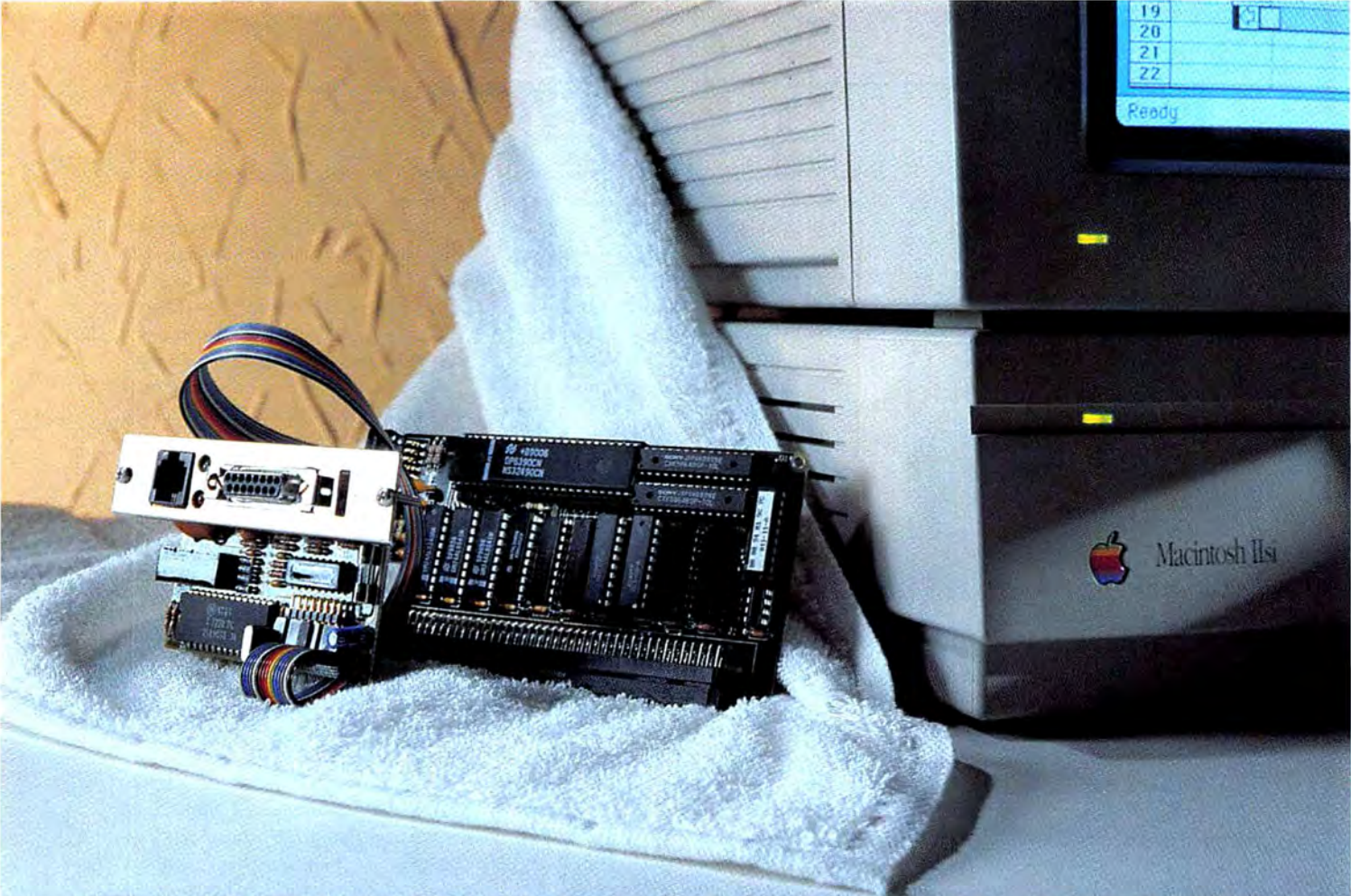
Imagine nostalgically browsing your high-school yearbook. You find the photo of a friend, read about her accomplishments—then listen to her recite her poetry. Yes, multimedia yearbooks have arrived, thanks to CD ROM technology and the pioneering determination of students in Eugene, Oregon.

The South Eugene High School students' SuperCard stack blends animation and sound with the text (continues)



Double Canvas: improved technical illustration makes Canvas 3.0 more CAD-like, while other features make it more of a designer's tool. (Note stars showing through hole in gear.)





# PHYSICALLY FIT

**Introducing the only IIsi Ethernet cards that fit without an adapter.**

If you're adding Ethernet to a Macintosh® IIsi computer, there is one thing you need to know. The new low profile of the IIsi requires all existing Ethernet cards to use an additional, expensive adapter.

The exceptions however, are the MacCon+™ 30i cards from Asanté.™ They are the only Ethernet cards designed specifically for the Macintosh IIsi that don't need an adapter.

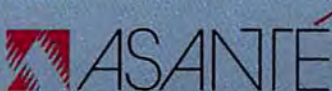
Eliminating the adapter saves you money. But, if you prefer to use the math coprocessor available on some adapters, you'll be happy to know that the MacCon+ 30i cards are fully compatible with all adapters as well.

To create the MacCon+ 30i, we took the technology that MacUser said, "buried the competition in raw performance tests," and put it in a small, elegantly designed IIsi package. The result is blindingly fast Ethernet performance on the fastest Mac bus.

Along with this performance comes unmatched compatibility and reliability. The MacCon+ 30i cards are register-level compatible with Apple's Ethernet card and both run A/UX. With their lower chip count, the MacCon+ 30i cards run cooler and have fewer parts. That translates to fewer problems. They're even backed by a five-year warranty.

Asanté Technologies is the only company that offers a full line of Ethernet products for all Macintoshes. If you're simply adding a IIsi to an existing network, or creating a complete high-performance Ethernet network from scratch, turn to Asanté for all the right connections.

The MacCon+ 30i comes in thick/thin and 10BaseT versions and is available now from your Asanté reseller. Call them today for full details.



Asanté Technologies, Inc. • 404 Tasman Drive • Sunnyvale, California 94089 • (800) 662-9686

Resellers: Asanté products are available from Ingram/MicroD, Merisel/Macamerica, and Tech Data.

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Circle 24 on reader service card





JAMES FOLTS

These students are at work on a yearbook that will include videos of school sports and recordings of school musicians.

and photographs of conventional yearbooks. The students used MacroMind Director to create animated menus, interFACE to introduce a friendly English-speaking guide, Digital Darkroom to touch up photos, and MacRecorder to digitize voices and music. With no precedent to follow, they agonized over trade-offs dictated

by designing screen-shaped translations of traditional two-page spreads. To simplify navigating the huge hierarchy of information, they invented special icons called GROFS—Graphical Representations of the Outline File System.

For the 1991 yearbook, the students plan more ambitious ways to exploit the medium. Electronic Eugenean editor Thor Prichard is excited about integrating sports videos and musical performances. "We're trying to make it a true representation of what it was like to be a student in 1991."

And what about students who find a CD in a pocket of their yearbook but have no access to computers? "We tell them to hang on to it," says student Aaron Ray. "In five years CD ROMs will be cheap and standard."—B. J. Novitski

## VIRUS WATCH

*Current viruses, Trojan horses, and worms affecting the Macintosh community.*

### MODM and zero

Type: Viruses

First listed in Virus Watch: 3/91

Info: Both are nVIR B clones; infect applications and system files.

Impact: Nondestructive; can cause crashes.

### ZUC B

Type: Virus

First listed in Virus Watch: 3/91

Info: A ZUC clone.

Impact: Nondestructive; infects applications and system files; renders cursor inoperable.

### MDEF C

Type: Virus

First listed in Virus Watch: 2/91

Info: A Garfield strain; infects applications and system files.

Impact: Nondestructive; can cause crashes.

### prod

Type: Virus

First listed in Virus Watch: 2/91

Info: An nVIR B clone; infects applications and system files.

Impact: Nondestructive; can cause crashes.

## Bigger Foxes



FoxBase/Mac's early speed records were impressive, and later versions added a Macintosh interface without slowing down. Now Fox says its latest, FoxPro/Mac, searches large disk-based databases a hundred times faster than before. (Fox has applied for several patents on a piece of technology code-named Rushmore.) New indexing algorithms require converting old data

files, but the new product is compatible with FoxPro/DOS and can use dBase IV programs and data.

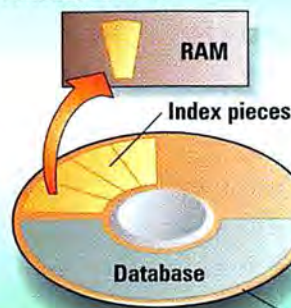
Fox claims that during in-house tests on a single-user system, FoxPro/Mac retrieved several thousand street names from a single-table, 1.6-million-record, 140MB address database in one or two seconds per name. Fox gave *Macworld* a hint at how Rushmore works, pointing out that the bottleneck is normally in calling up records from disk to see if they match search criteria. So Rushmore probably uses FoxPro's very compact indexing method to search a RAM-resident index, and then sweeps all the finds from indexed disk locations in one or two passes, thus bypassing much slower disk-based operations.

This makes the Mac on your desktop competitive with mainframes in dealing with huge quantities of data. (Mainframes still have advantages in transaction-processing and security features, but Fox claims third-party developers are currently writing these big-database functions in the Fox language.) FoxPro also includes a SELECT command and a large subset of other SQL commands for complex searches, and a new query-by-example scheme shows users how SELECT statements are constructed. New tools speed creating custom menu bars, adding pop-ups and keyboard enhancements, and developing custom applications.

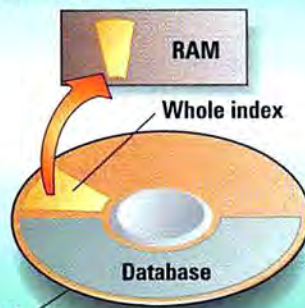
Pricing for FoxPro/Mac was not set at press time. For more information, call Fox Software in Perrysburg, Ohio, at 419/874-0162.—Charles Seiter

## Macworld's Theory about Rushmore

FoxBase+'s index



FoxPro's index



A guess about FoxPro/Mac: with a highly compressed database index, queries can run entirely in memory, and FoxPro accesses the disk only when it's ready to retrieve records.



# HIT THE ROAD, MAC.

In a shakedown of removable storage devices, one drive quickly rises to the top. The new 44MB Bernoulli® Transportable. A drive that delivers reliable hard-disk-like performance day in and day out. In the office or on the road.

drives have an unbeatable MTBF of 60,000 hours. And Bernoulli's 44MB disks can take 1,000Gs of shock force (or an 8-foot drop). We back that up with an unprecedented Gold Standard 5-year media life limited warranty.

The Transportable's performance puts you in the fast lane, too. A high transfer rate, with an intelligent buffer and user-configurable cache, gives Bernoulli exceptional real-life performance.

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Bernoulli takes your dollar the extra mile with dramatically reduced prices (up to 20 percent) that affect the

entire Bernoulli family, including the Dual.

Which all adds up to one thing: Bernoulli's closest competition isn't close at all.

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Bernoulli's patented design draws a flexible disk up to the read/write head. Which, unlike hard disks, makes Bernoulli virtually head-crash free. Should the drive encounter

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The numbers tell the story. Bernoulli

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Drive Reliability	Bernoulli	Syquest*
MTBF	60,000 hrs.	30,000 hrs.
Media Reliability		
Media Warranty	5 yrs.	2 yrs.
Drop Height	8 ft.	2.5 ft.
Non-operating Shock	1,000Gs	100Gs
Performance		
Effective Access Time	22 msec.	20 msec.
Transfer Rate	8-12 Mbits/sec.	4.8 Mbits/sec.
Large File Dsp. (3)	27 sec.	34 sec.
Small File Dsp. (many)	82 sec.	174 sec.
Installed Base		
Drives	625,000	300,000
Media	3,750,000	1,000,000

\*Includes Meta Micro, PLI, Eternus

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Circle 260 on reader service card



# The Professional's Choice

## QuarkXPress 3.0

### only \$525

QuarkXPress® has long been the professional's choice for publishing software worldwide because of its powerful and precise type handling, page layout, and graphics production features. The new 3.0 version delivers all these, with a redesigned interface and clear, comprehensive documentation that make QuarkXPress easier than ever to use.



#### **Interactive and Effective**

QuarkXPress 3.0 provides an array of interactive palettes that make it simple for new and experienced users alike to create effective, high-quality publications. A document layout palette enables you to insert, delete, and move pages easily by dragging page icons. And the new Library palette provides an easy way to store text and graphic items for use whenever they're needed.

#### **Text Creation Simplified**

QuarkXPress offers full-featured WYSIWYG word processing and editing capabilities that give you the look and feel of your document while you're creating it. The Global Spelling Check and Find/Change features make fine-tuning easy.

#### **A Tradition of Precise Type Handling**

QuarkXPress 3.0 continues a tradition of providing the most precise, flexible type handling of any comparable program. You can adjust font, size, style, leading, location, and angle of rotation in fractions of degrees, right on the screen. Whether you're creating automatic drop caps or editing already-rotated type, QuarkXPress 3.0 delivers the power and freedom you need to create the most eye-catching text possible.

#### **The Designer's Choice**

Because of the power and responsiveness of its page layout features, QuarkXPress is now the top choice of designers around the world. The program's advanced capabilities — including the rotation and skewing of graphics, picture box reshaping, rotation of text, and the creation of bleeds — make QuarkXPress the most flexible page layout program around.

#### **Complete Control Over Color**

With QuarkXPress, you can apply process or spot colors to any EPS graphic. What's more, you can create color separations without resorting to an add-on program. Besides supporting the

PANTONE MATCHING SYSTEM®, as well as RGB, CMYK, and HSB models, version 3.0 provides precision controls for trapping and other sophisticated prepress effects.

#### **Easy To Learn And Use**

Even if you've never used QuarkXPress before, you'll find this 3.0 version simple to learn and explore. The handy on-line Help system and clearly written user manuals that come with the program—in addition to the step-by-step, self-paced tutorial—quickly put you in charge of the most powerful publishing tool of its kind.

#### **Overnight Delivery Only \$3.00**

QuarkXPress 3.0 is available now — and you can have it tomorrow. Order before 12:00 midnight (E.S.T.) and we'll ship overnight for only \$3.00. When it comes to getting the newest products at the best prices, nobody beats MacWAREHOUSE — nobody!

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Item #DTP 0049 FaxFACTS 2509  
Publisher: Quark, Inc.

**MacWAREHOUSE Low Price:.....\$525**

**System Requirements:** The enhanced QuarkXPress 3.0 requires a Macintosh Plus, SE, or II series with a 6.0 or later operating system, 2MB of RAM (extra memory required for color or graphics-intensive applications), a hard drive, and a LaserWriter 5.2 or 6.0 printer.

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## 1-800-255-6227

Call toll-free twenty-four hours a day,  
seven days a week.

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# Tomorrow's Upgrade For Your Mac Is Only \$59\*

**FREE!**  
STEP-BY-STEP  
VIDEO  
INSTRUCTIONS

A MacWarehouse Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your Kit in your hands tomorrow!

## MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spread-sheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

## PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. Just open your Mac, slide out the main circuit board and plug in your SIMMS. Our FREE video will give you STEP-BY-STEP installation instructions. Every type of Mac is covered and we think we've made it a breeze.

## WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs - (2 @ \$59 ea.).

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory.	Do this: (Install in multiples of two only)
2 MB	Remove all four existing 256K SIMMS, install two 1 MB SIMMS, leave two sockets for future expansion.
2-1/2 MB	Remove only two 256K SIMMS, install two 1 MB SIMMS.
4 MB	Replace all four 256K SIMMS with four 1 MB SIMMS.
To upgrade an 8-socket Mac II, IIfx, IIfx, or SE 30 to this amount of memory.	Do this: (Install in multiples of four only.)
4 MB	Remove all four existing 256K SIMMS, install four 1 MB SIMMS, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMS, install four 1 MB in remaining sockets.
8 MB	Remove all four 256K SIMMS, install eight 1 MB SIMMS.

To open your Mac Plus or SE, you'll need a specially designed tool - it's available from us as part of a handy tool kit for just \$9.

## WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMS (Single Inline Memory Modules). Each one megabyte SIMMS card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products. Prices can vary a lot, based on quality, speed and demand. At press time our price for

1MB, 100ns SIMMS is \$59. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

## SPEED

Do you need 80, 100 or 120 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor reads 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

## OVERNIGHT DELIVERY

Place your order by 12:00 am (E), weekdays and we'll deliver overnight for just \$3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

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Inquiries: 1-908-367-0440

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## MACWAREHOUSE 30-DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.


**ONE YEAR WARRANTY.** MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

\* SIMMS prices vary. Call for latest information.

\*\* Limited Offer! Free video with purchase of 2 or more SIMMS.

MWD1P





# The Power User Hard Drive<sup>TM</sup> from MacWarehouse

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## MACWAREHOUSE TAKES THE HARD WORK OUT OF BUYING A HARD DRIVE.

The PowerUser Hard Drive is loaded with all the features you'd expect from a top quality drive. It's made for MacWAREHOUSE by a leading manufacturer - to our exacting specification. Its superior design fits right under the Mac Plus, Classic or SE, bringing the screen up to a convenient height.

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The PowerUser Drive is packed with quality components like the "state-of-the-art" Seagate hard disk. There's a rear panel SCSI address selector switch, two 50-pin SCSI connectors, and removeable internal SCSI terminators for your convenience.

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30MB Hard Drive .....	\$369	80MB Hard Drive .....	\$519
45MB Hard Drive .....	\$419	44MB Removable HD .....	\$629

the factory. The comprehensive "User Manual" includes all the necessary step-by-step instructions.

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Try the PowerUser Hard Drive for thirty days, and if you're not completely satisfied, call us for an RMA number and return it with all of its documentation for a full refund.

The PowerUser Hard Drive is covered by a one year manufacturer's warranty and, if you do ever have a problem, the MacWAREHOUSE loaner drive program guarantees you'll never be without a drive for more than a few hours.

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**M.Y.O.B. 2.0 (Teleware)**  
Streamlines your accounting, and delivers essential information on the status of your business. For example, create a sales invoice, and M.Y.O.B. adds the amount to receivables, decrements the inventory, and generates the monthly customer statement. If the inventory is low, it puts a reorder message on your To Do List. Integrating G/L, A/R, A/P, Inventory and card file, M.Y.O.B. gives you the informative reports you need to run your business. **FIN0087 \$145.**

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BND0013	PowerUser Carrying Case w/Free Cap	69
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ACC0251	Imagewriter II Carry Case (black)	45
ACC0438	MacIcx/ci Carrying Case - Black	75

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ACC0453	450AT UPS	349
ACC0454	520ES UPS	419
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ACC0347	HardTops Mac Extended Keyboard Cover	15
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**MacPro Plus (Key Tronic)**

Key Tronic's new MacPro Plus keyboard is compatible with all Macintosh computers. The enhanced 105-key layout includes Period/Comma lock capability, an interchangeable Caps Lock and Ctrl keys. Also, the connecting cable you need is offered at no extra charge. The keyboard is backed by a limited lifetime warranty and unlimited toll-free product support. Includes offer for Tempo II, a keyboard macro package from Affinity Microsystems at a \$149.95 value FREE! **INP0083 \$118.**

ACC0252	MacPlus/SE Carrying Case (black)	55
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<b>Checkfree Corporation</b>		
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<b>ChipSoft</b>		
FIN0114	TurboTax Personal 1040	50

## PixelPaint Professional 2.0 (SuperMac)

Now uses virtual memory to open and scroll through large and multiple documents. Its new 8-bit masking tool permits semi-transparent masking from any brush, tool, or image. Wet Paint allows you to reposition and edit any shape or text after original creation. Image processing tools let you adjust color, contrast, and brightness.

Many tools are now pressure-sensitive, so they work like real-world tools. PixelPaper lets you create textured canvases that simulate charcoal paper, concrete, linen, and slate.

**GRA0249 \$465.**



**Smart Alarms 3.0 & Appointments Diary 3.1 (JAM Software)**  
Let Smart Alarms and Appointment Diary take care of your daily schedule. Just enter your appointments into the diary, and let Smart Alarms remind you of the important events. With the Auto layout function, you can create custom diaries that display information in the format you prefer. New features include automatic backup, a snooze button, the ability to turn off alarms while using specified applications such as modern software, and a choice of beep options. Multi-User versions are compatible with LocalTalk, MacServe, TOPS, allShare, PSN and Apple Share.  
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## The "ULTIMATE" SE Carrying Case (I/O Design, Inc.)

The "ULTIMATE" SE Carrying Case is designed with the same high quality standards as other MacLuggage products. This case offers internal, padded compartments for ANY Macintosh keyboard, mouse, external hard disk and cables also holds the new Macintosh Classic. It also features 2 additional exterior pockets for everything from disks to umbrellas. Combine these features with sturdy Dupont Cordura nylon and 1/2 inch high density foam padding and you'll see why this is the "Ultimate" carrying case for your Mac. Available in black and navy blue. **\$69.**

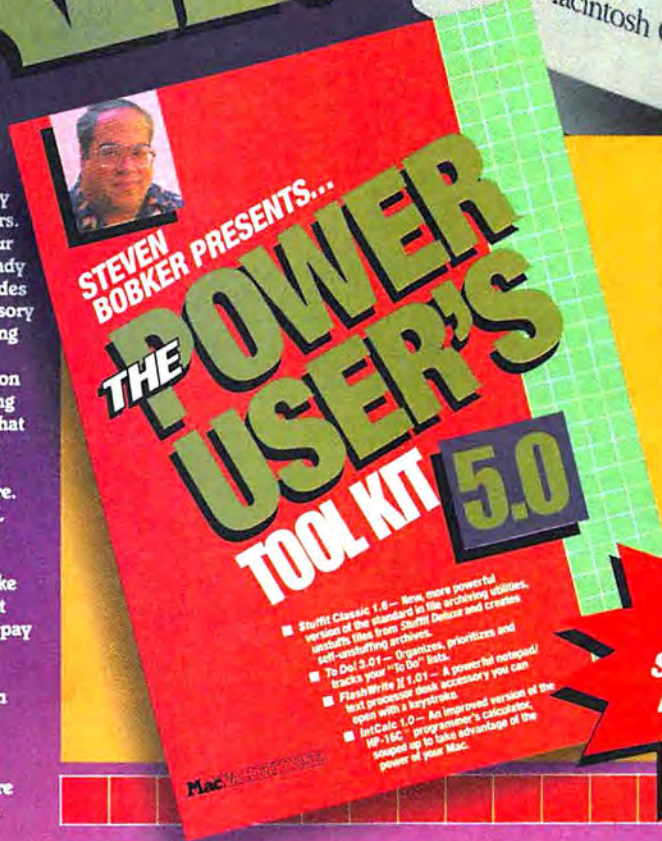




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The fifth edition of Steven Bobker's **Power User's Tool Kit** is now available exclusively to MacWAREHOUSE customers. A hand-picked collection of four powerful programs on one handy disk, the newest **Tool Kit** includes **To Do!** — a unique desk accessory for organizing and implementing your daily tasks. The newest version of **StuffIt Classic**, also on the disk, will create freestanding space-saving archives of files that you can expand whenever you need them without having any special decompression software.

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**NuBus MacII NET0089 \$399.**  
**NuBus SE/30 NET0091 \$399.**  
**NuBus 10-Pack NET0090 \$3449.**



## MacInTax

### MacInTax 1990 (Softview)

MacInTax 1990 guides you through the process of preparing your Federal or State taxes. Just type in the requested numbers and MacInTax does the rest. When finished, just print the completed return on your LaserWriter or ImageWriter. If you used MacInTax in a previous year, 1990 will read those files and bring forward relevant items, saving time and reducing errors. Send in your MacInTax registration card and Softview will send you information about their annual updates. **FIN0097 \$59.**

## MacPlus/SE- with Extended Keyboard Carrying Case (Targus)

Pamper your Mac with a Targus case made of Zilicone treated nylon to give you waterproof durability and an impact absorbing high-density foam layer with a soft protective lining for complete protection. Cushioned shoulder pad and handles provide extra comfort and convenience. There's room for everything from your Mac including the new Macintosh Classic, a hard disk drive, and the extended keyboard to pockets for your mouse, floppies, cables, and pens. **ACC0250 \$69.** Full Mac line available in black. Some styles available in blue, burgundy, and platinum. Premier Leather Case available (black) **ACC0482 \$175.**



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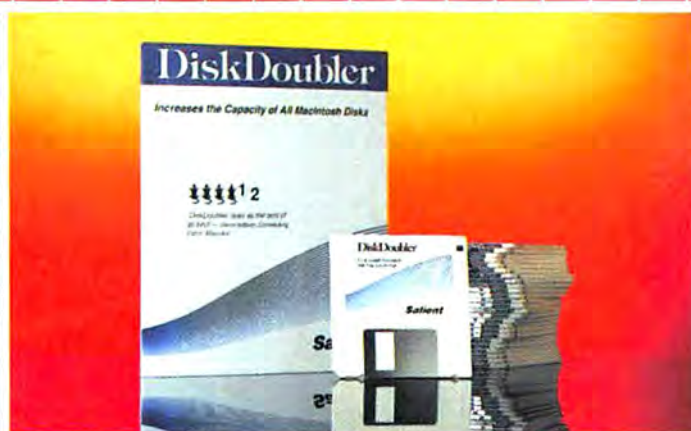
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DTP0055	Dynopage	57
Power Up		
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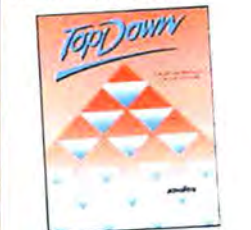
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DTP0047	PrePrint	329.
<b>Letraset</b>		
FON0086	LetraStudio	275.
<b>Multi Ad Services</b>		
DTP0042	Multi Ad Creator 2.21	695.
<b>Quark, Inc.</b>		
DTP0028	QuarkStyle	189.
DTP0049	XPress 3.0	525.
<b>Silicon Beach</b>		
DTP0040	Personal Press	205.
<b>TimeWorks</b>		
DTP0048	Publish It! Easy 2.0	145.

## DISK DRIVES & BOARDS

<b>Applied Engineering</b>		
DRI0287	AE HD Mac Drive	245.
INP0148	QuadraLink	215.
<b>Computer Friends</b>		
GRA0251	ColorSnap 32 Plus	649.
<b>Cutting Edge</b>		
DRI0042	800K Floppy Disk Drive	149.
DRI0157	20 meg Under the Mac Drive	319.
DRI0158	30+ meg Under the Mac Drive	389.
DRI0162	45 Mb Removable Hard Drive (Syquest)	639.
DRI0159	45+ meg Under the Mac Drive	429.
DRI0160	60+ meg Under the Mac Drive	479.
DRI0161	80+ meg Under the Mac Drive	529.
<b>Dayna Communications, Inc.</b>		
DRI0174	DaynaFile dual 360K (5.25) & 1.44 (3.5)	749.
DRI0104	DaynaFile single 360K (5 1/4)	499.
<b>Fujitsu</b>		
DRI0186	800K Disk Drive - Fujitsu	99.
<b>Kennet Technology</b>		
DRI0218	Drive 1200	259.
DRI0141	Drive 2.4	329.
DRI0219	Drive 360 (5.25 in. floppy disk drive)	259.
DRI0140	Rapport	199.

## MacaccessCard Reader (ASD)

The MacaccessCard Reader requires FileGuard 2.5 software. The software can be configured so that without a registered MacaccessCard or the combination of a MacaccessCard and an access key, no one can gain access to your Mac. Cards packaged with the reader can be used or the system can be trained to recognize any ID card (Visa, company or student ID card). **ACC0539 \$319.**



DRI0204	60 Meg External Hard Drive	469.
DRI0205	80 Meg External Hard Drive	519.

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<b>Beacon Technology, Inc.</b>		
HYPO034	HyperBible International Version 2.0	129.
HYPO035	HyperBible King James Version 2.0	129.
<b>Broderbund</b>		
EJ00170	The Playroom	29.
<b>Davidson &amp; Associates</b>		
EJ00037	Math Blaster	29.
EJ00118	Math Blaster Mystery	29.
<b>Help Software, Inc.</b>		
EJ00108	Desktop Help for Excel	52.
<b>HyperGlot Software Company</b>		
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<b>Tense Tutor:</b>		
	French, German, Spanish or Italian	ea. 39.
	Verb Tutor w/ Sound	
	French, German, Spanish or Italian	ea. 39.
	Word Torture: French, German, Italian, Russian or Spanish	ea. 29.
EDU0246	Easy Kana - Japanese	129.
EDU0245	RelBase	105.
<b>Learning Company</b>		
EDU0084	Math Rabbit	30.
EDU0048	Reader Rabbit 2.0	30.
<b>MicroMaps</b>		
GRA0229	MapArt PICT Format	99.
GRA0228	MapArt EPS Format	99.
<b>Nordic Software</b>		
EDU0142	MacKids Preschool Pack	36.
<b>Penton Overseas (Full line available)</b>		
	VocabLearn Level I or II: French, German, Hebrew, Italian, Japanese, Russian or Spanish	ea. 35.

<b>Queue</b>		
EDU0161	Computer SAT Prep	29.
<b>Visionary Software</b>		
EDU0207	LifeGuard	49.
EDU0209	Synchronicity 2.5	49.
<b>Voice &amp; Video</b>		
	Getting Started Video: Excel 2.2, PageMaker 4.0, Word 4.0	ea. 39.
	Advanced Techniques Video: Excel 2.2, PageMaker 4.0, Word 4.0	ea. 39.
EDU0063	HyperCard Getting Started Video	39.
<b>Zondervan Publishing House</b>		
BOK0022	MacBible - Greek	99.
BOK0021	MacBible - King James Version	59.
BOK0020	MacBible - New International Version	59.

## ENTERTAINMENT

<b>Artworx</b>		
ENT0303	Bridge 6.0	29.
<b>Baseline Publishing</b>		
ENT0351	Talking Moose	23.
<b>Broderbund</b>		
ENT0259	Shufflepuck Cafe	25.
	Where is Carmen Sandiego?	ea. 29.
<b>Bulls City Software</b>		
ENT0308	Morriarty's Revenge	35.
<b>Bullseye</b>		
ENT0045	Ferrari Grand Prix 1.6	31.
ENT0046	Fokker Triplane Flight Simulator 2.8	23.
ENT0261	P51 Mustang 2.80	35.
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ENT0329	BlackJack Strategy Tester (w/ BlackJack Ace)	65.
ENT0277	Casino Master	49.
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ENT0257	CrapMaster	27.
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<b>Electronic Arts</b>		
ENT0355	Harpoon	39.
ENT0319	Starflight	39.



## 9600M Plus Modem (Prometheus)

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<b>Mass MicroSystems</b>		
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GRA0243	QuickImage 24 Video Frame Grabber - II 749.	
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<b>Optical Access International</b>		
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DRI0202	30 Meg External Hard Drive	369.
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## LaserScript Printer (Abaton)

Solves printing problems for a mixed hardware office. It supports PostScript with a Microsoft/Bauer PostScript interpreter, and the HP LaserJet II PCL page printing language is resident. Also supports PostScript Type 1 fonts and Bitstream fonts, and has two slots for HP font cartridges. It has a LocalTalk port, plus RS-232 serial and Centronics parallel ports, so you can network it with all the computers in your office. Comes with manufacturer's one-year warranty with 90-day on-site service. **INP0130 \$1999.**

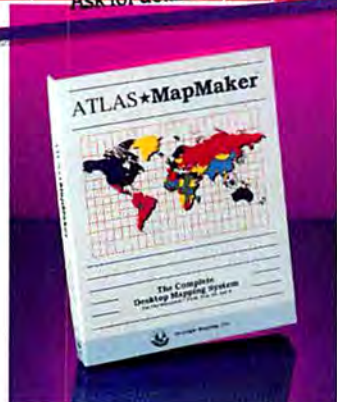




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## Sir Tech Software, Inc.

ENT0096 Wizardry ..... 35.  
ENT0347 Wizardry II: Knight of Diamonds ..... 29.

## Spectrum HoloByte

ENT0281 Chessmaster 2100 ..... 32.  
ENT0278 Life & Death ..... 32.  
ENT0269 The Hunt For Red October ..... 20.

## The Software Toolworks

ENT0281 Chessmaster 2100 ..... 32.  
ENT0278 Life & Death ..... 32.  
ENT0269 The Hunt For Red October ..... 20.

## Three-Sixty

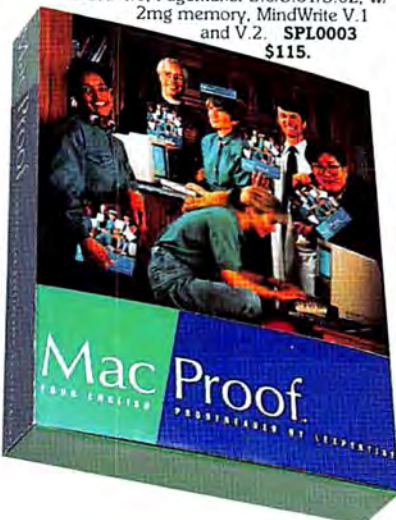
ENT0323 Sands of Fire ..... 32.

## Toyogo

ENT0270 Go Master 4.7 ..... 45.

## MacProof 3.2.1 (Lexpertise)

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ENT0326	Nemesis Deluxe	95
XOR Corporation		
ENT0274	MacGolf Classic	52
ENT0330	MacSki	40
ENT0212	NFL Challenge	55

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FON0264	Adobe Type Manager 2.0	55
FON0278	Adobe Type Manager Plus Pack	109
	Adobe Type Set 1 or 2	ea 58
FON0326	Adobe Type Set 3	129
	Smart Art I, II, III or IV	ea 59
DAC0028	TypeAlign	59
FON0295	Adobe Type Reunion	38

Altsys		
FON0183	Art Importer 2.0	95
FON0014	Fontographer 3.2	275
FON0284	Metamorphosis 1.5	95

## Broderbund

GRA0156	TypeStyler	119
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## Dubi-Click

FON0081	MenuFonts 3.0	31
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INP0138	Pacific MacPage	425
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## QMS

UTI0169	UtraScript	119
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## Tactic Software

FON0265	ArtFonts	50
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## TeleTypesetting

FON0343	T-Script	92
FON0357	T-Script Basic	55

## Farallon™ Computing

GRA0221	MediaTracks™	189
GRA0222	MediaTracks™ Multimedia Pack	319

## Graphsoft

CAD0024	Blueprint	219
CAD0030	MiniCAD+ 3.0	595

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GRA0104	Dreams 1.1	349

## Letraset

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DTP0019	ImageStudio 1.5	139

## MacroMind

GRA0140	MacroMind Director 2.0	439
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## Metro Image Base

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## Paracomp

GRA0235	FilmMaker	439
GRA0233	Swivel 3D Professional	439
GRA0234	SwivelArt	82

## Praxitel

UTI0211	Read My Lips	75
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## Preferred Publishers

GRA0239	Master Color	99
GRA0238	Master Paint	50

## Silicon Beach

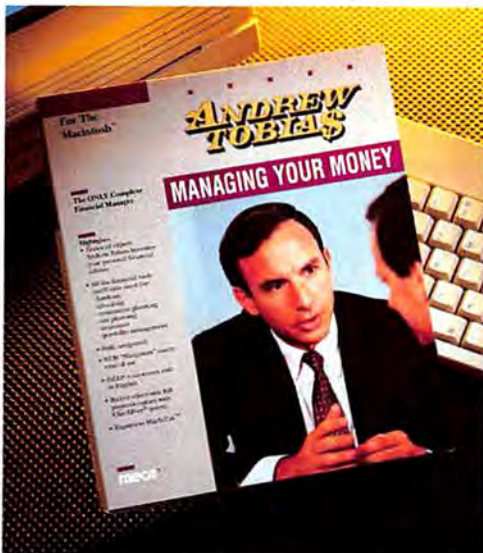
GRA0092	Digital Darkroom 2.0	259
GRA0131	Super 3D 2.1	339
HYP0027	SuperCard 1.5	205
GRA0112	SuperPaint 2.0	135

## Solutions, Inc.

DAC0002	SmartScrap & The Clipper 2.01	56
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## Strata

GRA0176	StrataVision 3D	375
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## Andrew Tobias' Managing Your Money 4.0 (Meca Software)

NEW! The most innovative personal finance package available for the Mac. Packed with powerful features including REMIND which records important dates, appointments and projects. MONEY, the heart of the program, tracks income, writes and prints checks, manages credit cards, create budgets and more. TAX leads you easily through every corner of the tax law and determines your final bill. INVEST handles all stocks, bonds, options and mutual funds. **FIN0039 \$135.**

## Graphics & Multimedia

### 3G Graphics

GRA0188	Images with Impact! Accents & Borders 1	65
GRA0111	Images with Impact! Business 1	65
GRA0089	Images with Impact! Graphics	50

### Abraca Data

CAD0032	Design Your Own Home-Architecture	65
CAD0033	Design Your Own Home-Interiors	65

### Adobe Systems, Inc.

DTP0054	Illustrator 3.0 (w/ ATM 2.0)	349
GRA0125	Streamline	119
GRA0191	PhotoShop	499

### Aldus

GRA0090	Freehand 2.02	329
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### Baseline Publishing

GRA0242	Color MacCHEESE	59
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### Bright Star Tech, Inc.

GRA0161	interFACE	249
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### Claris

CAD0029	ClariscAD 2.0	649
GRA0118	MacDraw II	289
GRA0117	MacPaint 2.0	92

### Creative Software

GRA0240	Easy Color Paint 2.0	47
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### Deneba Software

GRA0075	Canvas 2.1	189
GRA0187	UltraPaint	125

### Dream Maker

GRA0105	Cliptures Vol 1 Business Images	69
GRA0124	Cliptures Vol 2 Business Images	69
GRA0219	Cliptures Vol 3 Sports	69
GRA0101	MacGallery (Hypercard version)	27
GRA0102	MacGallery (MacPaint version)	27

### Electronic Arts

GRA0106	Studio/8	189
GRA0231	Studio/32	449

## Rapport, Drive 2.4, 360 & 1200

### (Kennect Technology)

Plug Kennect's New 5.25" Drives, Drive 1200 and Drive 360 into Rapport to read, write & initialize 1.2 Mb. or 360K MS DOS 7 Apple II 140K ProDOS. Drive 2.4, plugged into Rapport, is a 3.5" Diskette Drive which reads, write & initializes all Mac & IBM formats expands 800K diskettes to 1.2 Mb & High Density Diskettes to 2.4 Mb. Rapport alone enable older Macs to read 720K MS-DOS on the internal floppy drive or read & write 720K on an external Apple 800K Drive. **Rapport DR10140 \$199. Drive 2.4 DR10141 \$329. Drive 360 DR10219 \$259. Drive 1200 DR10218 \$259.**



## Read My Lips



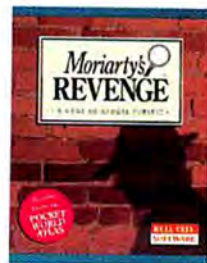
## Read My Lips

Attach sounds to documents you create using popular word processors, desktop publishing, and presentation software. Use pre-recorded sounds or record your own. Both the built-in microphones of the new Macs as well as MacRecorder are supported. **UTI0211 \$75.**



## Smartcom II 3.2

Specially designed to work with any Hayes modem, Smartcom II automates communications with Autopilots while providing a variety of error-free file transfer options. It holds informations for later use in a peruse buffer and stores frequently used instructions as programmable buttons. **COM0015 \$84.**



## Moriarty's Revenge

The infamous Dr. Moriarty is now a ranking leader of a worldwide crime organization and you must track him down. You'll travel the world puzzling over clues. Features over 1,000 clues and a computerized notebook for keeping them organized. **ENT0308 \$35.**





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### INIT Manager (Baseline)

Save sets of INITs, disable INITs, control startup icons, and generate reports. Includes a Damage Control feature to prevent recurring crashes. **UTI0187 \$35.**  
**1 Shot Worksheet:** Ideal for estimating, proposals, and amortization schedules. Combines a powerful forms generator and the mathematical capabilities of a spreadsheet. **BUS0149 \$59.**  
**Thunder 7:** Alerts you of spelling, capitalization and punctuation errors. Expands abbreviations and corrects frequent misspellings. Includes a 1.4 million word thesaurus. **SPL0029 \$59.**

### INPUT & OUTPUT

<b>Abaton</b>		
INP0130	LaserScript Printer	1999
<b>Calcomp</b>		
INP0102	The Wir Pen	57
INP0098	The Wir Tablet	159
<b>CH Products</b>		
INP0121	RollerMouse ADB	75
<b>Daladesk International</b>		
INP0097	DataDesk Switchboard	159
INP0047	Mac 101 Keyboard SE/II	129
<b>Digital Vision, Inc.</b>		
GRA0145	Computer Eyes B & W	199
GRA0154	Computer Eyes For Mac-Color	349
<b>ICD</b>		
INP0095	Graflex	82
<b>Kensington</b>		
INP0059	Turbo Mouse	109
INP0060	Turbo Mouse ADB (SE or II)	109
<b>Key Tronic</b>		
INP0083	Key Tronic Mac Pro Keyboard	118

<b>Strategic Mapping, Inc.</b>		
GRA0227	Atlas MapMaker 4.5	369
<b>Studiotechnics</b>		
GRA0189	Colorset 1.5	229
<b>SuperMac</b>		
GRA0109	PixelPaint 2.0	225
GRA0249	PixelPaint Professional 2.0	465
<b>T/Maker Co.</b>		
GRA0209	ClickArt Business Cartoon	33
GRA0039	ClickArt Business Image	32
GRA0088	ClickArt EPS Illustrations	82
<b>Zedcor</b>		
GRA0199	DeskPaint 3.3	115

### HARDWARE & PERIPHERALS

<b>ASD</b>		
ACC0539	MacAccessCard Reader	319
<b>Caere</b>		
INP0143	Typist	479

### CasinoMaster (Plus/SE) & Deluxe Mac II Version (Centron Software)

Let it Ride! You can bet on having hours of fun with Casino Master's five exciting casino games. Includes **Blackjack, Ace, Crapsmaster, Roulette Master, Pokermaster and Baccarat Master**. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/lose statistics and complete manual included in full color! An odds-on favorite with professional gamblers. Individual games \$27 each/5 game **Casino Master Package ENT0277 \$49. Deluxe Mac II version ENT0289 \$55.**

**Black Jack Strategy Tester** Includes Free copy of Blackjack Ace! Test your betting and playing strategies over thousands of hands. Card counting. 1-8 decks, 1-7 players. Develop a winning strategy, practice it with Casino Master or Blackjack Ace, then go off to the casino with confidence! **ENT0329 \$65.**

<b>CoStar</b>		
INP0091	LabelWriter	185
<b>Hewlett Packard</b>		
INP0096	HP DeskWriter - 2279A	759
<b>MegaGraphics</b>		
MON0015	8-bit 19" Hi-Res Greyscale for Mac II	1879
MON0016	8-bit 19" Hi-Res Greyscale for SE/030	1899
MON0006	Rival System for Mac II	1269
MON0008	Rival System for Mac SE	1269
MON0007	Rival System for Mac SE/30	1269
<b>Seikosha</b>		
INP0041	Seikosha SP 2000 AP Printer	235
<b>Sharp</b>		
COMP007	Wizard OZ 7000 (32KRam)	229
COMP018	Wizard OZ 7200 (64KRam)	255
<b>ThunderWare</b>		
INP0116	LightningScan 400	385
INP0007	ThunderScan Plus	199

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### MacPrint 1.2

Easy-to-use software utility that lets you use most Mac applications with any HP LaserJet, DeskJet or compatible printer including the Series III. Prints text and graphics at the printer's maximum resolution, but does not support Postscript. Cable is included. **UTI0098 \$95.**



### Metro ImageBase Electronic Clip Art

Add power to your documents with fabulous art images from Metro ImageBase (R)! They make newsletters, presentations, reports and brochures communicate more effectively. Each of the eighteen ImageBase packages contains at least 100 topic-related images drawn by professional artists. **\$85. ea.**



### Off-Line

A complete disk management system that's easy to use. Unlike other disk utilities, Off-Line was designed and optimized to manage floppy disks. Catalogs automatically, searches on multiple criteria, print disk labels and exports to other applications. **UTI0207 \$51.**

### SCORE IMPROVEMENT SYSTEM FOR THE SAT



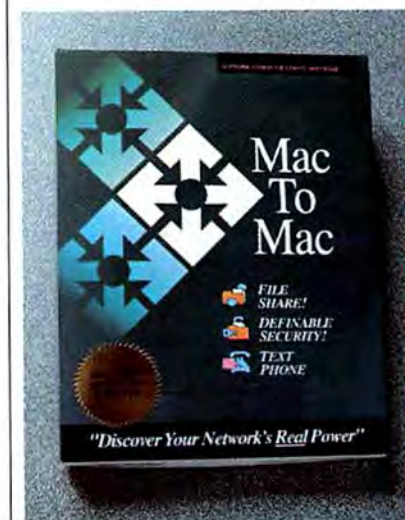
### SAT Complete (Queue)

Helps college-bound high school and prep school students learn how to take the College Entrance Examination Board's Scholastic Aptitude Test (SAT). No need to tremble before the dreaded exam, when you can learn about it in advance. The tutorial section explains each question and the logic behind the correct answer. And before you take the real SAT take the Practice Exam. Covers both the Math and Verbal sections. **EDU0161 \$29.**

<b>Koala</b>		
INP0127	MacVision 3.0	269
<b>Kraft</b>		
INP0094	Kraft ADB Trackball	79
<b>Kurta</b>		
INP0113	IS/ADB Tablet 8 1/2 x 11	319
INP0114	IS/ADB Tablet 12 x 12	385
INP0115	IS/ADB Tablet 12 x 17	625
<b>Microspeed</b>		
INP0126	MacTRAC ADB	75
INP0140	MacTRAC DB9	62
<b>MicroTouch</b>		
INP0084	The UniMouse	189
<b>Mouse Systems</b>		
INP0132	Little Mouse ADB	75
INP0134	Trackball / ADB	69
<b>Sophisticated Circuits</b>		
ACC0535	Power Key	65

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<b>Daystar Digital</b>	
DRI0224 FastCache IIci .....	289
DRI0288 PowerCache - 40 MHz (Ilici) .....	979
DRI0290 PowerCache - 50 MHz (Ilici) .....	1699
PowerCard 030 .....	starting at 1495



### Mac-to-Mac (Caravelle Networks Corporation)

Offers direct file transfers over any AppleTalk network, including multiple zones, without a server. Increases workgroup productivity by allowing Macs on a network to quickly and simply send or retrieve files to and from one another. All smoothly in the background with no work disruptions. Excellent security options, transaction log. User list automatically maintained. Easy to learn and use. Also, provides two-way text conferencing and answering machine capabilities. **5-Pack NET0099 \$165. 10-Pack NET0100 \$229. 50-Pack NET0101 \$979.**



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**TelePort, the ADB Modem (Global Village Communication)**

The perfect choice for powerful yet compact Mac communication. This 2400 baud modem with MNP5 data compression packs Hayes compatibility and error-free communication. TelePort plugs into your mouse (ADB) port and provides a pass-through connector for other devices. It uses no external power supply, and leaves your serial port free for other uses! **MOD0049 \$129. TelePortFAX includes SendFAX software.** Hold **OPTION** as you drag **FILE-PRINT** to easily send FAXes worldwide **MOD0058 \$189.**

**Microsoft Excel 2.2 (Microsoft)**

Now use the full memory of your Mac—up to 8 Megabytes. Excel 2.2 recalculates 40% faster while empty cells consume no memory at all. Cell annotation lets you add notes to any cell and auditing functions help you trace cell references. The new Search and Replace function makes global changes. Just doubleclick anywhere on a chart to see the dialog box for all the chartformatting commands. Charts are now dynamically linked to the original worksheet, so the chart automatically reflects any changes in the spreadsheet. Also supports "warm links" to Microsoft Word 4.0, so changes to your spreadsheet data automatically appear in your Microsoft Word documents.

**BUS0003 \$245.**

**SmartOne 2400/1200 (Best Data Products)**

When you need a 2400 baud modem, the SmartOne 2400/1200 provides an economical alternative. For less than the cost of some 1200 bps units, you get a

Hayes compatible modem with auto answer/originate, 300, 1200, and 2400 baud operation, pass-through phone jack, speaker with programmable volume, and a manufacturer's two-year warranty. All user options are stored in non-volatile memory. Includes free Quicklink II communications software, modem, cable, and **CompuServe/Prodigy Start-Up Kit offer.** **MOD0021 \$139.**



**Shiva**  
NET0067 NetModem V.32 (9600) 1395.

**Supra Corporation**  
MOD0020 SupraModem 2400 119.

**MUSIC & SOUND**

**Altech Systems**  
MUS0032 ALTECH MIDI Interface 59

**Coda Music Software**  
MUS0044 Finale 2.5 549

**Electronic Arts**  
MUS0004 Deluxe Music Construction 2.5 85.

**Farallon™ Computing**  
MUS0036 MacRecorder® 2.0 159.

**Opcode Systems**  
MIDI Translator 43.

**Tactic Software**  
Sound Clips Vol. 1, 2, 3 & 4 ea. 50.

**SECURITY & VIRUS PROTECTION**

**ASD Software, Inc.**  
UTI0135 FileGuard 2.5 139  
UTI0130 FileGuard 2.5 - Office Pack 5 349  
UTI0131 FileGuard 2.5 - Office Pack 10 579

**MacSki (XOR)**

Hit the slopes in sound and color with this challenging skiing simulator. Pick your skiing ability and choose your course. There are 20 different and challenging layouts from which you can select, or you can design your own. The program allows up to 256 different combinations of difficulty level, snow condition, visibility, and wind speed. **ENT0330 \$40.**



**WealthBuilder by Money Magazine (Reality Technology)**

WealthBuilder uses your financial data and your decisions about goals and acceptable risks to calculate the best investment strategy. It reads data directly from both Quicken and Andrew Tobias' Managing Your Money. It has a stock tracking and portfolio management system, and now includes 5000 stocks and 5000 bonds from Standard & Poor's, in addition to 1450 mutual funds. **FIN0068 \$145.**

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The complete personal financial management program



<b>Connectix</b>		
UTI0144	Virtual 030 UM3	115
DRI0185	Virtual 2.0 PMMU	188
<b>Dove</b>		
DRI0130	Marathon 030 (MacII) w/Virtual	529
DRI0198	Marathon 030 - (Mac SE) w/ Virtual	529
DRI0197	Marathon 030 - (MacPlus) w/Virtual	529
DRI0152	Marathon 030X (MacIIx) w/ Virtual	529
DRI0151	Marathon 030-SE/030 w/ Virtual	529
<b>Micron Technology</b>		
DRI0321	PicturePress Card (Xceed ICDP-II)	745.
<b>MicroTech International, Inc.</b>		
CHP0025	Mac Classic 1 Meg Upgrade	99
CHP0026	Mac Classic 3 Meg Upgrade	175
DRI0315	Mac Classic Upgrade Kit 20-1	399
DRI0317	Mac Classic Upgrade Kit 40-1	499
DRI0318	Mac Classic Upgrade Kit 40-3	575
<b>PowerUser</b>		
CHP0013	1 Meg Simm 100ns PowerUser	59
<b>Total Systems</b>		
DRI0295	Mercury 16MHz 68030 - Plus	499
DRI0297	Mercury 16MHz 68030 - SE	389
DRI0299	Mercury SCSI Module - Plus	189
<b>Gemini- Full Line Available</b>		
DRI0301	Gemini 20 MHz Card	799
DRI0302	Gemini 25 MHz Card	1039
DRI0265	Gemini Plus Kit	129

**MODEMS & FAX**

<b>Abaton</b>		
MOD0019	InterFax 12/48	265
MOD0034	InterFax 24/90	349
<b>Applied Engineering</b>		
MOD0054	Datalink/Mac	209
<b>Best Data Products</b>		
MOD0021	SmartOne 2400/1200	139
<b>Dove</b>		
MOD0038	DoveFax Desktop	299
<b>Global Village</b>		
MOD0049	TelePort	129
MOD0058	TelePort/Fax	189
<b>Hayes</b>		
COM0023	Smartmodem 2400	349
MOD0017	Smartmodem 9600 (V series)	719
MOD0060	Personal Modem 2400 w/Smartcom II	179
<b>Microcom</b>		
MOD0050	MacModem V.32 / 9600	689



David A. Cook  
Tom Zehner

**Symantec Corporation**

UTI0149 Symantec Antivirus for the Mac 2.0 (SAM)67.

**UTILITIES & PROGRAMMING**

<b>Abbott Systems, Inc.</b>		
UTI0113	CanOpener	64.
<b>Aladdin Systems</b>		
UTI0145	ShiftIt Deluxe	63.
<b>ALSoft</b>		
UTI0132	DiskExpress II 2.04 w/MultiDisk	57.
UTI0110	MasterJuggler 1.5	57.
<b>American Power Conversion</b>		
UTI0133	Power Chute	69.
<b>Baseline Publishing</b>		
UTI0187	INIT Manager	35
<b>Berkeley System Design</b>		
UTI0119	After Dark 2.0	24
<b>CE Software</b>		
UTI0188	QuickKeys 2 v.2	99.
<b>Custom Applications</b>		
UTI0136	Freedom of Press 3.0	255
UTI0185	Freedom of Press Light 3.0	56.
<b>Dantz Development</b>		
UTI0118	Retrospect	148
<b>Digitalk, Inc.</b>		
LN00036	Smalltalk/V MAC	125
<b>Dubi-Click</b>		
UTI0194	ClickChange	41.
<b>Fifth Generation Systems</b>		
UTI0063	FastBack II 2.5	118
UTI0087	SuitCase II 1.2	49.
UTI0035	SuperLaserSpool 2.02-Single User	93.
<b>ICOM Simulations, Inc.</b>		
UTI0084	On Cue	35.
<b>Insight Development</b>		
UTI0098	MacPrint 1.2	95.
<b>Magic Software</b>		
UTI0077	Autosave II	28





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Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes. MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 software Programs of 1989. **BUS0087 \$49. See line listings for all 10 editions.**

<b>Mainstay</b>		
UT10073	Capture 3.0	45
UT10004	MacFlow 3.1	125
<b>Microcom</b>		
UT10191	Microcom 911 Utilities	89
<b>Microsoft</b>		
LNG0030	QuickBASIC	64
<b>Multi Ad Services</b>		
UT10199	Multi Ad Search	125
<b>Now Software</b>		
UT10167	Now Utilities 2.0	79
UT10168	Screen Locker	45
<b>ON Technology</b>		
UT10142	ON Location	75



## Preferred Publishers

UT10190	Personality	53
UT10183	ScreenShot	31
<b>Salient</b>		
UT10179	DiskDoubler	45
<b>Shana Corporation</b>		
LNG0037	Inside Out	369
<b>SNA</b>		
UT10207	Offline	51
<b>Symantec Corporation</b>		
UT10151	Norton Utilities for the Mac	89
UT10078	Symantec Utilities for Mac II (SUM)	99
LNG0001	THINK's C 4.0	165
LNG0002	THINK's Pascal 3.0	165
<b>The HandOff Corporation</b>		
UT10148	HandOff II	52
<b>Zedcor</b>		
LNG0031	ZBasic 5.0	99

## WORDPROCESSORS & SPELLING CHECKERS

<b>Ashton-Tate</b>		
WRD0009	FullWrite Professional 1.1 .....	SPECIAL! 59.
<b>Baseline</b>		
SPL0029	Thunder 7 .....	59.
<b>Caere</b>		
UT10164	OmniDraft .....	69.
UT10100	OmniPage 2.1 .....	495.
UT10163	OmniSpell .....	69.
<b>Claris</b>		
WRD 0026	MacWrite II .....	142.
<b>DeltaPoint</b>		
WRD0032	Taste .....	85.
<b>Deneba Software</b>		
SPL0015	Spelling Coach Pro. 3.1 .....	124.
<b>Lexpertise</b>		
SPL0003	MacProof 3.2.1 .....	115.
<b>LifeTree Software</b>		
SPL0028	Correct Grammar .....	59.
<b>Microsoft</b>		
WRD0022	Word 4.0 .....	245.
<b>RightSoft</b>		
WRD0031	RightWriter .....	55.
<b>Sensible Software</b>		
WRD0023	BookEnds 1.2 .....	51.
SPL0018	Sensible Grammar .....	51.
<b>SNA, Inc.</b>		
WRD0033	Stylist .....	51.
<b>Tactic Software</b>		
WRD0030	Magic Typist .....	50.
<b>T/Maker Co.</b>		
WRD0018	WriteNow 2.2 .....	119.

## FileGuard 2.5 (ASD)

Protect your Hard drives and Partitions from unauthorized access (including security bypass with a system diskette), copying and erasure; Applications and Files/Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized users; Keep an eye on System Usage with the system users log which continuously tracks user/group activity. **Single UT10135 \$139. Office 5 Pack UT10130 \$349. Office 10 Pack UT10131 \$579.**

## Taste (DeltaPoint)

Combines a powerful word processor with page layout and graphic design. The word processor includes an address book with mail merge, search and replace. The page layout functions in Taste let you format multiple columns, create columns of different widths on the same page, and change layouts from page to page. Taste offers a variety of graphics tools, including rectangles, polygons, Bezier curves, and fills. Wrap text around or inside objects. Also includes a Thesaurus Module so you can find just the word you need - at the touch of a button. **WRD0032 \$85.**



# STOP PRESS

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Answer, Auto Dial and Advanced Diagnostics for error checking. **MOD 0043 Only \$99.**

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TERRY HUSEBYE

NuTek Computers founder Benjamin Chou is confident that his company's chip set, operating system, and user interface will serve as the basis for a thriving Macintosh-compatible market.



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# CLONES

*This  
is not  
an April  
Fool's  
joke*

**Since the introduction of the Macintosh, people have wondered if there would ever be a Macintosh-compatible computer. More recently, the question has become WHEN will we see the first Mac-compatible?**

IF THE LATE JANUARY ANNOUNCEMENT by two-year-old start-up NuTek Computers is any indication, Apple's quiet Macintosh monopoly may soon give way to a noisy host of Mac compatibles. According to NuTek president Benjamin Chou, the Cupertino, California-based company has developed three components—a chip set, an operating system, and user interface software—necessary for a fully functional Mac-compatible computer. NuTek's marketing strategy will involve licensing its products to select original equipment manufacturers (OEMs) that will build the actual computers.

Equipped with the NuTek operating system and user interface software, the new computers should run all well-behaved, 32-bit, clean Macintosh applications and work with nearly all the standard NuBus add-in boards and peripheral devices avail-

able from Apple and third-party vendors. NuTek claims the resulting machines will offer users enhanced features at lower prices than Apple's Macintosh machines. We speculate, for example, that buyers will be able to purchase a Mac-compatible with a color monitor, hard drive, and a 68030 processor for just over \$600. NuTek expects OEMs to make the first Mac-compatibles available by the end of the year, (NuTek's Motif interface will be the first NuTek component available to the public, offering Mac owners an alternative desktop environment.)

Getting working products to market within a year will be a daunting task given the technical and legal problems facing NuTek. NuTek engineers have spent two years developing an operating system that is functionally equivalent to the current Macintosh Operating System and are in the process of distilling their chip set down to three chips. Testing for software and hardware compatibility is currently under way. Also, like any developer attempting to create the functional equivalent of Apple proprietary technology, NuTek must take every precaution to guarantee that the new code will be significantly different from Apple's. Although



NuTek has been scrupulous about following clean-room techniques throughout the development process, the company may still find itself involved in costly battles with Apple's legal department (see "NuTek's Legal Strategy").

### It Happened to IBM

Designing a personal computer that is fully compatible with another personal computer is nothing new, as evidenced by the huge variety of IBM PC-compatible computers on the market. Barely a year after IBM introduced the original IBM PC in 1981, several vendors—including Compaq Computer—

### Hard Hardware Issues

The original IBM PC, XT, and PC AT were built with off-the-shelf components and chips, easily accessible to any potential manufacturer. The basic component of all Macs is Motorola's 680X0 CPU family, which anyone can buy. In contrast, Apple's strategy has been to keep the hardware design of the Mac proprietary by constantly replacing off-the-shelf components on the Mac's main logic board with custom-designed, application-specific integrated circuits (ASICs).

According to NuTek, its three chips provide virtually all of the logic required to create a Mac-compatible computer. Two of the very large scale integration (VLSI) ASIC chips provide a NuBus-compatible interface to a standard Motorola 680X0-family processor, as well as memory-management circuitry. The third handles all the I/O peripheral control.

In addition, NuTek's chip set includes all the logic necessary for controlling floppy disk drives, including SuperDrives. NuTek says that its chip set implements Apple's non-standard versions of SCSI and NuBus and that any computer built with the NuTek chip set will work with most standard peripheral devices—disk drives, printers, video boards, network adapter boards, and the like.

NuTek has also designed its chip set to support high-performance features currently not available for all Macs—burst-mode memory transfers from the microprocessor, a capability that could improve performance of memory-intensive Mac applications, and direct memory access (DMA), currently available only on the Mac IIx. All computers built with the NuTek chip set will be able to generate stereophonic sound, something the Classic, Plus, SE, and earlier Macs cannot do. All will support color. Finally, the chip set will address up to 64MB of main memory, twice that of current Macs, and will interface the CPU to the NuBus at speeds up to 33MHz.

Because the Apple Desktop Bus (ADB) technology is patented by Apple, NuTek will use a standard Intel 8742 chip to directly connect

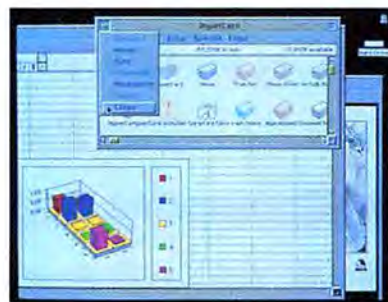
were shipping IBM PC-compatibles.

Compaq had written a legal version of the IBM ROM basic input/output system (BIOS)—the part of the operating system that allows DOS software to work with the Compaq hardware design. IBM had licensed PC-DOS from Microsoft; Microsoft subsequently licensed its version of the operating system, MS-DOS, to all comers—including Compaq.

In 1984, Phoenix Technologies developed and licensed its first IBM-compatible BIOS to Tandy Corporation. Phoenix's willingness to license its ROM BIOS to all prospective manufacturers enabled any vendor to develop PC-compatibles—without having to write its own ROM BIOS. The number of vendors and PC-compatible computers exploded. In fact, Phoenix claims that more installed PC-compatibles contain Phoenix ROM BIOS (over 14 million systems in 1989) than IBM BIOS.

Manufacturers of PC-compatibles, however, still had to design their own hardware to match that of IBM. That situation changed in 1985 when Chips and Technologies introduced a chip set that reduced the IBM PC AT logic board to five chips. Designing a PC-compatible became simple: buy the chip set and the ROM BIOS, and license the operating system.

**According to Michael Spindler, chief operating officer of Apple, "It is not a question of whether Apple will license its operating system, but how it will do this."**



Although the two are similar, there are some noticeable differences between NuTek's Motif interface and the Mac interface. Buttons, menus, and scroll bars have a three-dimensional look. The main Finder menu pops up when you click on the desktop, with choices in hierarchical menus (top). Instead of being anchored to the top of the screen, application menus—such as this one from Microsoft Word—travel between active windows (middle). Click in the upper-left-hand corner of any window and a Control menu appears (bottom). The Control menu allows you to size and close windows; reduce, or minimize, the window to an icon; restore a window to its previous size; and maximize a window to take up the whole screen.

PC-compatible input devices to the I/O ports of a NuTek chip set-based computer.

### Will They Buy?

By developing an operating system, user interface software, and chip set that constitute a relatively compatible Mac system, NuTek could find itself in the enviable position of being not only the Phoenix Technologies, but also the



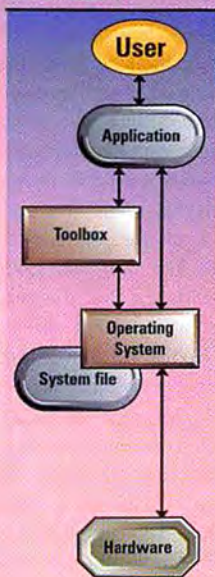
# System Architectures Compared



The Macintosh Operating System and User Interface Toolbox are contained in read-only memory (ROM) chips on the Mac's main logic board. (The System file on disk is actually a resource file necessary for the Mac Operating System to function.) Basic start-up information for the computer—available hard drives, floppy drives, and so on—is also contained in ROM. Among the Mac Operating System's responsibilities are memory management, serial- and ADB-port control, and disk input/output. The Toolbox is responsible for the Mac's user interface—the way windows, pull-down menus, dialog boxes, and the like appear on the Mac screen. Applications (even the Finder is an application) use Toolbox routines to draw the screen and use the Operating System to talk to Mac hardware.

In the PC, a basic input/output system (BIOS) located in ROM is responsible for *bootstrapping* the system into action at start-up. After testing

## Macintosh



itself, the ROM BIOS searches for an operating system on any floppy disks or hard drives attached to the PC. The BIOS then loads the operating system—for example, MS-DOS or Windows—from disk. PC applications use the operating system and ROM BIOS to communicate with the PC hardware.

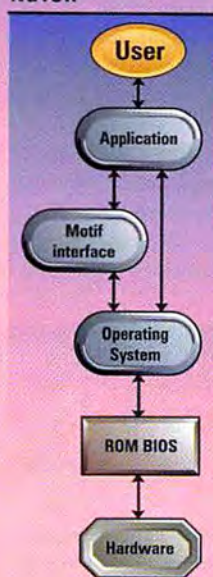
NuTek's system scheme for a Mac-compatible computer has more in common with the PC than the Mac—NuTek's operating system is disk-based like MS-DOS, not ROM-based like the Mac Operating System. A 64K start-up

## PC



ROM BIOS controls power-on self-test functions and then bootstraps the operating system from a floppy disk or hard drive. NuTek's user interface is based on a rewrite of the Open Software Foundation's Motif graphical user interface, which is a collection of software routines on disk. By keeping the majority of the operating system in software, NuTek can more easily update its operating system to keep pace with changes not only in Apple's operating system but also in future hardware technology.

## NuTek



Chips and Technologies of the Mac-compatible market. The rewards could be enormous.

Phoenix Technologies, for example, initially licensed its ROM BIOS to hardware manufacturers for \$10 per machine; if 1000 machines using its ROM BIOS were shipped by the hardware manufacturer, the manufacturer paid Phoenix \$10,000. At its peak, Chips and Technologies made \$200 million per year selling chip sets. Total the figures, and NuTek's two-year stake in developing the operating system, user interface software, and chip set is more than a good investment—it's a great one. As long as there are

no extraordinary legal fees, that is.

All of this depends, of course, on whether hardware OEMs are willing to license NuTek's technology. Certainly, the precedent set by sales of PC-compatibles is enticing to any prospective vendor of Mac-compatibles. IBM-compatible computers from Compaq Computer, NEC Corporation, Toshiba Corporation, and others, currently account for more than 60 percent of a worldwide market estimated at more than \$20 billion in annual sales. Worldwide sales of Macs are currently estimated at \$4.5 billion a year—and it's all going into Apple's coffers. Tandy Corporation, for one,

has expressed interest in selling Mac-compatible computers.

But hardware OEMs shouldn't overlook other issues. Signing on with NuTek requires considerable confidence in NuTek's technology and its ability to keep pace with Apple's system developments—both hardware and software. Even more, it requires confidence in NuTek's ability to stay in business should Apple decide to litigate. According to Chou, NuTek is willing to indemnify any hardware OEM from possible lawsuits filed by Apple regarding the NuTek operating system, user interface software, and chip set.



## NUTEK'S LEGAL STRATEGY

**A**ccording to legal experts, any company that wants to build a Macintosh-compatible computer needs three things: a detailed legal blueprint for avoiding Apple's intellectual property rights, scrupulous documentation of its independent development effort, and buckets of money to defend itself in court. NuTek Computers may be the first company to meet all three requirements.

In compatibility cases, there are user interface-copyright issues, software

described by author Anthony Lawrence Clapes, a group of experienced analysts study the target program to determine its functions and then write a detailed specification explaining how the program must perform, but not indicating how the code should be written. The company then hires programmers who have not had any previous contact with the target program. The programmers work only from the list of specifications, while the company maintains an audit trail of documentation, including mistakes made along the way, as evidence that the programmers' work is original.

NuTek roughly duplicated that process under the tutelage of G. Gervaise Davis III, a respected computer-copyright specialist with Schroeder, Davis & Orlliss of Monterey, California.

NuTek developed its operating system software and chip set by carefully looking at the design of the Macintosh and at publicly available documentation such as the *Inside Macintosh* series of books. Then, NuTek claims, its team of engineers duplicated the Macintosh's function by using newer technology and different processes. The company refused to hire former employees of Apple, in an attempt to avoid trade-secret issues; did a worldwide search for Apple's existing patents; and archived its weekly source-code development. According to Davis, a "person who should know" compared the resulting code with Apple's original and said the two are significantly different. And none of Apple's patents are infringed, according to Davis, who says NuTek's algorithm for graphic region-clipping, for example, differs significantly from that of Apple.

Even if NuTek has done all its legal homework, it may still be vulnerable if Apple sues. Since patents that have not been issued are not made public, Apple could conceivably have some pending applications that NuTek would have no way of knowing about. One attorney, however, thinks that is unlikely. "It's reasonable to assume that any hardware or any patentable aspect of the original Macintosh that isn't patented by now

probably is not going to be," says Ron Laurie, who heads the Computer Law Group of Irell & Manella in Menlo Park, California.

So the patent issue involves a calculated gamble. What about copyright? "If you're building a compatible product, you've got to look at something," according to Laurie. "You cannot independently create a compatible product—it's an oxymoron." NuTek looked at *Inside Macintosh*, which doesn't have any code in it. Still, Apple might argue that *Inside Macintosh* has a high-level description of the program and that by looking at it NuTek infringed Apple's copyright. Laurie, however, doesn't think that would be a good argument.

As a practical matter, if Apple does sue, NuTek will bear the burden of proving in court that it did not infringe Apple's copyrights, patents, trademarks, or trade secrets. "Courts, like most people on the street, think that it's not nice to exploit the fruits of somebody else's labors," says

**"The key is who is going to dare to be the first one to build a Mac clone, the person willing to go out and take some arrows in the back."**

code-copyright issues, and patent issues. Some Mac software, such as the user interface and the operating system inscribed in ROM chips, is copyrighted, while some Mac processes, such as QuickDraw's region-clipping procedure, are patented. (According to Apple, there are more than 60 patents on the Macintosh; NuTek claims the U.S. Patent Office lists fewer than 25.) A copyright protects the expression or description of an idea but not the idea itself, while a patent generally protects any useful, innovative invention, process, or machine.

NuTek sidestepped the user interface-copyright issue by licensing the Motif interface from the Open Software Foundation. (Motif is based in part on New Wave, a user interface from Hewlett-Packard that Apple claims infringes its copyright. But as a licensee, NuTek is not responsible for any resulting legal issues if Apple should win its suit against HP.) Still, significant software code-copyright and patent issues remain.

In the early 1980s, IBM PC-compatible makers employed *clean-room* procedures to convince courts that the makers had no access to IBM's code and that they independently developed their products. Clean-room procedures vary; one setup is described in *Software, Copyright, and Competition* (Quorum Books, 1989). As



ROBERT HOLMSTEDT

The U.S. intellectual property system does not give an absolute monopoly to any company, no matter how many patents or copyrights it has, according to NuTek's attorney, G. Gervaise Davis III.

Stephen J. Davidson, a Minneapolis attorney who specializes in computer technology issues.

NuTek should be able to counter that bias by showing how much time, money, and effort went into independently developing the Mac compatible. That way, according to Davidson, "you can go to the court and say, 'Look, these people didn't rip off something Apple had done, these people invested a zillion dollars and



a lot of hours and a lot of blood, sweat, and tears in developing a competitive product.' "

NuTek likes to compare itself to Compaq, the pioneering IBM PC-compatible maker that made a bundle off its compatible machines. Apple isn't convinced. A spokesman for the company would not comment specifically about NuTek, but notes that when it comes to the Macintosh, "there are copyrights, trademarks, and patents that do not relate to Intel-based clones."

In the absence of a business arrangement, he says, "there are no legal Macintosh clones or compatibles. We believe that you cannot clone a Macintosh without violating our intellectual property and, as you know, Apple aggressively defends its intellectual property."

NuTek hopes to avoid litigation but is prepared to go to court. "This company is funded by a group of investors who understood from the beginning that litigation might be a problem," says NuTek's attorney, Davis. An expensive problem according to attorneys, who estimate that the "burn rate" for this kind of litigation could be several million dollars per year for both Apple and NuTek.

Apple could decide not to sue NuTek but to go after any hardware company that builds Macintosh-compatible machines based on NuTek's products. "If Apple gets really litigious, they can scare a lot of the market away," according to one source, who asked not to be identified. "The key is who is going to dare to be the first one to build a Mac clone, the person willing to go out and take some arrows in the back."

NuTek hopes to protect its potential customers by indemnifying them against potential litigation by Apple. No one knows if that will be enough to reassure hardware companies and actually spur a new market, but there's plenty of speculation. "This is potentially an earthshaking development, not only in the industry but also in the Mac market," says Davidson. "If these people have done this right, I expect they'll be sitting on a gold mine."

—Deborah Branscum

If Apple does sue, NuTek's survival may lie not in its ability to prove that no infringement occurred, but in its ability to pay legal fees. NuTek investors include Chou, private sources in the United States, and one offshore investor, Lao-Yeo Hsu. Hsu is the chairman of Taiwan-based Ban Yu Paper Mill Company, a paper manufacturer that had pretax profits of over a billion dollars in 1989. According to 1990 Ban Yu Paper Mill figures, the company has approximately \$100 million in available capital.

### See How They Run

Even if NuTek can overcome legal hurdles and sell its chip set to computer vendors such as Dell or Tandy, software issues still present a major technical obstacle. Many software vendors are skeptical that NuTek can deliver on its promises of compatibility. The first IBM PC clones claimed complete compatibility but, more often than not, did not run major software packages correctly. The ROM in the early PCs contained only 16K of instructions; newer Macs use 512K ROM chips. "Apple's ROM and its system software are extremely complicated," says Joel West, president of Palomar, a vendor of software drivers for printers and plotters. "If they've failed to duplicate even one small quirk then there could be real compatibility problems for the user."

NuTek claims, however, that any software that follows Apple's specifications—and that doesn't address hardware directly—will run on the NuTek chip set. For the user, that means that all major applications, such as word processors, spreadsheets, and databases, should run correctly. Several games, such as Dark Castle, won't run, however—these programs frequently bypass Apple's managers in order to eke out the most performance they can. Applications that make direct calls to video hardware, such as HyperCard and Autodesk's AutoCAD, will not work either. And serial printers such as the Hewlett-Packard DeskWriter, GCC Personal LaserPrinter II, and Apple LaserWriter IISC may not work.

"When I hear 'mostly compatible' the hair on my head raises," says Dick Skeie, president of CE Software. "I



Gordon Campbell, president and CEO of Chips and Technologies, a company that successfully sells PC-compatible chip sets, feels that fear of Apple lawsuits will keep smaller vendors out of the market.

know how tough it is to keep up with Apple's systems. We follow Apple's rules and regulations when we develop software and things still break on new systems." Chou admits that NuTek has not implemented all of the Mac's calls. What no one currently knows is which calls NuTek has implemented and what those calls do.

If current versions of Mac software won't run on the NuTek chip set, vendors will modify their applications to run—but only if the Mac-compatible machines are selling in volume (for vendors, that means thousands of units per month). But for most vendors, the question of whether or not they will modify software is a moot point. Most believe that Apple will litigate and that NuTek will not be able to withstand that legal onslaught.

At the same time, the software community is pulling for the underdog. Most hope that the appearance of viable Mac-compatibles will force Apple to be more aggressive with its technology. Adobe Systems, a company that has felt the sting of clone makers, agrees that a challenger can only be good for the industry. "I can speak from experience," says John Warnock, president of Adobe. "[Clone technology] has made us more competitive and made us raise the bar on the level of our technology to stay ahead of others. Apple won't be able to be complacent any longer."

Warnock believes that the problems inherent in porting Mac applications to run under Motif would be minor. "I would make such an investment," he says.



### Who's Got the Clones?

Unlike NuTek, most companies have no desire to confront Apple with their own version of the Mac's ROM. Instead, they develop clever methods of working around the legal hurdles Apple has set up. Three such companies—Cork Computer, Hydra Systems, and RDI Computer Corporation—are developing Mac compatibility in very different ways for different uses.

Cork Computer's Cork System 30 is an inexpensive (\$2999) Ili-equivalent system that requires a 128K ROM from a monochrome Mac. Cork says that it developed a color ROM that adds the functions of 32-bit

he had a stock reply to any question about what Apple would do if someone attempted to clone its machines. Essentially his answer was that the company would spend up to its last remaining penny litigating to protect Apple's technology. Given Apple's lawsuits in the past, no one doubts the earnestness of his statements.

Times may have changed. The attorney who led Apple's Pyrrhic suits against Microsoft and Hewlett-Packard has left Apple. But Apple's most common response to companies trying to clone its hardware or software has been to wield its mighty financial and legal weight against those involved.

**As Adobe's president John Warnock puts it, "There are two choices [for Apple]. Either stand and defend your turf, or be creative and stay ahead."**

QuickDraw without infringing Apple's copyright. The market for the product will be owners of monochrome Macs who want to upgrade to color systems inexpensively.

RDI's Companion is a \$1695 combination of hardware (including a ROM from a Macintosh Classic) and software that lets Mac software run on RDI's Brite Lite, a SPARC-based laptop. Users will be Mac owners who want a powerful laptop but don't want to leave their Mac software behind. The company plans a software-only Mac emulation that will be faster and less expensive. Because RDI's Brite Lite has its own screen-drawing routines, it does not have to emulate QuickDraw.

Hydra Systems' product is a \$995 add-in board for IBM PC XT's, PC AT's, and compatibles that lets those systems run monochrome Mac software. (Hydra's board now requires a Mac ROM chip.) Hydra licensed the Xerox Star interface to avoid legal problems with Apple. Of the three companies only Hydra says it is working on a clean-room approach to cloning the Mac's ROM. Hydra hopes to finish that project in about a year, after which its board would not need the Mac ROM.

### Changing Times for Apple

For the ten years that Del Yocam was an executive at Apple Computer,

Franklin Computer was the first notable company that Apple successfully sued. Digital Research lost the lawsuit brought against it by Apple for infringing the copyright on Apple's interface and suffered substantial damage, although it remains in business. Cadmus, a Massachusetts-based workstation company, demonstrated Mac applications running on its workstations in 1986. Apple quietly acquired that company, which over time disappeared from sight. Outbound Systems, which like Dynamac and Colby, uses Mac ROM chips for its portable, seems to have gotten a little too good. Like Cadmus, Outbound is now entangled in a confidential and complex agreement with Apple.

Clearly, Apple's consistent strategy has been to bring lawsuits to protect



Chuck Colby, president of Colby Computer and a pioneer in the Mac-compatible market, argues that if Apple hadn't guarded its ROMs so carefully, the Mac market might be three times its current size.

its rights as soon as products such as these are brought to market. This suggests that NuTek and others are in for legal action.

### Market Share Is the Focus

During 1989 and 1990 John Sculley took a beating from the press, analysts, users, and vendors for neglecting to increase Apple's share of the personal computer market. Sculley seems to have taken these criticisms to heart. Expanding the Mac's installed base has become increasingly important in Apple's strategic thinking. Sculley's belief that the company had to produce cheaper computers for a mass market is verified by the Mac Classic's wild success.

Market-share growth is now a guiding principle in the thinking of Apple executives, but Apple's ability to manufacture more machines is saturated—the company is up to four shifts at its plant in Singapore. Apple cannot increase its speed without diminishing profitability on products that already have lower profit margins than any computer the company has manufactured to date.

### Licensing the Mac OS

Another request has been that Apple license its operating system to third-party manufacturers. This would create a larger set of developer opportunities, expand the number of Macintoshes sold in the personal computer market, and therefore increase Apple's market share. By late 1990 Apple executives were rec-



Wendell Brown is president and CEO of Hydra Systems, a maverick company offering DOS-users an add-in board that lets PCs and PC-compatibles run monochrome Macintosh software.



onced to the concept. According to Michael Spindler, chief operating officer of Apple, "It is not a question of whether Apple will license its operating system, but how it will do this."

Apple will have no difficulty finding partners to manufacture Macs. The difficulty lies in finding a partner pliable enough to adhere to all of the restrictions that Apple desires, restrictions that leave the development of technology in the hands of Apple while distributing the work of selling Macs to its licensed resellers. Apple has already experienced what it is like to lose technological leadership with its own machines—the bitter struggle with Adobe over type and printing technology is a recent example. This suggests Apple will eventually pick as a partner either a company too big and lethargic to develop a computer technology of its own (perhaps not even a computer manufacturer) or a smaller company that Apple can dominate.

#### Apple Views NuTek

On the surface, Apple appears placid about NuTek's announcement. Behind this facade lies a sophisticated strategy. Apple works nonstop to keep the lid on responses regarding potential competition and to prevent the company's executives from being seen as bad guys when Apple takes its possible competitors to court. Internally the reaction of Apple staffers to the NuTek announcement is an incredulous, stunned disbelief.

Big as Apple is, the company must recognize that in the face of a determined competitor, Apple cannot stop a clone any more than IBM could. At the moment, however, company spokespeople will not even admit that there is any similarity between what Compaq, Phoenix, and Chips and Technologies did in the IBM PC market and what NuTek and others may eventually achieve in the Mac market.

Once the OEM manufacturers of Macintosh-compatibles are announced, Apple can be expected to adopt a fall-back position; that is, to claim that customers will want a true Macintosh because only Apple (or its authorized licensees) can provide access to breakthrough technology. And there may be veiled allusions to compatibility problems with clones.

#### What Happens to Apple after Clones?

Apple will have an increasingly difficult time trying to reconcile growing research and development expenditures with declining profit margins. Competition from Mac-compatibles will dictate that Apple lead the market via technology rather than via marketing. Apple may begin to lose very profitable segments of its own market, such as peripherals.

While the company has stiff competition from peripheral vendors at present, it can be expected to become worse. Over time the Apple logo will



In the wake of NuTek's announcement, Michael Spindler, Apple's chief operating officer and president, must decide whether it's better to own the whole Mac pie, or a slice of a larger Mac-and-compatibles pie.

be no more important in the mass market than the IBM logo.

As Mac-compatibles begin to proliferate, prices will tumble. The second piece of Apple's business to crumble will be the stranglehold on the market channel it has through the authorization of dealers. Suddenly Apple-authorized dealers will face competitors selling Macintosh capability at 30 percent to 50 percent less. Mail-order vendors will introduce compatibles at cutthroat rates, taking away even more Apple revenues, and constricting the amount of money Apple can dedicate toward future products.

#### Apple Operating System Is the Key

It is easy to predict that the Mac market might duplicate IBM's, with compatible vendors actually producing higher-performance computers for less money. The big difference, of course, is that Apple writes its own

operating system while IBM licenses its operating system from Microsoft.

The question, then, is can Apple continue to lead its market, with its own operating system, after the release of Mac-compatibles? It should come as no surprise that Apple has yet another version of its operating system under way, a non-QuickDraw version. The company could introduce this new operating system in order to chill competition, but a new operating system is likely to require a major change within the Mac installed base, and such an introduction might only increase the confusion.

On the other hand, NuTek is already saying that it will not write software to emulate the Mac's 7.0 operating system until 7.0 has been shipping for some while. Yet another version of the Mac OS could be a hurdle that compatible manufacturers might not overcome.

#### What's It All Mean?

NuTek is gambling that it has enough engineering expertise to unravel the Macintosh's complex environment; that the company has mitigated potential legal hassles by carefully adhering to classic clean-room development techniques; and that the company has the financial clout necessary to withstand any litigation that might ensue anyway.

Manufacturers of NuTek-based machines will have to gamble that buyers are willing to trade less-than-perfect software and hardware compatibility for lower prices and a few enhancements. And these companies will have to trust that NuTek will in fact indemnify them should Apple choose to sue.

The real concern for Macintosh users and developers should be how Apple responds. As Adobe Systems' president John Warnock puts it, "There are two choices [for Apple]. Either stand and defend your turf, or be creative and stay ahead. In this day and age standing in some intractable stance—a defensive position—is doomed to failure." ■

.....  
*Written by Jerry Borrell,  
Brita Meng, Tom Moran, Cheryl England  
Spencer, and Suzanne Stefanac.*



# The Secrets of the Super



If every book in a bookstore looked the same, browsing wouldn't have the excitement and pleasure that any bibliophile knows. It's the same with stacks. More than 400 stacks and projects arrived at *Macworld* in time for the 1990 SuperStacks contest. To say that none of them looked alike is the understatement of the year. At the end of the three-week judging process, developers of 30 entries—which ranged in content from an animated dancing mouse to a simulation of an acute heart attack—emerged as SuperStacks winners.

What distinguished these stacks? From their opening cards, they cried out "Read me!" So, we did. Something about each of them reached out and grabbed us, took us in, and wouldn't let us back out until we'd explored every last nook and cranny. The winning stacks all share excellence in interface design, informational organization, graphic design, and media integration. But more than that, they're fun to use. **Know Your Audience**



SuperStacks winners designed their stacks to communicate specific information to a well-defined audience. The Earthquake Preparedness Stack, winner for Best Educational Entry, K-12, teaches that through knowledge and planning, you can improve your chances of surviving a big earthquake. Developer Kelly O'Brien compiled scanned graphics from public domain sources and material from at least 30 different periodicals and books to create a compelling interactive stack.

To avoid overwhelming her target audience of schoolchildren, O'Brien divided the stack into six chapters. Chapters include earthquake geology, scientific measurement, and home and office preparedness; each can be used as a separate lesson. And instead of presenting card after card of text, she chose graphics to explain and amplify short text fields of information.



For instance, you can explore ways to make your own home safer by clicking on bulleted hot spots—basement, kitchen, and bedroom—in a cutaway drawing of a house. Another card lets you interactively compare the intensity and magnitude of famous earthquakes, such as the 1985 Mexico City earthquake, measuring 8.1 on the Richter scale, and the 1989 Loma Prieta earthquake, measuring 7.1.

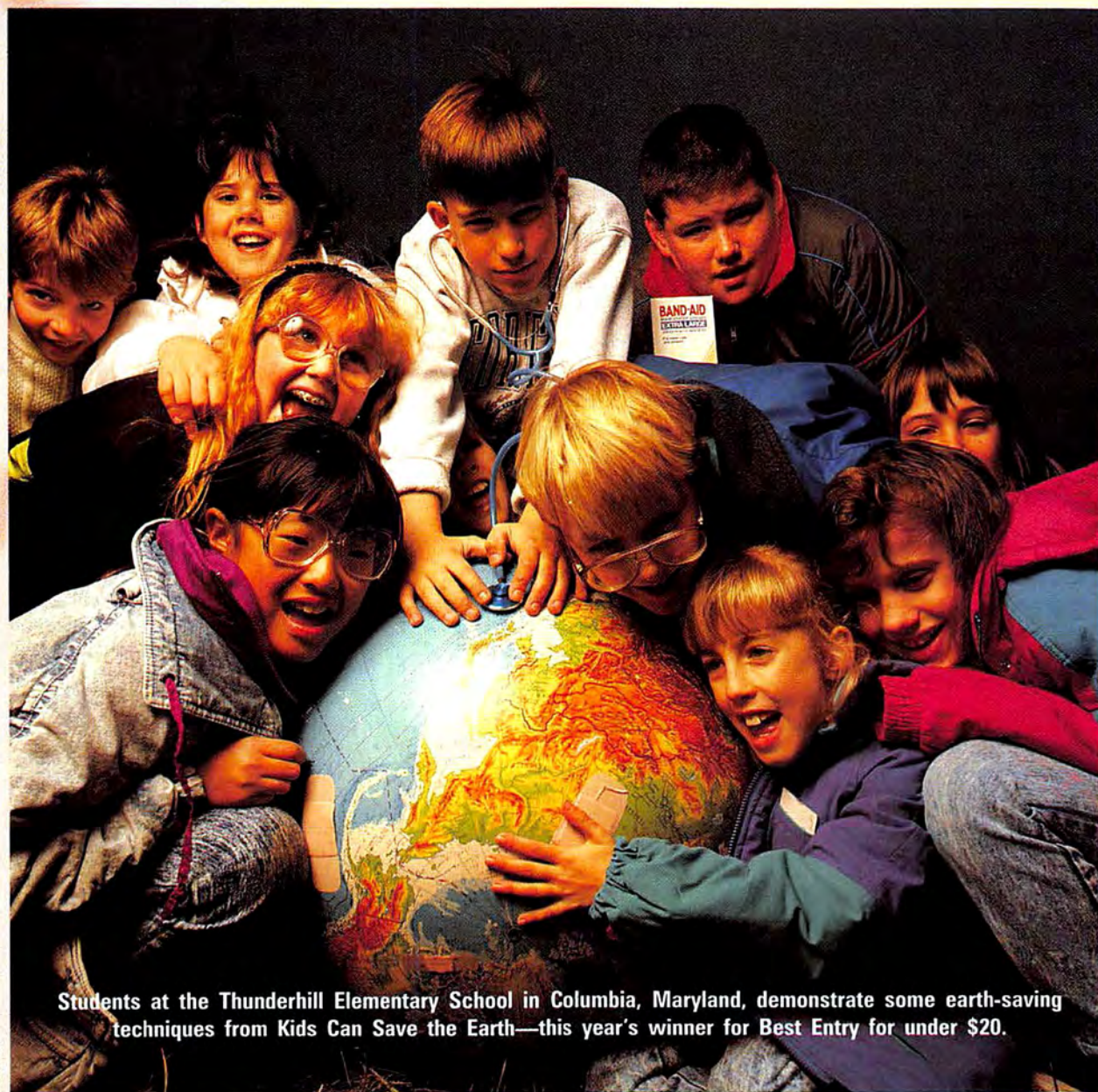




1990 SuperStacks contest know that the rest of us don't?

# Stacks

b y L i z a W e i m a n



Students at the Thunderhill Elementary School in Columbia, Maryland, demonstrate some earth-saving techniques from Kids Can Save the Earth—this year's winner for Best Entry for under \$20.

KAREN KILGUS

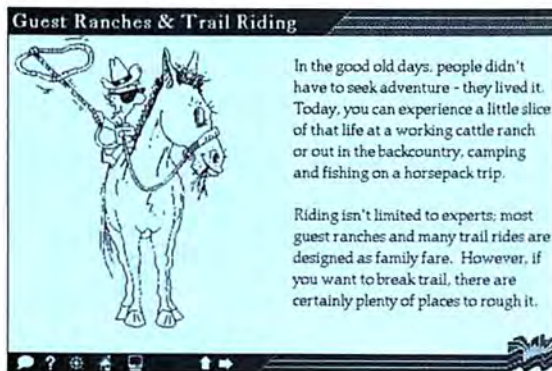


## Organize Your Information

Clear and simple organization of information was the hallmark of the Motion Works' Outdoor and Vacation Adventure Guide. Winner for both Best International Entry and Best Interface Design, this guide to the vacation spots of British Columbia turns a 78-page booklet created by the Wilderness Tourism Council of British Columbia into a fun interactive jaunt with Eddie, an animated character, as your tour guide (see "Eddie Goes on Vacation").

Designed for novice HyperCard users, the Outdoor and Vacation Adventure Guide makes sure you're never lost. There is a central, well-organized table-of-contents card. Buttons are consistently placed along the bottom left of each card. And throughout the stack, Eddie's always there—just like a reliable guide. He arrives by helicopter at the beginning of the stack, snaps tourist pictures (never getting the one he wants), climbs mountains, and sits before a fire at the end of a long day. If you pause for long, Eddie taps his foot. Pause longer, and he tells you how to click on a button for more help.

**The Eyes Have It** The Lazy Eye: A Primer on Neuro-ophthalmology uses HyperCard to simulate the movement of the eyes during an ophthalmological exam. The eyes track the cursor's movements realistically. Turning on the right or left flashlights or administering drugs with the dropper changes the size of the pupils.



Each branch of the stack contains information about a particular kind of vacation, say scuba diving, canoeing, or trekking and mountaineering, and then shows available resorts on a map of British Columbia. Once you finish exploring a branch, you can return to the table of contents. The Outdoor and Vacation Adventure Guide leads you through a series of sequential cards in an orderly way, but still leaves some room for creative exploration and roaming. (You don't have to read about *all* the fun stuff to do in British Columbia.)

## Stay One Step Ahead

SuperStacks winners know there's more to good interface design than



Shown here at the epicenter of the 1989 Loma Prieta, California, earthquake, just west of the summit of Loma Prieta Mountain, intrepid developer Kelly O'Brien does follow-up research for her Earthquake Preparedness Stack.

consistent button placement and understandable icons. The winning stacks always stay one step ahead of users, guiding and anticipating user actions.

The Lazy Eye: A Primer of Neuro-ophthalmology, winner for Best Educational Entry, Higher Education, lets medical students perform simulated eye exams on patients by moving the cursor in front of an on-screen patient's eyes and watching the resulting eye movement. (That's exactly what doctors are checking when they wave their fingers in front of your face.) The stack details both normal and abnormal ocular motions and pupillary reflexes in patients with clinically rare, but medically important, conditions. By using the stack, students gain valuable experience for their future practices.

At the bottom of each card in the stack, a control bar offers flashlights for examining the right and left eye, and a dropper for administering drugs (which cause the pupils to dilate or contract). Other buttons jump to drawings illustrating the underlying anatomy of the simulated conditions. As you move the cursor across all buttons, text appears explaining the function and use of each. It's an elegant way to guide the user, and one that makes the stack easy to use (see "The Eyes Have It").

## Eddie Goes on

**Vacation** Outdoor and Vacation Adventure Guide uses Eddie, a goofy animated character, to lead you through the stack. Note the clear placement of the navigational icons in the lower left-hand corner and the pleasing graphic design of the whole card. As you go to the next card, Eddie takes a dramatic fall off the horse.



The Microsoft Excel Tutorial, winner for Best Training Entry, takes an entirely different approach to user guidance. Created to teach a beginner how to use Microsoft Excel, the stack guides you through a series of three structured lessons. Each lesson begins by defining a concept to be studied, and proceeds with a guided tutorial where you actually create a worksheet, chart, or database by following step-by-step instructions.

As you work, the stack analyzes your actions and provides hints and suggestions when you give incorrect answers, insisting on a sequential solution to the tutorial problems. It really feels as though there's someone helpful at your elbow, gently guiding you through complex concepts and procedures. The stack so skillfully imitates Excel's worksheet format and environment that when you open Excel for the first time, it looks like an old friend.

### Looks Count

Just as with books and magazines, the graphic design of hypermedia is a powerful factor in its ability to communicate. The look of a stack or project defines its personality, helps state its purpose, and directs the user to important information.

The Mackerel Stack, winner in the Best Interface Design category and of the Leslie Liedtka Memorial Award (for the truly excellent stack that doesn't quite fit in any other subject category), is a playful and wacky combination of promotional information about Mackerel Design's Macintosh work; the biology, history, and enjoyment of the firm's namesake fish; and baseball (don't ask). The stack's striking graphic design cap-

tures your interest immediately and keeps your attention all the way through.

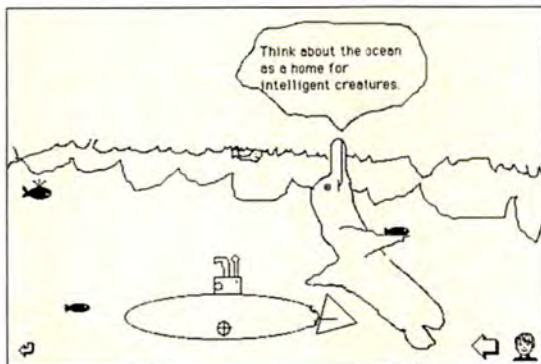
The playful content of the stack—there are even six recipes for mackerel you can print out and try—is matched by its unconventional interface, which takes you through all the information in this multidimensional stack (see "What They Do"). Click on the picture of a dog's ears, for instance, and the text message "Macintosh Graphics Systems Consulting" flashes; then the stack jumps to a card explaining how the folks at Mackerel Design have always got their ears perked for interesting new developments in the Mac world. Click on a row of application icons at the left of a screen, and a text field pops up, explaining how the designers use those applications in their work. And the sounds of snare drums, water drops, and digitized voices saying things like "Holy Mackerel!" keep the stack engaging and exciting to explore.

### Mix Your Media

Skillfully integrating text, graphics, sound, and animation isn't easy, but the SuperStacks winners know how to do it.

Ludwig van Beethoven Symphony No. 9, winner for Best Commercial Entry, takes media integration the furthest. It combines a CD-audio recording of Beethoven's Ninth Symphony with an informative, interactive HyperCard program that offers insight on the music, the symphony's structure, and Beethoven himself. By offering CD-quality audio recording, expert commentary, and immediate access to any part of the symphony, Symphony No. 9 represents a won-

**Song of the Sea** More than 100 children contributed to Kids Can Save the Earth. Simple animation and sound provide a cohesive interface that weaves an overall identity around the diverse entries.



## The 1990 Winners

### Best Commercial Entry

**Winner:** Ludwig van Beethoven Symphony No. 9; The Voyager Company

**Honorable Mention:** interFACE; Bright Star Technology

**Honorable Mention:** TypeChart 1.0b; Octavo Productions

### Best Vertical Market Entry

**Winner:** Display Net; Eric Alderman, The HyperMedia Group, Electronic Catalog Corporation

### Best Training Entry

**Winner:** Microsoft Excel Tutorial 2.2; Curtis Marsden

**Honorable Mention:** LessonCard; Mel Ristau and Tony Cecala, Visual Interface Architects

**Honorable Mention:** The Book of MIDI; Steven Rappaport and Opcode Systems

### Best Educational Entry, K-12

**Winner:** Earthquake Preparedness Stack; Kelly O'Brien, Gaja Systems

**Honorable Mention:** Ballet Tutor; Rosendo Gonzalez and Joyce Wong, Shan-Yee Poon Ballet School

**Honorable Mention:** Mac Frog 1.0; Bob Doltar

### Best Educational Entry, Higher Education

**Winner:** The Lazy Eye: A Primer of Neuro-ophthalmology; Howard Bregman, M.D., and Phong T. Ly, University of Pennsylvania School of Medicine

**Honorable Mention:** SuperImage; Joseph Klingler, M.D., Image Analysis Research Center, Medical College of Ohio

**Honorable Mention:** Bayshore Blast; Paul Baerman, Duke University Press

### Best Entry for Under \$20

**Winner:** Kids Can Save the Earth; compiled by Karen Rall and Amanda Goodenough

**Honorable Mention:** Hyper-Abledata; Gregg Vanderheiden, Trace R&D Center and Newington Children's Hospital

### Best Multimedia Entry

**Winner:** A Simulation of Acute Myocardial Infarction; Lee Andrews, M.D., Joseph Klingler, M.D., Michael Begeman, and Brad Behrendt, Image Analysis Research Center, Medical College of Ohio

**Honorable Mention:** Women Artists of Color: A Multimedia Research Tool; Dana Bass

(continues)



## The 1990 Winners

**Honorable Mention:** Macroscopic; Michael Hamilton, James San Jacinto Mountain Reserve, Regents of the University of California

**Honorable Mention:** Bird Anatomy II; Patrick Lynch and Noble S. Proctor, Biomedical Communications, Yale School of Medicine

### Best Entry by Kids

**Winner:** El Verbo Simple; Jason Sluzevich

**Honorable Mention:** HyperMailbox 3.3; E. Kenji Takeuchi

**Honorable Mention:** The Dancing Mouse and Metromorphosis; Donnie Madsen and Mariner Janes, Wonder-tree Education Society

### Best International Entry

**Winner:** Outdoor and Vacation Adventure Guide; Lloyd Bernhardt, Motion Works, Vancouver, B.C., Canada

**Honorable Mention:** Revolución; Hugo Rosatti, Pontificia Universidad Católica de Chile, Santiago, Chile

**Honorable Mention:** Terremoto; Ian Bertie, Pontificia Universidad Católica de Chile, Santiago, Chile

### Best Interface Design

**Winner:** The Mackerel Stack; Gordon Gower, Patrick Rodrigues, and Kevin Steele, Mackerel Design

**Winner:** Outdoor and Vacation Adventure Guide; Lloyd Bernhardt, Motion Works, Vancouver, B.C., Canada

**Honorable Mention:** Bird Anatomy II; Patrick Lynch and Noble S. Proctor, Biomedical Communications, Yale School of Medicine

### Best Development Tool

**Winner:** Dialoger Professional 1.5; theResult Software

**Honorable Mention:** HyperRegister 1.2; George Pytlik

**Honorable Mention:** Bubble Help for HyperCard; Randal Jones

### Leslie Liedtka Memorial Award

**Winner:** The Mackerel Stack 1.5; Gordon Gower, Patrick Rodrigues, and Kevin Steele, Mackerel Design

**Honorable Mention:** The Andean World; Charles Brod, Latin American Studies Program, Cornell University

**Honorable Mention:** Cosmic Osmo; Activision

derful integration of hypermedia and music (see *Reviews*, *Macworld*, June 1990).

The winner for Best Multimedia Entry, A Simulation of Acute Myocardial Infarction is a SuperCard stack from the Image Analysis Research Center at the Medical College of Ohio. This stack integrates recorded voices with detailed and medically accurate 3-D animations modeled and rendered on computers from Sun Microsystems and Pixar (see "The Heart of the Matter"). Using the stack, medical students can listen to expert medical commentary as they watch animations of cardiological events on the screen.

To create Kids Can Save the Earth, winner for the Best Entry for Under \$20, Karen Rall and Amanda Good-enough collaborated with more than 100 schoolchildren. The project is a collection of children's essays, poems, artwork, and stacks about eight major problems facing the earth and what can be done to solve those problems. The sounds, animation, and graphics in Kids Can Save the Earth not only surprise the user, but also create continuity between and add personality to the illustrated characters (see "Song of the Sea").

### Make the Information Useful

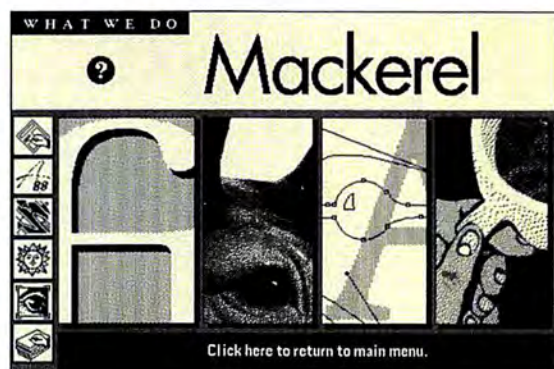
Some SuperStacks entries won because they provide needed information in a creative and useful way. De-



The Mackerel Stack design team—(clockwise from upper right): Gordon Gower, Patrick Rodrigues, and Kevin Steele—somehow managed to convey their wacky sense of humor in 2-bit black-and-white.

veloped for Electronic Catalog Corporation, Display Net, winner for Best Vertical Market Entry, is a SuperCard electronic catalog for the visual merchandising industry (the people who design store windows and interior displays) that is distributed on CD ROM. Display Net allows you to browse the catalog, select three items at a time for comparison viewing, create an invoice, and place orders automatically through a custom electronic-mail system. The project represents several years' worth of time and effort, and is already in use at several large retail chains including Mervyn's, Lazarus, and Nordstrom who appreciate having all the materials they need in one convenient place.

One particularly vexing problem the developers had to solve was image-



**What They Do** The striking interface of The Mackerel Stack relies almost exclusively on pictures. If you click on the coffee cup, the stack goes to another card that allows you to see samples of Mackerel Design's illustration work.



color fidelity in the comparison screen, color being an important part of a purchasing decision. To keep colors accurate, the developers first prepared a set of smaller versions of each image using only 80 optimized colors. When you select these items to compare, a series of XCMDs mixes the resulting 240 colors to define the system palette

includes the many mystifying and frustrating irregular verb forms. *El Verbo Simple* has background information and examples for all 17 tenses, so you can read up on that pesky preterite subjunctive. It also lets you search through all the verbs in either English or Spanish, and add your own verbs—the stack conjugates them automatically.

*Dialoger Professional 1.5*, winner for Best Development Tool, allows scripters to easily add custom dialog boxes to any HyperCard stack, extending HyperCard's functionality while using familiar HyperCard objects (buttons and fields). *Dialoger Professional* is filled with useful examples, enabling beginners to get started right away; experts, meanwhile, get a head start with the development of custom stacks. It also provides a tutorial and a cross-indexed reference stack for the serious dialog developer.

### Secrets Revealed

From places as far away as Santiago, Chile, and from children as young as seven, the 1990 entries were uniformly good, yet incredibly diverse. It is especially exciting that the two categories with the most entries were Best Entry by Kids and Best Educational Entry, K-12. One frustrated judge, knee-deep in entries, said that any of the 1990 entries could have

been semifinalists in 1989—and many of them would have been winners.

As *SuperStacks* repeat winners Lloyd Bernhardt, Amanda Good-enough, Patrick Lynch, and The Voyager Company can attest, practice helps. The continual refinement of interface design, informational organization, graphic design, and media integration makes hypermedia projects better with every iteration.

The 1990 *SuperStacks* winners represent a cross section of excellence in stack design, and we are proud to present them to you. And this year, many of the winning stacks are available in the Macworld Resource Center area on America Online. Just look for the *SuperStacks* folder, download the files, and discover their secrets for yourself. **M**

See *Where to Buy* for contact information.

## Special Thanks

The 1990 *SuperStacks* contest couldn't have happened without the discerning opinions of the judges: Mary Bushnell, HyperCard product specialist, Claris Corporation; Eric Carlson, HyperCard engineer, Apple Computer; Steve Costa, founder, BMUG; Doug Doyle, multimedia solutions manager—higher education marketing, Apple Computer; Bob Eddings, HyperCard testing team leader, Apple Computer; Stuart Henington, strategic marketing manager, Silicon Beach Software; Mike Holm, HyperCard product-line manager, Claris Corporation; Roger Knight, multimedia marketing specialist K-12, Apple Computer; Kevin La Rue, SuperCard product manager, Silicon Beach Software; Linda Neumann, manager of program development, Apple Computer; Robin Shank, HyperCard stack engineer, Apple Computer; and Robertson Reed Smith, HyperCard engineer, Apple Computer.

A special acknowledgment of thanks goes to the following organizations for their support and sponsorship of the 1990 *SuperStacks* contest: Apple Computer, Claris Corporation, Digidesign, Farallon Computing, Iomega Corporation, National Semiconductor Corporation, Silicon Beach Software, Spinnaker Software, and Storage Dimensions.

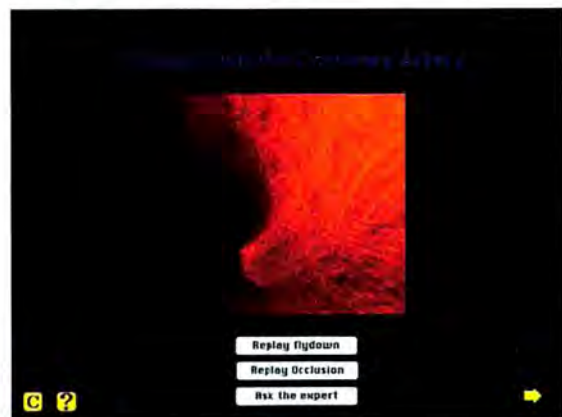


JAY ASQUINE

The Medical College of Ohio team scrubbed down and got serious when they created *A Simulation of Acute Myocardial Infarction*, their multimedia simulation of a heart attack.

for the set. The three images are then displayed using that system palette, bypassing SuperCard altogether.

Any student of Spanish will appreciate *El Verbo Simple*, winner of the Best Entry by Kids category. Designed by 16-year-old Jason Sluzevich during his summer vacation, the stack is based around an XCMD that Sluzevich wrote in Think C. The stack conjugates 250 Spanish verbs in 17 tenses and



### The Heart of the

**Matter** Imagine being able to fly through the coronary artery. That's exactly what *A Simulation of Acute Myocardial Infarction* lets you do, thanks to its 3-D animation.







# GOING THE Ethernet ROUTE

No doubt about it, Ethernet offers Macintosh users a variety of enticing network alternatives. The primary reason so many users are tempted to get onto Ethernet, of course, is speed. Because Ethernet cable can transmit data at faster rates than LocalTalk cable can—10 megabits per second versus 230.4 kilobits per second—using Ethernet instead of LocalTalk to connect an AppleTalk network can mean speed increases of five to six times in network throughput.

If you have two or more separate Mac networks in a building, Ethernet also offers a convenient way to link them. If you create an Ethernet *backbone*, a Mac in one network, or *zone*, can print to a LaserWriter or access a file server in another zone. Finally, Ethernet is an established network standard commonly used by large computers and powerful workstations. Should your Macs suffer from a lack of communication with a Digital Equipment Corporation VAX or a Sun Microsystems UNIX workstation, you can take advantage of Ethernet to bridge that gap.

Luckily, numerous options exist to put the Mac on the Ethernet highway. Add-in boards for the Macintosh SE, SE/30, LC, and II series provide the cable interface necessary to hook up directly to Ethernet. External SCSI devices enable a Mac Plus, Classic, or Portable to access Ethernet directly

(see "Ethernet Direct Connect"). And routers—either hardware or software—enable a Mac to access Ethernet via a LocalTalk network rather than through a direct Ethernet connection. Because a router is a shared device, it provides an Ethernet connection to all Macs on the LocalTalk network.

Last year, Macworld Lab reviewed most of the available Ethernet add-in boards and SCSI boxes (see "On the Ethernet Highway," *Macworld*, March 1990). This year, we tested the performance of several LocalTalk-to-Ethernet routers. As we discovered with add-in boards, not all Ethernet routers are created equal.

## Planning for Ethernet

Before you make any kind of Ethernet connection, you must first decide what type of Ethernet cable to use. You have three primary choices: thick-wire coaxial, thin-wire coaxial, and unshielded twisted-pair cables.

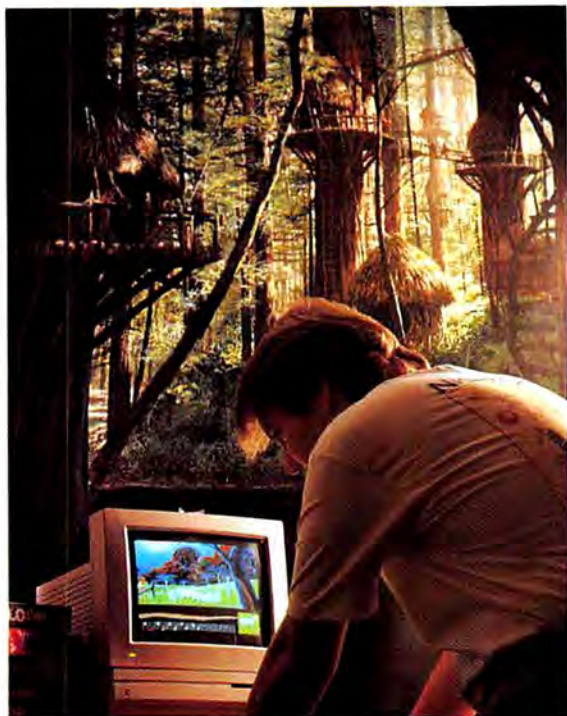
Unwieldy thick-wire coaxial cable is best reserved for Ethernet backbones. Although a thick-wire coax interface is built into almost all Ethernet hardware devices (boards, SCSI boxes, and routers), connecting to it still requires a separate transceiver and another interface device, called a *tap*.

Thin-wire coaxial cable—currently the most popular way to create an Ethernet network—is much easier to install than thick-wire coax. Thin-wire

RON CHAN

BY DAVE KOSIUR





DAN ESCOBAR

At Lucasfilm's games division, Ethernet routers connect Macs on LocalTalk to PCs and minicomputers on Ethernet.

coax is about the same thickness as television cable. You can connect thin-wire coaxial cable directly to any Ethernet hardware device; the necessary transceiver is built into all such devices.

The newest Ethernet medium is unshielded twisted-pair cable, called UTP or 10BaseT (see "Another Twist to Ethernet"). UTP has proven to

be a quick, economical, and more flexible way to connect LocalTalk (PhoneNet-type) networks, and it offers the same capabilities for Ethernet networks. Although not all Mac Ethernet devices offer 10BaseT interfaces, the number that do is increasing rapidly.

### Connection Options

Once you've picked the type of Ethernet cable you want to use, you must decide how to attach Macs to the network. Direct Ethernet connections—such as those offered by add-in boards and SCSI devices—are a good idea if you're looking to get the most out

of the network's speed. There's now a fierce battle shaping up for a piece of the Ethernet pie, evidenced by dropping costs for such devices. That's one clear reason Ethernet has become a viable alternative to LocalTalk.

Keep in mind, however, that many Macs with a direct connection can't keep up with Ethernet's 10Mbit-per-second speed. Macworld Lab tests of

direct-connect devices last year showed that the combination of the SCSI Manager and a hard drive was a considerable bottleneck to Ethernet data transfer. As a result, the real-world performance of add-in boards and external SCSI devices—though two to six times faster than LocalTalk—does not come near Ethernet's maximum transfer rate.

A router, on the other hand, provides a more cost-efficient way to connect a Mac to Ethernet. Although more expensive than a single interface board, a router is shared by all the Macs on a LocalTalk network. As a result, a router lets you hook up a group of Macs for less than it would cost to put a board in, or a SCSI device on, each machine. A router also offers network-management services—zone security and configuration, for example—that add-in boards and SCSI devices can't.

For all routers, LocalTalk is the limiting factor in performance; some traffic must either enter or leave the router at LocalTalk speeds. That's a far cry from being directly on Ethernet. Thus, a router is most appropriate when you have a group of Macs that don't need constant access to Ethernet. For example, users may need the Ethernet connection only to send an occasional piece of

## ANOTHER TWIST TO ETHERNET

**S**ince the Institute of Electrical and Electronics Engineers certified unshielded twisted-pair (UTP) cable as an official Ethernet medium last October, Mac users have been hit with a flood of 10BaseT Ethernet interfaces. Why all the fuss? Because UTP provides a way to install Ethernet networks using one of the least expensive and most common types of wiring—telephone wiring—without compromising network performance.

If you're planning to use UTP to connect an Ethernet network, keep in mind that its setup differs from that of a PhoneNet network, which also employs unshielded twisted-pair cable. (For more information on using UTP in PhoneNet networks, see "Net-

working for the Novice," *Macworld*, December 1990.)

- Unlike PhoneNet-type networks, which need only one pair of twisted-pair cable, a UTP Ethernet network requires two pairs of wire for each connection. One pair is used for transmitting data, the other for receiving data.
- Ethernet networks using UTP must be *active star* networks. In other words, they require an active hub, or concentrator, to connect each *branch* of the network. This differs from PhoneNet, which does permit creation of *passive star* networks without a hub. These hubs perform the same signal-amplification duties for Ethernet that Farallon's StarController or

Nuvotech's TurboStar performs for PhoneNet-type networks.

- Only one node can be attached to each branch of a UTP Ethernet network. You cannot daisy-chain several nodes on a branch as you can with PhoneNet-type networks.
- Each node on a UTP Ethernet network must be no more than 100 meters from the central hub. This may not be a problem for you: AT&T reports that 95 percent of all phone connections have a telephone within 100 meters of a wiring closet. If wire quality is poor, the nodes must be closer to the hub. Before setting up a UTP Ethernet network, you should check not only the lengths of each network branch but also wire quality.



## ROUTERS COMPARED

Router	Company	Price	Maximum Number of Ports (LocalTalk/Ethernet)	Centralized Configuration	Diagnostics, Statistics	Automatic Restart	Security Zone/Password	Phase Support 1/2/Mixed	Other Protocols Supported	Remote Access
AppleTalk Internet Router 1.0	Apple Computer	\$399	2/6	○	●	●	○/●	●/●/●	none	○
ComTalk 2.0	APT Communications	\$3250+	6/1	●	●	●	●/●	●/●/●	TCP/IP	●
E-Server/LAN <sup>1</sup>	Solana Electronics	\$2795	2/1	●	○	●	○/○	●/●/●	none	○
EtherGate 3.15	Shiva Corporation	\$2399	2/1	●	●	●	●/○	●/●/○	TCP/IP	●
EtherRoute 1.5.4	Compatible Systems	\$1495	2/1	●	●	●	●/●	●/●/●	TCP/IP	○
FastPath 4 8.0.1	Shiva Corporation	\$2795	1/1	●	●	●	●/○	●/●/●	TCP/IP, DECnet	○
GatorBox 1.6	Cayman Systems	\$2795	1/1	●	●	●	●/○	●/●/●	TCP/IP	○
MacGateWay AT 2.0	Wollongong Group	\$2295	2/1	○	○	○	○/○	●/○/○	TCP/IP	○
MaxWay 500 2.05	Tri-Data Systems	\$5495+	4/2	●	○	●	○/○	●/●/●	TCP/IP, IPX, SNA	○
MultiPort Gateway 1.24	Webster Computer	\$4995	4/1	●	●	●	○/○	●/○/○	TCP/IP	○
MultiGate 2000	Network Resources Corporation	\$1995	2/1	●	○	●	○/○	●/●/●	TCP/IP	○
MultiGate Mac 1.0	Network Resources Corporation	\$795	2/4	○	●	●	●/●	●/●/●	TCP/IP	○
Net One MaxTalk 16.3	Ungermann-Bass	\$4695	16/1	●	●	●	○/●	●/○/○ <sup>2</sup>	TCP/IP	○
PhoneNet Liaison 3.00	Farallon Computing	\$395	2/5 <sup>3</sup>	○	●	●	●/●	●/●/●	none	●

● = yes; ○ = no <sup>1</sup> Not tested. <sup>2</sup> Phase 2 support planned for first quarter 1991 release. <sup>3</sup> Liaison supports a maximum of 5 network interfaces at one time.

electronic mail to a VAX, to download a file from another zone's file server, or to access a shared database file elsewhere on the network.

### Comparing Routers

A router's primary job is passing network data, or *packets*, between LocalTalk and Ethernet networks. However, the formats of LocalTalk and Ethernet network packets differ, particularly in the way they specify destination. The router, then, must ensure that LocalTalk packets are provided with the correct destination address for Ethernet nodes, and that Ethernet packets are correctly formatted for LocalTalk destinations.

There are two types of routers: hardware routers and software routers. Hardware routers range from simple devices that handle one or two LocalTalk networks and one Ethernet network to high-end devices that support from 4 to 16 separate LocalTalk networks and 2 Ethernet networks. *Multiport routers*, those with more than one LocalTalk port, can be a distinct advantage if you need to connect multiple LocalTalk networks to an Ethernet network.

Low-end hardware routers typically employ a 68000 microprocessor to process all the network traffic that

passes between the LocalTalk network and the Ethernet network. But to handle the greater number of attached networks, high-end hardware routers must have more processing horsepower—the primary reason for their higher cost. For example, Tri-Data's MaxWay 500 uses a Scalable Processor Architecture (SPARC) chip from Sun Microsystems. Ungermann-Bass's Net One MaxTalk takes a different tack: instead of using one more-powerful processor to control all the network ports, it uses multiple processors to handle network ports.

Software routers are programs that enable you to turn any Mac—including an AppleShare file server or electronic-mail server—into a router. As a result, software routers are especially appealing to a network manager who either has a spare Mac to devote to routing tasks or wishes to install the router software on a server. Keep in mind, however, that although software routers can be cost-effective alternatives to hardware devices, the performance of both the router and the server can degrade considerably if traffic on the network is heavy.

### Speed Tests

Even though some network traffic must travel at LocalTalk rates, any

router that connects a LocalTalk user to Ethernet at a speed significantly slower than that of LocalTalk isn't of much use. In fact, the router itself becomes a network bottleneck if it can't forward packets fast enough. Macworld Lab tested 13 routers to see how quickly they transfer data between LocalTalk and Ethernet (see "Router Speed Tests").

In the first set of tests, a single router linked a single LocalTalk network and a single EtherTalk (AppleTalk protocols on Ethernet cable) network. The results have some interesting implications for users on traffic-heavy networks. When only one user transfers a file through the router, every router performs at about the same pace. But as traffic through the router increases—as more users access the router simultaneously—some routers suffer performance lapses. Shiva's EtherGate fared the worst by far; it took almost six times longer to transfer a file with four users than with one user. (Shiva says a new version of EtherGate software, currently under development, will improve the EtherGate's routing speed.)

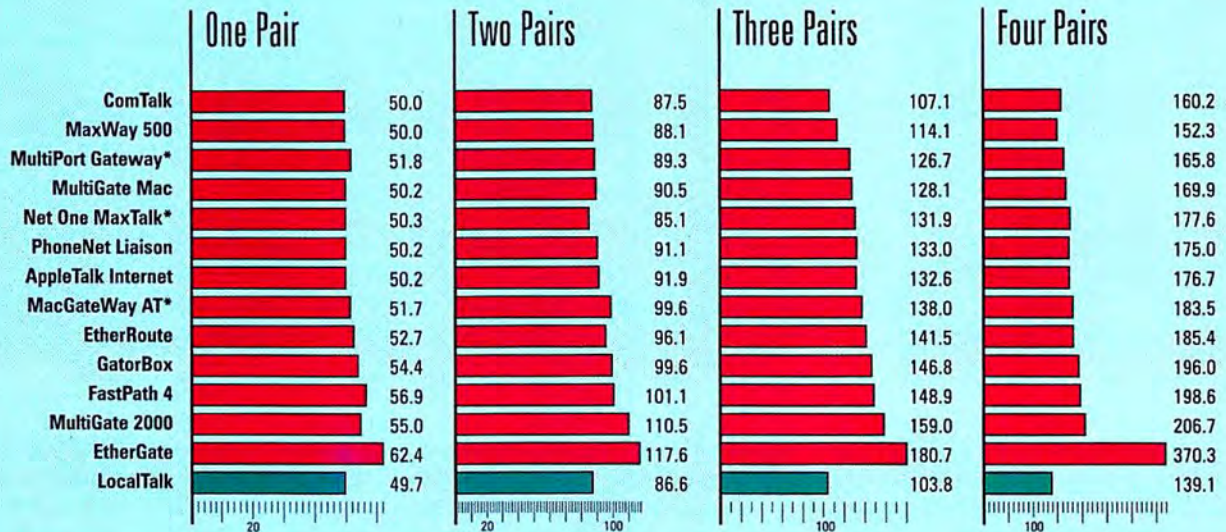
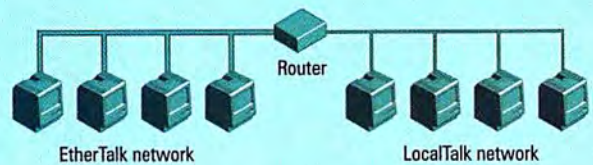
The second set of tests used two identical routers to connect two LocalTalk networks to an Ethernet backbone. Compared to the results of



# Router Speed Tests

All times in seconds

## Single-Router Test



\* Tested only with Phase 1.

Macworld Lab tested 13 routers in two different network configurations. The first setup employed one router to connect a LocalTalk network and an EtherTalk network (AppleTalk protocols running on Ethernet cable). In the second configuration, two identical routers provided two LocalTalk networks access to an Ethernet backbone.

On the LocalTalk network were four 8MB Mac IIcx computers set up as AppleShare servers; four other 8MB Mac IIcx's, configured as AppleShare clients, resided either on the EtherTalk network (the first configuration), or on another LocalTalk network (the second configuration). Each server was paired with one client to ensure that any measured bottlenecks were the result of

the single-router tests, every router's performance was slower, usually by 10 to 20 percent. The decline in speed most likely occurs for two reasons. First, two protocol translations, not one, are necessary in a backbone configuration. One router must format a LocalTalk packet so it can be sent over Ethernet; the other router must strip the Ethernet address from the packet to send the packet to its final LocalTalk destination. Second, each router must periodically provide the other router with information about the networks it services. As a result, there's additional traffic on the network.

For pure speed, high-end multiport routers can't be beat. The MaxWay 500 and APT Communications' ComTalk routers consistently

shared the honors for fastest router. All the software routers functioned well—in some cases, outperforming some hardware routers. To achieve maximum performance, however, a software router must run on a dedicated Mac. When we configured Farallon's PhoneNet Liaison to run in the background with a lower priority, Liaison's routing performance slowed by 34 percent. Neither Apple's AppleTalk Internet Router nor Network Resources Corporation's (NRC) MultiGate Mac allows you to prioritize routing when run on a nondedicated Macintosh.

Macworld Lab also performed a separate set of tests on multiport routers. Judging by our results, each LocalTalk port really does behave as a separate router. At the same time,

each port still quickly routes traffic to Ethernet. For example, four 1MB file transfers performed simultaneously through four separate ports took only 50 seconds each to complete. That compares favorably to the time it took to transfer a single file over one port, as well as to the time it took to transfer four files over one port.

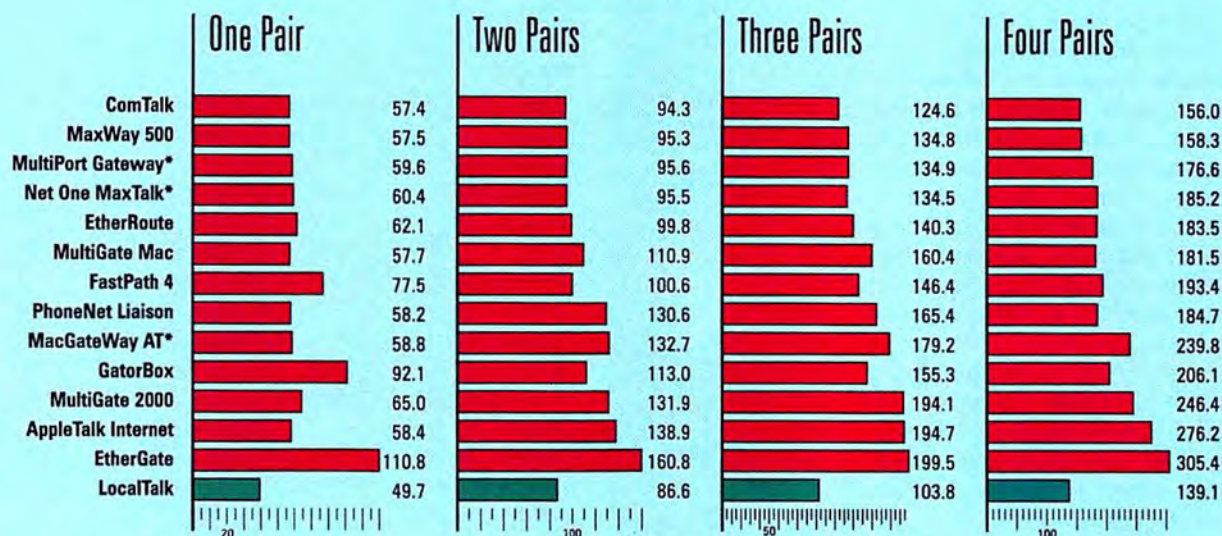
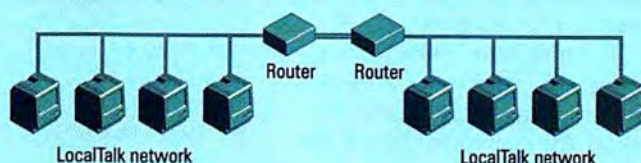
### More Than Speed

When choosing a router, however, you should also consider factors other than speed. Almost all of the 13 routers tested have some options—ranging from foreign protocol (non-AppleTalk) support to additional hardware features—that make them unique (see "Routers Compared").

**Configuration and Management** It probably comes as no surprise that



# Backbone Test



\* Tested only with Phase 1.

network and router performance, not server performance. Software routers used a dedicated Mac SE/30 with 8MB of RAM. To see how each router handled increasing amounts of traffic, we transferred a 1MB file from a server to its client ten times. The file transfers were then performed with two client-server pairs, then three, and finally four.

Except where noted, all routers used AppleTalk Phase 2 protocols, not AppleTalk Phase 1. Performance of routers using Phase 1 protocols was less than 4 percent slower than performance of routers using Phase 2 protocols. Routers are ranked from top to bottom, in each of the two tests, based on their overall performance.

different routers have different configuration and management schemes. With two exceptions—the Wollongong Group's MacGateWay AT and Ungermann-Bass's Net One MaxTalk—you can configure and manage all hardware routers from a central Macintosh on the network. Because of the fact that the MacGateWay AT can be configured only with a Macintosh attached to its LocalTalk port, managing more than one MacGateWay AT on a network is quite difficult. The Net One MaxTalk, meanwhile, requires an IBM PC for configuration management.

As for software routers, they can be configured only at the Macintosh they are installed on, making central management of multiple software routers impossible. Apple's AppleTalk

Internet Router's configuration is handled via a desk accessory; Farallon's Liaison uses the Chooser, while NRC's MultiGate Mac employs a HyperCard stack.

If you have multiple routers on a network, configuring and managing them is easier if they all support *seeding*. Seeding allows one router, which is called the seed router, to store all the appropriate network numbers and zone information for other routers on the network. When you attach other routers to the network, they acquire network configuration information from the seed router. Not all routers can act as seed routers, nor do all routers accept data from seed routers.

**Automatic Restarts** Another router capability that should be near and dear

to managers' hearts is automatic restarting. Not all routers can remember their configuration upon restarting after a power loss. Shiva's FastPath 4 and EtherGate and Compatible Systems' EtherRoute store their configuration information either in battery-backed-up memory or nonvolatile programmable read-only memory (PROM).

On the other hand, the Cayman Systems GatorBox remembers only basic routing information after a power outage occurs. The GatorBox can be instructed, however, to automatically download more detailed information from either a Macintosh on LocalTalk—which I consider to be a definite disadvantage—or a UNIX computer on the network. Similarly, the NRC MultiGate 2000 can be set



to download more detailed information from a Macintosh running the MultiGate Manager software.

**AppleTalk Phase Support** Not all routers provide support for AppleTalk Phase 1 and AppleTalk Phase 2 protocols. At testing time, three routers—the Net One MaxTalk, Webster's MultiPort Gateway, and the MacGateWay AT—supported only Phase 1 protocols.

Although Phase 1 protocols can suffice for smaller networks, Phase 2 protocols improve the behavior of routers on large networks. In addition, Phase 2 permits up to 16 million AppleTalk nodes on Ethernet, while Phase 1 restricts the number of AppleTalk nodes to 254. Finally, keep in mind that some products—such as Farallon Computing's PhoneNet Talk—require Phase 2 protocols when running on Ethernet.

Routers that do support both Phase 1 and Phase 2 protocols can often be used as transitional routers. With them, you can upgrade a network to Phase 2 protocols gradually, rather than all at once.

**TCP/IP Support** LocalTalk-Ethernet routers are often used as Transmission Control Protocol/Internet Protocol (TCP/IP) gateways, linking an AppleTalk network of Macs to an existing IP network. With a router that supports TCP/IP protocols, Macs can exchange information with other computers such as IBM mainframes, DEC VAXs, Cray supercomputers, and Sun workstations. In addition, an IP Ethernet backbone can connect geographically separated AppleTalk networks.

The FastPath and the GatorBox offer perhaps the most extensive range of TCP/IP services. (The FastPath also supports DECnet protocols.) Additional software from Cayman allows Macintosh users to access files on Network File System (NFS) file servers or UNIX users to print to LaserWriters.

**Serial Support** Another router feature that may appeal to users is dial-in support. Some routers, such as Liaison, do permit remote access. A user can then call the router via a modem to use network resources such as file servers, E-mail, and printers. The EtherGate provides an interesting twist

## ETHERNET DIRECT CONNECT

Product	Vendor	Price	Mac	Transceivers <sup>1</sup>		
				Thick	Thin	UTP
Asante EN/SC <sup>2</sup>	Asante Technologies	\$595	all	●	●	●
DaynaPort E/30	Dayna Communications	\$399	SE/30, IIsi <sup>3</sup>	●	●	○
DaynaPort E/30-T	Dayna Communications	\$399	SE/30, IIsi	○	○	●
DaynaPort E/II	Dayna Communications	\$399	IIsi, II, and up <sup>4</sup>	●	●	○
DaynaPort E/II-T	Dayna Communications	\$399	IIsi, II, and up	○	○	●
DaynaPort E/LC <sup>5</sup>	Dayna Communications	\$399	LC	●	●	○
DaynaPort E/LC-T <sup>5</sup>	Dayna Communications	\$399	LC	○	○	●
DaynaPort E/SE	Dayna Communications	\$399	SE	●	●	○
DaynaPort E/SE-T	Dayna Communications	\$399	SE	○	○	●
DaynaPort E/si	Dayna Communications	\$399	IIsi	●	●	○
DaynaPort E/si-T	Dayna Communications	\$399	IIsi	○	○	●
E4010	Cabletron Systems	\$699	SE	○	○	●
E4020	Cabletron Systems	\$599	SE	●	●	○
E5010	Cabletron Systems	\$699	SE/30, IIsi	○	○	●
E5020	Cabletron Systems	\$649	SE/30, IIsi	●	●	○
E6010	Cabletron Systems	\$699	IIsi, II, and up	○	○	●
E6020	Cabletron Systems	\$699	IIsi, II, and up	●	●	○
Ether TnT II	Generation Systems	\$395	IIsi, II, and up	○	●	○
Ether TnT IIsi	Generation Systems	\$395	IIsi	○	●	○
Ether TnT LC	Generation Systems	\$395	LC	○	●	○
Ether TnT SE	Generation Systems	\$395	SE	○	●	○
Ether TnT SE/30	Generation Systems	\$395	SE/30, IIsi	○	●	○
Ether TwP II	Generation Systems	\$395	IIsi, II, and up	○	○	●
Ether TwP IIsi	Generation Systems	\$395	IIsi	○	○	●
Ether TwP LC	Generation Systems	\$395	LC	○	○	●
Ether TwP SE	Generation Systems	\$395	SE	○	○	●
Ether TwP SE/30	Generation Systems	\$395	SE/30, IIsi	○	○	●
Ether+	Compatible Systems Corporation	\$495	all	●	●	○
Ether2	Compatible Systems Corporation	\$395	IIsi, II, and up	●	●	○
EtherDS	Compatible Systems Corporation	\$395	IIsi	●	●	●
EtherLink/NB	3Com Corporation	\$595	IIsi, II, and up	●	●	○
EtherLink/SE	3Com Corporation	\$495	SE	●	●	○
Ethernet LC Card <sup>6</sup>	Apple Computer	\$375	LC	○	●	●
Ethernet NB Card <sup>6</sup>	Apple Computer	\$599	IIsi, II, and up	○	●	●
EtherNode 16 NB	National Semiconductor Corporation	\$495	IIsi, II, and up	●	●	○
EtherNode 16 NB-T	National Semiconductor Corporation	\$495	IIsi, II, and up	●	○	●
EtherNode 16 SE	National Semiconductor Corporation	\$449	SE	●	●	○
EtherNode 16 SE-T	National Semiconductor Corporation	\$449	SE	●	○	●
EtherNode 32 SE/30	National Semiconductor Corporation	\$595	SE/30, IIsi	●	●	○
EtherNode 32 SE/30-T	National Semiconductor Corporation	\$595	SE/30, IIsi	●	○	●
EtherPort II	Shiva Corporation	\$499	IIsi, II, and up	●	●	○
EtherPort IIT	Shiva Corporation	\$499	IIsi, II, and up	●	○	●
EtherPort SE	Shiva Corporation	\$499	SE	●	●	○

● = yes; ○ = no

<sup>1</sup> Some boards or devices may not support all available transceivers simultaneously.

<sup>2</sup> Has 2 SCSI ports.

<sup>3</sup> IIsi requires Macintosh IIsi 030 Direct Slot Adapter Card.



Product	Vendor	Price	Mac	Transceivers <sup>1</sup>		
				Thick	Thin	UTP
EtherPort SE/30	Shiva Corporation	\$499	SE/30, IIsi	●	●	○
EtherPort SE/30T	Shiva Corporation	\$499	SE/30, IIsi	●	○	●
EtherPort SET	Shiva Corporation	\$499	SE	●	○	●
EtherVHP	Compatible Systems Corporation	\$595	IIsi	●	●	●
FastNet III	Dove Computer Corporation	\$499	IIsi, II, and up	●	●	●
FastNet LAN 020 <sup>7</sup>	Dove Computer Corporation	\$1849	SE	●	●	○
FastNet SE	Dove Computer Corporation	\$499	SE	●	●	●
FastNet SE/30	Dove Computer Corporation	\$499	SE/30, IIsi	●	●	●
FastNetSCSI	Dove Computer Corporation	\$1249	all	●	●	○
FriendlyNet LC Card <sup>8, 6</sup>	Asante Technologies	\$349+	LC	●	●	○
GatorCard E/II	Cayman Systems	\$595	IIsi, II, and up	●	●	○
LanWay E-10T	Tri-Data Systems	\$425	IIsi, II, and up	●	○	●
LanWay E-10T	Tri-Data Systems	\$425	SE/30, IIsi	●	○	●
LanWay E-10T LC <sup>8</sup>	Tri-Data Systems	\$345	LC	●	●	●
LanWay E-10T LC-10Base-T	Tri-Data Systems	\$425	LC	○	○	●
Mac1000	Network Resources Corporation	\$345	IIsi, II, and up	●	●	●
Mac1000	Network Resources Corporation	\$345	SE	●	●	●
Mac2000	Network Resources Corporation	\$999	IIsi, II, and up	●	●	●
MacConnect SE	Racal-InterLan	\$495	SE	●	●	○
MacConnect SE/30	Racal-InterLan	\$550	SE/30, IIsi	●	●	○
MacCon+30i	Asante Technologies	\$495	IIsi, SE/30	●	●	○
MacCon+30iT	Asante Technologies	\$495	IIsi, SE/30	●	○	●
MacCon+IIE	Asante Technologies	\$495	IIsi, II, and up	●	●	○
MacCon+IIEt	Asante Technologies	\$495	IIsi, II, and up	●	○	●
MacCon+SEE	Asante Technologies	\$395	SE	●	●	○
MacCon+SEET	Asante Technologies	\$395	SE	●	○	●
Magic EtherNet II	MacProducts USA	\$249	IIsi, II, and up	●	●	○
Magic EtherNet II/10T	MacProducts USA	\$249	IIsi, II, and up	●	○	●
NIA310 MacConnect	Racal-InterLan	\$495	IIsi, II, and up	●	●	○
NIA310 MacConnect-10BT	Racal-InterLan	\$550	IIsi, II, and up	●	○	●
NuvoLink II	NuvoTech	\$395	IIsi, II, and up	●	●	○
NuvoLink II-T	NuvoTech	\$395	IIsi, II, and up	○	○	●
NuvoLink SC	NuvoTech	\$549	all	●	●	○
NuvoLink SC-T	NuvoTech	\$549	all	○	○	●
PhoneNet Card for Ethernet <sup>8</sup>	Farallon Computing	\$595	SE/30, IIsi	●	●	●
PhoneNet Card for Ethernet <sup>8</sup>	Farallon Computing	\$595	IIsi, II, and up	●	●	●
SpeedLink II	Everex Systems	\$449	IIsi, II, and up	●	●	○
SpeedLink SE	Everex Systems	\$449	SE	●	●	○
SpeedLink SE/30	Everex Systems	\$449	SE/30, IIsi	●	●	○
SpeedLink/II TP	Everex Systems	\$449	IIsi, II, and up	●	○	●
SpeedLink/SE TP	Everex Systems	\$449	SE	●	○	●
SpeedLink/SE30 TP	Everex Systems	\$449	SE/30, IIsi	●	○	●
Technology Works Mac II Ethernet Kit	Technology Works	\$299	IIsi, II, and up	●	●	○
Technology Works Mac II/10T Ethernet Kit	Technology Works	\$299	IIsi, II, and up	●	○	●
UTPMac	NetWorth	\$499	Mac IIsi, II, and up	●	○	●

<sup>4</sup> Indicates Mac II, IIfx, IIfx, IIfx, and IIfx; IIsi requires Macintosh IIsi NuBus Adapter Card.

<sup>5</sup> Floating-point unit option available.

<sup>6</sup> Supports Apple Ethernet Cabling System.

<sup>7</sup> Includes 68020 accelerator.

<sup>8</sup> Includes Timbuktu.


to this scheme. Not only can it act as a router, but it also has a serial port that allows Ethernet and LocalTalk users to share a modem or printer.

## The Final Word

Because of their LocalTalk connections, routers do not provide the performance that Ethernet add-in boards or SCSI devices do. However, Ethernet-to-LocalTalk routers offer advantages that those direct-connect methods don't.

First, a router can be shared by an existing LocalTalk network. If you have a number of occasional users of Ethernet-based services, a router is definitely a reasonable alternative to buying an Ethernet board for each user, even in spite of the fact that prices are dropping for add-in boards. Second, a router provides more services to LocalTalk users. For example, by using a TCP/IP gateway, you can access UNIX (or other) computers. Third, routers can be used to help control traffic on Ethernet networks. Just as LocalTalk-only routers keep traffic from affecting all users on a network, LocalTalk-to-Ethernet routers restrict traffic to the networks on which the source and destination computers sit.

If you're starting from scratch, I recommend the EtherRoute as a single-port router. At \$1495, it's a bargain, and for \$400 more, EtherRoute includes TCP/IP services. The single-port version of APT Communications' ComTalk is my second choice: it performs better than the EtherRoute, but also costs more at \$3250.

For those situations where you can tie four LocalTalk networks into one location, the MaxWay 500 is a definite price-performance winner. Four EtherRoutes would cost \$5980, while the MaxWay 500 is \$5495. That's only a small price savings, but the MaxWay 500 is faster. 

See *Where to Buy* under Ethernet Products for contact information.

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# THE DESK POTATO'S GUIDE TO *Macros*

**SIT DOWN AND GET LAZY.  
HERE'S MACWORLD'S GUIDE  
TO SOFTWARE SERVANTS.**

## ask

the maker of a macro program, "What's so great about macros?" The response will surely include the mandatory phrases "automate your Mac," "enhance productivity," and "increase efficiency."

But want to know the real reason macros are great? Because they let you be lazy. By performing tedious, repetitive, boring tasks you usually have to do yourself, a macro program lets you kick back and relax while it types the date, sorts a database, or backs up that hard drive. This puts some of the work load back where it belongs: on the sturdy shoulders of an expensive computer. All you have to do is tell it, with a keystroke, which tedious task to begin—and get used to the privileges of desk potatoism.

And goodness, no—there's absolutely nothing wrong with being a desk potato. Indeed, it's something to be proud of! Desk pota-

toes represent people over machines, brains over brawn; desk potatoes live to max their Macs while expending as little energy as possible themselves. They thrill to programs like Nisus, MicroPhone, and Excel, which have built-in macro capabilities; and they absolutely slaver at the prospect of general-purpose macro programs, which let them reduce their net muscular activity in any application.

If you're not already using macros, you'll be amazed at how much effort they can save. And if you're considering getting into them, there are a few options: there's Tempo II Plus, QuicKeys<sup>2</sup>, Apple's MacroMaker (free with System 6.05 or later), AutoMac III (free with Microsoft Word), and MasterStrokes (free with Datadesk 101 keyboards). In any case, let your fingers do the walking through this guide to the software servants.







## The Tasks

A macro program lives in the System Folder (they're INITs or cdevs—programs that run automatically at start-up). To signal a macro program that you want to teach it something new, choose Start Recording from a menu (or press a keyboard equivalent). Then, at whatever lazy pace you want, you go through one fragment of your daily routine: choose Set Startup; open your address-book DA; type your return address—whatever. The macro program watches, lurking, learning, until you finish. It pops a dialog box up on the screen, asking what trigger key you want to teach it.

This, of course, is precisely why you've got all those weird-looking keys on your extended keyboard: Home, PgUp, F1, F2, Control, and so on. Teach the Home and End keys to go to the beginning or end of a file. Use F1 to type your modem-service password. Assign Control-C to open the Calculator. The sky's the limit.

The only hitch: teaching a job to a macro is similar to teaching it to someone new at the office. Like sorcerer's apprentices, they have the potential to wreak minor havoc if you're not careful and explicit when explaining the task. And sometimes they're too dumb to get the concept even when you're the quintessence of clarity. So let's throw some typical tasks at each of the five programs in the Mac macro macrocosm. Let's find out not only how well they perform, but also how well they learn. For each challenge, you'll rate each program according to the International Committee on Personal Inertia's laziness scale, the *Système des Points d'Utilisation Diminution* (otherwise known as SPUD points). The higher the SPUD point rating, the better a macro program's capacity for decreasing your grunt-work quotient.

## Menu Manipulation: Taking Out the Trash

In the Finder, you can press ⌘-N to create a new folder, ⌘-O to open something, and so on. But to empty the Trash, you have to grab the mouse, roll up to the Special menu, and choose Empty Trash—by the desk potato's standards, an unforgivable expenditure of calories. With a good

macro program, you can empty the Trash (or select any other menu command) without taking your hands off the keyboard.

All five programs pass this test with flying colors. You start recording, choose Empty Trash, stop recording, and give the new macro a keystroke (⌘-T has a nice ring). Immediately afterward—and forevermore—you can empty the Trash by pressing ⌘-T. All but Tempo II Plus empty the Trash so fast it's unbelievable. (Tempo II Plus, whose macros are stored on disk instead of in memory, waits about one second before performing its feat.) At first, you may feel a little out of control. But once you realize that your software slave is only doing what you've asked, you'll start to feel the desk potato's warm glow of lethargy.

QuickKeys<sup>2</sup> and Tempo II Plus even offer an important additional menu feature: the ability to select a menu command either by its position on the menu (as the other three programs do) or by its name. You might want a by-name menu macro for Word's Italic command, for example, because its position in the menu changes depending on whether Full Menus or Short Menus is in effect.

## Mouse Maneuvers: Dragging Disks

Choosing a menu command is one thing; what about something that requires a little more brains, like dragging a floppy-disk icon to the Trash? Four out of the five macro programs perfectly record and play back this one-drag macro (MasterStrokes can't drag). But suppose you're creating a presentation for the Idaho Tuber Growers Association, and want a macro to magically draw a many-eyed potato logo before the assembled throngs? You need a macro to move the mouse in more complex ways than just straight lines.

With MasterStrokes or Macro-Maker, you're out of luck. They define mouse movements solely by the starting and ending points. AutoMac III, QuickKeys<sup>2</sup>, and Tempo II Plus offer a Real Time playback mode, where mouse movements are replayed precisely as they were recorded—zigs, zags, hesitations, and all. Using a real-time macro, you can create anything from an animated Mac training "video"



**Macros in Space** Dr. Kritina Holden, Human Factors Engineer for Lockheed Engineering and Sciences Company at the NASA Johnson Space Center, used AutoMac III and QuickKeys<sup>2</sup> aboard the space shuttle to do the data collection in a series of experiments designed to evaluate cursor control devices for use in zero gravity.

to a complete MacPaint cartoon... with one keystroke.

## Window- and Box-Brains: Doing Windows

In the desk potato's never-ending quest to minimize mouse activity, cutting down window-clicking and dialog box-clicking is high on the list. Wouldn't it be simpler to press Control-C to close, Control-B for Best Quality, and so on?

QuickKeys<sup>2</sup> has an awesome advantage in the window-handling event, because it has a number of predefined window macros: Close Window, Select Rear Window, and so on. They work regardless of the window's position: the Close Window macro closes the front window even if its close box is offscreen. Thus QuickKeys<sup>2</sup>'s Zoom Window macro is especially useful when a window is completely off the screen (because it was saved on a bigger monitor); QuickKeys<sup>2</sup> neatly centers and resizes the window.

While there are no canned window macros for Tempo II Plus and Macro-Maker, those programs also have the brains to apply macros to the active window, even offscreen. AutoMac III, though, only does windows if their close or zoom boxes are onscreen. And if the window has moved since you recorded the macro, your MasterStrokes window-zoom macro just clicks futilely on the desktop.

## Having a Dialog

Another task the effort-conserving often delegates to a macro is selecting



items in dialog boxes. Suppose, for instance, that you want your subhead macro, Control-S, to select Bold and Small Caps in Word's Character dialog box. Any macro program could learn to click on check boxes. Trouble is, if you apply the same macro to a passage that's already bold, it clicks the Bold check box a second time, turning Bold off. That's why QuicKeys<sup>2</sup> and Tempo II Plus have a click-only-if-button-is-off option, so they click only if the check boxes aren't already checked.

You might think Control would be the perfect macro key, since it's almost never used in applications. Yet AutoMac and MasterStrokes don't recognize the Control key. And while we're at it: a macro program should let you create unmodified letter-key macros, too, so that pressing the P key in MacPaint selects the Pencil tool, for example. But Tempo II Plus and MasterStrokes require at least one modifier key (except for F-keys). AutoMac doesn't even let you use the function keys.

### Keyboard Skills: Taking a Letter

All right. You've reduced your mouse usage to the absolute minimum. The desk potato's next priority is to cut down on that other major energy-waster: typing. Why on earth should you consult your calendar and type the date at the top of every letter? You've got a computer, for goodness' sake!

QuicKeys<sup>2</sup> and Tempo II Plus are ready and waiting; each has an assortment of ready-made date-stamping macros in all different formats. Slap that macro onto the F5 key and forget about looking up the date. The other programs have no such built-in features. The best you can hope to create is a macro that opens the Alarm Clock desk accessory, copies the date, and pastes it. Even that method's not ideal, unless you want "5:17:52 PM 3/9/91" at the top of your letter.

### Boiling Over

Of course, a macro can learn to type more than just the date. Your return address is a typical candidate. So are frequently used lengthy or hard-to-type phrases (the MacroMaker manual gives Zbigniew Brzezinski as an example). Lawyers and others who draw

up contracts have plenty of standard paragraphs; they're called *boilerplate* text, and they're a cinch with macro programs.

MacroMaker and AutoMac III have basic boilerplate skills: start recording, then type the passage. QuicKeys<sup>2</sup> is slightly better at boilerplate text, because it lets you copy the text from an existing document (instead of typing it again for the macro's benefit).

Tempo II Plus takes boilerplate text so seriously that it has a special feature called Autopaste. You don't even have to copy the text into Tempo II Plus—just select text in a word processor and choose Autopaste from the Tempo menu. This even works with graphics like your signature. When the time comes to sign your letter, hit Control-S (or whatever's been assigned); after Tempo II Plus's characteristic one-second hesitation, your signature pops into your letter.

If there's an approach that's better yet, it's MasterStrokes'. You trigger the automatic typing not with a ⌘- or function-key combination, but with an abbreviation. That is, type normally; when it's time to insert the vegetable du jour, just type FRIES (with a space on each side); MasterStrokes instantly backspaces over the word and types "A tenderly fragrant serving of fresh potato product, lovingly fried in Kansas beef fat, and served with a tasty dash of granulated sodium chloride."

### Multistep Macros and Looping: Work Processing

No desk potato would stop at macros that only relieve them of a keystroke or two. Power macro users learn to create multistep macros, or sequences, that perform

a whole series of actions in a row.

Suppose you've completed a 70-page paper on warships—so much sheer labor it'd turn the average desk potato's hair white. Imagine your horror when you discover that ships' names should be italicized. Using Word's Find command, you could create a macro that searches for the ship prefix (USS), highlights the following word (such as *Constitution*), and chooses Italic. But there are 250 ship references in the paper. You need

## THIRTY GREAT JOBS FOR MACROS

Get your hands off that mouse! Here are 30 great uses for macro programs that are already saving people thousands of cumulative hours. And think: each merely requires one keystroke.

Most of these macros have already been made up for you. They're available at no charge from America Online, in the Macworld Resource Center (keyword: Macworld), in MacroMaker, Tempo II, and QuicKeys<sup>2</sup> formats. Start downloading and get lazy.

Task	Macro Program
Back up hard drive (today's work)	A, Q, T
Change printers via Chooser	A, MM, MS, Q, T
Change tools (PageMaker, MacPaint, Canvas, and so on)	A, MM, MS, Q, T
Check Inbox for new mail; save it	T
Choose common font/size combination	A, MM, MS, Q, T
Convert all straight quotes to curly quotes (existing file)	T
Convert all straight quotes to curly quotes (while typing)	Q
Drag top MultiFinder window to bottom of screen	A, MM, MS, Q, T
Eliminate extra spaces between sentences	A, MM, MS, Q, T
Fetch logo from Scrapbook and paste it	A, MM, MS, Q, T
Find/delete Word Temp files (using DiskTop)	Q, T
Initialize blank floppy disk	A, MM, Q, T
Jump to a specified folder when you Open or Save	T, Q
Launch Excel (or any program)	Q, T
Log on to online service (America Online, CompuServe, Delphi...)	A, Q, T
Mount AppleShare volume	Q
Open address-book desk accessory	A, MM, MS, Q, T
Print only page 1	A, MM, MS, Q, T
Reconfigure numeric keypad (put 1, 2, 3 on top row)	Q, MM
Replay all steps up to a crash (while programming)	T
Restart or shut down the Mac (within any program)	Q
Save your work every ten minutes	A, Q, T
Select next window	Q, T
Select Text Offset for a graphic (PageMaker)	A, MM, MS, Q, T
Set clock to Daylight Savings Time	A, MM, MS, Q, T
Strip linefeeds from telecom text	T
Switch color monitor to B&W (or back)	A, MM, MS, Q, T
Type "SUM()" in Excel, put cursor between ()'s	A, MM, MS, Q, T
Unstuff a StuffIt Deluxe archive	Q
Zoom all PageMaker pages to same % view	T

A=AutoMac III, MM=MacroMaker, MS=MasterStrokes, Q=QuicKeys<sup>2</sup>,  
T=Tempo II Plus.



## SPUD POINTS

### Menu Manipulation

All of the programs are superb for choosing menu items, but Tempo and QuicKeys<sup>2</sup> get an extra SPUD point apiece for their intelligence in choosing commands by name.

AutoMac III	0000
MacroMaker	0000
MasterStrokes	00000
QuicKeys <sup>2</sup>	00000
Tempo II	00000

### Mouse Maneuvers

Tempo and AutoMac get extra SPUD points because they're the best at mouse maneuvering, and they let you incorporate real-time segments into regular (step-time) macros; a QuicKeys<sup>2</sup> macro must be recorded in either all real-time or all step-time. MacroMaker drags the mouse only in a straight line; MasterStrokes can't even do that properly.

AutoMac III	00000
MacroMaker	00
MasterStrokes	
QuicKeys <sup>2</sup>	0000
Tempo II	00000

### Window- and Box-Brains

QuicKeys<sup>2</sup> excels at doing windows, with its pre-made, sure-fire, and trustworthy window macros. Tempo and MacroMaker do equally well, although their window macros aren't canned. AutoMac works only if the window is fully on screen, and MasterStrokes isn't smart enough to click the Zoom box if it's not where it was when you recorded. Extra points to QuicKeys and Tempo for having

common sense in checkbox- and button-clicking operations.

AutoMac III	00
MacroMaker	000
MasterStrokes	0
QuicKeys <sup>2</sup>	00000
Tempo II	0000

### Keyboard Skills

MasterStrokes makes it easy to call up boilerplate text, because remembering your own abbreviation is easier than remembering a key combination. Tempo even has boilerplate graphics, and you don't have to type the text again to create the macro. QuicKeys limits text length to 256 characters (although you can string several together), but it has terrific built-in date-stamping; the remaining programs have to watch you type the full text.

AutoMac III	000
MacroMaker	000
MasterStrokes	00000
QuicKeys <sup>2</sup>	00000
Tempo II	00000

### Multistep Macros and Looping

All five programs handle multistep macros gracefully; MacroMaker and MasterStrokes, however, don't let you edit those macros once you've created them. Tempo II's built-in brains handle looping with aplomb. MacroMaker and AutoMac can loop a few times; QuicKeys' Timer feature can do a pseudo-loop; and MasterStrokes—well, you don't want to try looping with MasterStrokes.

AutoMac III	00
MacroMaker	0
MasterStrokes	0
QuicKeys <sup>2</sup>	00000
Tempo II	00000

a macro that can repeat itself, looping until the task is complete.

Only Tempo II Plus is designed for looping. With one keystroke, its Play By Name dialog box appears; in it you can play a macro simply by typing its name. In the same box, there's a "Play the macro \_\_ times" field; just enter the number of times you want the macro to repeat. Indeed, Tempo has powerful (but technical) *conditional branching* skills; that is, the macro does one thing if one on-screen condition is true, and another thing otherwise. Thus, the macro continues finding and italicizing ship names until it reaches the end of the document, whereupon it simply stops.

The other programs aren't designed to loop. You have to create two macros, each of which ends by invoking the other. That is, the Control-1 macro finds and italicizes the first ship name, then presses Control-2. The Control-2 macro handles the next case, then presses Control-1 . . . and so on.

This works splendidly with MasterStrokes. Trouble is, there's no way to stop the infinite loop. Ultimately, you have to shut off the Mac (in the desk potato's book, a disgraceful waste of effort). MacroMaker automatically stops after about 10 loops, and AutoMac III after about 20—not a bad compromise.

The twin-macros method doesn't work in QuicKeys<sup>2</sup>—not even once. Fortunately, QuicKeys<sup>2</sup> has another feature that works almost as well: a Timer option, which can set any macro to run at regular time intervals. If you set your italicizing macro to run once per second, it works almost as fast as Tempo II Plus's self-looping macro. Once again, though, there's no way to stop the mad macro once it's begun. Even if you click to cancel, the looping begins again immediately. You can interrupt the cycle only by opening the QuicKeys<sup>2</sup> control panel and turning off the Timer feature—workable, perhaps, but inefficient.

### Macrobatcs Summary

It's tough to criticize AutoMac III and MasterStrokes; after all, they're provided as free helpful bonuses by the makers of nonmacro products. But the desk potato would blanch at AutoMac III's dialog box-intensive interface.



## MACROPHILE FEATURES

And remember that AutoMac III won't let you assign macros to the row of function keys or the Control key; that takes away half the fun of macro making. MasterStrokes has one or two terrific features—for example, that boilerplate text feature is glorious. But too many tasks fall into MasterStrokes' can't-do-it category—everything from mouse drags to file launching.

The other three programs are terrific, but are aimed at different kinds of users. MacroMaker is amazingly underrated. Its ever-present menu means that you never have to memorize your macros (or even give them keystroke assignments). Unlike any other program, MacroMaker has an Info box for each macro for entering in short descriptions. And MacroMaker's is the only interface you could conceivably navigate without a manual. It isn't meant to perform tasks that involve more than menus, clicks, and typing; but it does these with speed, brains, and reliability.

QuickKeys<sup>2</sup> is a powerful midlevel program. It classifies every Macintosh action as one of about a dozen types: Text, Click, Date/Time, Menu, and so on. On one hand, the controls for all these types clutter QuickKeys<sup>2</sup>'s interface somewhat. On the other hand, because each step of a macro is identified this way, it is easy to access and edit individual steps of a multistep macro—a crucial capability that MasterStrokes and MacroMaker don't give you. You won't get far without the QuickKeys<sup>2</sup> manual, but the program is much more flexible and programmable than the simpler programs are.

And finally there's Tempo II Plus. Glancing at the "Macrophile Features" table, you'd think Tempo II Plus can do almost anything. Indeed, it's by far the most powerful, intelligent, and limitless macro program. Because it's so programmable, you can, with patience, create complex macros that perform lengthy overnight tasks; one

might, for example, automatically log on to a mainframe at midnight, download data, format it in Word, print it out, and shut down the Mac. No, Tempo II Plus is not for beginners. Its dialog-boxy interface won't win any design awards, and editing macros is more cumbersome than it is in, say, QuickKeys<sup>2</sup>. But more than one lucky soul's database-conversion project or massive document-formatting task has been saved by Tempo II Plus's programmable smarts.

### Lifting a Finger

The Golden Rule of Desk Potatoes: If you catch yourself performing a task for the second time today, hand it over to a macro. (Let the list of "Thirty

Great Jobs for Macros" give you some ideas.) If you're already using macros, please sit down and observe a moment of laziness in honor of all the cumulative energy you've conserved. And if you're not yet using macros, go get that Utilities disk that came with your Mac, and try out MacroMaker as a first step. That's the one bit of effort you'll be very glad you made. **M**

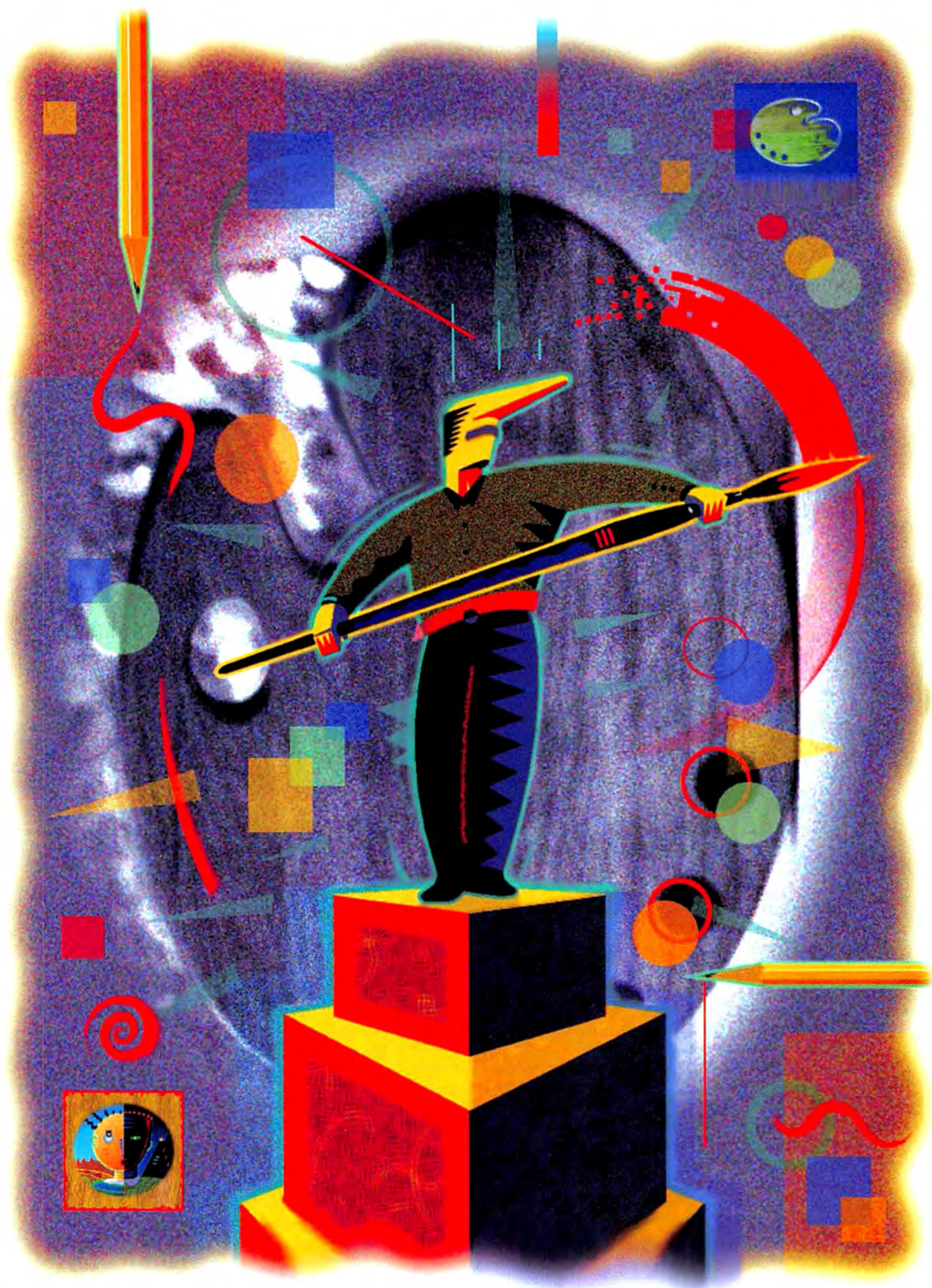
See *Where to Buy* for contact information.

.....  
**David Pogue**, a Macworld contributing editor, lives in New York City, where he's writing a high-tech Macintosh thriller. He's still trying to make Control-D run the dishwasher.

Company	AutoMac III Microsoft	MacroMaker Apple	MasterStrokes Datadesk	QuickKeys <sup>2</sup> CE Software	Tempo II Plus <sup>1</sup> Affinity
Price	2	Free	3	\$149.95	\$169.95
<b>MENU MANIPULATION</b>					
Menu selection by name	○	○	○	●	●
Menu while pressing ⌘, Shift, and so on	○	○	○	●	●
<b>MOUSE MANEUVERS</b>					
Drag cursor in straight lines	●	●	○	●	●
Reproduce cursor drag exactly	●	○	○	●	●
<b>WINDOW- AND BOX-BRAINS</b>					
Zoom/Close front window anywhere on screen	●	●	○	●	●
Zoom/Close window even if off screen	○	●	○	●	●
Click-only-if-button-is-off option	○	○	○	●	●
<b>KEYBOARD SKILLS</b>					
Date- and time-stamping	○	○	○	●	●
Create text macros without retyping	○	○	○	●	●
Boilerplate graphics	○	○	○	●	●
<b>MULTISTEP MACROS AND LOOPING</b>					
Editable multistep macros	●	○	○	●	●
Interruptible macros	●	●	○	●	●
Conditional branching	○	○	○	○	●
Controlled looping	○	○	○	○	●
Nested macros	○	○	○	●	●
<b>OTHER STUFF</b>					
How to play macro <sup>4</sup>	B,D	D,E	D	A,D,F,G	B,C,D,E,G,H
Play a macro at start-up	●	○	○	●	●
File/Application launching	○	○	○	●	●
Playback: real-time or fast only	either <sup>5</sup>	fast only	fast only	either <sup>5</sup>	either <sup>4</sup>
External "plug-in" features	○	○	○	●	●
Printable keyboard overlays	○	○	○	●	○
Display alert boxes/pause for user input	●/●	○/○	○/○	●/●	●/●
Recognizes Control key/Function keys	○/○	●/●	○/●	●/●	●/●
Permits unmodified letter keystrokes	●	●	○	●	○
Sound capabilities	beeps	○	○	any sound file	any sound file
Timed-release macros	●	○	○	●	●
Number of dialog boxes encountered to create one macro	3	1	1	2	1
Permits global (any-program) macros	○	●	●	●	●

● = yes; ○ = no or none. <sup>1</sup> Formerly sold as separate packages, Tempo II and Tempo + Tools. <sup>2</sup> Bundled with Microsoft Word. <sup>3</sup> Bundled with Datadesk 101 keyboards. <sup>4</sup> A=Apple menu, B=dialog box, C=Finder icon, D=keystroke, E=menu, F=pop-up macro list, G=timer, H=type macro name. <sup>5</sup> Real-time and fast playback may not be combined in one macro. <sup>6</sup> Real-time and fast playback may be combined in one macro.







# The Electronic Palette

by Deke McClelland

## 11 COLOR PAINT AND 2 PHOTO-EDITING PROGRAMS CROSS BRUSHES

With the advent of 32-bit QuickDraw, virtual memory, pressure sensitivity, and enhanced image processing features, color paint applications have been transformed from diverting toys into extraordinarily capable tools. Full-color image-editing and image-creation software packages now offer a wide spectrum of traditional and innovative tools and techniques for electronic painting. After seeing the range of possibilities open to you, you might be moved to say the sky's the limit. But you'd be wrong. With a color paint program, you can edit the sky too.

### Serious Painting, Serious Storage

If you're serious about color painting, there's no substitute for a true-color, 24-bit system and its 16.8 million colors—provided, of course, you can afford it. The software itself is not necessarily expensive. Delta Tao Software's Color MacCheese, for example, a limited but adequate 24-bit paint program, can be had for under \$100. But be prepared to hock your inheritance on the hardware.

The first pieces of equipment you'll need are a bigger hard drive and a backup system. True-color paintings are disk hogs. At the typical 72-dots-per-inch screen resolution, an 8½-by-11-inch RGB image can take up as much as 1.5MB of space on a hard drive. Increase the resolution to 300 dpi, and the image soars to nearly 25MB.

Lots of memory is also a necessity. Of the 11 color paint programs reviewed here, only Electronic Arts' Studio/32 uses disk-based virtual memory to edit images that are larger in size than the available RAM (for a comparison of Adobe Photoshop and ColorStudio, see "Want My Real Opinion?"). Less expensive programs require that you load an entire painting into RAM before working on it, which severely limits the kinds of paintings you can produce. A 4MB system allows you to create low-resolution, letter-size paintings; an 8MB

system, not running MultiFinder, gives you the most flexible working environment.

Together, a 24-bit video card and a compatible monitor can cost about \$2000 more than their 8-bit counterparts. However, three paint programs—Color MacCheese, Zedcor's DeskPaint, and Studio/32—allow you to access 24-bit color using an 8-bit system. With 32-bit QuickDraw installed in the System folder, pixels are automatically dithered to simulate colors that cannot be displayed on screen. The display isn't perfect, since you can't see exactly what you're painting, but images can be saved to disk and printed as 24-bit paintings.

### The Perfect Toolbox

Most color paint programs are remarkably similar in terms of general features and interface, unlike, for example, desktop publishing applications, which vary widely. The best color paint programs are those based on the now-familiar set of tools and functions introduced in MacPaint, so you can get up and running with them in a relatively short period of time.

MicroIllusions' Photon Paint is a notable exception. The program lacks such hallmark tools as the pencil, eraser, and grabber hand. Its toolbox, which consumes an enormous portion of the screen, contains a collection of squiggles, line graphs, and peacocks (really, that is what the icon looks like) that are seemingly designed to send the hardest user scrambling for the manual. But because the manual lacks even a single illustration, hours into using the software you may be left wondering which icon does what.

Oddball tools—tools that appear familiar but don't perform as expected—can also be frustrating. Olduvai's VideoPaint (offspring of the bizarre GraphistPaint) and SuperMac's PixelPaint Professional, for instance, have pencil tools that don't erase in a normal fashion.

Another tool that varies widely from program to program is the airbrush. MacPaint's airbrush (known



as the spray can) sprays a fixed pattern of dots, and only when you drag the cursor. Other programs offer a well-implemented airbrush tool that sprays a continuous random pattern of dots. If you pause while still pressing the mouse button, paint continues to be applied, much as if you're using



an actual airbrush. Of the programs reviewed here, only Creative Software's Easy Color Paint, Preferred Publishers' MasterColor (previously CA-Cricket Color Paint),

and Olduvai Corporation's VideoPaint lack such well-implemented airbrushes. Easy Color Paint's airbrush is even worse than MacPaint's. Though MacPaint's sprays a constant pattern, it skips every other pixel regardless of how slowly you drag, lending your airbrushed patterns a random appearance. Easy Color Paint doesn't skip every other pixel, so dragging its airbrush tool slowly produces an unbroken line that bears little resemblance to shading. MasterColor's airbrush is identical to MacPaint's. But the program also provides a fully customizable texture tool that paints both randomly and continuously with a variety of multicolor splatters. VideoPaint's airbrush tool allows you to control the shape and size of individual dots and lines in the airbrush pattern, but it does not operate continuously; it applies color only when the tool is dragged.

Taken as a whole, the best toolboxes are those available in Studio/8 and Studio/32 and the PixelPaints (both 2.1 and Professional). Rather than presenting huge and sometimes confusing collections of tools—as MasterColor and Deneba Software's UltraPaint do—the Studios and PixelPaints offer medium-size toolboxes with extensive modification options. In special-effects mode in PixelPaint Professional and PixelPaint 2.1, selecting a tool brings up a custom menu complete with options for applying cycling colors and gradation. In the Studios, you select modifica-

tion options from special pop-up menus below the toolbox, each of which may be toggled from the keyboard even as you're using a tool. For example, while you are using the paintbrush tool, pressing 2 on the numeric keypad changes the brushstroke from opaque to tinted (semi-transparent); if you're painting with a pattern, pressing 2 a second time makes the white portions of the pattern transparent. You can make all these changes without breaking your stroke or concentration.

### Colorful Demands

Color increases the range and quality of a painting more than any other single element does. However, color also complicates your work by introducing additional tool requirements. For example, you need to be able to select colors quickly both from a palette and directly from the page. All 11 color paint applications reviewed here solve this problem by offering a dropper tool. Clicking on a color in a painting makes that color the foreground color (the color currently applied by most painting tools). Most programs also allow you to temporarily access the dropper from the keyboard, so you don't have to move the mouse back and forth between the drawing window and the toolbox to change colors. Only DeskPaint and Photon

Paint fail to provide temporary keyboard access to the dropper tool.

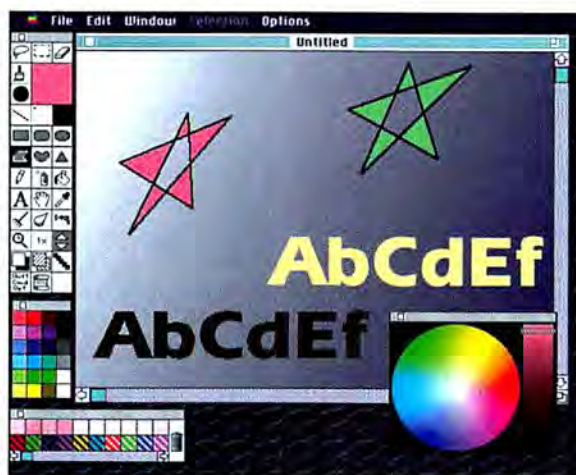
Even though paint programs create only bitmapped documents, color paint offers a way to avoid the jagged edges normally associated with bitmapped artwork. By blending pixels along the borders between contrasting colors, you can blur jagged edges, making the transitions appear softer and more natural. The most common means for accomplishing this is antialiasing, which blends the edges of a line or character of type as it is applied to the page. Some programs, like UltraPaint, DeskPaint, and DeskDraw, provide charcoal tools that let you draw free-form lines with blurred edges. Studio/32, VideoPaint, and MasterColor also have special antialias brush tools. Better yet, Studio/32, Color MacCheese, and PixelPaint Professional offer antialias modifiers that affect the creation of geometric lines and shapes as well as type (see "Smoothing the Jagged Beast").

With the exceptions of Studio/32 and UltraPaint, which provide special layers for creating and modifying object-oriented text, color paint programs print only bitmapped text, so what you see on screen is exactly what you get on paper.

However, if you use Adobe Type Manager in combination with one of the three color paint programs that

offer antialias type—Studio/32, Color MacCheese, and PixelPaint Pro—large type may appear quite smooth and readable when printed. ATM optimizes the appearance of on-screen type based on printer-font information; antialiasing blends the remaining jagged edges of the letters more smoothly into the background of an image.

After using the standard painting tools to apply colors, you may want to blend colors on screen using a smudge tool, offered by all the programs reviewed here except Photon Paint, PixelPaint 2.1, Color MacCheese, and Easy Color Paint. Unlike real paint, which sets as it



**Smoothing the Jagged Beast** Color MacCheese's antialias modifier (the jagged line in the lower-right corner of the toolbox) controls the appearance of type and geometric lines and shapes. When the modifier is activated, pixels around the border of an object are blended with background colors to give the image a softer, more natural appearance. Compare the untreated text and star on the left with their antialiased counterparts on the right.



dries, electronic paint may forever be manipulated. It is "dry" or "wet" depending on the whim of the user and the prowess of the programmer. The smudge tool picks up color from one portion of the painting and smears it onto neighboring pixels, much as if the colors were finger paints. Indeed, the process is so much like the finger painting of yesteryear that the smudge tool commonly appears as a finger pointed toward the page.

For users with a keen interest in more advanced image processing features, VideoPaint, UltraPaint, and the two PixelPaints provide Blur and Sharpen commands for filtering the appearance of a large selected area. For experienced users who require a higher degree of control and accuracy, Studio/32 offers both a blur tool and a sharpen tool, for precise work on small areas of a painting. The blur tool,

represented by a water drop, acts like an antialiasing tool that you use after creating a painting, to smooth existing images and soften contrasting pixels. The sharpen tool in-

creases the contrast between pixels and is especially useful for bringing fine details into sharper focus.

Selecting is another operation that takes on new meaning in a color paint program. Suppose that you want to select the image of a daisy that appears against a grassy background. Somehow you have to isolate the whites and yellows of the flower from the greens and browns of its surroundings. If you have a steady hand, you can simply lasso the flower by carefully tracing its outline. But if you've ever tried to clip an image from a photograph, you know how unsuccessful and damaging such free-form selection can be. For this reason, many high-end paint applications offer several ways to select areas in a painting.

Studio/32 and UltraPaint have magic wand tools, which select a contiguous area of pixels whose colors fall within a specified range. As an example, consider a scanned image of Alan Bates's face. While the pixels that make up his hair are not colored uniformly, they are colored similarly—certainly they are similar enough to be easily distinguished from his face. To select only the hair, click on a series

## WANT MY REAL OPINION?

If you're serious about color painting take my advice and part with a few extra bucks to buy a full-fledged color photo-editing package. ColorStudio and Adobe Photoshop, the most powerful examples, sell for about \$300 more than either PixelPaint Pro or Studio/32. Although they lack tools for creating geometric shapes like rectangles and ovals, both are far superior products for many high-end color paint projects. Both Photoshop and ColorStudio provide 24-bit color using an 8-bit monitor; virtual memory; a slew of useful image-editing filters; full contrast, brightness, and color balance control; antialiasing; and pressure sensitivity. In addition, both offer exacting control when creating four-color separations, and they provide direct support for scanners (see "Real to Realer").

Deciding between the two, however, is a difficult proposition for the discerning artist. ColorStudio offers an extremely versatile collection of drawing tools and brush shapes. The program also allows you to customize brush shapes, which can be saved and transferred to other versions of ColorStudio as annex files—special resources that can include separation modules and image-editing filters. From an electronic painter's perspective, ColorStudio's greatest strength over Photoshop may be the Shapes annex, a collection of object-oriented tools and commands that rival those of dedicated drawing programs such as Adobe Illustrator and Aldus Free-Hand. Like Illustrator 3.0, ColorStudio's Shapes allows you to reshape PostScript type outlines to create logos and other specialized letterforms.

Unfortunately, while it's a dramatic improvement over its predecessor in many ways, ColorStudio 1.11 has inherited two frustrating ancestral traits. First, it demands 5MB of RAM to run—more than



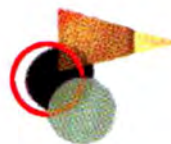
**Real to Realer** This 28MB painting features images from three different photographs scanned using an Epson ES-300C. Of the 24-bit programs currently available for the Mac, only a handful provide both image-editing and color-separation capabilities. Of these, your best bet for creating this sort of artwork is a dedicated color image-editing application such as Adobe Photoshop.

twice as much memory as Photoshop requires—preventing many users from operating ColorStudio under MultiFinder. And second, the program has a cumbersome user interface, cluttered with complicated dialog boxes.

Photoshop, on the other hand, delivers high-powered painting prowess in a substantially simplified format. A highlight among Photoshop's points of painting interest is the magic eraser tool, which selectively reverts portions of a painting to their previously saved appearance. ColorStudio lacks even a standard eraser. What's more, Photoshop offers versatile transformation commands and straightforward masking control in which selections act as editing stencils. These features are present but less intuitive in ColorStudio.

But regardless of which program you choose—ColorStudio or, my favorite, Photoshop—there's no getting around the fact that these two image-editing applications double as the best color paint programs on the market.





## COLOR PAINT CONTRASTS

## COLOR PAINT PROGRAMS

	Color MacCheese 2.0	DeskPaint & DeskDraw 3.03	Easy Color Paint 2.0	MasterColor 1.0	Photon Paint 1.1.1	PixelPaint 2.1
Company	Delta Tao Software	Zedcor	Creative Software	Preferred Publishers	Microllusions	SuperMac Technology
List price	\$99	\$199.95	\$89	\$199.95	\$149.95	\$249
GENERAL FEATURES						
Opens multiple paintings	●	●	○	●	●	○
Supports PICT/TIFF	●/●	●/●	●/● <sup>1</sup>	●/○	●/○	●/● <sup>2</sup>
Supports MacPaint/EPS	●/● <sup>3</sup>	●/○	●/○	● <sup>3</sup> /○	○/○	●/●
Maximum painting size (in pixels)	<sup>5</sup>	4000 by 4000	<sup>5</sup>	1024 by 1024	<sup>5</sup>	1024 by 1024
Direct scanner support	○	○	○	○	○	●
Prints color separations	○	○	○	○	○	process, spot
Halftone screen frequency control	○	○	○	○	○	●
COLOR						
24-bit color	●	●	○	○	●	○
Key colors per gradient	2	2	2 <sup>4</sup>	2	2	2
Pantone color support	○	○	○	○	○	●
Color editing modes	RGB	HSL, RGB	HSL, RGB	HSL, RGB	HSL, RGB	CMYK, HSL, RGB
NTSC gamma correction	○	○	○	○	○	●
32-bit alpha channel control	○	○	○	○	○	○
PAINTING TOOLS						
Bezier curves	○	○	○	●	○	uneditable
Antialias line control	●	●	○	○	○	○
Editable multicolor patterns	●	○	●	○	●	○
Adjustable paint opacity	●	●	○	○	●	○
Paint on lighter or darker colors only	○	○	○	○	○	●
Antialias brush control/charcoal tool	○	●	○	●	○	○
Adjustable airbrush size/flow	●/●	●/●	NA	●/●	●/○	●/●
Airbrush splatter control	○	○	NA	●	○	●
Image-editing tools	blur	smudge	○	blur, smudge	○	○
Pressure sensitivity	○	○	●	○	○	○
Object-oriented drawing tools	○	DeskDraw only	○	○	○	○
TEXT HANDLING						
Antialias type control	●	○	○	○	○	○
Supports multiple fonts and sizes in text block	○	●	○	●	●	○
Maximum type size (in pixels)	<sup>7</sup>	127	127	72	255	255
Object-oriented text capabilities	○	DeskDraw only	○	○	○	○
SELECTION CAPABILITIES						
Magic wand selection	○	○	○	○	○	○
Select shape from inside	●	○	●	○	○	●
Autoslip lasso control	○	●	○	○	○	○
Select noncontiguous areas	●	○	●	○	●	●
Select/reshape most recent object	○/○	○/○	○/○	●/●	○/○	●/○
Add or subtract to selected area	○	○	○	○	○	○
IMAGE-EDITING FEATURES						
Mask objects/colors	○/○	○/○	○/○	○/○	○/○	●/○
Nudge selection one pixel	○	●	●	●	○	○
Resize selection by percent	○	●	○	○	●	○
Wrap selection onto shape	○	○	○	○	●	○
Project light source on selection	○	○	○	○	●	○
Image-editing filters	1	9	0	2	1	10

● = yes, ○ = no, none.

<sup>1</sup> Saves in monochrome TIFF only.<sup>2</sup> Saves in gray-scale TIFF only.<sup>3</sup> Opens only.<sup>4</sup> Saves only.<sup>5</sup> Limited only by available memory.



# PHOTO-EDITING PROGRAMS

PixelPaint Professional 1.0	Studio/8 2.0	Studio/32 1.0	UltraPaint 1.0	VideoPaint 1.0	Adobe Photoshop 1.0.7	ColorStudio 1.11
SuperMac Technology	Electronic Arts	Electronic Arts	Deneba Software	Olduvai	Adobe Systems	Letraset Graphic Design Software
\$699	\$295	\$695	\$199	\$495	\$895	\$995
○	●	●	●	○	●	●
●/●	●/●	●/●	●/●	●/●	●/●	●/●
●/●	● 3/○	● 3/●	●/○	● 3/● <sup>4</sup>	●/●	○/● <sup>4</sup>
1024 by 1024	4096 by 4096	<sup>5</sup>	7700 by 7700	2048 by 2048	<sup>5</sup>	<sup>5</sup>
●	○	○	○	○	●	●
process, spot	○	○	○	process	process	process
●	○	○	○	●	●	●
●	○	●	○	●	●	●
2	32	32	2	2	2	2
●	●	●	○	○	○	●
CMYK, HSL, RGB	CMY, HSL, RGB	CMYK, HSL, RGB	CMYK, HSL, RGB	HSL, RGB	CMYK, HSL, RGB	CMYK, HSL, RGB
●	○	○	○	○	●	●
○	○	●	○	○	○	○
uneditable	●	●	●	○	○	●
●	○	●	○	○	●	●
○	○	○	○	○	●	●
●	●	●	●	●	●	●
○	●	●	○	●	●	○
○	○	●	●	●	●	●
●/●	●/●	●/●	●/●	NA	●/●	●/●
●	○	○	●	NA	○	○
blur, smudge	smudge	blur, sharpen, smudge	blur, smudge	blur, smudge	blur, sharpen, smudge	blur, sharpen, smudge
○	○	●	●	○	●	●
○	○	○	●	○	○	●
●	○	●	○	○	●	●
○	●	●	●	○	○	○
255	127	<sup>7</sup>	127	128	1000	300
○	○	●	●	○	○	●
○	○	●	●	○	●	●
●	●	●	○	●	○	●
●	●	●	○	○	○	○
●	●	●	●	●	●	●
●/○	●/●	●/●	●/● <sup>8</sup>	○/○	○/○	○/○
○	○	●	○	○	add only	○
●/○	●/●	●/●	●/○	○/●	●/○	●/○
○	●	●	●	○	●	●
○	●	●	○	○	● <sup>9</sup>	●
○	○	sphere only	○	●	sphere only	○
○	○	○	○	●	○	○
9	3	6	7	9	28	14

<sup>6</sup> Gradients may fill selected area only.

<sup>7</sup> Unrestricted.

<sup>8</sup> In drawing layer only.

<sup>9</sup> Applicable to entire image only.



of representative pixels with the magic wand tool. A range of similarly colored contiguous pixels becomes selected. If portions of the face become selected, specify a smaller range. If the selection misses some follicular pixels, increase the range.

Another selection method, auto-slip lasso control, is offered by DeskPaint (the program calls it masking), PixelPaint Professional, and the two Studios. In contrast to a magic wand, this feature allows you to define the colors that should be exempt from a selection. If you drag across the green and brown areas around the daisy, for example, the program ignores all green and brown pixels and selects only the whites and yellows inside the lassoed area—the daisy itself.

### Some Very Special Effects

If you're looking for razzle-dazzle, you'll find much to admire in the new crop of color paint software. VideoPaint and Photon Paint are perhaps the most powerful applications in the special-effects arena, although they have their share of special difficulties too. Both programs enable you to wrap selected images onto spheres, cones, cubes, and other three-dimensional objects. You may also define a light source, the angle of light, and diffusion rate with these two programs. The problem is that the results are long in the making and extremely difficult to predict. On a Mac II, a standard surface-mapping command can take as long as five minutes to complete. If you're unhappy with the results (which I found to be a common experience), you have to choose Undo and start all over again.

If you're too impatient to withstand the slings and errors of the special-effects programs, you might prefer to settle for the less dramatic Studio/32. Studio/32 allows you to wrap a selection onto a sphere, though you cannot define a light source. You can also create a 3-D montage of repeating perspective tiles (see "The Ideal Linoleum"). The effect is time-consum-

ing, but more predictable than the surface mapping offered by other programs.

### Printing Your Painting

All right, color paintings look great, but what good are they? What can you do with the final image? Unfortunately, this is the biggest failing of the majority of color paint applications. If you're on a budget, you can print monochrome halftones or color composites on PostScript-compatible output devices, and use photocopies to create multiple copies for fliers or other informal documents.

But only VideoPaint and the two PixelPaint packages provide the color-separation capabilities and the halftone screen frequency control required for professional offset printing. PixelPaint 2.1 and PixelPaint Professional display comprehensive print dialog boxes that allow you to choose both process-color and spot-color separations. In VideoPaint, you have to save your painting as four PostScript-language separation files—one each for the cyan, the magenta, the yellow, and the black components. You then download each of these to a PostScript-compatible printer. It's time-consuming, but at least it works.

While lacking direct color-separation capabilities, UltraPaint, Studio/8, Studio/32, and DeskPaint do allow you to save images as color TIFF documents, which you can then separate

with other programs, such as Aldus PrePrint, Adobe Photoshop, or Letra-set ColorStudio.

If you're more interested in video than in print output, you can save your artwork as a PICT file—the only format supported by all 11 color paint programs—and import it to a presentation program such as Aldus Persuasion or use it as a background in a full-blown animation application such as MacroMind Director.

### The Final Touches

So when all is said and done, what's the best color painting program? It really depends on how much money you want to spend. If you can't justify spending more than \$100, I recommend Color MacCheese over its slightly less expensive rival, Easy Color Paint. Color MacCheese offers 24-bit color, all the expected tools, an adequate collection of anti-aliasing features, and limited image-editing features, certainly enough for the casual user. The manual is next to worthless, but the program comes with a hand-painted box and some Taoist philosophy thrown in.

If it weren't for the existence of the very inexpensive Color MacCheese and Easy Color Paint, PixelPaint 2.1 and Studio/8 would be reasonable deals for under \$300. But as it is, I can't recommend any program in the \$100-to-\$500 range except for the \$199 UltraPaint—and that only because UltraPaint provides a drawing layer complete with a set of object-oriented tools.

If your idea of painting includes photo editing, painterly drawing control, and an occasional color separation, you should consider shelling out \$700 for a top-of-the-line program. Insofar as a pure drawing experience is concerned, Studio/32 is my personal favorite. It provides pressure sensitivity (see "As If That Weren't Enough") and a host of fine drawing-modification controls that make on-screen painting a real pleasure. Studio/32 also offers access to Apple's alpha channel. But Studio/32



**The Ideal Linoleum** Studio/8 and Studio/32 both offer a Fill Perspective Plane command that repeats a selection to a specified horizon as if laying floor tiles. The central blue tile was positioned using the standard Perspective command, thereby matching the angle and depth of the repeated tiles.



## AS IF THAT WEREN'T ENOUGH

**H**aving seen the future of color bitmap software, I can tell you that it begins with pressure sensitivity and ends (at least for now) with Time Arts' new paint package Oasis.

The Wacom tablet, with its two pressure-sensitive styluses, does everything a mouse does and more. Used with some paint programs, it responds to variations in the pressure you apply, letting you create naturalistic images that look for all the world like watercolors or oils.

Presently, a handful of paint programs support the Wacom pressure-sensitive tablet. The best of these—Studio/32, UltraPaint, ColorStudio, and Adobe Photoshop—allow you to vary line thickness by pressing harder or softer as you move the stylus. As you gradually release the stylus, the line tapers to a soft, delicate tip.

Several new programs, not yet shipping at press time, will also support the Wacom tablet. These include VideoPaint Pro, scheduled to ship in mid-1991; PixelPaint Professional 2.0, the new heavyweight contender from SuperMac; StrataVision Paint, the first program to address 64-bit color; and Oasis, the Mac version of the much-respected Lumina for IBM PCs and compatibles.

Of these, only Oasis will allow the user to specify how the pressure-sensitive data is to be interpreted. You will be able to direct the pressure to affect the size of the cursor, as is com-

mon in most programs; the density of the ink; the color of the ink, as selected from the current gradation; or all three at once. Using the antialias brush tool, you will even be able to use pressure to determine the "wetness" of the brush. As you release the stylus, the ink will "dry" slightly to produce a coarser line.

Oasis will also offer several image-editing filters. After you select the



**A Pressing Future** This image was created in Photoshop using the Wacom tablet with a pressure-sensitive, cordless stylus. The image was then opened in a prerelease version of TimeArts' Oasis, which allows you to dynamically preview filter commands before applying them to a painting.

portion of the painting to be affected and choose a filter command from the Area menu, a preview dialog box will appear, enabling you to preview the consequences of your changes before you apply the filter (see "A Pressing Future").


Oasis will also include a standalone video module designed to assist the transfer of RGB images to videotape and overlay computer-created

type and graphics onto live video images. Real-time antialiasing will also be available. Oasis will be priced under \$800, less than either Photoshop or ColorStudio.

The comparably priced PixelPaint Professional 2.0 promises to give Oasis a run for its money. In addition to pressure sensitivity, PixelPaint Pro 2.0 will offer virtual memory, semi-transparent masking, and a special dialog box for defining multicolor gradients. The new WetPaint feature will allow you to select and modify an image before integrating it into the painting (much like the FreshPaint feature pioneered by Cricket Paint and now found in MasterColor). Most alluring of all will be the integration of PixelPaper, a feature that will let you determine the texture of the surface on which you paint.

You say 16.8 million colors just doesn't hack it? It may sound ridiculous, but StrataVision Paint will provide access to 282 trillion colors, well beyond the capabilities of existing hardware. But never fear, users with 8- and 24-bit systems will be able to use StrataVision Paint to create full-color paintings while they wait for the technology to catch up with the program. Specifically designed to be compatible with the upcoming System 7.0, StrataVision Paint will ship in January for \$695 retail, slightly less than either PixelPaint Pro 2.0 or Oasis.

doesn't provide any color-separation capability, which means that you'll have to transfer your images to another program that does. If you need one program that does both color paint and color separations, get PixelPaint Professional instead. It won't make you hoot and holler, but it's more than adequate for creating professional-quality artwork. Pixel-

Paint Professional also offers several image-editing filters and a few airbrushing effects missing from Studio/32. But most important, PixelPaint Pro offers 24-bit color control, as well as spot and process color-separation features required by a professional painter. 

See *Where to Buy* for contact information.

.....  
**Duke McClelland** is a writer in Boulder, Colorado. His recent books include *Painting on the Macintosh* (1989), *Drawing on the Macintosh* (1990), and *Mastering Adobe Illustrator*, Macintosh version 3.0 (1991) (*Business One Irwin*) as well as the *Encyclopedia Macintosh*.



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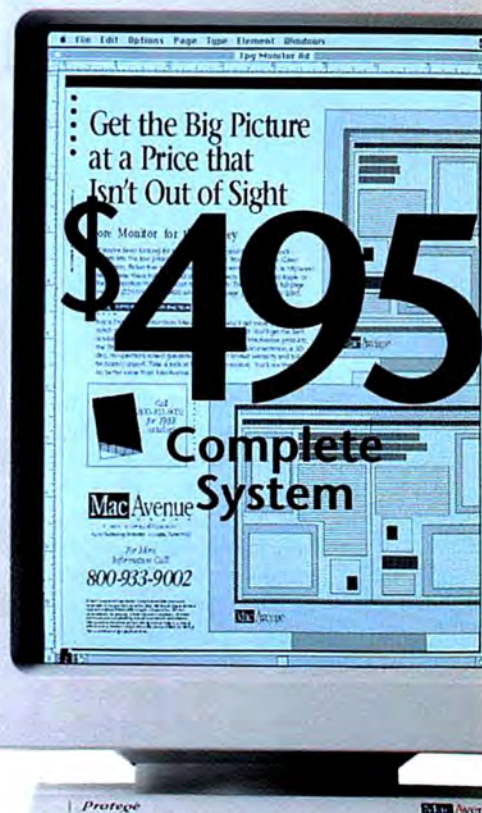
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# REVIEWS



## Professional Paint Program

### STUDIO/32 1.0

**Pros:** 24-bit color capabilities; support for virtual memory, Pantone Matching System, and pressure-sensitive tablets; antialiasing; superb selection control; special text layer for creating fully editable, high-resolution type; modifiable, intuitive interface. **Cons:** Can't generate color separations; can't alter size of existing document; overpriced.

**Company:** Electronic Arts. **Requires:** Mac II; 2MB of RAM; color monitor. Recommended: hard drive; 5MB of RAM and 24- or 32-bit video board to work in 32-bit mode. **List price:** \$695.

**32** Since most painting programs are based on the common MacPaint model, they are essentially easy to use. A typical user can sit down and start painting right away, without having to spend hours sifting through a manual. But when you get ready to tackle the intermediate and advanced features—masking, transformation effects, color control—many high-end paint programs lurch wildly into a meandering bog of bizarre menu commands and unfathomable dialog boxes. Studio/32 is a wonderful exception. Happily, the program starts out easy to use and becomes even more predictable as you become increasingly familiar with it. Every feature has been implemented logically and with careful attention to convenience and versatility.

#### Tools and Modifiers

Cut and dried, Studio/32 is a 24-bit upgrade to Studio/8, the two-year-old 256-color paint program also from Electronic Arts. If you've used Studio/8, you're already familiar with the basic interface. The toolbox features a



DON WOOD

collection of standard painting and image-editing tools followed by a handful of pop-up icons that modify the tools' actions. All tools can be accessed from the keyboard. Pressing 1 through 9 on the keypad toggles the modifier settings.

The ability to access and modify Studio/32's incredible tools from the keyboard is a convenience, and it augments your capacity to control colors and objects. Almost any tool's function can be modified from the keyboard while you are using the tool, or even after you've completed an operation. For example, suppose you want to select and manipulate a complex object independently of its complex background. Studio/32 offers two selection modifiers: the slip colors modifier, used to determine which colors are selected inside a lassoed or marquee'd area, and the shrink/expand modifier, which controls whether the selection shrinks to the exact boundary of the selected object, tightens to a rectangular marquee, or expands to

include boundaries surrounding the lassoed or marquee'd area. Both modifiers can retroactively adjust the confines of the current selection. Together, the slip colors and shrink/expand modifiers offer up to 15 different selection alternatives for each execution of the lasso or marquee tool, making it possible to change your mind several times without so much as touching the mouse.

#### Beyond the 8th Bit

Because they offer an exponentially wider array of colors, true-color paintings are predictably more intricate than their 8-bit counterparts. Studio/32 has several new capabilities to help rein in the color overload. Foremost among these capabilities are features that offset hardware inadequacies. If you can't quite justify the additional expense of a 24-bit video board, Studio/32 enables you to open and edit 16- and 24-bit images even while you're using a standard 8-bit monitor. Also, Studio/32 is one of the new



generation of Macintosh programs offering disk-based virtual memory. True-color paintings consume a lot of space, both on disk and in your computer's memory. If you don't have the 5 to 8 megabytes of RAM needed to load a large painting, Studio/32 loads what it can and allocates the overflow to an unused space on your hard drive. To save time as well as wear and tear on your hard drive, only as large a portion of the painting as will fit into RAM is displayed in the document window. You can access a hidden portion of the picture by double-clicking on the grabber hand icon in the toolbox to bring up the Show Document window, which displays the entire painting. Move the work area to a new location with respect to the painting, and then press Return to continue.

Another 32-bit enhancement is the antialias modifier, which softens the outlines of bitmapped type and geometric shapes by slightly blending pixels around the perimeter of the object. A special antialias brush tool creates soft lines that are further blended as you increase the width of the stroke. A Pressure option, accessed by double-clicking on the antialias brush icon in the toolbox, allows you to create semitransparent brushstrokes. And if you're keen on creating lines of varying opacities, Studio/32 supports pressure-sensitive input compatible with the Wacom drawing tablet. Press hard on the stylus to get an opaque line; release it gradually to create an increasingly transparent stroke.

For the professional artist, Studio/32 supports unlimited resolutions and page sizes. Even though the program provides no direct scanner support, the program is capable of reading both resolution and document size when opening scanned pictures. (Studio/8 1.0 reads document size only, converting all pictures to 72 dpi, which often results in a loss of detail.) Unfortunately, Studio/32 does not allow you to change the size of an existing document. If you want to enlarge or reduce a painting, you must copy the current picture, alter the new document's default size in the Preferences dialog box, create the new document, and paste. This seems like a

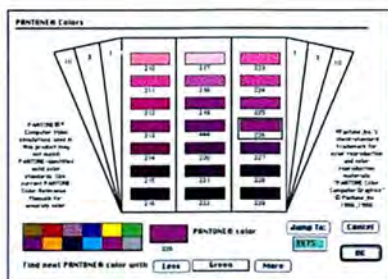
tremendous amount of work to perform such a common and normally simple operation.

### Printing Companion

Printing is an area in which Studio/32 at first impresses but ultimately disappoints. For enthusiasts of high-resolution type, Studio/32 offers a special text layer for creating and editing object-oriented text. Type on the text layer is forever editable and will print from Studio/32 to PostScript and TrueType printers at full resolution, relying on the printer font definition just as drawing and page-layout programs do. However, type on the text layer can only be black and cannot be saved in a format that any other program will recognize. Unless you re-



**Uncommon Tutankhamen** Studio/32's unique interface makes it as useful for painting as for image editing. This montage was produced by duplicating and transforming several scanned images and augmenting them using carefully modified painting tools. Note that the text is bitmapped, having been applied to the paint layer. The letters were enhanced by masking the area around the text and manipulating the unmasked area using the pencil, smear, and antialias brush tools.



**Pantone Paradise** Studio/32 provides an enormous dialog box for accessing and selecting Pantone colors. Three cards are shown at a time, each matching a card in the Pantone color formula guide. Though Studio/32's Pantone support is versatile, its ultimate utility is questionable, since the program cannot generate color separations.

quire small type for labeling an image, it's more fun to apply text to the paint layer, where you can color, antialias, and manipulate it using standard paint tools.

Studio/32 offers full on-screen support for the 747-color Pantone Matching System. The interface for selecting and using Pantone colors is truly exceptional, allowing you to locate colors by number or by color qualities (see "Pantone Paradise"). But here's the clincher: What good is Pantone color support, no matter how cleverly organized, if the program doesn't provide color-separation capabilities? This is Studio/32's great failing—its *only* major failing, really. It has to rely on other programs to produce color separations. Studio/32 paintings can be separated using Adobe Photoshop or Letraset's ColorStudio, or they can even be saved as TIFF files and separated using Aldus PrePrint. But all these options involve the added cost of purchasing separation software or visiting a service bureau. And none of these options let you print high-resolution type saved to the text layer or create spot-color separations, which are necessary for printing true Pantone colors.

### Interface Lift

Electronic Arts plans to release Studio/8 2.0, an upgrade to the original 8-bit program, at a price halved to \$295. If Studio/32 were priced as competitively, I would heartily recommend it as a companion program for any Macintosh owner interested in creating full-color, bitmapped graphics. But sadly, Studio/32 is not worth \$400 more than Studio/8, as the retail price tag might lead you to expect. Make no mistake, Studio/32 is a tremendously enjoyable and reliable painting program that in many ways equals Adobe Photoshop and surpasses PixelPaint Professional. But without support for color separations, direct scanner input, or video output, Studio/32 users have to purchase an additional program to provide input and output and separations. No program is an island, but when I think of parting with \$700, I anticipate a painting application that at least pretends to be self-sufficient.

—Deke McClelland

See Where to Buy or circle 705 on reader service card.



★  
Digital Recording and Playback Software

## DECK 1.03

**Pros:** Tape deck-like interface; compact disc-quality sound; versatile signal-processing options; automated mix-down settings; allows control from external MIDI faders; allows integration of MIDI sequences and audio. **Cons:** Can't adjust input level during recording; requires fast, high-capacity hard drive; finicky about system configuration; jerky fader movement during playback; copy protected.

**Company:** Digidesign. **Requires:** Mac II; 2MB of RAM; hard drive with 28ms access time; Digidesign Audiomeia or Sound Tools hardware; appropriate audio amplifier and sound source. **Recommended:** 4MB of RAM. **List price:** \$349.



One of the hottest trends in today's music world is the personal recording studio. The Mac and other personal computers have fanned the flames, thanks to the Musical Instrument Digital Interface (MIDI) and music software that lets you record, play back, and edit the data that MIDI instruments transmit (see "Getting Started with MIDI," August 1990). As a result, pros and amateurs alike have turned basements and bedrooms into studios whose capabilities would have cost tens of thousands of dollars not long ago.

One cornerstone of most personal studios is a multitrack tape deck, which can record and play back multiple tracks of music. By successively recording a different instrument on each track, a single musician can build up complex arrangements. Multitrack decks start at under \$500 and use

standard audio cassettes to record and play back up to four tracks. They are terrific for fleshing out arrangements and creating demo tapes, but their sound quality is not up to professional audio standards.

Digidesign's Deck uses a Mac's hard drive to record digital sound with the fidelity of a compact disc. Deck also lets you combine digital audio and MIDI information in ways no conventional tape deck can.

Deck costs about as much as the least expensive four-track audio recorder, but you'll also need Digidesign's \$995 Audiomeia expansion board, which contains the circuitry needed to translate between audio signals and bits and bytes (see *Reviews, Macworld*, May 1990). You can also use Digidesign's more sophisticated and costlier Sound Tools hardware. And because a Deck recording inhales disk space at a rate of 20MB per minute, you also need a copious hard drive and backup medium. Throw in a Mac II, and you've spent several thousand dollars—a lot for an amateur to spend, but peanuts for pros and school music labs.

## In the Studio

Deck's sole screen display is faithful to the multitrack recording metaphor, with volume meters that dance during recording; sliding faders that adjust recording and playback volumes; and transport controls that let you record, play back, fast forward, and rewind (see "Now on Deck"). If you've used conventional multitrack decks, you'll feel at home with most of what you see. And you'll be delighted with some of the differences, such as instantaneous rewinding.

Recording a track with Deck involves selecting the desired track, adjusting the input volume to avoid clipping (which causes distorted sound), and then clicking on the Record button. After you record one track, you can record additional tracks. If you fill all four tracks and still need more, you can merge two or more tracks into one, freeing the others for reuse. This technique, called bouncing, is often used with conventional multitrack decks, too. But bouncing tracks in the analog world degrades a recording's quality; that doesn't happen with Deck.

Deck also exploits the digital signal processing (DSP) features of the Audiomeia board to enable you to alter the sound of a track during playback. Several digital effects are supported by Deck, ranging from a digital equalizer, which lets you accentuate or attenuate certain frequencies, to a stereoizer, which processes a monophonic recording to simulate stereo.

## The MIDI Connection

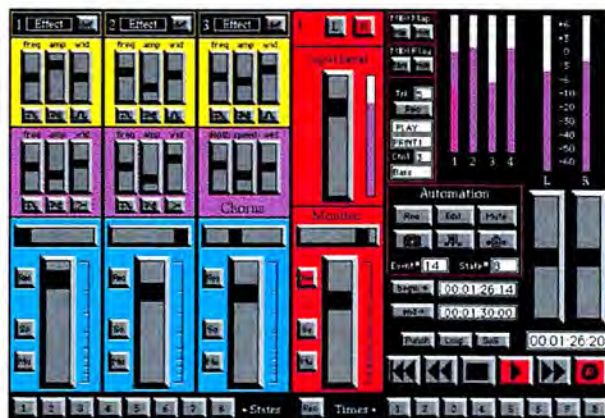
Deck can import and play back a MIDI composition created using sequencer software such as Opcode Systems' Vision and Mark of the Unicorn's Performer. To include a MIDI sequence in a Deck recording, you save the sequence as a standard MIDI file and then import it into Deck. Thereafter, when you play back your audio recording, Deck also plays the sequence, thereby controlling any MIDI instruments attached to your Mac.

Deck reaches out to the MIDI world in another way: it lets you assign, or map, one or more of Deck's on-screen faders to the physical sliders on a MIDI fader box such as J. L. Cooper Electronics' FaderMaster. (A fader box contains slider knobs that transmit MIDI data when you move them.) With this feature, you can control the playback volume of one or more tracks by moving the sliders on the fader box instead of using Deck's on-screen sliders.

Deck provides some features that enable it to synchronize its playback to industry-standard time-code signals, but these sync features are limited compared to the ones in Digidesign's Sound Designer II software.

(continues)

**Now on Deck** Deck turns the Mac into a multitrack digital audio recorder with automated mix-down features and the ability to import and play back MIDI sequences. Here, track 4 is being recorded while the remaining three tracks play back, and a chorus effect is being applied to track 3.







# CLAIMS Vs. ACCLAIMS

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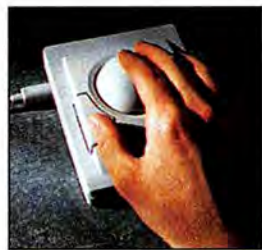
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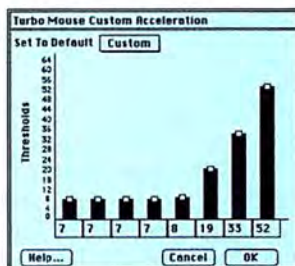
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## The Final Mix

The final step in any recording session is the mix-down, which involves adjusting the playback volume of each track while recording in standard two-track stereo on a second deck. As the multitrack recording plays back, a recording engineer often adjusts the volume of certain tracks, changes their apparent location in the left-right stereo spread, and makes other fine adjustments to arrive at the best-sounding final product. Twiddling all those knobs as a piece plays requires some dexterity, and twiddling them in the exact same way each time is all but impossible. For these reasons, professional recording equipment often provides automated mix-down features that "remember" the adjustments the engineer makes so the final mix can be re-created if needed.

Deck brings automated mix-down to the desktop. You can save and restore up to 200 different combinations of fader and effects settings. During playback, Deck's faders and other on-screen knobs move to the appropriate positions by themselves. Automation files are stored separately from the recording itself, letting you apply different automation files to a single recording to see which you prefer.

You can move recording files between Deck and Digidesign's AudioMedia and Sound Designer II software. Deck can also import files saved in the Audio Interchange File Format (AIFF), used by sound-editing programs such as Passport Designs' Alchemy.

On the downside, Deck is a bit finicky. It doesn't coexist well with start-up documents (INITs), especially network and electronic-mail software, which eat into the Mac's processor time. It also requires a fast hard drive (28ms or faster) without a lot of fragmented free space. And because Deck gives priority to playing back at an accurate speed rather than to updating the screen and responding to the mouse, its on-screen faders operate sluggishly, making real-time volume adjustments difficult and frustrating. (An external fader box eliminates this problem.)

In all, Deck is a superb program. No comparably priced analog multitrack tape deck offers Deck's sound quality and automation features, and

no tape deck of any price boasts Deck's ability to import and play MIDI sequences. Don't buy any analog multitrack deck until you've seen Deck and the Audiomedia board in action.

—Jim Heid

See Where to Buy or circle 618 on reader service card.

## ★ Educational HyperCard Stack

### EARTHQUEST 1.0

**Pros:** Interactive hypermedia approach encourages individual exploration; broad in scope; fun. **Cons:** Some rough edges; not fully functional on some 1MB machines. **Company:** Earthquest. **Requires:** Mac Plus; hard drive; System 6.0.2. Recommended: 2MB of RAM. **List price:** \$79.95; ten-station Lab Pack \$350.



HyperCard and other hypermedia let students explore personal paths through information, rather than being tied to the beginning-to-end approach dictated by most books and videos.

Earthquest is one of the best examples yet of how HyperCard can be used to give students from ten years old to adult a global, rather than parochial, perspective. Instead of presenting the earth from a discipline-specific point of view, Earthquest allows students to simultaneously study natural and human history, ecology, sociology, and geopolitics, exploring the interconnections between these different worldviews in the process.

#### Earth to Mac

The main menu screen of Earthquest, the Explore card, looks like a planetary version of the HyperCard Home card



**Global Sampler** The Earthquest stack navigator is a collection of icons, each of which offers a new way of exploring the earth.

(see "Global Sampler"). It's filled with colorful icons grouped into four broad categories: Earth, Journey, Environment, and World Tour. (Although most of Earthquest is presented in HyperCard's traditional monochrome, several cards are decorated with splashes of color.)

Clicking on the Planet icon reveals a drawing of the Solar System, showing Earth in relation to the planets. In one corner of the Solar System, a spreadsheetlike button hides a pop-up chart full of Solar System data. Clicking on any planet brings up a scrolling text window with a brief description of that planet.

Continue scrolling in that window for descriptions of the other planets. The text window's mini menu includes commands for instantly jumping to the text for any planet, and utilities for finding particular words and printing the text.

The Planet screen is far more than a click-to-read-about-it picture display, however. Like other Earthquest screens, it has all sorts of buttons that cause interesting things to happen. A click on the flying saucer launches an Earthquest "movie"—a short animated sequence created with MacroMind Director. The saucer sequence, like the other Earthquest movies, is likely to disappoint multimedia aficionados expecting a Spielberg epic, but it's the kind of thing that motivates kids to explore every nook and cranny of the program.

#### It's a Big World

And there's more. A tiny triangle below the title of the Planet card leads to a pop-up menu that links to different global map projections and to screens showing how Earth, the Sun, and the Moon interact to produce tides, seasons, and day and night.

Seven more pop-up menus line the bottom of the Planet card (and most other Earthquest cards). Some of these serve as alternative navigation tools if you don't want to search the screen for hidden buttons; others provide access to different Earthquest treasures. The Quotes menu, for example, is like a small Bartlett's that gives you an eclectic collection of quotations.

(continues)



# MacAvenue Service Puts You On Easy Street

Buying Macintosh-compatible products has never been easier — or more worry free — than on MacAvenue. We give you unmatched service while you're making up your mind, when you place your order and after you get down to work. At MacAvenue, we build on the CompuAdd tradition of award-winning service. For nine years, CompuAdd has been helping people choose reliable computer systems. And we share that commitment. The result? MacAvenue is your best full-service resource for Mac products. Look how stress-free MacAvenue can be:

Every hardware product carried by MacAvenue is covered by a **30-day, no-questions-asked, money-back guarantee.**



If you have a problem with any MacAvenue product during the first **90 days**, we will replace the product with equivalent merchandise *and* pay for Federal Express shipping both ways.

The easy living on MacAvenue starts with a toll-free call to our **MacsFAX** information service. Dial 800-933-9002, punch in a product number, and we'll fax you a detailed spec sheet on any one of hundreds of products. Absolutely free.



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In most cases, we ship your order the same day you call. And for **only \$2**, we will send your purchase via Federal Express for next-day delivery.

Once you have your hardware or software up and running, you might have a question or two. Feel free to call. Just place a toll-free call to MacAvenue's **technical support** staff (800-766-6221). Problem with a particular program? Our technicians probably can bring the same program up on their screen and answer your questions in just a few minutes.

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871

**MacAvenue**

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# Choose MacAvenue's Protegé Line for a Great Picture or a Smooth Drive.

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Constant scrolling takes the creative joy out of graphic design — not to mention driving you crazy. And waiting for the screen to refresh can chase off the most ardent Muse. MacAvenue rescues you from the creative doldrums with a larger and sharper image of your whole design. No scrolling.

Our Protegé Display systems are value leaders in large-format Macintosh displays. Sharp screen images, flicker-free refresh rates and convenient ergonomic features such as a tilt/swivel base mean Protegé Displays are comparable to Apple and Radius products that can cost twice as much.

Berkeley Systems™  
After Dark and  
Now Software's™  
Now Utilities —  
**FREE!**

A \$258.95 Value!

The 15-inch, ultra-high resolution screen of the Protegé Full-page Display features a complete 8 1/2" x 11" page with no reduction of image size or quality. Complete with video card, it's only \$495. Or get a 2-page view with the 20" Protegé Dual-page Display for a mere \$895. Just to make sure you get full enjoyment from your Protegé Display, we bundle Now Utilities and the After Dark screen saver — **FREE!** For a

second opinion, ask **Bob LeVitus**, author of *Dr. Macintosh*, who says, "I love the crisp, bright image I get with a Protegé Display. And with the 30-day, no-questions-asked money-back guarantee, you just can't go wrong. I highly recommend the Protegé Display." Sure, other companies offer large monitors. But MacAvenue's prices let you actually take one home.

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How can we look you straight in the face and tell you we have the best hard drive on the market? Everyone knows that the heart of any hard drive system is the drive mechanism — and it's usually the same, no matter whose name is on the product.

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A \$259.90 Value

### Protegé Hard Drives

Capacity	External		Internal	
	Seagate	Quantum	Seagate	Quantum
20+MB	\$345	n/a	\$295	n/a
40+MB	\$395	\$455	\$325	\$349
80+MB	\$525	\$645	\$465	\$549
100+MB	n/a	\$695	n/a	\$599
200+MB	n/a	\$995	n/a	\$945

# MacAvenue™

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Four-time World Class and Eddy award winner! MacInTax is the best-selling tax product for the Macintosh. Loaded with new features for 1990! And MacInTax is the only tax product available that prints exact replicas of IRS forms and schedules on blank paper. Full integration with 13 optional state supplements.

MacInTax (SoftView). 28502.....\$59

# MacInTax

1040  
Personal  
Edition  
1990

### TIME AND PROJECT SCHEDULING

Clarix		
MacProject II v1.21	29740	\$366

### Communications

#### ON THE MODEM

Farallon Computing		
Timbuktu/Remote v2.0	27669	\$123
Hayes		
SmartCom II v3.2	27663	\$84
Microcom		
Carbon Copy Mac v1.04	27708	\$119
Microsoft		
MS Mail 20 Pack v2.0	27680	\$959
MS Mail Workstation	27676	\$83
Prodigy Services		
Prodigy Startup Kit	27726	\$27
Solutions Inc.		
Faxgate Plus	27712	\$237
SW Ventures		
Microphone II v3.0	27660	\$213



### Desktop Publishing Made Easy

Publish It! Easy 2.0 from Timeworks gives you high-end desktop publishing features at a low-end price. Word processing, graphics and page-layout features work on any Mac — Publish It! Easy doesn't require a hard drive, a MacUser Eddy award winner.

Publish It! Easy 2.0 (Timeworks). 29896.....\$145

Tops		
NetPrint v. 2.0	27686	\$115
Tops Network Bundle/DOS	27685	\$159
Tops Network Bundle/Mac	27682	\$188
Traveling SW		
LapLink Connectivity	27710	\$119

#### ON THE NETWORK

Dataviz		
MacLink Plus	27718	\$118
Farallon Computing		
Timbuktu v3.1	27667	\$95
Insignia Solutions		
Soft PC AT w/ EGA Add-on Module	27716	\$355
Soft PC v1.3	27714	\$245

### Education and Entertainment

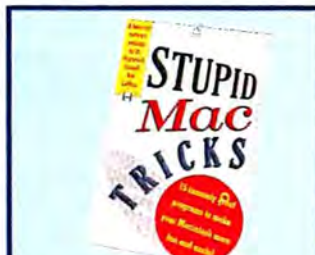
#### ON THE LEARNING CURVE

A Lasting Impression		
ResumExpert	28016	\$38
Broderbund Software		
Calculus v1.2	27964	\$57
Geometry v1.2	27962	\$57
Physics v1.2	27966	\$57
Typel v1.0	27958	\$18
Carina Software		
Voyager v1.2	28004	\$87
Davidson & Assoc.		
Algebra Plus	28042	\$37
Math Blaster Mystery	27970	\$27
Math Blaster! v1.0	27968	\$29
Goldstein & Blair		
Mac Bible, 3rd edition	28026	\$22
Mac Bible (Super)	28028	\$28
Great Wave		
KidsMath v1.1	27990	\$25
Individual SW		
Training for Pagemaker	28030	\$38
MECC		
Exploring Microsoft Works	28032	\$17
Number Munchers	28034	\$29
Word Munchers	28036	\$29
Sensible Software		
Sensible Grammar v1.6.2	28010	\$50
Simon & Schuster		
Typing Tutor	28008	\$28
Visionary Software		
Synchronicity v2.5	28040	\$39

#### JUST FOR THE FUN OF IT

Accolade		
Mean 18	28690	\$25
Stratego	28772	\$31
Activision		
Cosmic Osmo	28700	\$40
Manhole	28696	\$28
Manhole (CD ROM)	28698	\$34

Bob LeVitus		
Stupid Mac Tricks	28750	\$16
Broderbund Software		
Playroom	28770	\$32
SimCity Supreme (Mac II)	28680	\$47
SimCity v1.2	28678	\$28
Carmen San Diego Europe	28674	\$29
Carmen San Diego USA	28676	\$29
Carmen San Diego World	28672	\$29
Carmen San Diego Time	28774	\$29
Bullseye		
Fokker Tri-plane v2.02	28682	\$25
Casady and Greene		
Mission Starlight	28752	\$29
Sky Shadow	28754	\$29
Centron		
Casino Master	28758	\$38
Casino Master Deluxe	28760	\$43
Electronic Arts		
Bards Tale	28654	\$30
Chuck Yeager Flight Simulator	28656	\$30
Earl Weaver Baseball	28768	\$32
In-Line Design		
Bomber v2.0	28739	\$30
Sierra-On Line		
Kings Quest 1	28724	\$28
Kings Quest 2	28726	\$28
Kings Quest 3	28728	\$28
Software Toolworks		
Life & Death	28658	\$31
Spectrum Holobyte		
Faces	28766	\$24
Falcon v2.2	28614	\$30
Tetris	28606	\$20
Welltris	28604	\$19
Strategic Studies		
Reach for the Stars	28652	\$25
SW Toolworks		
Chessmaster 2100	28748	\$31
XOR		
MacGolf	28708	\$33
MacGolf Classic	28628	\$51
MacSki v1.0	28756	\$38
NFL Challenge v1.2	28630	\$54



### New Tricks for Your Mac

The Macintosh is fun to use, but a few Stupid Mac Tricks will make it even better. Use this book and the free disk to teach your Mac to make strange sounds and perform off-beat antics.

Stupid Mac Tricks (Addison-Wesley). 28750.....\$16

## Create Professional Animation

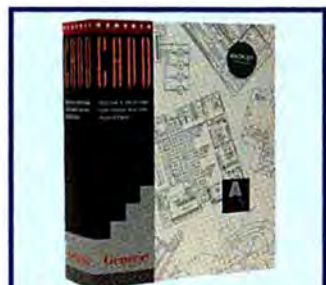
FilmMaker from Paracomp gives you professional-quality animation with features such as real-time control over position, scale and rotation of animated objects, as well as full-screen anti-aliasing. And with the help of FilmMaker, your presentations also will take on new power.

FilmMaker (Paracomp). 29900.....\$437

## The Graphic Arts

### MOSTLY DRAWING/PAINTING

Adobe		
Illustrator v3.0	29789	\$348
Photoshop v1.0.7	29266	\$498



### "Cream of the 2-D Crop" - Infoworld

Generic CADD from Generic Software gives you powerful computer-aided design features and sophisticated tools — all the tricks of the trade — at a price that's only a shadow of other CAD package prices.

Generic CADD (Generic SW). 29280.....\$372

Aldus		
Freehand v2.02	29784	\$326
Baseline		
Color MacCHEESE v1.05	29310	\$55
Clarix		
Clarix CAD v2.0	29207	\$639
MacDraw II v1.1	29204	\$291
MacDraw Professional	29205	\$291
Clarix MacPaint v2.0	29202	\$94
Generic Software		
Generic CADD	29280	\$372
Paracomp		
Swivel 3D Professional v1.0	29294	\$427

### GRAPHIC ART COLLECTIONS

Multi-Ad Services		
ProArt Holidays	29876	\$95
ProArt Sports	29878	\$95
Paracomp		
Swivel Art v1.0	29308	\$82

### MOSTLY GRAPHICS EDITING

Paracomp		
FilmMaker	29900	\$437

### PRESENTATION MANAGERS

Symantec		
More v3.0	30605	\$265

### CERTIFICATE AND AWARD GENERATORS

Broderbund Software		
Print Shop v1.31	29836	\$35

### GRAPHICS UTILITIES

Frame Technology		
FrameMaker Mac	29864	\$745

### DO IT YOURSELF PROGRAMMING

MicroSoft		
QuickBasic v1.0	27590	\$64
Spinnaker		
PLUS v2.0	27826	\$279
Symantec		
Just Enough Pascal v1.0	27582	\$48
THINK C v4.0	27586	\$163
THINK Pascal v3.0	27584	\$160

### OPTICAL CHARACTER RECOGNITION

Dest		
Recognize!	30640	\$479



# Customer Service is Our Most Important Product

## More Serial Ports



Expand your system's expandability. Applied Engineering's easy-to-install QuadraLink lets you add four additional serial ports to your Macintosh. Includes a "shadow driver" so that all the new ports will be recognized by virtually all software.

QuadraLink (Applied Engineering). 26917 .....\$205

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<b>Advanced Gravis</b>		
ADB MouseStick	25286	\$66
<b>DataDesk</b>		
Mac 101 Keyboard Platinum (Plus)	25185	\$134
Mac-101 Keyboard, ADB	25180	\$134
Mac-101 Keyboard Beige (Plus)	25181	\$134
SWITCHBALL	25183	\$98
SWITCHBOARD	25182	\$159
<b>Kensington</b>		
Turbo Mouse ADB	25281	\$107
Turbo Mouse Plus	25280	\$107
<b>MacAvenue</b>		
101 Extended Keyboard ADB	25186	\$99
<b>MicroSpeed</b>		
MacTrac (SE, II, IIGx)	25285	\$75
<b>Mouse Systems</b>		
Little Mouse	25283	\$75
Trackball ADB	25284	\$69
<b>Seiko</b>		
DT3600 Digitizing Tablet	23734	\$295

## ACCESSORIES

<b>American Power</b>		
UPS 110SE	26292	\$207
UPS 370ci	26294	\$337
<b>Applied Engineering</b>		
QuadraLink	26917	\$205
<b>Bernoulli</b>		
Bernoulli B33C 44MB Tape Cartridge	57804	\$95
<b>Calcomp</b>		
WIZ	26918	\$157
<b>Cover-Up</b>		
Diskette Wallet 10pk (alligator)	26909	\$7.50
Diskette Wallet 10pk (blue)	26910	\$7.50
Diskette Wallet 3pk (alligator)	26911	\$5.50
Diskette Wallet 3pk (blue)	26912	\$5.50
Mac Plus KB Skin (81 Key)	25780	\$14.95
Mac Plus KB Skin (w/ # Pad)	25781	\$14.95
Mac SE II 101 KB Skin	25782	\$14.95
Mac Plus/SE Dust Cover	26894	\$8
<b>Fellowes</b>		
Compact Personal Shredder P5 50	52655	\$119
<b>Inland</b>		
3 Mode Surge Protector	40505	\$14.50
<b>InnovativeTechnology</b>		
The Library (grey)	26903	\$12
The Library (black)	26905	\$12
<b>Interex</b>		
9 Pin Male to 9 Pin Male	26298	\$7.95
Keyboard Replacement Cable, 3ft.	26900	\$7
Mac 128/S12 to Hayes DB9 to 25pin, 6ft.	26281	\$7
Mac 128/S12 to Imgwtr DB9 to 25pin	26282	\$7
Mac to SCSI 25pin M to 50pin M 2ft.	26280	\$11
Mac to SCSI System Cable, 6ft.	26290	\$15
MacPlus Peripheral Adapter cable, 1ft.	26283	\$7
MacPlus, SE, II to Apple Modem	26284	\$7
MacPlus, SE, II to Hayes DIN8 to 25pin	26285	\$7
MacPlus, SE, II to Imgwtr DIN8 to 25pin	26286	\$7
MacPlus, SE, II to Imgwtr II DIN8 to DIN8	26287	\$7
Mini DIN-8 to Mini DIN-8 Null	26297	\$7.95
SCSI Terminator, 50pin M/F Daisy-Chain	26295	\$18
SCSI Terminator, 50pin male	26296	\$18
<b>Inwin Magnetics</b>		
External Tape Back-Up 5040/60	23832	\$529
External Tape Back-Up 5080/120	23833	\$719
<b>Kensington</b>		
Apple RGB Anti-Glare Filter	26891	\$62
Mac II Monitor Extended Kit	26899	\$32
Mac II Monitor Stand	25580	\$62
Mac II Stand and Cable Kit	26892	\$63



## A Better Network Manager

Technology Works' GraceLAN network management software profiles every device on your network without wearing out your blue suede shoes. Create a comprehensive report of software and hardware configurations, locate any conflicts and even find out which programs are used most often.

GraceLAN (Technology Works). 27750...\$375

<b>Kensington (continued)</b>		
Mac II System Stand	26887	\$20
Masterpiece Mac II	26893	\$103
SE Anti-Glare Filter (beige)	26882	\$32
SE Anti-Glare Filter (platinum)	26883	\$32
Security Kit	26884	\$33
System Saver Plus (beige)	26888	\$62
System Saver Plus (platinum)	26907	\$62
System Saver SE	26889	\$62
Tilt/Swivel Monitor Stand	25582	\$24
Universal Printer Stand	26896	\$16.95
<b>MacAvenue</b>		
Fuji Rainbow Diskettes-1.44M DS/HD	47496	\$15.95
Keyboard drawer	41753	\$19
Teak 3.5 Double Rolltop Box (90)	41601	\$29
Teak 3.5 Single Diskette Box (45)	41600	\$17.99
Teak Keyboard Drawer	41752	\$69



## DayStar Gives You Top Speed

When you're ready for serious high-end performance — 40 Mhz speed — you need DayStar Digital's PowerCache IIci. Plug in this turbo-charged cache card and your IIci will be the fastest Mac alive, faster than even the IIfx. PowerCache 40 MHz IIci with co-processor (DayStar). 23651...\$1167

<b>Pace</b>		
MacAvenue Carrying Case	26898	\$65
MacAvenue Carrying Case Extended Kybd	26901	\$76
<b>Sony</b>		
3.5 Diskettes 1.44MB 10PK	57440	\$24.95
Sony 3.5 Diskettes 800KB 10PK	57401	\$13.95
<b>Sophisticated Circuits</b>		
PowerKey	25030	\$64
<b>Tripplite</b>		
SpikeBar SK6-6	40510	\$22

## SOUND INTERFACES

<b>Articulate Systems</b>		
Voice Navigator II	23736	\$649
<b>Farallon Computing</b>		
Hyperdialer	26886	\$32
MacRecorder	23730	\$158
<b>Passport Designs</b>		
MIDI interface	23732	\$76

## Writing and Publishing

### WORD PROCESSING, WRITING

<b>Ashton-Tate</b>		
FullWrite Professional v1.5	30601	\$253
<b>Clarix</b>		
MacWrite II v1.1	30586	\$157
<b>Microsoft</b>		
Microsoft Word v4.0	30582	\$245
Microsoft Write v1.0	30584	\$77
<b>Nolo Press</b>		
WillMaker v4.0	29888	\$34
<b>WordPerfect</b>		
WordPerfect Mac v2.0	30591	\$234

### PAGE LAYOUT PUBLISHING

<b>Aldus</b>		
PageMaker v4.0	29781	\$497
<b>Clarix</b>		
SmartForm Designer	29200	\$291

### UTILITIES FOR WRITERS/PUBLISHERS

<b>DeltaPoint</b>		
Taste	30638	\$98
<b>Lexpertise</b>		
MacProof v3.2.1	30630	\$115
<b>Lifetree</b>		
Correct Grammar v2.0	30633	\$49
<b>Reference Software</b>		
Grammatik Mac v2.0	30634	\$50

### FORMATS AND FONT UTILITIES

<b>Adobe</b>		
Adobe Plus Pack v1.0	29834	\$119
Streamline v1.2	29268	\$225
TypeAlign v1.0.4	29826	\$58
TypeManager v2.0	29825	\$57
<b>Broderbund Software</b>		
Typewriter	30450	\$115

## Business Software

### INTEGRATED/BUNDLED APPLICATIONS

<b>Microsoft</b>		
Microsoft Works v2.0 w/ Quicken v1.5	30580	\$199

### ACCOUNTING/BOOKKEEPING

<b>ChipSoft</b>		
Turbo Tax	28500	\$51
<b>DAC</b>		
Easy Light Checkbook Accounting v2.0	28475	\$41
<b>Intuit</b>		
Quicken v1.5	28458	\$39
<b>Meca</b>		
Managing your Money v3.0	28463	\$139
<b>ProPlus</b>		
Wall Street Investor	28494	\$395
<b>Reality Software</b>		
WealthBuilder	28496	\$145
<b>Softsync</b>		
Accountant Inc. Professional	28481	\$345
<b>SoftView</b>		
if x: Personal Tax Analyst	28498	\$47
MacIntax 1040 Federal 1990	28502	\$61
<b>Software Toolworks</b>		
Dollars & Sense v5.0	28465	\$86
<b>Timeslips</b>		
Timeslips III v2.0	28504	\$196

### DATA ANALYSIS AND PRESENTATION

<b>Odesta</b>		
Data Desk v3.0	27818	\$458

### DATABASE

<b>Acus</b>		
4th Dimension v2.1	27780	\$489
File Force	27820	\$247
<b>Clarix</b>		
FileMaker Pro	27789	\$216
<b>Fox Software</b>		
FoxBase + Mac v2.1	27791	\$292



## Hold a Conference via Macintosh

With Aspects, up to 16 Macs can be connected for a real-time, interactive conference. This MacUser Eddy award-winning program lets everyone write text, create graphics or add notes from their own files so everyone in the group will have the information immediately. Saves time and money by linking Macs from across the street or across the country.

Aspects (Group Technologies). 27746...\$198

<b>Lotus</b>		
Marketplace	29904	\$525
<b>Microsoft</b>		
Microsoft File v2.0A	27798	\$123
<b>MySoftware</b>		
MyAdvanced Mailist	27816	\$27
<b>Preferred Pubs</b>		
Database	27834	\$67
<b>Sensible Software</b>		
Bookends v1.2	27830	\$50
<b>Ventura</b>		
Ventura Publisher v3.0	29906	\$582

### OFFICE PRODUCTIVITY PROGRAMS

<b>Microsoft</b>		
Microsoft Mail v2.0	30496	\$85
<b>Power Up</b>		
Letter Writer Plus v1.0	30440	\$54

### SPREADSHEET PROGRAMS/TEMPLATES

<b>Informix</b>		
Wingz v1.1	30184	\$245
<b>Microsoft</b>		
Microsoft Excel v2.2	30180	\$245



## NEW MacAvenue Software Paks!

### More Fun, Less Money

The MacAvenue Fun Pak includes 5 programs: Hitchhiker's Guide to the Galaxy, Leather Goddesses of Phobos, Crystal Quest, Solitaire Royale and Talking Moose. A \$299 value!

Fun Pak 29400 .....\$39.95

### Make Life Better

The MacAvenue Better Living Pak gives you Dinner at Eight (including The Encore Edition and The Weeknight Gourmet), QuickLetter, Synchronicity and Protector Shark. Six packages worth more than \$300!

Better Living Pak 29402.....\$49.95



## Hardware

### STORAGE DEVICES

Quantum		
10MB External Protege	24390	\$455
10MB External Protege	24391	\$645
05MB External Protege	24392	\$695
10MB External Protege	24400	\$995
10MB Internal - (llcx,ci)	24191	\$349
10MB Internal - (llcx,ci)	24192	\$549
05MB Internal - (llcx,ci)	24193	\$599
10MB Internal - (llcx,ci)	24196	\$945
10MB Internal - (SE-llx)	24188	\$349
10MB Internal - (SE-llx)	24189	\$549
05MB Internal - (SE-llx)	24190	\$599
10MB Internal - (SE-llx)	24200	\$945
agate		
10MB External Protege	24380	\$345
10MB External Protege	24381	\$395
10MB External Protege	24382	\$525
10MB Internal - (llcx,ci)	24184	\$295
10MB Internal - (llcx,ci)	24185	\$325
10MB Internal - (llcx,ci)	24186	\$465
10MB Internal - (SE-llx)	24180	\$295
10MB Internal - (SE-llx)	24181	\$325
10MB Internal - (SE-llx)	24182	\$465



### PowerKey to Mac Success

Power up your entire system with the touch of a key and turn it off with "Shut Down" using PowerKey from Sophisticated Circuits. Your computer and three peripherals plug in to PowerKey's four surge-suppressed outlets and a cdev allows you to set up a timed on/off and macro schedule for unattended operation. Bundled with QuickKeys Light.

PowerKey (Sophisticated Circuits). 25030 .64

Applied Engineering		
3.5 800K Floppy Drive	24735	\$205
High-Density 3.5 1.44K Floppy Drive	24736	\$239
Dayna Communications		
DaynaFile 1.2MB DF0200	24732	\$550
DaynaFile 360K DF0100	24738	\$519
DaynaFile 360K/1.2MB DF0102	24733	\$725
DaynaFile 360K/1.44MB DF0104	24737	\$745
Jijitsu		
800K Floppy Drive	24731	\$99
omega		
Bernoulli 40-40	24384	\$2195
Mac 1B Interface Kit	23834	\$48
Portable 44MB	24385	\$1429
ennect Technology		
360K 5.25 Drive	24740	\$299
Drive 2.4 (3.5)	24730	\$325

MacAvenue		
Protege HD Carrying Case	26908	\$24

### PRINTERS, SCANNERS AND FAXES

Adobe		
Postscript for IJ-II	38432	\$299
Complete PC		
Complete Page Scanner	22753	\$758
Dest		
Personal Scan w/ Recognize! Software	22762	\$699
Digital Vision		
Computer Eyes B/W	22758	\$196
Computer Eyes Color	22759	\$344
Dove		
DoveFax-External	22701	\$289
Epson		
ES-300C Color Scanner w/ I/F	22765	\$1824
Kodak		
M150 Mac Portable	22855	\$519
Logitech		
ScanMan 32	22751	\$319
MicroTek-IMS		
Microtek 3002 Color Scanner	22755	\$1945
Orchid		
OrchidFax Modem	22702	\$449
Relisys		
Telax RA2110	22700	\$895
Seiko		
Label Printer	22852	\$195
Labels for Seiko Label Printer	35623	\$11.99
Texas Instruments		
17 Font microLaser w/ ATalk board	22856	\$1595
17 Font microLaser XL w/ ATalk board	22858	\$2795
35 Font microLaser w/ ATalk board	22851	\$1795
35 Font microLaser XL w/ ATalk board	22859	\$3095
Envelope Feeder	23056	\$279
Legal Paper Tray	23057	\$59
microLaser Toner Cartridge	38311	\$46

### COMMUNICATIONS-MODEM

Applied Engineering		
DataLink Express w/ MNP-5/Send Fax	22312	\$239
DataLink/Mac w/ MNP-5/Send Fax options	22313	\$275

Global Village		
Teleport Modem	22311	\$134
Hoyes		
Smartmodem 9600	49578	\$899
MacAvenue		
2400 External w/o SW	49557	\$119

### COMMUNICATIONS-NETWORK

Asante		
MacCon+ IIE thk/thn	22538	\$395
MacCon+ IET thk/UTP	22529	\$395
MacCon+ SE30E thk/thn	22526	\$395
MacCon+ SE30E thk/UTP	22531	\$395
MacCon+ SE thk/thn	22525	\$295
MacCon+ SEET thk/UTP	22532	\$295
Dayna Communications		
EtherPrint	22541	\$375
Farallon Computing		
Liaison v3.0	27744	\$259
PhoneNET Connector DB-9	22511	\$31
PhoneNET Connector Din-8	22513	\$31
PhoneNET Repeater	22517	\$313
PhoneNET StarController	22516	\$824
Portable Pack	22519	\$329

MacAvenue		
LocalTalk connector DB-9 to Din 3	22520	\$32
LocalTalk connector Din-8 to Din 3	22521	\$32
Phone Connector DB-9	22522	\$23
Phone Connector Din-8 w/ cable	22523	\$25

Navotek		
Nuvolink II	22536	\$279
Nuvolink SC	22535	\$305
Shiva		
NetModem V.32 9600 baud	22528	\$1425
NetSeral K232	22504	\$275

Technology Works		
Mac II Ethernet Kit	22539	\$275
Mac II/10i Ethernet Kit	22540	\$275
Modem (thin)	22527	\$395



### Adobe™ PostScript for Under \$1600

The new 17-font T1 microLaser offers all of the features of the 35-font version — less 18 resident fonts. MacUser awarded the T1 microLaser 4.5 mice and said it "outperforms its competitors."

Texas Instruments  
17-Font microLaser 22856.....\$1595  
See listings for more microLaser options

### MONITORS AND VIDEO CARDS

MacAvenue		
Protege Dual Page Display w/ Mac II Card	22017	\$895
Protege Dual Page Display w/ SE Card	22015	\$895
Protege Dual Page Display w/ SE/30 Card	22016	\$895
Protege Full Page Display w/ Mac II Card	22013	\$495
Protege Full Page Display w/ SE Card	22011	\$495
Protege Full Page Display w/ SE/30 Card	22012	\$495
Micron		
Mac II 8-Bit 1024X768	23544	\$585
Mac II 8-Bit 640X480	23543	\$345
SE/30 8-Bit 1024X768	23542	\$585
SE/30 8-Bit 640X480	23541	\$345
RasterOps		
19" monitor w/ Color Board 708	22006	\$4550
Color Board 208	23538	\$375
Color Board 264	23531	\$575



### Wired for Performance

To build a high-performance network, you need the best cables. MacAvenue offers two of the most popular (and reliable) phone connectors to get your system wired. Take a look at the product listings for more MacAvenue cable options.

MacAvenue Connectors  
Phone Connector DB-9, 22522.....\$23  
Phone Connector Din-8, 22523.....\$25

Colorboard 264/SE30	23539	\$685
ColorBoard 364	23540	\$974
Grey Scale 19" monitor GS for Mac II	22007	\$1614

Seiko		
14" Color RGB	22002	\$595
20" Color w/ 8-Bit 1024X768 Mac II	22018	\$2770
20" Color w/ 8-Bit 1024X768 SE/30	22019	\$2770
20" Trinitron Color Monitor w/o card	22009	\$2395

Seiko/RasterOps		
14" w/ ColorBoard 208	22005	\$909
14" w/ ColorBoard 264	22001	\$1119

Sigma Designs		
Colormax 19" monitor w/ Mac II adapter	22000	\$4645
L-View Multi-Mode 19" w/ Mac II adapter	22008	\$1495
PageView 15" w/ Mac I adapter	22100	\$1050
PageView 15" w/ SE adapter	22101	\$999
PageView 15" w/ SE/30 adapter	22106	\$1050
SilverView 21" w/ Mac I adapter	22104	\$1599
SilverView 21" w/ SE adapter	22107	\$1599
SilverView 21" w/ SE/30 adapter	22103	\$1599

Sunkyoung		
Full Page Monitor	22010	\$349

### ACCELERATOR AND EXPANSION BOARDS

DayStar		
030 25MHz llcx w/ co 68882	23640	\$1499
030 33MHz llcx w/ co 68882	23641	\$1899
030 40MHz llcx w/ co 68882	23642	\$1999
030 50MHz llcx w/ co 68882	23643	\$2599
50MHz PowerCache ilci	23649	\$1995
Technology Works		
lci Cache Card	23648	\$269

### MEMORY EXPANSION

Applied Engineering		
1MB Upgrade for MacRam Portable Card	25488	\$359
MacRam Portable Card w/ 1MB	25487	\$499
Bay Electronics		
1MB T1 Laser Memory Upgrade	25489	\$159
Interex		
Tool kit, 3 pieces	26881	\$13.49
Technology Works		
2 X 1MB SIMM Kit 80ns	25480	\$104
4 X 1MB SIMM Kit 80ns	25482	\$208
4 X 4MB III/IX SIMM Kit	25490	\$1195
4 X 4MB III/IX SIMM Kit	25491	\$1399
4 X 4MB SIMM Kit 80ns	25481	\$1120
Mac Portable 1MB Upgrade Kit	25485	\$389
Mac Portable 3MB Upgrade Kit	25486	\$1195

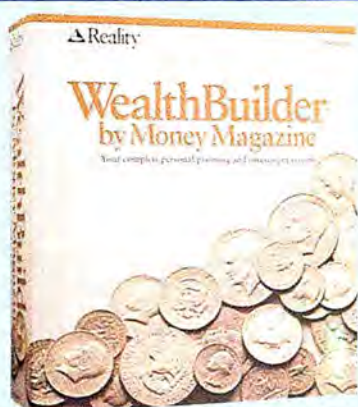


# Try MacsFax 800-933-9002

## Build Your Wealth

**WealthBuilder** by *Money* magazine will guide you through the stormy waters of financial planning and give you advice on investing, saving and strategic planning. You just ask questions, **WealthBuilder** has all the answers.

**WealthBuilder v1.0** by *Money* magazine (Reality Software). 28496.....\$145



## HP Printing Utility

**MacPrint** lets you print from any Mac application to the Hewlett-Packard LaserJet and DeskJet series printers as well as the Epson EPL 6000. Convenient Chooser-level driver selection provides straight forward Mac printing.

**MacPrint v1.2** (Insight). 30428.....\$94



## Safety, Maintenance and Repair Utilities

### DATA ORGANIZATION

**On Technologies**  
**OnLocation v1.0**.....30434 \$75

### DATA STORAGE, MANAGEMENT/REPAIR

**Baseline**  
**APB Express v1.0**.....30544 \$55  
**Central Point**  
**Mac Tools Deluxe v1.01**.....30365 \$79  
**Microcom**  
**911 Utilities**.....30550 \$92  
**Complete Undelete v1.0**.....30420 \$48  
**Salient**  
**Disk Doubler v3.0**.....30546 \$47  
**Symantec**  
**Norton Utilities for the Mac v1.0**.....30436 \$79  
**Sum II v2.0**.....30340 \$98

### SHORTCUT AND TIME SAVING UTILITIES

**Individual SW**  
**101 Scripts & Buttons**.....30426 \$35  
**Software Innovations**  
**HandOff II**.....30510 \$51

### SCREEN SAVER UTILITIES

**Berkley Systems**  
**After Dark v2.0**.....30425 \$24  
**Fifth Generation**  
**Pyro v4.0**.....30399 \$25  
**Ibis Software**  
**Protector Shark**.....30538 \$31

### VIRUS DETECTORS AND ERADICATORS

**Microcom**  
**Virex v2.7**.....30413 \$53  
**Symantec**  
**SAM v2.0**.....30342 \$63

### OTHER UTILITIES

**Abbott Systems**  
**CanOpener v1.1**.....30348 \$63  
**Baseline**  
**Talking Moose v3.0**.....28762 \$23  
**Broderbund**  
**SimEarth**.....28764 \$45  
**CE Software**  
**QuickKeys v2.0**.....30357 \$94  
**Custom Applications**  
**Freedom of Press Light v3.0**.....30554 \$58  
**Freedom of Press v3.0**.....30444 \$255  
**Fifth Generation**  
**Suitcase II v1.2.3**.....30402 \$47  
**GDT**  
**ParaLink Express**.....30548 \$99  
**Insight Development**  
**MacPrint v1.2**.....30428 \$94  
**Now Software**  
**Now Utilities v2.0**.....30498 \$75  
**Power Up**  
**Calendar Creator v1.0**.....30432 \$41  
**Letter Writer Plus/Address Book Plus v1.0**.....29404 \$85



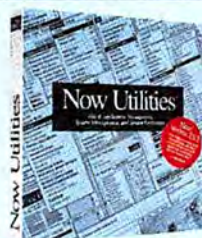
## CD-ROM Software

### ON THE LEARNING CURVE

**Wayzata**  
**US Civics**.....28012 \$79  
**World Factbook 1989**.....28014 \$79

### GRAPHIC ART COLLECTIONS

**NEC**  
**Clip Art 3D**.....29880 \$241  
**Image Fello**.....29882 \$244  
**Photo Gallery**.....29884 \$244  
**Type Gallery**.....29886 \$244  
**Wayzata**  
**US Seals**.....29304 \$55  
**Recognize!**.....30640 \$479



## 12 Utilities in a Single Box

Cut corners and streamline your Mac operations with **Now Utilities** from **Now Software**. For starters, you can customize your Finder, rename your inits or add a pop-up menu of most-used folders. Use a few of these handy utilities and you'll wonder how you got by without them.

**Now Utilities** (Now Software). 30498.....\$75

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## That's as easy as 1, 2, 3!

# 1

### 30-Day Money-Back Guarantee

Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

# 2

### Toll-Free Technical Support • 90-Day Product Replacement

If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 1-800-766-6221 weekdays from 8:00 am to 7:00 pm, CST. We will replace the item and pay Federal Express shipping both ways.

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For up to one full year after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product with which you are not completely satisfied, and we will pay for Federal Express return freight to you.

Everything at MacAvenue is designed to give you the affordable, reliable Macintosh products you want *when you want them*.

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If we have to split an order into two shipments, you will be charged only once for shipping. All orders under \$30 will be shipped UPS Ground.

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# MacAvenue





With all of the links between cards in Earthquest, it's easy to lose your way. The upper-right-hand corner of almost every screen contains a navigation control center for returning to the previous card or to the main menu. There's enough variety to keep kids (or adults) busy for hours—watching animated simulations of the ecological consequences of overpopulation; clicking on dynamic maps that show the geological phenomena and geographical boundaries of the planet; hearing snippets of other languages while reading about cultural diversity; learning about concrete actions we can all take to preserve the planet; and playing test-your-knowledge multiple-choice games. (As a bonus, the package includes a copy of the outstanding Global Warming stack created by Apple employees and given to Soviet President Gorbachev last year.)

### It's a Small World

In the sense that Earthquest promises the world, it sets itself up for failure. Packing all of human knowledge onto a handful of floppy disks is bound to result in some agonizing compromises. Musical morsels are unforgivably short; movies are simplistic; "simulations" are little more than animated snippets; explanations are often missing or superficial; places that look as if they should be buttons don't do anything. (Why on earth is the Bermuda Triangle the only button on the continental United States map?)

Earthquest is too big for many Macs. I had trouble installing it on a Mac Plus, and even after it was installed, I found that some of the features didn't operate properly. The company strongly recommends 2MB of RAM; I'd say it's a necessity. In short, Earthquest should be on a CD ROM where it wouldn't be subject to disk space limitations.

I found that, even on a beefed up Mac IIci, Earthquest occasionally froze the system, forcing me to restart.

### Down to Earth

Earthquest is available in lab packs for classrooms at substantial savings (\$350 for a 10-station site license and teacher-support materials). The program has tremendous potential as an enrichment tool for middle- and high-

school science and social studies classes. Students can use it for independent exploration and study; teachers can use it as a basis for class projects. Students and teachers can export maps and pictures to a Workshop, modify the artwork with HyperCard's paint tools, and print it. (Unfortunately, there's no option for exporting text via the Clipboard.)

Many educational tools are designed to help students understand the details of a discipline; few help them to see the big picture. It's hard to imagine how anyone could spend time exploring this stack and not come away with a deeper understanding of the home planet.—George Beekman

See Where to Buy or circle 624 on reader service card.



### Financial Planner

## WEALTHBUILDER BY MONEY MAGAZINE 1.0

**Pros:** Suggests investments based on your investment philosophy; attractive reports; videotape introduces financial planning concepts; excellent context-sensitive help system and on-line financial tutorial; handy financial calculators. **Cons:** Stock, bond, and mutual fund databases contain only 500 entries each; confusing interface. **Company:** Reality Technologies. **Requires:** Mac Plus; hard drive with 6MB free disk space; System 6.0. **List price:** \$249.95.



The essence of my financial plan has always been to make as much money as possible, save whatever I can without changing my life-style, and live and retire comfortably. My investment strategy follows similar lines. Pick a few stocks or mutual funds at random, and see what happens. Then I watch the stocks drop to 50 percent of their purchase value, hold them for 5 to 15 years in the hope that they'll come back, and sell them all the day before the start of the next great bull market. By comparison, Las Vegas is starting to look good. (At least I know the odds.)

The purpose of WealthBuilder by Money Magazine is to help you formalize the financial planning process

and come up with real, measurable objectives. The program forces you to set goals for budgeting, saving, and investing. It includes a database of stocks, bonds, and mutual funds that you can sort, filter, and compare in order to select your ideal investments. Over time, the program tracks your progress and suggests steps you can take to help achieve your goals.

### Setting Up

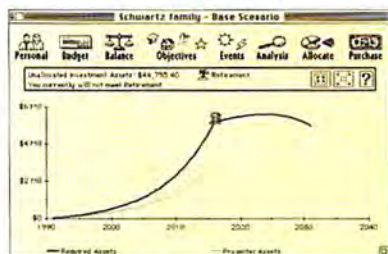
Before you can plan for the future, WealthBuilder needs to know how you're doing today. You enter basic information about yourself and your dependents, set up a monthly budget with typical expenses and income, and provide figures necessary to calculate your net worth. You must also specify an investment philosophy—somewhere between Very Conservative and Very Aggressive. WealthBuilder uses all this information to suggest an appropriate mix of investments.

Most people won't stop with calculating their net worth. That's not where WealthBuilder's power lies. The next step is to formulate some goals (Objectives), such as retirement or financing a child's college education. To set an objective, you fill out a simple worksheet. In the case of retirement, indicate how much money you'll need per year of retirement (in today's dollars) and which of your current assets should be earmarked for that purpose. There are several key assumptions that affect the program's projections, such as your age at retirement and life expectancy, the inflation rate, and whether you want to preserve or deplete your principal during retirement. Once you complete the worksheet, you can instantly see the likelihood of meeting your goal. The program's Timeline window shows what should happen if nothing in your financial situation changes (see "Timeline Window"). Objectives directly supported by the program are college education, buying a house, and retirement. There's also an option to set special goals, such as buying a new car.

### Building a Portfolio

Clicking on the Allocate icon lets you compare the makeup of your current (continues)





**Timeline Window** Icons in the Timeline window let you move into any major segment of the program. The graphic time line shows instantly the likelihood of attaining any specific financial objective.

portfolio with one suggested by the program. Based on your Investment Philosophy setting, the program tells you what percentage of equities, bonds, metals, and cash your portfolio should contain. You can also request a detailed suggested allocation and get a further breakdown of the types and dollar amounts of bonds, stocks, and mutual funds you should buy.

Assuming you're ready to make some investments, you can check WealthBuilder's Product list—detailed information on 500 stocks, 500 bonds, and 500 mutual funds. You can filter the list by showing only the ones judged most likely to produce maximum capital gains or long-term growth, and then select only the industries and sectors you're interested in. You can sort the information by a number of criteria, such as current price, beta, S&P ranking, or P/E ratio. As you identify investment vehicles of interest, you can perform additional analyses, producing comparative graphs of annualized, cumulative, or start-adjusted returns. You can also see how each of your picks has performed historically compared to key indicators such as the New York Stock Exchange, T-bills, and gold. Although WealthBuilder won't suggest specific stocks, bonds, or funds, it provides you with most of the information you need to make your own choices.

### Problems

For the most part, WealthBuilder looks and acts like a HyperCard stack. The Timeline window serves as the main menu, enabling you to get to most of the components by clicking on icons. The HyperCard analogy isn't carried far enough, though. The icons won't take you everywhere. Some actions can be

initiated from the Timeline window, some only from menus, and some from both places. Some items on the different WealthBuilder "cards" respond to clicks, and others are only highlighted by this action. Several dialog boxes have no Cancel option. If, for example, you click on the Special Objective icon just to see what it does, you have to choose the Delete Objective menu item to get rid of it. As with most programs, you adjust with experience, but the interface needs work.

WealthBuilder's database of mutual funds, bonds, and stocks might make you feel like you're missing something. Of the four mutual funds I hold shares in, only one is listed. For a larger set, you have to subscribe to one of the database update programs. In fact, if you're serious about investing, you should consider the updates a *must* buy.

Updates to the mutual fund and stock/bond databases are available on a subscription basis for \$99.95 each (plus shipping and handling) or \$174.95 for both. The updates expand the databases to include information on 1200 mutual funds, 4600 stocks, and 6100 bonds. A \$9.95 demo of WealthBuilder is also available and includes a copy of Money Magazine's Guide to Financial Planning and a \$10 rebate coupon for WealthBuilder.

Finally, although WealthBuilder produces a variety of beautifully formatted reports, you'll find that report printing doesn't work if Radius's Math INIT is present. If you generate a report with background printing switched on, the spool file continues to build in size until your entire hard drive is filled.

Most people I know are unsophisticated investors. Not only will WealthBuilder educate you in investment basics, it'll also suggest an appropriate mix of investments and track the progress made toward your financial goals. Of the product's shortcomings, all except the interface design can easily be remedied—just pull the INIT and buy the updates. If you've been looking for a financial program that can do more than just record investment transactions, WealthBuilder fits the bill. It's the financial program I've been waiting for.—**Steven Schwartz**

See Where to Buy or circle 715 on reader service card.

### Professional Flight Simulator

## ELITE PROFESSIONAL FLIGHT SIMULATOR 1.0

**Pros:** Realistic flight-instrument depiction; real-life navigation database; key-boardless user interface; accurate aircraft flight dynamics. **Cons:** Can't save state of simulation; can't print flight-path display. **Company:** AzureSoft. **Requires:** Mac II; 2MB of RAM; math coprocessor; 8-bit color display. **List price:** \$749.

**I**f flight simulators in the past were primarily entertainment, AzureSoft's ELITE (Electronic IFR Training Environment) is the first Macintosh flight simulator developed exclusively for flight training. A licensed instrument-rated pilot can use ELITE to satisfy most of the Federal Aviation Administration's (FAA) six-month recurrency training requirements, and a private pilot looking to obtain an instrument rating may soon be able to satisfy half of the required flight hours with ELITE-based simulator training.

### Not a Toy

AzureSoft—a subsidiary of Azure Technology, maker of aircraft navigation equipment—expects only serious pilots to use ELITE. The basic package simulates a simple IFR-equipped (Instrument Flight Rules) single-engine airplane, and includes software, a thin manual, and a Universal Controls Interface box that connects the Mac to separately purchased flight controls. The minimum Mac configuration requires a II-class CPU with a math coprocessor, 2MB of RAM, and an 8-bit color display. It runs best on a Mac IIcx or faster machine.

The flight controls—a yoke and optional rudder pedals—are needed to really fly the simulator. Without them (and the attendant interface box) ELITE lapses into a three-minute demo mode during which you can experiment with the controls and do some limited flying. You can use either the Maxx Yoke control wheel (\$99.95) or the more sensitive (and easier to use) FlightStick from CH Products (\$79.95).

(continues)



# The only other name you need to know.

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Along with Apple, we've listened to your demands for new products. That's why we continue to develop products that keep pace with the latest technology, including the new Macintosh Classic, LC and IIsi. For these new computers, we have developed upgrade solutions that allow dozens of economical memory and storage options with strict adherence to Apple specifications.

### Quality upgrades with more value.

Upgrade your new Mac with Microtech products that fit *your* needs. Add muscle with a new, high speed Europa™ internal Classic drive of 20, 50, or 100MB, or a Europa external drive of 20, 40, 80 or 100MB. The Europa Series is the perfect upgrade solution — built for economy without sacrificing quality.

Pump up the performance of your Mac with one of our new Io™ memory boards. Our 1MB board offers the flexibility of SIMM expansion. And if System 7.0 is in your future, our unique 3MB solution is a must.

For the convenience and portability of removable media, our R50, utilizing the reliable Ricoh mechanism, offers speed, flexibility and unlimited storage capacity.

### The Microtech name means quality.

For over 5 years, Microtech International has been setting the precedence in quality, service and support. Because we know what quality means to you — a product you can depend on, service you can rely on. Microtech products are backed by the longest warranties in the industry, and our service and support team, accessible toll-free, are winners of Macworld Magazine Service Hero Awards. Microtech also has an outstanding record for repairs in 48 hours or less, and our MicroLink BBS is available 24 hours a day.

So for quality, value, service and support in new Macintosh products, there really is only one other name you need to know... Microtech International.

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**MICROTECH**  
INTERNATIONAL, INC.



The optional Maxx Rudders give you rudder pedals, which might be useful for initial instrument training but which aren't really necessary if you're already an instrument-rated pilot.

Also available is a \$99 ELITE/SEL high-performance aircraft add-on, which simulates a "complex" single-engine aircraft with retractable landing gear and more-sophisticated navigation equipment. AzureSoft also offers a \$699 ELITE/Jet add-on, which simulates a DC-9 model MD-80 airliner, complete with radar altimeter, machmeter, turbine-engine instruments, and a fully programmable navigation system.

The basic package includes a navigation database for the San Francisco Bay Area, covering about 30 airports. You can purchase additional databases for any metropolitan area in the United States for \$50 each.

If you already know how to fly airplanes and understand IFR navigation, the skimpy manual is perfectly adequate. The manual briefly describes the ELITE setup, some basic operating procedures, the instrument panel, and the moving map display. It doesn't explain how to take off, navigate, find the destination airport, or land.

### Virtual Reality

ELITE is easy to operate, however, even if you're completely unfamiliar with the Mac. This is in part due to ELITE's stunning color instrument-panel presentation (see "The Captain's View"), but it's mostly the result of AzureSoft's decision to exclude any keyboard controls. You operate ELITE's cockpit the way you operate controls in a real aircraft: by reaching out and touching them (with a pointing-finger cursor). The instrument panel depicts all equipment with the same layout found in real aircraft, and with astonishing visual detail. Controls are three-dimensional and tactile. Buttons push, sliders slide, knurled wheels wheel. Annunciator and warning lamps illuminate with the same colors found in a genuine cockpit, and instrument faces show the same markings as the real instruments. Even the navigation radios provide audio morse-code identification on demand.

These are not Macintosh controls but real-life controls. For example, if

you slide off a button after pushing it and holding the pointing finger on it, the button activates, just as in real life. Similarly, pulling the landing-gear handle partway down leaves the switch in the partial position—the switch isn't snapped to a fully on or off position like Mac toggle switches.

This attention to detail makes ELITE immediately flyable by any pilot. With the control stick in your left hand and the mouse in your right, operating ELITE is natural and comfortable. You quickly forget you're flying a simulator and begin concentrating on the instrument panel and the view out the window.

The objective of IFR flying is to control the aircraft and navigate without reference to outside visual cues such as the horizon. With ELITE—just as in real instrument flying—you see two things outside: the runway when you take off and the runway again when you land. Shortly after takeoff you fly into the cloud ceiling and the windshield view goes gray, then hazy, then milky white. On final approach, you slowly descend out of the soup (at the preset cloud-ceiling altitude) with a realistically foggy, mist-shrouded view of the runway that gradually clears as you get closer. ELITE lets you practice your approach-transition technique, including an option to set a variable cloud ceiling that could force you to execute a "missed approach" procedure—another critical IFR training regimen.

The runway in the windshield on final approach is an authentic depiction of the actual destination airport's runway—right down to the runway

length and type of approach-lighting system. Even the Visual Approach Slope Indicator (VASI) lights—red and white lights on the side of the runway that indicate your approach angle—indicate the FAA-published approach angle. ELITE uses actual FAA navigation data for the airport latitude and longitude, runway configurations, navigation beacon frequencies, geography, airways, and intersections. This means you can navigate in ELITE airspace using standard-issue government maps and approach charts.

### No Airplane Does This

ELITE provides a moving map display that shows your current position, ground track, and (optionally) vertical flight profile. This display provides valuable feedback on your piloting technique, letting you see how closely your flying complies with FAA position and altitude rules. In addition, you can drag the aircraft's icon on the map display to any geographic location in the database and preset your altitude, heading, and airspeed—a feature that simplifies the repetitive practice of a troublesome approach procedure.

ELITE supplies an Environment control panel, from which you can set the turbulence level (from none to severe), wind speed and direction, cloud ceiling, visibility, and barometric pressure—all parameters that directly affect instrument flying. AzureSoft's attention to detail shows here, too: turbulence causes gauges to jiggle; wind direction and speed gradually change from the surface to your flight altitude; the cloud-ceiling altitude varies randomly; barometric pressure affects the accuracy of the altimeter if you forget to make a compensating setting on the altimeter itself. The Environment panel also lets you tag instruments for imminent failure—at some random future time. When an instrument fails, it behaves just as it would in a genuine failure—giving somewhat inaccurate readings before going dead as a doornail.

### Kudos and Caveats

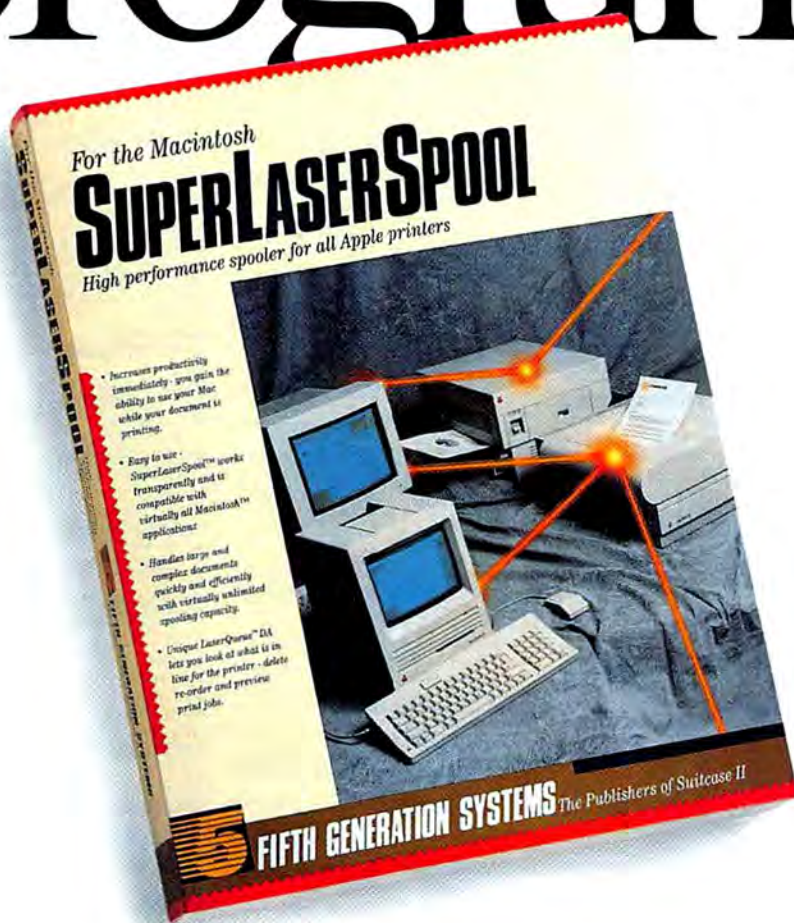
ELITE's best features are its excellent navigation database, high-quality cockpit imagery, and keyboardless direct-action interface. If anything, ELITE (continues)



**The Captain's View** This view of the final approach to San Jose International (SJC) runway 30L is exactly what you'd see in a real aircraft making an actual instrument approach into SJC, right down to the radio frequencies, runway heading, and approach-lighting configuration.



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is harder to fly than the aircraft it simulates, thus ensuring a good workout for any pilot. During my extensive testing—including actual recurrency training logged as legal flight time—I encountered only one bug (a mountain where it shouldn't have been); AzureSoft says the bug will be fixed by the time you read this.

However, ELITE's minimalist manual may be its weak point. And the moving map display—perfect for training—lacks a provision for making a permanent printed record. A print-out would be invaluable for student/instructor review, and although I did get a printable screen snapshot using the shareware utility Flash-It (version 1.3, by Nobukazu Toge), that's hardly a convenient procedure.

I also found myself wanting to save the state of the simulation. ELITE has a pause button that lets you temporarily suspend flight, but you can't quit the simulation and then resume where you left off. Neither can you call up a preset position—say, the final approach into San Jose International runway 12R. If you want to repeatedly practice an approach, you must set it up manually each time. Finally, while ELITE runs under MultiFinder, you can't leave ELITE without quitting the application because ELITE takes over the entire Mac interface, including menu bars and the keyboard. This isn't a serious problem, but AzureSoft should document the limitation.

As an instrument-rated pilot constantly struggling to keep up with the FAA's six-month recurrent training requirements, I found ELITE competed favorably with the \$30,000 analog simulators typically used for IFR training today. Such simulators rent for \$20 to \$50 per hour. If you train in a real aircraft (at a cost of \$70 or more per hour) you'd recover your \$749 investment in ELITE in less than two years.

According to AzureSoft, ELITE may soon qualify as the first personal computer-based primary-instrument flight trainer, making it eligible for initial instrument training as well as recurrency training. ELITE, which also runs on 386-based IBM PCs and compatibles, truly opens the door to low-cost, PC-based instrument flight training. —Mel Beckman

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★  
Portable Hard Drives

## LA CIE TSUNAMI 80-Q

**Pros:** Small; portable; value-added software included. **Cons:** Limited manual; SCSI screws come loose. **Company:** La Cie, a Plus Development company.

**Requires:** Mac Plus. **List price:** \$799.

## LIBERTY 80

**Pros:** Small; portable; no fan needed.

**Cons:** Uses larger connector than SCSI; troublesome daisy-chaining; very limited manual.

**Company:** Liberty Systems.

**Requires:** Mac Plus. **List price:** \$899.



Liberty Systems and La Cie are vying for the lightweight championship of hard drives.

Liberty Systems points out that its drive is smaller than the Tsunami, and that's true. Both weigh in at 80MB, but the La Cie measures 8 by 6 by 2 inches while the Liberty 80 measures 7 by 5 by 2. The Tsunami 80-Q and the Liberty 80 are both easily transportable. The Liberty 80 fits into a briefcase easily and squarely. The Tsunami 80-Q is somewhat harder to pack in such a small space because of the ridges on the side and the cylindrical vent on the front. If you don't need to transport



La Cie Tsunami 80-Q, Liberty 80

the drive a lot, however, the size difference shouldn't matter. The heads autopark when you turn off the units, and the drives perform well when you hook them up again.

Both units have mechanisms built by Quantum, so there is little performance difference. In tests conducted using the SCSI Evaluator program, both drives had an average seek time of 22 milliseconds. Liberty claims access times of 12ms to 19ms while La Cie refers only to "access times as fast as 15ms" for its entire line of drives, from 20MB to 210MB.

The Liberty unit has the company's phone number prominently displayed on the FCC sticker—a great idea. If you have a problem with the drive, you don't have to go fishing through mounds of owner's manuals.

One definite advantage of the Tsunami is that it comes packed with value-added software including Symantec Utilities for Macintosh; The Norton Utilities for the Macintosh (also from Symantec); La Cie utilities; a Wingz test-flight (demo) from Informix; and a whole array of shareware and public domain programs, games, and utilities.

I had trouble daisy-chaining the Liberty drives. This was partially due to the fact that the Liberty 80 has industry-standard Centronics jacks (so it can be used on a wider variety of computer platforms); the Tsunami 80-Q has the Apple SCSI jacks (the Liberty 170MB and larger drives all have SCSI connectors). I also had a problem when I removed the SCSI cable to switch drives—a piece of the hard drive fell out. It wasn't too serious, only the socket for the screw that

(continues)

## BENCHMARKS


	Tsunami	Liberty
Seek Time	22 ms	22 ms
Read Average	5329	5096
Write Average	4379	4155


Seek time is the time taken to move the head of a hard drive from one track to another (averaged over 10,000 seeks). The average includes the time it takes to move the head after receiving the seek command from the CPU and the time it takes for the head to settle on the data on the destination track.


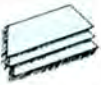

Read and write averages (represented here in kilobits per second) are the average rates of transferring different-sized blocks of data from the hard drive to the CPU (read) and from the CPU to the hard drive (write).

All benchmarks were performed using SCSI Evaluator, a shareware utility by Digital Microware.




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tightens the SCSI cable, but it was a surprise. I screwed it back in as tightly as I could, but it kept coming loose.

Some people complain about technical support from La Cie, but I had no difficulty—once I actually got to talk to someone. I called the company and was told all the tech support people were busy and that someone would get back to me. Several hours later, a very helpful tech support person called.

Liberty's technical support is somewhat faster than La Cie's. When I called, I was instantly in touch with a tech support person, who worked with me to solve my problem.

Overall, the Liberty 80 and the Tsunami 80-Q drives are excellent investments. Their small size makes them very transportable—you can carry them over your shoulder like a Walkman or slip them easily into luggage—and their speeds won't make you wait for data. With their small size and big volume, it would be hard to beat these drives.—**Shawn Tomlinson**

See Where to Buy or circle 658 (La Cie Tsunami 80-Q), 662 (Liberty 80) on reader service card.



#### Apple File Exchange Translators

### SOFTWARE BRIDGE MACINTOSH 1.0

**Pros:** Transfers and translates files in one step. **Cons:** Supports only current versions of word processors; doesn't support Microsoft Word's Fast Save format. **Company:** Systems Compatibility Corporation. **Requires:** Mac 512K; hard drive; Apple File Exchange; Super-Drive, or other means of transferring files. **List price:** \$129.



Since October of 1987 Apple has included Apple File Exchange (AFE) with every version of system software as a means of transferring files to and from IBM PCs and other machines. AFE requires translators to convert the files first. Apple supplies a few, but it's generally left up to third-party developers. Systems Compatibility's Software Bridge does just this.

Software Bridge Macintosh translates documents created in Microsoft Word 4.0, MacWrite II 1.0, WordPerfect

1.0, and 3 other Macintosh text formats (ASCII, DCA/RTF, and Microsoft RTF) to and from 24 PC word processing formats. Translators are also included for exchanging files among the 3 Macintosh word processors. At press time files in Microsoft Word's Fast Save format could not be translated, although an upgrade is supposed to fix this. A workaround to the problem is supplied in the Read Me file.

#### Enhanced Exchange

Software Bridge Installer, which you must copy into the Apple File Exchange folder, is a utility used to install translators for use in AFE. To do this you first select a source format and then select destination formats. Your choices are added to a scrolling list labeled Translators (see "Instant Installation"). The only wrinkle in this simple process is that you must ⌘-click to select or deselect multiple items, rather than Shift-click.

With the appropriate translators installed, all that remains is to launch AFE and begin translating. This is no more complicated than navigating a few scrolling lists. Instructions for using AFE are included with the documentation accompanying the Mac's system software, as well as in the Software Bridge manual.

When a PC is the source or destination, the easiest way to transfer files is through the SuperDrive, Apple's high-density floppy disk drive. When used with AFE, instructions in the Mac's ROM let this drive read DOS files on DOS-formatted 3½-inch disks.

Working on a 386SX clone, I created a PC Word 5.0 file that contained codes for centering, bolding, italics, underline, strikethrough, justification, margins, indents, tabs, superscript, subscript, plus a footnote and various point sizes. I transferred the file via the SuperDrive, then translated the document into the three Macintosh word processors supported by Software Bridge Macintosh, and opened each file in turn. In each case, all of the formatting was retained. A Mac Microsoft Word-to-PC WordPerfect translation was equally successful, except for the font, which wasn't available to the PC. Graphics can only be transferred with a Mac-to-Mac file transfer, but I succeeded in making both a WordPerfect-



**Instant Installation** Installing translators in Software Bridge is easy once you remember to ⌘-click to select and deselect multiple items. Here the MacWrite II translators are added. The translators are available to the user when Apple File Exchange is launched.

to-Word and a Word-to-MacWrite II graphics translation.

#### Talented Transfer

Software Bridge outperformed Word for Word Mac, another file-transfer program (see *Reviews*, *Macworld*, December 1990). Word for Word Mac has translators that Software Bridge Macintosh doesn't have (notably one for translating PC Excel files for use in Mac word processors, plus several versions of ASCII), but Software Bridge is easier to use because it completes transfer and translation in one operation. Word for Word Mac, in contrast, assumes that you've already transferred the files you're going to translate.

Software Bridge supports only the current versions of Microsoft Word, MacWrite II, and WordPerfect. People with documents written using an earlier version, or who use WriteNow, Nisus, FullWrite Professional, or other word processors will have to look elsewhere, or first translate their files to ASCII. According to the company, translators for Word 3.02 and WriteNow may be the next produced for Software Bridge Macintosh.

Finally, although the packaging claims, in underlined copy, that Software Bridge will make "exact" translations, the manual denies that it can perform this feat. And to make the point clear, 17 of the manual's 64 pages contain listings of things that the translators can't translate such as some font-dependent Mac characters, and (except in Mac-to-Mac transfers) outline and shadow-formatted text. Even so, most users will be happy with the good document translation that Software Bridge delivers.—**Philip Bishop**

See Where to Buy or circle 702 on reader service card.



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★  
Scientific and Business Graphing

## MACGRAPHX 1.0

**Pros:** Fast, flexible graphing program; superior interface and data-import extensions. **Cons:** No exotic chart types.

**Company:** Bravo Technologies.

**Requires:** Mac Plus; System 6.0.3.

**List price:** \$199.



A new graphing/charting program for the Mac world better have a pretty good excuse for existing. Not only have the charting capabilities built into spreadsheets improved since the first releases, but there's no shortage of competent graphing packages for both business and science. Into this crowded market Bravo Technologies, developer of the spreadsheet MacCalc, has now introduced MacGraphX. Amazingly enough, Bravo has found a way to distinguish itself, chiefly by offering speed and interface advantages over its competitors.

## Seven Easy Pieces

At first the MacGraphX package seems Spartan. It gives you seven standard chart types: scatter, line, area, bar, stacked bar, and pie charts, as well as a "table" chart. It does, however, let you play a few tricks to expand this humble list. A transpose function sets the bar charts sideways (giving the type of chart other programs call column), and simply holding down Shift when selecting a new graph from the Graph menu lets you overlay any of the graph types. Since overlaying lets you mix line and bar charts, for example, you can generate more chart types, and using transformations of variables (logarithms and most arithmetic functions, as well as financial functions, are available) you can produce more types yet. There's no obvious way to make the equivalent of polar charts, but with a little labor you can produce most of the charts listed as separate types in other programs.

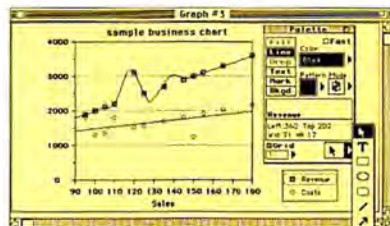
The workarounds for chart-type proliferation are evidence that Bravo thinks it's more important to do a good job on the basics than to provide a huge fixed menu of charts, and convenience in charting basics is

MacGraphX's real strength. All the chart elements are independent objects; all the objects can be manipulated directly through menu commands rather than dialog boxes; and the graphic aspects of all the objects can be manipulated even more quickly using the Palette tool kit in the charting window (see "Little Helpers").

To create a chart, you enter data or import tabbed-text, WKS, SYLK, Excel, or MacCalc files into MacGraphX's spreadsheet-style format. You then select an x-axis data set (the cursor becomes a little horizontal bar) and some y-axis data sets (the cursor changes to a vertical bar), drag to select the data you want to graph, and choose a graph type; the program pops open a window with your graph. For creating basic chart types, the program is two to six times faster than Excel, DeltaGraph, or CA-Cricket Graph. To modify a graph, simply click on any graph element to move it around, or double-click and a dialog box appears where you enter and change Data. Redraw speed is more than just a convenience: as you step through the process of axis scaling, major- and minor-grid tinkering, and text adjusting needed to transform an on-screen plot into publication-ready hard copy, you find that MacGraphX saves you serious amounts of time. Furthermore, the interface is "expectation-friendly"—the features are self-explanatory and work exactly the way you expect. It's simple to get final output looking exactly right.

## Down to Business

For tailoring black-and-white laser-printed graphics for publication, Mac-



**Little Helpers** MacGraphX has put all its color-modification capabilities into a palette rather than menus or dialog boxes. The Fast check box lets you turn off backgrounds for faster screen redraw. That's a little selection of drawing tools at lower right in the figure, and a cubic spline fit through the upper data set!

GraphX is a clear leader, and you can edit its output easily with the Palette tool kit to take advantage of color printers (the program takes no explicit notice of the existence of plotters). MacGraphX also produces a superior version of the graduated color fills popular in business presentation graphics, and it offers letterhead and layout features for producing standard graph templates and for publishing groups of charts. Business users who have grown to love exploded pie charts, 3-D bar charts, and scalable elements, however, will be disappointed to find these favorites missing. The reason for their absence is revealing. Most authorities on the graphical display of data maintain that these tools lend themselves readily to misrepresentation of relative quantities. Bravo, in a display of purity of intent that will win applause from Edward Tufte and graphing authorities everywhere, if not from this month's sales manager at G-Whizz Products, specifically declined to include them (shadowed bar charts are the only concession to 3-D glitz).

This otherworldly approach to marketing is apparent in other MacGraphX features as well: file format specifications are included in case you have a special format you need to import, and C language files are provided to assist you in developing extensions to MacGraphX's basic curve-fitting and statistical capabilities. This open data architecture is likely to appeal to graduate students who want to automate parts of their thesis production, but it might not be immediately valuable to the user who needs a market-projection chart by 9:00 tomorrow morning.

If you find yourself occasionally spending hours tuning up sets of graphs, you are going to like MacGraphX. It is not only faster than competing products, but many refinements in its interface make it a pleasure to use. It doesn't have a large range of built-in graph types, but the graphs themselves are remarkably easy to modify. Designed in close adherence to the most enlightened current thinking about data display, it's worth a close look if you're serious about graphing.—Charles Seiter

See Where to Buy or circle 664 on reader service card.



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# WINDOW SHOPPING

by Lawrence Stevens

*This month I look at tutorials, floppy disk catalogers, and list managers*

## Algebra I Homework Tutor 1.9.4

Algebra I Homework Tutor (\$99.95 from Missing Link Software) is the best algebra tutorial program I have seen. First, it works with algebra problems that the student types in from his or her own textbook. Second, it can generate an unlimited number of random algebraic problems.

The software includes an editor for entering algebraic notations. After a student enters an algebra problem and begins typing the steps leading to a solution, the program automatically evaluates each step. The tutor enters a single check if the step is correct; an  $x$  if the step is incorrect; a check and a question mark if the step could eventually lead to the correct solution; and a double check for the correct solution. The student can request a series of hints to help find the solution at any time.

To create random problems (for use without a textbook), the student first selects the type of problem (Laws of Exponents, Monomial Operations, Multiplying Binomials, and so on), then chooses from a number of options (With Integers, With Decimals, Inequalities), and finally clicks on a difficulty level (Easy, Medium, or Hard).

The ability to generate an unlimited number of problems puts Algebra I Homework Tutor in a class by itself.

## Alge-Blaster Plus 1.0

Alge-Blaster Plus (\$59.95 from Davidson & Associates) doesn't work along with a student's textbook—in effect, it is the textbook.

Alge-Blaster Plus presents a series of lessons that teach basic to intermediate concepts of algebra. It includes examples, a graphing module, and an algebra game.



Alge-Blaster Plus lets students work at their own pace and needs little teacher involvement. Some instructors might prefer this approach over a traditional textbook whose problems must be graded by the teacher.

## Your Personal Trainer for the SAT 1.0

Scholastic Aptitude Test (SAT) scores can be improved when students are taught strategies for finding solutions to different types of test problems and are given a chance to practice on

sample questions. Your Personal Trainer for the SAT (\$59.95 from Davidson & Associates) includes dozens of hints for obtaining a higher score, provides plenty of example questions, and has charts for tracking progress.

There are five sections to this package. The Assessment section lets the student take a practice verbal or math SAT test under timed conditions. Unfortunately, the student has to read the test questions in the book that comes in the package and mark the answers on the screen. The program, however, gives an immediate score and recommends areas to practice.

The Vocabulary, Reading, and Math sections display sample questions, one at a time, along with general hints on how to find the answers.

The final section is a game in which you try to capture blocks before they disappear by answering questions about test-taking strategies.

Your Personal Trainer for the SAT provides 40 hours of instruction, which is about equal to an SAT course. While nothing can substitute for a teacher, Your Personal Trainer for the SAT is the next best thing.

## Professor Mac 1.7

Spend a couple of days with Professor Mac (\$49.95 from Individual Software) and you'll be familiar with Mac hardware and software. Professor Mac vocalizes many instructions and is virtually idiot-proof; it lets you practice with real menu items such as Cut and Paste but doesn't allow you to make a mistake (see "Mac Practice"). Professor Mac covers all basic Mac operations, such as creating folders, as well as intermediate topics, such as Font/DA Mover and the basics of HyperCard.

Like most tutorials, Professor Mac doesn't allow you to skip around. But *(continues)*



**Making Algebra Fun** Alge-Blaster combines algebra practice with the thrill of a video game. Students enter coordinates in the boxes on the right to erect barricades to prevent the bomb from hitting the edge of the game area and exploding.



if you like the disciplined approach, the program can help you learn how to use a Mac.

### MusiCard Maker 1.0

MusiCard Maker (\$49.95 from Intelimation) helps you produce handsome musical notation on cards in a HyperCard stack. The program provides a tool for virtually every musical symbol: notes, bowing symbols, clefs, rest signs (see "Point-and-Click Musical Notation"). You select the appropriate tool from a palette, and a simple mouse-click places the symbol where you want it. Standard HyperCard tools such as the lasso, eraser, and text tools are included.

The program plays any note or melody you enter on the screen, but each screen holds only a few notes. MusiCard Maker, like most HyperCard applications, is excruciatingly slow. After you click on the location where you want a symbol, you have to wait five seconds for it to appear.

If you need to display a short, difficult musical passage, create flash cards for memorizing bars, or design displays for a music class, MusiCard Maker is excellent, but it can't replace paper and pencil or a MIDI system for composing or notating long passages.

### MacPhoneBook 3.0

MacPhoneBook (\$49.95 from Synex) allows you to create center-stapled hard-copy phone books with printing on both sides of a page. Three black covers are included with the program.

The program includes both a DA and an application. The DA allows you to find and add names as well as dial a number using a modem or automatic dialer. Using the application, you can sort a list according to any field or category, print labels, or export a text file.

There are some disadvantages: you must enter each piece of data (first name, second name, and so on) in a separate field—a needless tedium if you never expect to sort by field. And if you need sophisticated Boolean searches, automatic elimination of duplicates, or other high-end database features, you won't find them here.

### MacList 1.5

MacList (\$79 from JAM Software) can, like MacPhoneBook, be used as an



**Mac Practice** Professor Mac provides practice along with instruction. After reading the information on this card, you have an opportunity to move the icons around using the mouse pointer.



**Point-and-Click Musical Notation** Each tool at the left of this screen in MusiCard Maker lets you enter a musical symbol. Many of the tools include submenus. For example, the note tool (third one down) allows you to select from any type of note.

address book. But it's better to think of MacList as a database application. MacList allows you to find names using a Search facility and dial a telephone number using a modem or automatic dialer.

This DA is set up in rows and columns. As in Excel, you can change the size of columns, delete or add rows or columns, sort by up to three column headings in ascending or descending order, and calculate the sum of any column or row. MacList, however, lacks many of the spreadsheet features that make list manipulation easy. You cannot delete by category, eliminate duplicates, use mathematical operators such as the greater than symbol (>) in searches, or use data entry shortcuts such as Fill Down. But MacList is excellent if you need a cost- and memory-effective means of list manipulation.

Possibly the best use of MacList is to store data that you later export to a spreadsheet for manipulation. The program automatically uses the data in the top row as headings when you import. With MacPhoneBook, you have to enter headings manually.

### Offline 1.01

Offline (\$79.95 from SNA) allows you to catalog floppy disks so that you can view their contents without inserting them into the drive. You can search for files by name, type, or creator. The program also automatically generates labels for all cataloged disks.

Offline is similar to Cataloger (reviewed here in February). Cataloger, however, represents disks by disk icons, and it has a View menu with exactly the same options as the Finder's View menu has. Cataloger also has a few more searching options than Offline, including the ability to search for files that were modified before or after a particular date.

But the main difference between the two products is price—Cataloger is about half the price of Offline.

### Disk Accessory Plus 1.0

If you only want to print labels for floppies instead of creating an on-screen catalog, Disk Accessory Plus (\$10 from Vertical Solutions) is a cost-effective option. In what is probably one of the best values in commercial Mac software, this \$10 program automatically creates floppy disk labels with all the file and folder names on the disk.

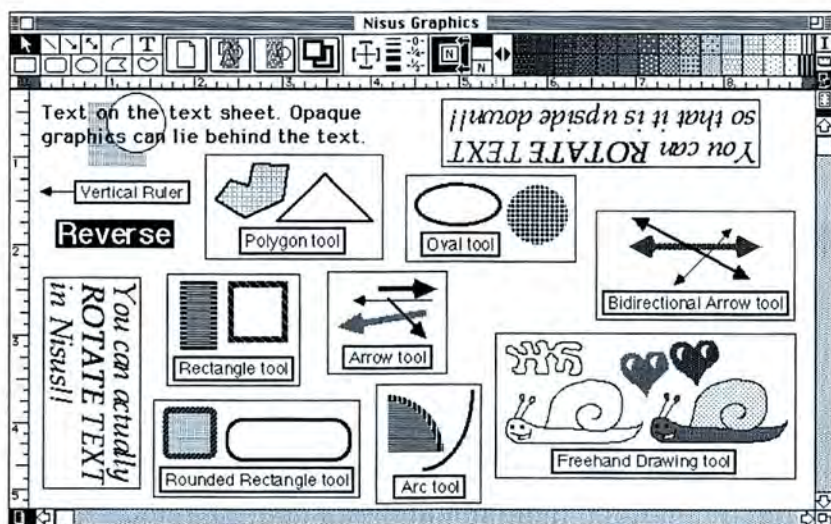
Despite its price, Disk Accessory Plus has all the features you need: you can print the names of all files, all folders, both, or just the title of the disk; you can add or delete text on the label; you can insert an icon or PICT graphic; and you can print the disk name upside down on the spine (the area that folds over the edge of the disk).

The program even lets you perform some housekeeping duties such as duplicating, erasing, and formatting disks without using the Finder.

Vertical Solutions plans to release a new \$10 software package every quarter (if you return the plastic case, included with your original disk, you will receive 50 percent off your next purchase). Disk Accessory Plus is a welcome first entry in what I hope will be a series of good low-cost utilities for the Mac. ■

See Where to Buy or circle 605 (Algo-Blaster), 676 (MacList), 677 (MacPhoneBook), 685 (MusiCard Maker), 693 (Professor Mac), 716 (Your Personal Trainer for the SAT) on reader service card.





## If a picture is worth a thousand words, then why not use a word processor that processes pictures too?

Nisus® lets you communicate the way the Macintosh works—with words and graphics

Most people aren't really interested in whether a program is a word processor, a graphics program, or a page layout program. All they really want to do is communicate.

Sometimes, something as simple as a note with an arrow attached is all you need to make your point. Other times, a little grey background behind some text seems more appropriate. The tools you need to communicate come built into Nisus, or you can place a PICT graphic like the features list on the right.

You can "Place" any page of a Nisus file containing text and graphics into another Nisus file where it becomes a picture called a "Placed Page Graphic." Double clicking this "Placed Page Graphic" will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text, giving you total control.

Nisus lets you rotate text, which is very important if you are designing a self-mailer that folds into three panels. Nisus also enables you to print two pages up—pamphlet style. So, for example, suppose you want to print two pages on a single 8 1/2 by 11-inch sheet of paper turned sideways. You can do it with Nisus by a simple selection. Perhaps more important, however, is that this same command will collate your pages—in an 8 page document, for example, page 1 and

### CIRCUIT DIAGRAMS IN A NISUS® DOCUMENT

This is a Laser TechFont® diagram. As you can see you can put a complicated diagram directly into your document. In this case the diagram was drawn using specialized "draw" circuit fonts, along with the Scientific text fonts. These special fonts allow you to design a schematic quickly, using a draw or paint program, or a word processor with integrated graphics, such as Nisus®, the amazing word processor from Paragon Concepts, Inc.

FIGURE 1A

### SCIENTIFIC EQUATIONS WITHIN A NISUS® DOCUMENT

This is a section of Laser TechFont® within a Nisus document. The first part of the equation,  $\frac{1}{2}x^2$ , is an example of the Fractio font, which allows a fraction to be typed in one line of text. The exponent 2 in the numerator of Fractio is superscripted. The second part of the equation,  $(x^2 - y)^3$ , is an example of the Scientific font, with the exponents 2 and 3 in the SuperScientific font.

You can type equations into Nisus using Laser TechFont®, and then put boxes around them. These boxes, drawn using the Nisus graphics palette, call attention to examples and formulas. This feature is perfect for writing manuscripts, exams and study guides.

FIGURE 1

page 8 will lie next to each other!

If you're new to the Macintosh word processing market, you probably want a word processor that is easy to use. If you've been around for a while, you undoubtedly want a powerful word processor. Chances are you have tried either MacWrite or Microsoft Word. 4.0. One is easy to use, the other offers power. Both, however, have severe limitations which is why we developed Nisus in the first place.

Nisus has a built-in word processing language which does for word processing what built-in languages do for databases. For example, the language allows

you to develop routines to index all proper names, a method to find and correct all double words, periods, and extra spaces, or index every word in a document except those you specifically want to exclude. You choose the features.

Discover why Nisus is shipped with every Macintosh in Korea, why MacUser U.K. named Nisus "1989 Best Word Processor," and why Macworld Australia uses Nisus as its word processor of choice.

This two column format above is actually a separate Nisus file placed into the master file. This gives you total control over how you layout a Nisus document.

Nisus Feature Comparisons	NISUS 3.0	Word 4.0	WriteNow	MacWrite II
Built-in word processing language (GREP & macros)	■			
Noncontiguous text selection	■			
Unlimited column formats	■			
Find and replace or index	■			
Find any font, style, size, or color	■			■
Place text or graphic linked to parent text or graphic file	■			
Find and replace in unopened files	■			
Cross reference text	■			
125,000+ user definable key commands	■			
"Super Style sheets"	■			
Automatic File Comparison	■			
10 editable clipboards	■			
Mark text as electronic book mark	■			
Built-in Graphics	■			
Rotate text and graphics	■			
Unlimited undos back to "open file"	■			■
Reads and Writes Microsoft Word Files	■	■	■	■
Vertical Ruler	■			
■ Limited implementation				

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Circle 253 on reader service card

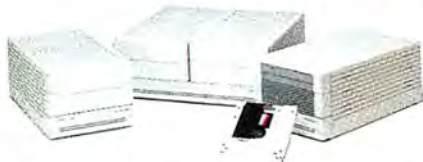


# The New MacinStors® For The New Macs.®



## Giant Steps. No Footprints.

The newest Macintosh® computers were designed to deliver leading edge technology in the most cost effective packages. With them, Apple has taken a giant step into



the world of value. Frankly, it's a world in which we at Storage Dimensions have been doing business for some time now.

Our new slimline ZFP (zero footprint) models, for instance, reflect giant steps of their own – and leave no footprints. Tucked smartly under the Mac Classic,™ or just as smartly between the Mac II™ chassis and monitor, they're available in 50, 100, and 205 MB capacities. And they're

among the fastest in the industry. What's more, they include comprehensive disk management software, with advanced features like disk mirroring and volume spanning.

In fact, features like these have always been included across the entire MacinStor product family. Whether it's a 650 MB internal or a 4 GB external. Whether it's an erasable optical solution or a hard disk standalone solution, every MacinStor delivers *more for your money*. Because Macintosh users expect more.

Take a giant step in performance, reliability, features, support and value. Ask for more than just storage. Ask for Storage Dimensions. Call (408) 879-0300. Storage Dimensions, 2145 Hamilton Avenue, San Jose, CA 95125.



**STORAGE DIMENSIONS**

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**To be called Circle 176 on reader service card  
For literature circle 127 on reader service card**





# NEW PRODUCTS

**Edited by**  
**Mary Margaret Lewis**

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

## HARDWARE

### The Air Mouse

Remote Mac input device that combines the use of a patented sensor with digital infrared technology. Enables the user to select all of the display system's functions from on-screen menus. Works with an AirMouse base station that sits on top of or beside the video screen and connects to the mouse or digitizer port on the equipment. \$450 to \$500. Selectech, 617/383-0128.

### ATTO Cache ci

64K static-RAM-cache board that is designed to increase the speed of the Mac IIci by 40 to 70 percent. Takes advantage of the fact that programs access some small portions of code and data more frequently than others; stores the frequently used data in 25-nanosecond static RAM until needed by the 68030 processor. Plugs directly into the 120-pin cache connector on the Mac IIci; includes optional cache-control. \$279. Atto Technology, 716/688-4259.



**ATTO Cache ci**

### CS-1 Control Station

Hardware control interface for disk-based recording systems, sequencers, and multimedia software. Acts as an input device when used with Digidesign's Sound Tools and Audiomedia and with Opcode's Vision and Mark of the Unicorn's Performer sequencers. Keys are programmable, and unit is built with a scrub wheel that enables precise positioning within a recording for scrub editing. \$599.95. JLCopier Electronics, 213/306-4131.



**CS-1 Control Station**

### MacClassic 3 Meg Module

3MB expansion board for the Mac Classic. \$175. Technology Works, 512/794-8533, 800/688-7476.

### SampleCell

Stereo, 16-bit, 16-voice, 8-channel output, sample-playback board for the Mac

II series. Enables musicians to play digitally recorded or sampled instruments from a computer for use in MIDI, recording, and audio post-production applications. Supports up to 8MB of Mac II RAM. Works with all MIDI Manager-compatible programs. \$1995; with 8MB of RAM \$2005. Digidesign, 415/688-0600.



**SampleCell**

### Scan 300/Color

24-bit color and gray-scale scanner that produces gray-scale, halftone, and line-art images. Includes scanning software with features for scaling and zooming, controls for brightness and contrast, and a gray map for manipulating scanned images. Requires Mac interface kit that comes with Adobe Photoshop. \$1995; Mac interface kit \$495. Abaton, 415/683-2226.



**Scan 300/Color**

### SRM-3/Mac Modem

Portable modem that does not require AC power but

is powered directly from the Macintosh. Weighs 1.1 ounces and is less than 2 1/2 inches long. May be ordered with a variety of connectors such as terminal block, RJ-11, or RJ-45. \$70. RAD Data Communications, 201/587-8822.



**SRM-3/Mac Modem**

### TelePort/Fax

Fax modem that connects directly to the ADB port. Includes MNP Level 5 data compression, performs as a background operation, transmits facsimiles at 4800 bps, and is Hayes compatible. Data is transmitted at 300 bps, 1200 bps, or 2400 bps. \$265. Global Village, 415/329-0700.

### True-Color Hand Scanner

Color wide-width hand scanner that comes with an OCR and color-paint application. Built with proprietary design developed for the multimedia, graphics, and animation markets. Unit is a SCSI device that scans images up to 4.1 inches wide at 100 dpi to 400 dpi and at 200 dpi in halftone mode, with a scanning speed of 3 seconds per pass. Uses automatic gamma correction. \$699. Animas, 714/590-3334.

(continues)



**XCeed NB12-108 Video Card**

Multiple-resolution video board for the Mac II series. Has dual-page image capabilities; works in 1-, 2-, 4-, or 8-bit mode; provides 256 simultaneous colors; functions in multiple-monitor environments. Designed to take advantage of the high refresh rates of 19-inch screens. \$719. Micron, 208/383-4000.



XCeed NB12-108 Video Card

**SOFTWARE****3 in Three**

Puzzle with more than 80 configurations ranging from

word puzzles to graphical puzzles in which the player rearranges pieces to produce an image. Includes logic puzzles, word jumbles, and elevator puzzles. All games center around the odyssey of a character based on the number 3. This character falls out of a fictitious spreadsheet during a power surge and spends all of her time trying to find a way back. If the player masters all 80 of the puzzles, 3 gets back home. Comes with a hint book. 1MB min. memory. \$49.95. Cinemaware, 805/495-6515.



3 in Three

**4D Calc**

Spreadsheet module for integration into a 4th Dimension database. Allows spreadsheets to be actively associated with a specific record in a database. Includes a business graphics package called 2D Graph. 512K min. memory. \$295. ACIUS, 408/252-4444.

**DBMS/Copy Mac with PC-Access**

Data-translation software designed for two-way conversion between files created in various Mac and PC applications. Works with 12 major Mac applications including Excel, Works, FoxBase+/Mac, and Oracle, and is compatible with 65 similar PC applications. Supports any form of ASCII file. DBMS/Copy Mac Lite performs PC-to-Mac file conversion using the 12

Mac applications in DBMS/Copy Mac with PC/Access, but supports only 26 of the PC applications. DBMS/Copy Mac supports only the Mac software packages. Retains variable names and formatting during file conversion. 512K min. memory. \$290; DBMS/Copy Mac \$95; DBMS/Copy Mac Lite \$185. Conceptual Software, 713/667-4222, 800/782-8969.

**DitchBuilder and ReproLog**

Sets of Microsoft Excel templates designed by a landscape architect. DitchBuilder is a set of templates for design and documentation of trapezoidal, triangular, and parabolic section ditches, channels, and swales. ReproLog is a set of templates for organizing and tabulating billable reprographic expenses such as photocopying, blue-

# With the HP DeskWriter, you can

**The Paradise Times**  
VOL. III SPRING, 1990 WANDERING TOURS LTD.

For the traveler craving the tropical essence of the Yucatan as well as a dash of the good life, Akumal is the place. It's not the luxury class of Cancun, but it beats the parties and most other small resorts along the coast.

Akumal proves herself on the conspicuous absence of telephones, TVs or busting activity.

Folks, this town is laid back. It offers a good selection of hotels, dining and activities to soothe frazzled city nerves.

A large barrier reef runs parallel to the Quintana Roo coast, protecting the lagoon from the open sea. Basically it creates a gigantic underwater playground, chock full of Caribbean underwater goodies which attract divers from all over the world.

For the archaeology buffs out there, Akumal is 15 km from Tulum. For the rest of us that means it's close to one of the few well-preserved Mayan ruins.

Selha is another 5 km, and even the amateurs among us will want to slip into masks, snorkels and fins to check out this natural underwater aquarium.

In Mayan legend, Akumal means "Place of the Turtle" not because it's so laid back, but because giant green turtles have come ashore since the dinosaur days to lay their eggs in the warm sands of the Caribbean.

Surrounding Akumal are lush jungles and thick coconut groves. Bright red bird melinda bloom high in the trees during early spring.

This month's featured destination:

## Akumal

Along the pour-ous sand of the Akumal beaches, you'll find lots of really neat stuff: conch shells, fancy red seaweed, coconuts sprouted after soaking in the sea for months, and crabs of all sizes and colors.

While checking out bromeliads, you will probably see it's a must-see: the orchid.

Relax amidst the long stretches of wind bent coconut trees which set off the blazing white sands of Akumal's sweeping beaches.



printing, laser printing, and faxing. 1MB min. memory. DitchBuilder \$99; Repro-Log \$24. StormWorks, 919/834-9420.

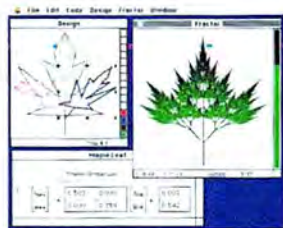
### Expert Backgammon

Backgammon game that has multiple skill levels from novice to expert, has the ability to store and recall games and positions, can be played in tournament or single-game mode, and evaluates your chances of winning from any position. Program can print a list of the moves in a game, in standard notation, and can randomly generate dice rolls. 512K min. memory. \$65. Komodo Software, 415/941-7784.

### Fractal Attraction

Program for designing fractals using iterated function systems. User manipulates

transformations by pointing, clicking, and dragging in a draw/paint-like window. The resulting fractal is generated in another window. Tool renders color using IFS transformation. User can base fractal design on imported images. Intended for education or graphic design. 1MB min. memory. \$49.95. Sandpiper Software, 612/644-7395.



Fractal Attraction

### GraceLAN

AppleTalk network-management tool that enables network administrator to view all nodes on a net-



GraceLAN

work. Can be used to view machine type, RAM size, hard drive volume size and available space, System file and printer versions, active applications and their versions, INITs and cdevs, DAS and fonts, NuBus boards, and SCSI devices. Data can be exported into spreadsheets and can produce management reports. 1MB min. memory. 50-user set \$395; 50 additional users \$195 each; corporate version for 200 or more Macs \$995. Technology Works, 512/794-8533, 800/688-7476.

### Home Fitness Consultant

Application designed to help set up a fitness program at home. Accommodates up to six users, with optional password protection for each. Contains modules for body-composition analysis, fitness training, nutritional analysis, activities planner, status and goals, graphs, and a note pad. Food portion of program developed by a registered dietician. 1MB min. (continues)



Home Fitness Consultant

# have it all. (But keep it to yourself.)



## The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a \$995\* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

The DeskWriter is also designed for easy use with your Macintosh, and has both serial and Apple Talk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter's whisper-quiet operation, and keeping it to yourself will be that much easier. So call 1-800-752-0900, Ext. 1004 for your authorized HP dealer.

There is a better way.



**HEWLETT  
PACKARD**



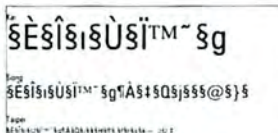
memory. \$129. Bio-Plum, 408/293-7593.

### The Instant Decorator

How-to program that gives advice and tips on room design. Applies the rules of the Two-Seasons Design method to help users coordinate furnishings and accessories with the architectural features of a room to produce rooms with a finished decor. 512K min. memory. \$49.94. Abraca-data, 503/342-3030.

### MacChinese Taiwan

Nine-disk set of fonts for 6000 traditional Chinese characters and a Taiwanese operating system that gives you a choice of three input methods: BoPoMoFo, phonetic input that is not pinyin, and input by radicals. Has three bitmapped fonts: Taipei 16-point,



MacChinese Taiwan

Spong 24-point, and Kai 24- and 48-point. 2MB min. memory. \$99.95. Linguist's Software, 206/775-1130.

### MarblePatterns

Patterns that can be used as backgrounds or as stand-alone graphics and are available in a variety of packages. Compatible with software that supports grayscale TIFF format produced by programs such as Aldus



MarblePatterns

PageMaker, Ventura Publisher, QuarkXPress, and Digital Darkroom. 1MB min. memory. Sample professional package containing three patterns \$99.95. Progressive Desktop Publishing, 301/948-3047.

### Metazoa: Vanishing Kingdom

Multimedia study of invertebrate animals, authored by Kerry B. Clark, professor of biological sciences at Florida Institute of Technology. Displays colorful graphic images and detailed solid-model animations; plays digital sounds. Program is designed to present in-depth technical description of the animal kingdom, including natural history, structure, classification, and diagnostic features, and is presented at the level of a college course. Requires System 6.0.3 or later ver-



Metazoa: Vanishing Kingdom

sion, 24-bit QuickDraw, Spinnaker Software's Plus 2.0 or its run-time module, and Mac II with 100MB hard drive. Includes a MacroMind Player module. 8MB min. memory. Single-computer educational license \$495; each additional computer license \$250. Ocellus Productions, 407/768-8000 ext. 8195.

### Note Wizard and Scale Master

Two-part series of self-teach tools for music teachers, hobbyists, and musicians. Part I: Note Wizard has

# With the HP ScanJet Plus, you've

## The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for \$2,190\*, about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call 1-800-752-0900, Ext. 1005 for your authorized HP dealer.

There is a better way.



For all its amenities, ease of use, good image quality, and low price, *Publish!* recommends the HP ScanJet Plus as their "Best Buy."



drills, exercises, and tutorials to teach keyboard skills, music theory, and ear training. Part II: Scale Master teaches musical scale construction. 512K min. memory. \$79.95 each. Digital Horizons, 503/622-4034.



**Note Wizard and Scale Master**

### Oasis

Graphics software that enables artists to produce images on screen with tools that simulate brushes and ink pens. Lets user apply color to backgrounds and retouch existing color images using solid brush, tint, colorize, saturate, smear, and other options. Brushes



**Oasis Image**

come with size, shape, and density attributes; lines, shapes, fill patterns, and gradations can be varied. Images can be rotated, reflected, and cropped. 5MB min. memory. \$795. Time Arts, 707/576-7722.

### Pink SQL

Relational database-management system that is based on ANSI SQL standards. Functions as a client/server system and contains links with a variety of front-end applications, such as HyperCard and 4th Dimension. 2MB min. mem-

ory for server; 1MB min. memory for clients. Server with five clients \$2275; each additional client \$375; developer package \$1590. MacVonk, 215/667-9781.

### RésuméMaker

Software helps create résumés and cover letters. Contains hints on interviewing and successful job searching. Offers three résumé types—chronological, functional, and performance—and eight formats. 1MB min. memory. \$49.95. Individual Software, 415/595-8855.

### Tesserae

Puzzle game in which users eliminate tiles from a board by positioning them according to their color and texture. Has beginner through advanced levels of difficulty and a variety of

board configurations. 1MB min. memory. \$49.95. Inline Design, 203/364-0063.



**Tesserae**

### VTXpress

Mac interface to VAX VTX, Digital Equipment Corporation's videotext product for electronic information distribution. Application directly accesses the VTX server to reduce overhead on the host system and eliminate the need for an individual account for each VTX user. Supports a range of graphic formats and enables users to simultaneously view multiple VTX (continues)

# got it made in the shades.





Infobases. 2MB min. memory. \$399. White Pine Software, 603/886-9050.

### Wizardry II: Knight of Diamonds

Player pilots characters introduced in Wizardry I: Proving Grounds of the Mad Overlord through a 3-D, graphic maze in search of the five fabled pieces of the Knight of Diamonds' armor and ultimately the Staff of Gnilda. 512KE min. memory. \$49.95. Sir-Tech, 315/393-6633.

### Xdata

Data-publishing extension for QuarkXPress 3.0. Enables user to flow data through exactly positioned text boxes for precise alignment to forms or labels. Can conditionally include or exclude one or more fields or other static

text based on the value of a field or subfield in the current or previous record. Imports more than 1000 standard address records per minute on a Mac II and is MultiFinder compatible. 1MB min. memory. \$199. Em Software, 203/399-8472.

### ACCESSORIES

#### Baby's First Computer

Squeezable, nontoxic toy computer for children.



Baby's First Computer

Comes in yellow or blue. \$9.99. Remote Control Systems, 703/548-8983.

#### The Big Difference

Retractable, height-adjustable keyboard holder that fits under a work surface, including steel-framed desks and credenzas that are at least 18 inches deep. Unit retracts under the work surface when not needed. Gear-shift lever enables user to adjust and lock the height to a position that is comfortable. \$149.95. Forminco, 514/



The Big Difference

347-1524, 800/662-3345 ext. 522, 800/245-0035 ext. 522 in New York.

#### Cartridge Brief

Portable briefcase for carrying Ehman, Cutting Edge, PowerDrive, PLI, and other major manufacturers' disk drives, plus power and data cables. Contains a compartment that can store four removable-media 44MB disk cartridges. Case is made of ballistics-type material with foam padding; closes with a zipper. \$79.95. Thinker Toys, 805/496-3246, 800/368-4777.

#### Komfort Wrist Rest

Device designed to help protect keyboard users from carpal tunnel syndrome and repetitive strain injury. Consists of polyurethane foam, covering molded plastic. Unit can be

# It's no figment. It's pigments for

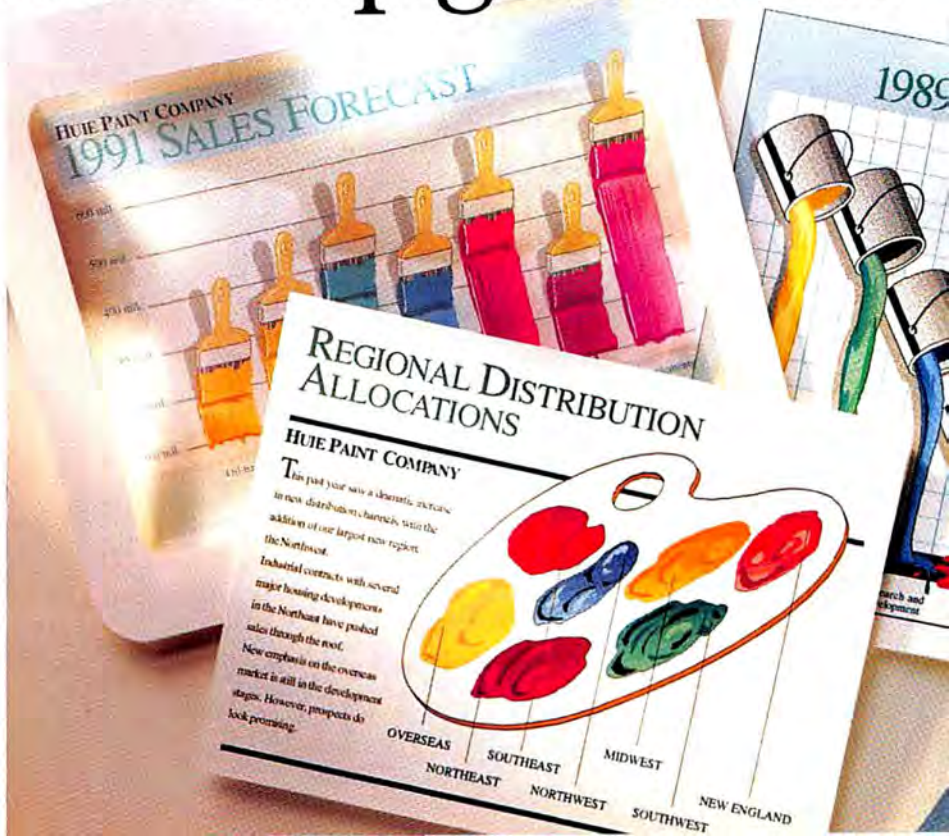
For a limited time only, you'll get a \$200 rebate when you buy a fully Macintosh-compatible HP PaintWriter color printer. Imagine that.

Now imagine having your output colors match your screen colors. Right down to the exact PANTONE® number. Our new, enhanced software drivers and improved, brighter inks make sure of that. And, as always, you get high-quality output in millions of colors for paper or transparencies.

For shared use, check out the PaintWriter XL. It offers AppleTalk, faster speed, and auto-sheet feed.

But whatever you do, do it soon. This rebate offer expires May 31, 1991. So call us at 1-800-752-0900, Ext. 2113. We'll quickly send you the name of your authorized HP dealer and a piece of sample output.

You'll see that anything else is unimaginable.





adjusted to three positions. \$35. JMJ Enterprises, 714/472-4409.

#### LC-1200 Line Conditioner

Voltage regulator and power-line conditioning unit for computers and electronic equipment. Provides 1200 watts from four isobar-spike-protected AC-output receptacles. Filter banks protect equipment. Comes in a compact cabinet and has a 12-amp circuit breaker, an AC power cord, and a two-year warranty. \$249. Tripp Lite, 312/329-1777.



LC-1200 Line Conditioner

#### Portable Inventory System

Hand-held portable inventory system designed for off-line data entry that can be downloaded to the Mac. Program ships with two-field data-collection software, but works with software that records from one to four data fields. Data is input either by scanning bar codes or pressing keys on the unit's keypad. System can store up to 2000 records before being downloaded to the Mac. \$995. Percon, 503/344-1189, 800/873-7266.

#### Wristsaver

Wrist support designed to provide a comfortable typing environment and help reduce the risk of carpal tunnel syndrome. Lightweight 18-inch-by-3-inch foam-covered device lifts the wrists approximately 1

inch above the desk surface. \$15. LB Innovators, 619/423-6644.

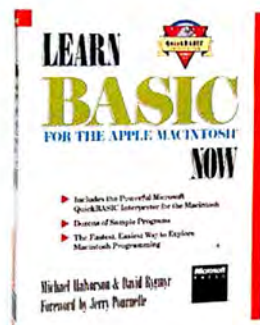
#### BOOKS

##### Build Your Own Mac Book


Guide to assembling a Macintosh from catalog parts. Includes tips section and more than 80 photographs and illustrations. Written by Bob Brant. \$17.95 plus \$3 s/h. Brant Associates, 503/659-3670.

##### Learn BASIC for the Apple Macintosh Now

Book designed to teach BASIC programming concepts and how to write programs in BASIC. Includes sample programs, a section with questions and exercises, and the Quick-Basic Interpreter companion disk. Written by Michael Halvorson and David Ryg-



##### Learn BASIC for the Apple Macintosh Now

myr. \$39.95. Microsoft Press, 800/677-7377. 

.....  
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 (and two copies of software) to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107.

# \$200 less.



*The PaintWriter*  
\$1,395\*



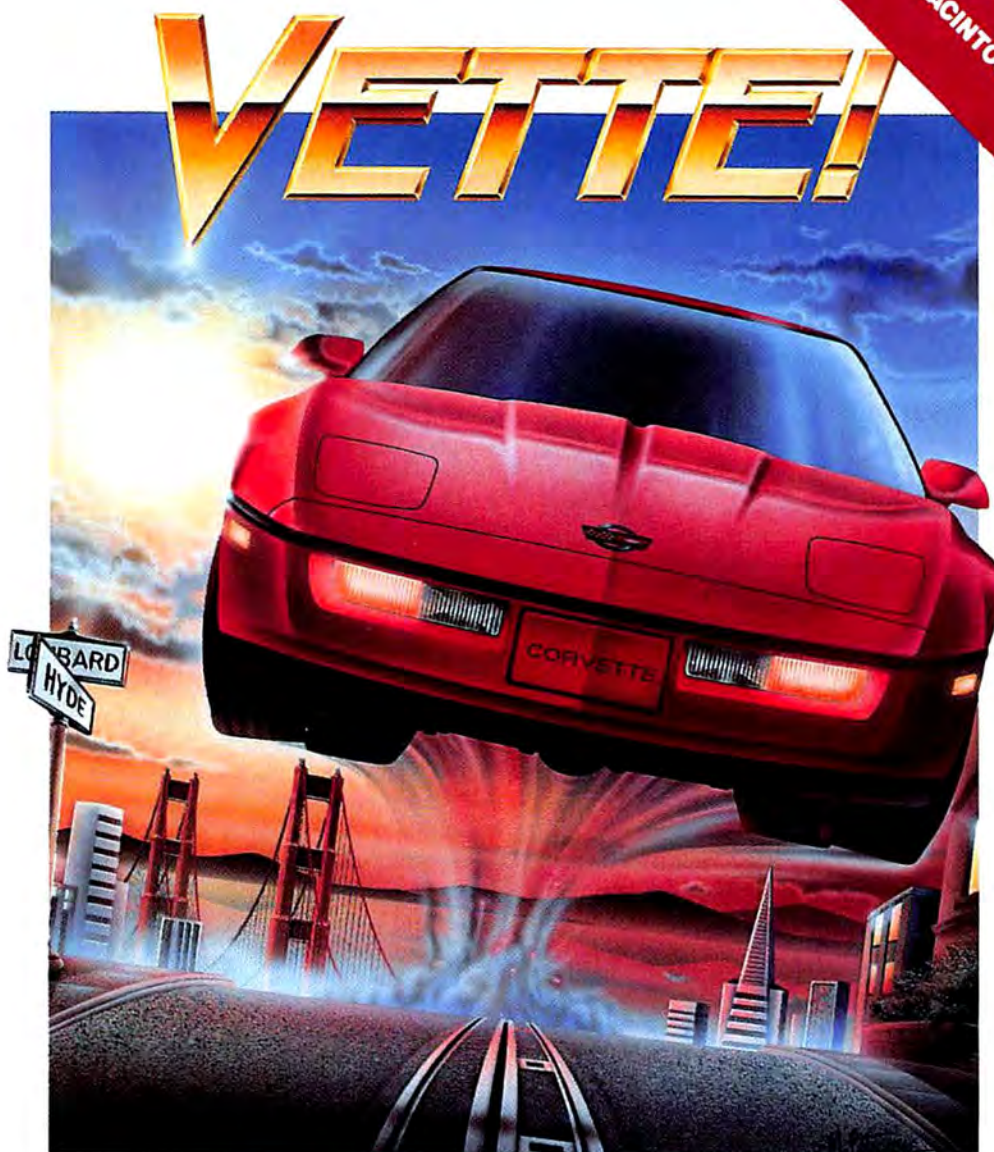
*The PaintWriter XL*  
designed for shared use.  
For only \$2,595\*



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PANTONE is Pantone, Inc.'s check standard trademark for color reproduction.



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boring race track or freeway driving simulations when you can thrill to the chase through one of the most alluring cities in the world. **VETTE! – THE NEW STREET RACE SIMULATION!**

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## Spectrum HoloByte™

A Division of SPHERE, INC.

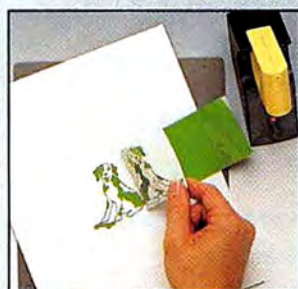
2061 Challenger Drive Alameda, CA 94501 (415) 522-0107

Available on Macintosh/Macintosh II color and IBM.

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# See Spot Color.



Cover black and white copy or laser print-out with color strip, apply heat with ColorTAG unit, remove strip.

Color, color, color. ColorTAG™ binds vibrant color directly to black and white copies and laser print-outs of your artwork. What was black and white becomes a colorful, eye-catching presentation piece.

Simply place a color strip over a copy of your art. And give it a pass with the heating element. Add one color, or ten colors.

With over 72 colors, including metallics and fluorescents, ColorTAG can transform logos, headlines, and entire presentations in no time.

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The starter kit is only \$99.95 plus \$2.00 shipping and handling. It includes everything you need: hand-held applicator, heating base, imaging pad, two packages of ColorTAG Color Strips. Order now and receive a special coupon redeemable at your art materials supplier: Buy two packs of ColorTAG Color Strips, get a third pack FREE!

To order, fill out and mail to: Letraset USA, ColorTAG™ Order Dept., 40 Eisenhower Drive, Paramus, NJ 07653. Or call 1-800-526-9073 to order or for the name of the art material dealer nearest you.

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Circle 356 on reader service card





# Quick Tips

SCANNING SLIDES CHEAPLY, IMPROVING LASER-PRINTED GRAYS,  
ELIMINATING VIRAL PLAGUE, AND MORE

**T**

BY LON POOLE

he version of HyperCard that comes with every Macintosh has always been set initially to user level 2 (Typing). Accessing the higher levels of Painting, Authoring, and Scripting used to be a simple matter of changing a setting on the

User Preferences card of the Home stack, but no longer. Now you must type the word *magic* (and press Return) in HyperCard's message box before you can select a higher user level on the User Preferences card. To use the message box, choose Message from HyperCard's Go menu.

The minimal HyperCard documentation included with a Mac doesn't explain how to use the higher levels. However, an assortment of books is available on the subject. Also, Claris sells two HyperCard products that include manuals and 19 example and reference stacks not bundled with the Mac. One of these products, the HyperCard 2.0 Upgrade (\$49 directly from Claris at 800/628-2100), includes a script-language guide. The other product, HyperCard 2.0 Development Kit (\$199 from Claris dealers), includes the script-language guide and four other manuals—over 1400 pages in all. The version of HyperCard that comes with these two Claris products doesn't require a magic word to access higher user levels.

## Answers from Apple

Apple still doesn't want to answer your questions about Apple products directly. You're supposed to ask an Apple dealer, a school support center, a user group, or a consultant. If those sources can't help you (as has all too often been the case in the

past), you can now call Apple's toll-free customer support phone line at 800/776-2333 from 6 a.m. to 5 p.m. Pacific time. Before calling, though, prepare a description of the problem and a list of the software and hardware you're using. Be prepared to cite the support sources you've already stumped and what their responses were. If you call the support line and are unable to provide this information, all you'll get is Apple's toll-free number (800/538-9696) for locating dealers and user groups.

## Clearing the Desktop

The discussion in last December's *Quick Tips* about desktop icons being obscured when you're using MultiFinder struck a responsive chord with Mike Berger of Salem, Massachusetts. When he first started using MultiFinder, he was distressed by the system's inability to provide clean wipes when switching programs. Then he discovered that AlSoft's MasterJuggler utility can hide an application's windows when you switch to another program. If you always switch programs using MasterJuggler, you will get an unobstructed view of the desktop when you switch to the Finder. You switch programs using MasterJuggler's Application List or Application pop-up menu, as described in the MasterJuggler manual (see "Hide and Switch").



## Works to FileMaker

**Q** I have a database of my cassette collection, created in Microsoft Works. I would like to transfer the information from the Works database to FileMaker. Is this possible?

Dave Bruno  
Philadelphia, Pennsylvania

**A** Yes. Export the information using Works' Save As command (File menu). In the Save As dialog box, select the Export option, type a file name, and click the Save button. If you wish to export only certain records from your Works database, use the Match Records or the Record Selection command (both in the Organize menu) to select the records you want to export. Then, in the Save As dialog box, select the Save Selected Records Only option before clicking Save.

In either FileMaker II or FileMaker Pro, create a new database to hold the information; its structure does not have to be the same as the Works file's. Then use the Import command (File menu) as described in the FileMaker manual to import the information. (continues)



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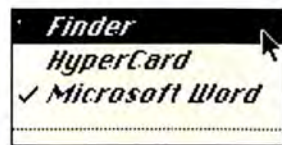
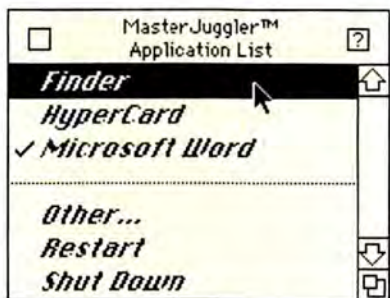
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**HIDE AND SWITCH** To hide windows of inactive programs and see all desktop icons with MultiFinder active, switch programs using MasterJuggler's Application List (top) or its Application pop-up (bottom). Disable Window hiding by pressing **⌘-T** in the Application List.

setting the File Type option to Tab-Separated Text. Because the imported information can have a different structure from the FileMaker database, tell FileMaker the relationship you want between the imported fields and the fields in the new database.

#### Plague

Although I frequently scan my hard drive and floppies with SAM Intercept and Virex 2.0, I keep getting a recurring warning that a strain of the WDEF virus has been found on the desktop of my hard drive. I have tried both deleting and repairing this file, as well as scanning my hard drive when starting up with another disk, but every few days the strain reappears.

Andrea Martinez  
Diamond Bar, California

The WDEF virus has been around well over a year but still causes lots of trouble because it spreads so easily from disk to disk. Sometimes merely inserting an infected floppy will infect your hard drive. WDEF infects only the invisible Desktop file, in which the Finder stores icons and other desktop information. It does not infect programs, documents, or system files.

To eradicate WDEF, you must scan and repair all disks that you or anyone else uses with your Mac. The two products you mention, along with sev-

eral others, can detect and eliminate the WDEF virus and all other known viruses. Disinfectant, by John Norstad of Northwestern University, is my favorite antiviral program because it's fast, thorough, and free. It's available from most user groups and online information services.

You can also remove WDEF (but not other viruses) from a disk simply by rebuilding the Desktop file. To rebuild a hard drive's Desktop file, hold down the **⌘** and Option keys at start-up time. When inserting a floppy disk (or a removable hard disk cartridge), press **⌘-Option** until the Mac asks whether you want to rebuild the desktop, and then click OK. If you have multiple drives, keep pressing **⌘-Option** until you've instructed the Mac to rebuild each one.

After making repairs, you should install protective software on all your start-up disks to prevent their reinfection by known viruses. Some protectors, such as SAM Intercept, also detect suspicious activity that may be caused by an unknown virus. Most of these reports turn out to be false alarms, so I prefer simple protective software like that included with Disinfectant.

#### Show Info Report

**TIP:** Microsoft Excel's Show Info command (Windows menu) displays useful auditing and debugging information in the Info window, but only for one cell at a time. To see the information for multiple cells, select them, choose Show Info, and then choose Print. Whereas the Info window displays only one cell at a time, the printed info covers all selected cells. You can display and print any type of information—cell reference, formula, value, format, protection, names, precedents, dependents—by choosing those items from the Info menu, which appears only when the Info window is active.

Neil Ticktin  
Santa Monica, California

#### Economy Slide Scanning

**TIP:** You don't always have prints of slides and negatives lying around ready for scanning on a desktop scanner. Yet only a few flatbed scanners have transparency attachments available. Constantly making prints





**SCAN LITE** You can get decent scans of slides and negatives using ordinary flatbed scanners made for scanning prints. This image was scanned from a medium format (2 1/4-inch) transparency with an Apple Scanner. A small Letraset light box turned upside down illuminated the slide.

from negatives and shooting halftones from slides can become frustrating. But you can adapt a flatbed gray-scale or color scanner to get good quality scans from slides and negatives. You need an inexpensive mini-light box (\$15 to \$25 at art supply stores) made for viewing transparencies. Use a better light box for higher-quality scans.

Place the slide or negative on the scanner, and put the light box upside down on top of that. Turn on the light box and scan away. You can invert the scan of a negative to a positive with an image-editing program such as ImageStudio or Photoshop. I have had excellent results using these scans for placement only (not for final film), saving a lot of time and money. "Scan Lite" shows what you can expect.

Howard A. Wright  
Grand Rapids, Michigan

#### When Good Disks Go Bad

**TIP:** Bad disks make good coasters, but you should try to have them replaced. After I returned four bad disks to Sony (three used, one new), I received a box of 10 disks and a written apology.

Bill Achuff  
Philadelphia, Pennsylvania

#### Secret Bookmark

**TIP:** Microsoft Word always displays the first page of an existing document when you open it. However, choosing Go Back from the Utilities menu (or pressing ⌘-Option-Z or pressing 0 on the numeric keypad) scrolls to the place where you were working when you last saved the document. If you had text selected (highlighted) when you saved the document, that text

will be reselected automatically.

John B. Andreas  
Lafayette, California

This trick often fails if you're using two monitors with your Mac and you have moved the document window to the monitor without the menu bar any time before saving the document.—L.P.

#### File-Recovery Gotchas

**TIP:** Users of file-recovery programs such as Symantec's SUM II and The Norton Utilities for the Macintosh, and Central Point Software's MacTools Deluxe may be in for a surprise when trying to recover deleted files. You might not be as protected as you think if you use any software that routinely creates and deletes temporary files, such as FileMaker, Microsoft Word, MacWrite II, and many others. In addition, printing on a LaserWriter with the Chooser's Background Printing option causes temporary spool files to be created and deleted. So does using other print spoolers, such as SuperLaserSpool. File-recovery programs track these automatic file deletions as well, leaving less space for storing the files you knowingly delete. Therefore, your list of recoverable files may be filled with "Spool file 1," "FileMaker Temp 4," "Word Temp 13," and the like. To maximize your protection, allocate the largest amount of space your file-recovery program allows for keeping track of deleted files.

Chris Catalano  
Farmingville, New York

Larry McHenry, a technical support representative for Central Point Software, points out that tempo-  
(continues)

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**M**ountains appear more lofty the nearer they are approached, but great men resemble them not in this particular.

*Lady Marguerite  
Blessington*

**M**ountains appear more lofty the nearer they are approached, but great men resemble them not in this particular.

*Lady Marguerite  
Blessington*

**LASER GRAYS** Shaded text, boxes, and other graphics appear coarse when printed on a 300-dpi laser printer with a standard halftone screen of 60 lpi (top). At 133 lpi, they look smoother and crisper (bottom). You can change the halftone screen in QuarkXPress 2.12 or 3.0 using the Page Setup command.

rary files actually pack a double-whammy. Not only do they crowd out known files from the list of recoverable files, they may also reuse the disk space formerly occupied by files you have deleted. Even if your file-recovery program recognizes a file by name, you will be unable to recover that file if its contents have been overwritten by a temporary file that was subsequently deleted.

McHenry also notes that recovery of deleted files is further hampered by disk-optimization (defragmentation) software, which eliminates disk space once occupied by now-deleted files. AlSoft's DiskExpress II is particularly insidious in this regard. It optimizes the disk continuously in the background, severely lessening your chances of recovering a deleted file.

To work around these problems, put a folder near the Trash to use as a holding bin. When you're ready to delete a file, drag it to the holding bin folder instead of the Trash. When the disk gets full,

drag the oldest items from the holding bin to the Trash. Check your holding bin when you need to "recover" a "deleted" file.—L.P.

#### Enhanced Gray Shades

**TIP:** When printing from QuarkXPress 3.0 on a laser printer, I found that shades of gray appeared coarse because the standard Halftone Screen setting of the Page Setup command is 60 lpi. Changing it to 133 lpi enhances shaded rules, text, and boxes for laser printing (see "Laser Grays"). Avoid settings of 150 or 200 lpi, however, because they make grays turn black.

Carole Pye  
Northbrook, Illinois

A 133-lpi screen frequency will probably cause banding in any gradated fills your document may contain (see *Quick Tips*, January 1991).—L.P.

#### Simplified Disk Naming

**TIP:** I conscientiously make archival copies of all original software disks. (It took only one crashed master disk to teach me that lesson!) For two years I have gone through all kinds of contortions to reproduce the weird characters in the names of the original disks for the copies. Then I found that you can copy and paste a whole icon name. You click the icon whose name you want to copy, press ⌘-C (for Copy), click the icon you want to name, and press ⌘-V (for Paste). Voilà!

Michael J. Hull  
APO New York

.....  
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# Getting Started with Hardware Upgrades

FINDING THE BEST WAY TO KEEP YOUR MAC UP TO SPEED

**B**uying into the Mac world is like boarding a

moving train. You stand alongside the tracks, waiting until the right model comes along, then you time your leap and hold on as money flutters from your pockets. Whew—you made it.

But where are you heading? Is a new model going to pass as you settle into your seat? And if this train can't take you to your destination, will you be able to transfer to one that can?

Every Mac owner has faced worries like these at one time or another—most likely last year, when Apple released four new Macs while discontinuing another four. And Apple's System 7.0 software further complicates matters. Will your upgrade be compatible with all of System 7.0's features? Should you get a new Mac instead?

There are no easy answers, but one thing is certain: an old Mac may not be the fanciest train on the tracks, but it can still take many people where they want to go. More to the point, you can upgrade an old Mac to give it most, if not all, of the features in Apple's current offerings. And if you have one of the newest Macs, hardware upgrades can make a good thing even better. This month, I examine the most common upgrade options available for old and new Macs, to help you map out an upgrade path that makes the most of your Mac and your money.

BY JIM HEID



SCOTT BALMAIN

## Upgrade Options

Before devising an upgrade strategy, it helps to know what your options are. Hardware upgrades fall into two broad categories (which often overlap): ones that make your Mac faster and ones that add new features. The most common include the following.

- **Memory** More memory helps programs run faster and enables Multi-Finder to run more of them at once. More memory also lets you create larger documents with programs that keep entire documents in memory instead of swapping between memory and disk. Memory prices have plummeted in recent years; at this writing, several mail-order retailers offer 4-megabyte upgrades for a few hundred dollars, and some include an installation video and technical support. A 4MB upgrade consists of four 1MB *Single In-line Memory Modules*, or *SIMMs*—small, plug-in boards, each containing eight memory chips (see “Memory Details” for a list of memory upgrade options and configurations for each Mac).

- **Hard drives** With its vast storage capacity and swiftness, a hard drive is the most important upgrade you can buy. With one, your Mac will start programs and open documents far

(continues)





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more quickly, and you'll be able to keep all your files in one place instead of swapping and waiting for slow floppy disks. External hard drives start at under \$300.

• **Accelerator boards and CPU upgrades** These silicon brain transplants replace the Mac's central processing unit (CPU) with a faster, flashier one. Accelerators for the Mac Plus, SE, and Classic usually replace those machines' 68000 CPU with a 68020 or 68030—the CPUs that drive Apple's Mac LC and II series, respectively. (The original Mac II used a 68020 CPU.) Accelerators for the Mac II family replace the CPU with one that runs at a faster *clock rate*, enabling the Mac to do more in less time. What's the difference between an accelerator and a CPU upgrade? Accelerator boards often include sockets for memory; memory installed there runs faster than memory installed on the Mac's logic board. CPU upgrades simply replace the CPU and thus don't provide the same degree of performance enhancement as accelerators. Costs range from several hundred dollars for an SE or Plus CPU upgrade to several thousand for a II-family accelerator.

• **Logic board upgrades** Having an Apple dealer replace your machine's logic board can only step you up to a model that comes in the same basic case—you can upgrade a 128K and a 512K Mac to a Plus; an SE to an SE/30; a IIcx to a IIci; and a II and a IIx to a IIfx. Logic board upgrades generally cost more than accelerators but have a significant advantage: a *ROM upgrade*. All logic board upgrades either include or require the purchase of new read-only memory (ROM) chips, which contain some of the Mac's fundamental system software. When the ROM upgrade is sold separately from the logic board upgrade, the ROM upgrade sometimes also includes a *SuperDrive* floppy disk drive. A SuperDrive, also called an *FDHD* (short for *floppy disk, high density*) can use high-capacity 1.4MB floppy disks in addition to the 800K disks used by most earlier Macs. Thus your Mac not only gets faster, it gets new features as well. The SE-to-SE/30 upgrade, for example, gives you Color QuickDraw, which opens the doors to

color video boards. The logic board upgrade will serve you well when System 7.0 is released, too (see "System 7.0 and Upgrades").

• **Video boards** A video board's circuitry works with a display monitor to create the Mac's screen image. Most Macs include video circuitry on the logic board but can also accept plug-in video boards that control color or large-screen monitors or add other display talents, such as the ability to attach the Mac to a videocassette recorder (see "Getting Started with Desktop Video" and "Prime-Time Video," *Macworld*, September 1990, and "Mac Video, Take II," February 1991).

• **Coprocessors** These specialized microprocessors work along with the Mac's CPU, lightening its load. Math coprocessors speed up calculations in spreadsheets and other number-crunching programs. Math chips are often built in to or offered for accelerator boards, and are available on plug-in expansion boards for the Mac LC and IIsi. (Other Mac IIs and the SE/30 include math chips; the LC can accept one via its expansion slot—several boards bearing math chips have been announced but none have shipped at this writing.) Graphics coprocessors, also called graphics accelerators, are generally used with or included on *true-color*, or 24-bit, video boards. True-color boards enable Macs to display images with photographic realism but must move megabytes of data to do it (see "Fast Color," *Macworld*, January 1991). Without a graphics accelerator, true color can require true patience. Graphics accelerators, currently available for the Mac II series only, aren't cheap, with Apple's Macintosh Display Card 8•24 GC costing \$1999.

• **Sound-recording hardware** The Mac LC and IIsi contain sound-recording circuitry that, with appropriate software, lets you "attach" recorded comments to documents and send voice-mail messages to other Macs on a network (see "Getting Started with Networks" and "Mac IIsi," *Macworld*, December 1990). You can add sound-recording features to other Macs using external hardware such as Farallon's MacRecorder (\$149 to \$249, depending on the model) or Artic-  
(continues)



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## GETTING STARTED

### HOW TO

#### SYSTEM 7.0 AND UPGRADES

**W**here hardware upgrades and System 7.0 are concerned, you should pay special attention to one area: virtual memory, a feature that lets the Mac treat part of a hard drive as memory. In the past, it was believed that all you would need to use System 7.0's virtual-memory feature would be a Mac containing a 68030 processor or a 68020 combined with a 68851 PMMU (Paged Memory-Management Unit) chip, available from Apple as well as third-party vendors. Not so. System 7.0's virtual-memory software relies on certain ROM routines that aren't present in Pluses or SEs. Thus, the virtual-memory feature works only with Macs designed around the 68030 processor, or with original Mac II's equipped with the optional PMMU chip.

To work around this, many accelerator boards will (or already do) include Connectix Corporation's Virtual utility software, which implements virtual memory with today's system software and which will be updated to be compatible with System 7.0. What does this mean for accelerator shoppers? If you want virtual memory in your 68030-accelerated Plus or SE, be sure a 68030 accelerator includes or is compatible with Virtual before you buy. And if you want virtual memory without having to use a third-party utility, buy an Apple 68030 logic board upgrade or a new machine instead of an accelerator.

late Systems' \$129 DesktopMikeVL.

- **Cache memory boards** These special-purpose memory boards boost a Mac II's overall performance 15 to 30 percent by storing the most recently used instructions and data in a small amount of high-speed memory that

can be accessed faster than main memory. For a few hundred dollars, you can add a cache memory board to the original Mac II as well as to the IIci, which contains a slot designed specifically for a cache board. Cache memory is built in to the Mac IIfx and many accelerator boards.

#### What Works for Your Mac?

Some Macs are less receptive to upgrades than others. The Classic, Plus, and earlier machines are especially resistant—with no expansion slots for plug-in boards such as video, accelerator, and high-speed networking boards. To work around this, upgrade developers generally use the Killly Clip, which straddles the processor and thus taps into the signals that would otherwise be provided by an expansion slot.

This clip-on technique works, but it's not without potential problems. One risk is electrical: the Plus and earlier machines lack fans, and their power supplies can be stressed by having to provide juice for extra hardware. The other risk is mechanical: accelerator clips can be jostled loose or develop unreliable connections, especially if you move your machine around. The Classic may be especially prone to this problem: according to several upgrade vendors, the way its processor is soldered to the logic board makes it difficult to develop a clip that stays put.

The IIfx, IIci, IIsi, and LC also contain soldered rather than socketed CPU chips. This has hampered the accelerator board market for these machines, since most accelerator boards require that you remove the original CPU and plug the accelerator board into the CPU socket. The physical design of these machines' CPUs prohibits clip-on alternatives.

The accelerator-and-soldered-CPU issue aside, upgrading a Mac is generally straightforward, since most models provide at least one slot. With the single-slot SE, SE/30, LC, and IIsi, there isn't much room to grow, so you need to choose upgrade options carefully. Fortunately, several SE accelerators accept large-screen video boards via piggyback connectors. And as the LC and IIsi become increasingly

*(continues)*

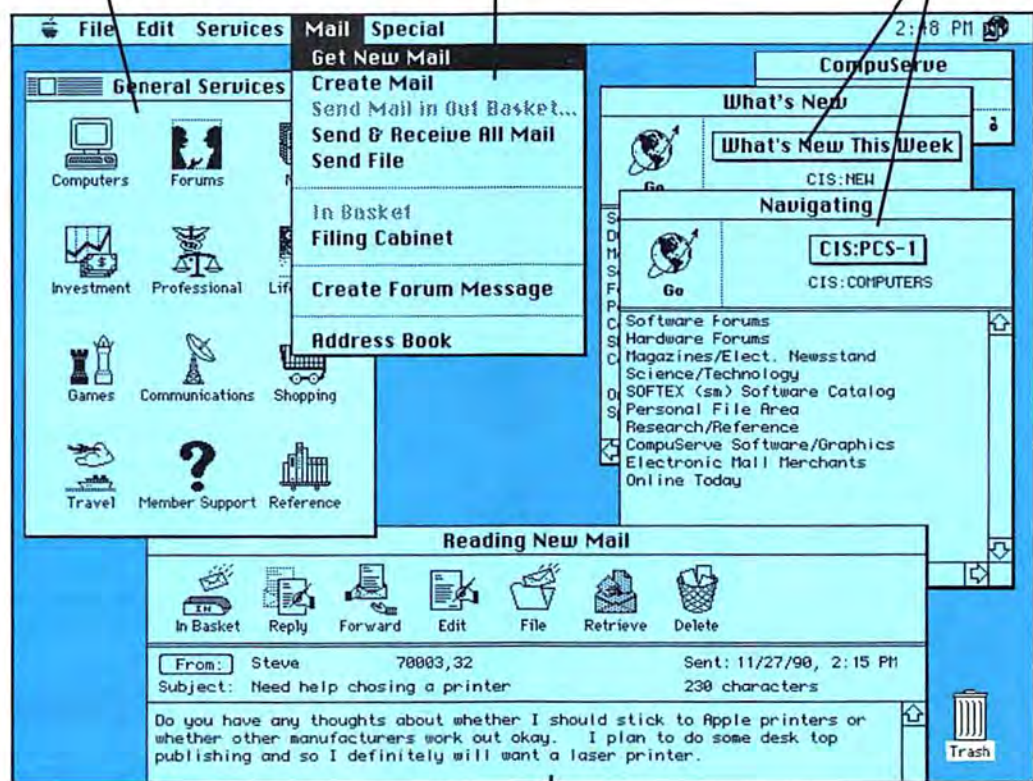


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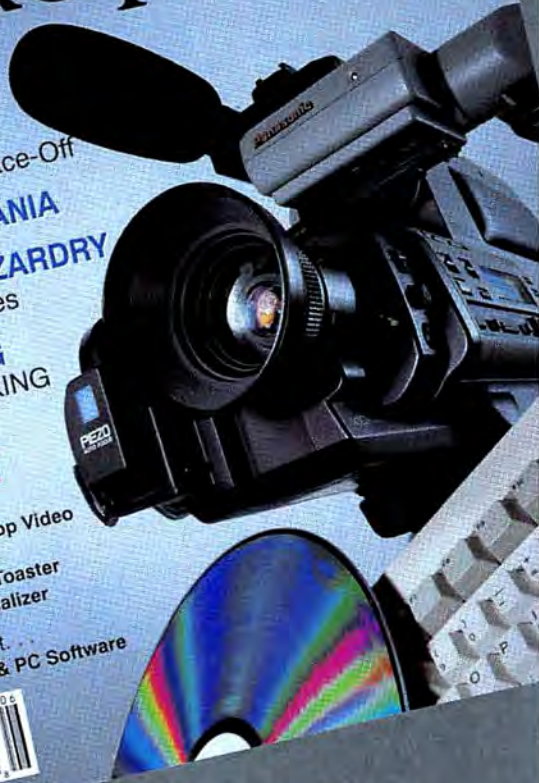
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## GETTING STARTED

### HOW TO

#### MEMORY DETAILS

Model	Total Memory	Configuration	Comments
Classic	1MB	logic board memory	150ns or faster chips required
	2MB	as for 1MB plus the Macintosh Classic 1MB Memory Expansion Card with SIMM sockets empty	
	2.5MB	as for 2MB plus two 256K SIMMs	
	4MB	as for 2.5MB plus two 1MB SIMMs	
Plus, SE	1MB	four 256K SIMMs	150ns or faster chips required
	2MB	two 1MB SIMMs	
	2.5MB	two 256K SIMMs plus two 1MB SIMMs	
	4MB	four 1MB SIMMs	
LC	2MB	logic board memory; SIMM bank B empty	100ns or faster chips required
	4MB	as for 2MB plus four 1MB SIMMs in bank B	
II, IIx, IIcx, IIci, SE/30	1MB	four 256K SIMMs in bank A; bank B empty	120ns or faster chips required (80ns for IIci); for best performance from IIci, put larger-capacity SIMMs in bank B
	2MB	as for 1MB plus four 256K SIMMs in bank B	
	4MB	four 1MB SIMMs in bank A; bank B empty	
	5MB	as for 4MB plus four 256K SIMMs in bank B	
IIfx	4MB	four 1MB SIMMs in bank A and in bank B	80ns or faster chips required; special SIMMs required; 1MB minimum SIMM size
	8MB	as for 4MB plus four 1MB SIMMs in bank B	
IIsi	1MB	logic board memory	100ns or faster chips required
	2MB	as for 1MB plus four 256K SIMMs	
	5MB	as for 2MB plus four 1MB SIMMs	
Portable	1MB	logic board memory	100ns or faster, low-power chips required
	2MB	as for 1MB plus 1MB Memory Expansion Kit	

popular, we'll probably see more multifunction boards that cram several upgrades into one slot.

#### Strategies for Discontinued Macs

We'll look at some specific upgrade strategies, starting with discontinued Macs. See "Where to Buy Upgrades" for a list of upgrade vendors and representative products.

**Mac 128K, 512K, and 512KE** You can upgrade a 512K Mac to a 512KE by buying Apple's Macintosh Plus Disk Drive Kit, which also includes the 128K Mac Plus ROM chips. But the 512KE lacks the SCSI circuitry needed for fast hard drives, and it lacks sufficient memory to run most of today's programs. For that reason, it's better to buy both the disk drive kit and the Macintosh Plus Logic Board Kit to get a full-fledged Mac Plus. If you have a 128K or 512K Mac, you can also assemble the equivalent of a Plus by using Apple's Mac Plus ROM chips along with third-party SCSI and memory hardware from firms such as Computer Care, Dove Computer, and

Newbridge Microsystems. However, now that the Plus has been discontinued, rumor has it the 128K ROM chips and Apple's upgrades may not be available for long. (Some upgrade firms are reporting ROM scarcities now.) Given all this, it may make more sense just to buy a new Mac.

Considering the poor track record of Plus and pre-Plus power supplies, if you do opt for an upgrade, you'll probably want to beef up your power supply using the \$80 Power Up kit from Total Systems Integration, which replaces the supply's most failure-prone parts. You can either have a dealer install the kit or send the power-supply board to TSI for installation (\$148 including the kit).

**Mac Plus** If you've outgrown the Plus, your best option is to sell it or supplement it with a new machine. Accelerators and large-screen adapters are available, but the Plus's weak power supply and lack of a fan make these upgrades somewhat risky (note the power-supply comments above).

(continues)



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## WHERE TO BUY UPGRADES

Company	Phone	Products
Aox	617/890-4402	DoubleTime-16 accelerator for SE
Apple Computer	408/996-1010	logic board, floppy disk drive upgrades
Aura Systems	619/438-7730	ScuzzyGraph series drives monitors via SCSI
Computer Care	800/950-2273	memory, video upgrades for 128K, 512K, 512KE, Plus, SE, and Classic
Computer System Associates	619/566-3911	FasTrack accelerator for SE
DayStar Digital	404/967-2077, 800/962-2077	accelerators and cache boards for II series
Dove Computer	919/763-7918, 800/622-7627	accelerators and CPU upgrades for most Macs; SCSI and memory upgrades for Mac 128K, 512K, and 512KE
Lapis Technologies	415/748-1600	video upgrades for most Macs, including Classic
Mac Doctor Electronics	415/964-2131	Brainstorm series of memory upgrades for 128K and 512K Macs
Newbridge Microsystems	613/592-5080	accelerators, memory, and CPU upgrades for most Macs, including 128K and 512K; graphics accelerator for II series
Novy Systems	904/427-2358	Mac20MX accelerator for 512KE, Plus, and SE
Orchid Technology	415/683-0300	MacSprint II cache board for original Mac II
PSI Integration	408/559-8544	cache board, 030 slot adapter for IIsi
Radius	408/434-1010	accelerators for Plus and SE; video upgrades for most models
Second Wave	512/343-9661	expansion chassis for most Macs
Siclone Sales & Engineering	408/263-8207, 800/727-8207	accelerators for Mac II, IIfx, and SE; memory upgrades for Portable
SuperMac Technology	408/245-2202	SpeedCard accelerator for SE
Total Systems Integration	503/345-7395, 800/874-2288	memory, SCSI upgrades, and accelerators for 128K, 512K, Plus, and SE

**Mac SE** There's a brighter future for this recently canned Mac, whose expansion slot can reliably accept accelerator boards and large-screen monochrome monitor adapters (sorry, no color). Apple's SE/30 Logic Board Upgrade is even more appealing, providing Color QuickDraw, a more up-to-date expansion slot, and support for virtual memory under System 7.0. Keep in mind, though, that an SE expansion board (such as an accelerator or large-screen video board) won't work in an SE/30's slot.

**Mac IIfx** This workhorse Mac II can last for years, thanks to three NuBus expansion slots and a large selection of boards to fill them. (The term *NuBus* refers to an industry standard that describes the physical and electrical design of the slots and the boards that go in them.) However, all but the very first IIfx machines contain soldered rather than socketed CPU chips, and as mentioned earlier, that's a problem for accelerator boards. DayStar Digital is the only firm offering IIfx accelerators (PowerCard 030, in 25, 33, 40, and 50MHz versions), and you need to send in your machine's logic board to have a CPU socket installed. (If you can't bear the downtime, some DayStar dealers will swap logic boards for an extra charge.)

A better upgrade alternative may be Apple's IIfx logic board, which gives you faster performance, a slot for a cache memory card, and new ROM chips that support more than 8MB of memory under System 7.0.

**Mac II, IIfx** With six NuBus slots, these two may have the brightest future of all. Accelerators such as those from DayStar Digital and Siclone Sales & Engineering provide 68030s with clock rates of 33MHz to 50MHz, for speed that rivals the top-of-the-line IIfx. Speaking of which, the Macintosh IIfx Logic Board Upgrade retails for just \$2999 plus memory—a deal so good it's created a hot market for used II's and IIfx's and helped push down prices for II and IIfx accelerator boards.

### Strategies for Current Macs

Just because a Mac is still being manufactured doesn't mean there isn't room for improvement.

**Mac Classic** The Classic's soldered (rather than socketed) CPU chip promises to make life difficult for accelerator developers. Still, several 68030 upgrades for the Classic have been announced at this writing, and others will probably follow. Large-screen video adapters are also available. Given the challenges the Classic presents to CPU clip manufacturers,

you might want to make sure the wrinkles have been ironed out before buying a product that clips onto the Classic's CPU.

**Mac SE/30** It's a good thing this Mac is reasonably fast, because no accelerator boards are available for the current model. (Dove Computer's MarathOn 030 Accelerator is available for early SE/30s, whose CPUs were socketed.) Large-screen and color video boards are available, however.

**Mac LC** Several accelerators have been announced for the fledgling LC, as well as Dynamac's \$99 LCDevice board, which contains sockets for a 68030 CPU and a 68882 math coprocessor chip. Dove has a similar product on the drawing board. DayStar Digital plans to develop an accelerator, but representatives told me the machine's small power supply presents a considerable design challenge—it supplies only 4 watts to expansion boards, versus 15w in the IIfx. The LC's soldered CPU complicates things too. Video hardware is just beginning to appear for the LC; one noteworthy product is Dynamac's LCDisplay, a liquid-crystal display (LCD) technology similar to that used by many portable computers. PSI Integration's Bus Adapter Card lets you use SE/30 expansion boards and



provides a slot for a cache memory board. Finally, Second Wave's adapter that will let you use one NuBus expansion board with the LC should be available by the time you read this; its price has not been announced.

**Mac IIsi** Thanks to its unique expansion-slot design, this littlest Mac II can accept either a NuBus board or a board designed for the SE/30's 030 Direct Slot. NuBus compatibility means a huge selection of boards, but some, including Apple's own graphics accelerator, draw more current than the IIsi's power supply can deliver. Determine the power requirements of any NuBus board you plan to buy for the IIsi. DayStar Digital and Dove plan to support the IIsi with accelerator and CPU upgrade boards, but have not announced specifics.

**Mac IIfx** One of the most popular and inexpensive upgrades for this fast Mac is a cache board. Citing reliability problems, Apple yanked its Macintosh IIfx Cache Card from the market last year, but there's a large selection of third-party boards. (Apple's should be available again by the time you read this.) Another way to speed up the IIfx is to use a NuBus video board instead of the machine's built-in video, whose design can slow down the machine, especially in its 16- and 256-color modes. (This speed-up tip applies to the LC and IIsi too.) No accelerators are available for the IIfx.

**Mac IIfx** Given this machine's blazing speed and exotic design, it's not surprising that no accelerators are available for Apple's top-of-the-line Mac. Memory, storage, and video upgrades abound.

**Mac Portable** One of the most useful upgrades for the Portable is an external video monitor adapter. Two are currently available: Aura Systems' ScuzzyGraph, which attaches to the Portable's SCSI port and can drive monochrome or color monitors; and Computer Care's Video Mac Pac board, which plugs into the Portable's Processor Direct Slot (PDS) and supports monochrome monitors.

Finally, it's worth noting that Second Wave offers *expansion chassis* for most Mac models. These external boxes contain expansion slots and power supplies. The Plus and Portable chassis let you use SE expansion

boards, while the SE/30 and II-family chassis support NuBus boards.

### Upgrade or New Machine?

Buying the right upgrade requires pinpointing your Mac's weaknesses. Do programs take too long to start, or documents too long to open? You might need a faster hard drive (or any hard drive, if you don't have one). Once a program starts, does it run sluggishly? Which operations are sluggish? Do calculations take too long? A math coprocessor or an accelerator or logic board upgrade might be in order. Do true-color graphics ooze onto the screen? You might need a graphics accelerator. If you answer "all of the above," think about a new, faster machine.

Last but far from least, it's important to assess your financial options to determine which will cost less: upgrading an existing Mac or selling it and buying a new one. Before last October, upgrading an existing machine usually made better financial sense, since the only alternative was a considerably more expensive new machine. Now that Apple has lowered prices and introduced the more affordable Classic, LC, and IIsi, the decision isn't as easy. Given the cost of hardware upgrades—and the compatibility and reliability risks that sometimes surround them—a new machine may be the smarter buy. That's especially the case if you want to take a big leap forward, from, say, a 1MB SE to a 4MB, 68030-based machine that supports sound recording. And even if a new machine costs slightly more, the extra features it provides may be worth the cost.

There is another plus to buying a new machine: in doing so you get a blank slate that is ready to accept all the upgrade options that will be developed for it. That knowledge will be comforting when the next convoy of new trains starts rolling out of Apple Station. ■

See *Where to Buy* for contact information.

*Jim Heid is a contributing editor of Macworld. His latest book, coauthored with Peter Norton, is Inside the Apple Macintosh (Brady, 1989).*

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And deadbeats to collect from—only I had no idea who owed us how much or for how long. Some suppliers may have even

thought of us as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

I found atOnce! The manual looked orderly. I dug in...

**The familiar with the unfamiliar**  
atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices—and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!—realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

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# Insights on MacInTax

HINTS TO HELP MAKE DOING YOUR TAXES, ALMOST—FUN?

M

BY CHARLES SEITER

MacInTax is, by most accounts, the most successful special-purpose program yet released for the Macintosh; it's won *Macworld's* World Class award for best tax planning/preparation or personal finance program for the last four years. Other

than speed increases and the accommodation of IRS schedule modifications, the program stays nearly the same from year to year. Nonetheless, power users (MacInTax power users tend to be CPAs who prepare hundreds of returns year-round) keep finding underused and, occasionally, even undocumented features. Here are some tips and hints for getting the most out of MacInTax 1990. I would like to acknowledge help from SoftView (Sue Morgan, Russ Sprouse, and Jeff Felder), writer George Beekman, and tax attorney Rick Seim.

## Mistakes and Missing Fields

MacInTax keeps track of mistakes and missing fields in data entry but recognizes that at 10:30 p.m. on April 14 you may simply need to get a return printed, even if the program thinks you haven't filled out the form properly. Thus the program will print out forms even if they don't meet its rigorous logical standards.

Nonetheless, MacInTax lets you inspect your forms to look for errors and incomplete areas. Hold down the Option key, press Return, and the cursor jumps to the field the program thinks contains a mistake (see "Options for Errors"). The program checks for these errors: (1) sign errors such as a plus or minus sign where the program expects no sign; (2) size errors, where an entry is larger or smaller than

the expected range; (3) incomplete entries; (4) entries in IRS-defined blank zones; (5) format errors, in which an entry the IRS expects to be Y or N, for example, is filled in with a number; and (6) box-checking errors, in which you have checked a set of options that the IRS will find inconsistent.

## A Few Hints

Before you reach for the phone to call either SoftView or the eternity-on-hold 800 number provided by the IRS, remember that if you double-click on the text for any line in a form, MacInTax gives you a little window displaying the IRS instructions pertaining to that part of the form (see "Help from Big Brother?").

Besides the IRS's instructions, SoftView includes hints and other advice for preparing returns. Make sure you scroll all the way down the pop-up instruction box until you get to the heading Tax Hints—some of this advice can save you serious money.

## Saying No to Corruption

On occasion files become corrupted. This may show up when you try to save the file—the system typically gives you the message "THIS FILE USES FORMS THAT ARE NOT AVAILABLE" and returns you to the Finder. In the Finder you can see the

right form, but the last modification date doesn't correctly show the last time you worked on the file. The recommended safety precaution is to lock all your forms using Get Info from the desktop. This way, if you find your system crashing often, you won't have to do anything other than restart, and although the data you were entering at the time of the crash may be lost, your original files will be preserved.

## Instant Access

When you click on a line in Form 1040, the Edit menu shows the instructions, itemizations, or worksheets currently linked to that line, and you can select one of these documents and open it directly. This is a good way to navigate. (continues)





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## INSIGHTS HOW TO

untitled / Form 1040			
See instructions on page 8.	<table border="1"> <tr> <td> <b>Form 1040</b>            If a joint return, spouse's first name and initial            Home address (number and street).            105 Happiness Lane            City, town or post office, state and ZIP code.            (If you have a foreign address, see page 9.)            Lottin, TX, 45017         </td> <td>           Apt. no.            For Privacy Act and Paperwork Reduction Act Notice, see instructions.         </td> </tr> </table>	<b>Form 1040</b> If a joint return, spouse's first name and initial Home address (number and street). 105 Happiness Lane City, town or post office, state and ZIP code. (If you have a foreign address, see page 9.) Lottin, TX, 45017	Apt. no. For Privacy Act and Paperwork Reduction Act Notice, see instructions.
<b>Form 1040</b> If a joint return, spouse's first name and initial Home address (number and street). 105 Happiness Lane City, town or post office, state and ZIP code. (If you have a foreign address, see page 9.) Lottin, TX, 45017	Apt. no. For Privacy Act and Paperwork Reduction Act Notice, see instructions.		
Use RS label. Otherwise, please print or type.	<table border="1"> <tr> <td> <b>Spouse's social security number</b>            5311211990         </td> <td> <b>Spouse's name</b>            Anonymous         </td> </tr> </table>	<b>Spouse's social security number</b> 5311211990	<b>Spouse's name</b> Anonymous
<b>Spouse's social security number</b> 5311211990	<b>Spouse's name</b> Anonymous		
<b>Presidential Election Campaign</b> (See page 9.)	Do you want \$1 to go to this fund? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If joint return, does your spouse want \$1 to go to this fund? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
<b>Filing Status</b> 1 <input checked="" type="checkbox"/> Single (See page 10 to find out if you can file as head of household.) 2 <input type="checkbox"/> Married filing joint return (even if only one had income) 3 <input type="checkbox"/> Married filing separate return. Enter spouse's social security no. above and full name here. <input type="checkbox"/> 4 <input type="checkbox"/> Head of household (with qualifying person). (See page 10.) 5 <input type="checkbox"/> Qualifying widow(er) with dependent child (your spouse died in 1998). (See page 10.)	<b>Check only one box.</b> 6a <input type="checkbox"/> Yourself If you are the dependent of another person, do not check box 6a. But be sure to check the box on line 7b.		
<b>Exemptions</b> 6a <input type="checkbox"/> Yourself If you are the dependent of another person, do not check box 6a. But be sure to check the box on line 7b.	<b>No. of boxes checked on 6a and 6b</b> 0		

**OPTIONS FOR ERRORS** When you press Option-Return, MacInTax jumps to the next erroneous or the next unfilled field. You can use this feature as an aid in filling out the forms for the first time, or for checking your work before printing.

gate the program, since the Edit menu shows explicitly what the program recognizes as being linked to a particular line. Or you can navigate by selecting a field and then using ⌘-H for help, ⌘-W for worksheet, and ⌘-I for itemizations.

The other navigation tool that requires a bit of explanation is the Open Forms command under the File menu. This command displays a list of all the forms, schedules, worksheets, statements, and itemizations that have been opened for the current tax return. Incomplete forms are conspicuously labeled "Not Done" and provide a snapshot of the return's status (see "A Command of Form").

To work on Schedule A, for example, highlight Schedule A and click on the OK button, or simply double-click on Schedule A. If you want to open multiple forms, hold down the Shift key and select the forms you want, and then click on the OK button to open them.

### Putting Worksheets to Work

Often MacInTax users plunge in and begin filling in forms and schedules directly. For simple returns this doesn't cause any problems, but in

general it's better to enter data at the worksheet level and let the program fill in the schedules from worksheet data.

Remember that if you enter an amount manually on a line in a form, you can't get a worksheet to calculate that amount. You must first delete the manually entered amount and then double-click on the line. And also please note: a zero entry qualifies as an amount (see "Zero Isn't Nothing").

Worksheets also provide a way to override automatic calculations performed by the program. For example, to adjust earned income calculated by the program, you can open the Schedule SE Adjustments worksheet and enter an adjustment on the indicated line. This forces the program to accept your entered amount rather than its own calculation. You can access worksheets (for example, the Schedule SE worksheet) in two ways: by simply selecting it from the Worksheets menu, or by opening the Short or Long Schedule SE from the Schedules menu and double-clicking on either line 1 or 2.

If you have K-1 activity, be sure to use the K-1 worksheet located on the (continues)

untitled / Form 1040	
<b>Line 6a</b> Yourself Check the box on line 6a unless your parent (or someone (else)) can claim you as a dependent.	<b>Form 1040/Line 6a Instructions</b> (5) No. of months lived in your home in 1990: <input type="text"/> (6) No. of children on 6c who: <input type="text"/> • lived with you <input type="text"/> • didn't live with you due to divorce or separation (see page 11) <input type="text"/> No. of other dependents on 6c: <input type="text"/> Add numbers entered on lines above: <input type="text"/> Total number of exemptions claimed: <input type="text"/>
<b>Line 7</b> Wages, salaries, tips, etc. (Attach Form(s) W-2). <b>Line 8a</b> Taxable interest income (also attach Schedule B if over \$400).	<b>Line 7</b> 0 <b>Line 8a</b> 0

**HELP FROM BIG BROTHER?** Double-clicking on the title line for a field brings up a pop-up help window that gives you the official IRS advice on filling in the field.



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Worksheets menu. This worksheet is similar in design to the actual Schedule K-1 the IRS publishes. MacInTax automatically carries forward the many variations of the K-1-type income and deductions to the proper form and schedule (this is tiresome, verging on impossible, to do manually with paper forms) and provides an audit trail that backs up the information filed with your return.

Following this recommended worksheet-oriented style, enter your tax payments on the Tax Payments worksheet. If you have federal and/or state withholding, and you complete the W-2 summary worksheet, the Tax Payments worksheet is automatically opened for you. The total of your state payments made in the current tax year automatically carries over to Schedule A and also to the state return. The program uses the dates of your tax payments, if applicable, to compute the information necessary for Form 2210, Underpayment of Estimated Tax.

### Discarding Linked Items

If you can't discard a form or worksheet, it means that you have something linked to it. This may be another form, schedule, worksheet, or statement, or it may be an itemization. Discard the linked item or items first, and then the program lets you discard the original item. If you aren't sure what documents you have opened, use the Open Forms command to view a complete list of all documents, then delete them manually.

### A Form with Two Views

Since IRS forms are pretty long compared to the dimensions of a compact Mac screen, you may want to see one part of a form while you are working on another part of the same form.

**A COMMAND OF FORM** The Open Forms command under the Edit menu is particularly useful for preparing complex returns, since it shows the status of the documents you have linked to a 1040 form (flagging unfinished forms as Not Done).

MacInTax allows you to open the same form twice, placing it in two independently scrollable windows. After opening a form from the menu, hold down the Option key and select the same form again. This opens the form in another window, and you can then independently resize and position the two windows on screen for simultaneous viewing. This doesn't create another copy of the form, just another view of the same form.

### Finely Tuned Fonts

The fonts shipped with MacInTax are individually fine-tuned for each font size to make the text fit properly in crowded forms. Be sure to install all the fonts and sizes recommended for this year's product for the printers you intend to use with MacInTax (Adobe Type Manager doesn't fix this situation).

### Looking Forward

The advantage of using a sophisticated tax-preparation program is actually twofold: you make it easier to prepare this year's return, and you also make it easier to plan ahead. With MacInTax, throughout the year you can plan for filing your taxes by entering the current year's data in last year's forms. Specifically, you can put each individual piece of data (that is, each *transaction*) into an itemization, adding to the file periodically. If all your income appears as a single lump on a W-2 with proper withholding, this is not so critical, but if you are self-employed with several variable sources of income and lots of deductions, it's a practice that lets you estimate your total tax liability at any point in time. Furthermore, by the end of the year your taxes are almost complete. You can use the Converter on the Utility



untitled / Form 1040		No. of other
<b>Form 2106-1: Your Employee Expenses</b>		
1 Vehicle expense from line 22 or line 29	1	
2 Parking fees, tolls, and local transportation, including train, bus, etc.	2	
3 Travel expense while away from home overnight, including lodging, airplane, car rental, etc. Do not include meals and substantiated	3	71.75
4 Business expenses not included on lines 1 through 3. Do not include meals and entertainment	4	
5 Meals and entertainment expenses. (See the separate instructions.)	5	
<b>Form 2106-1/Line 3 Itemization</b>		
<b>Form 2106-1/Line 3 Itemization</b>		
Itemization of:	Total	71.75
3 Items		
• Woody-Bits: back 6/10	Description	Amount
• Woody-Bits: forth 6/11		23.50
• Woody-Bits: back 6/12		24.75
• Woody-Bits: forth 6/13		23.50
• Woody-Bits: forth 6/13		24.75

disk to move the accumulated data into the new year's forms.

The program provides two options for converting this data: (1) to bring forward the prior year's tax information that would be applicable to this year's forms, or (2) to transfer *all* data from last year's forms to this year's. You want this second choice if you have been storing all the transactions in itemization lists.

### First Items of Business

MacIntax support staff and power users all emphasize the advantages of using the program's itemization capabilities. By using itemizations, you document entries and provide a clear audit trail showing the source of each entry.

Here's an itemization example. Suppose you are a professional actor and want to itemize, on line 2 of Form 2106, your transportation expenses to and from the set of the Woody-Bits Dog Food commercial. You select Form 2106 from the Forms menu and double-click in the data entry area of line 3 (see "Hot Items"). A blank itemization for that expense then appears. You can also open the itemization for

that line by highlighting the line, and then selecting Itemize Line 3 from the Edit menu or pressing ⌘-1.

Now you can enter your transportation expenses into the itemization as shown in "Hot Items." As you enter data, MacIntax automatically totals the expenses and keeps track of the number of items you've entered. MacIntax then posts the total back into Form 2106 on the appropriate line. If you need to include additional transportation expenses to the total at a later time (perhaps you get called back for a cat food follow-on), simply open the itemization again and add the new information. The amounts are automatically updated. This proves valuable as a memory aid not only if you are audited but also when you prepare next year's taxes.

By using *nested* itemizations, you can create itemizations for individual amounts within the main itemization, for more complete and accurate documentation. To create a nested itemization, open an itemization window for the expense involved. For example, suppose you have entered data on lines a through d of a base itemiza-

**HOT ITEMS** Itemizations are a great MacIntax strength—they let you keep running totals through the year, and they provide valuable evidence for audits. Itemization worksheets pop up when you double-click on fields in the appropriate forms.

untitled / Form 1040		No. of other
<b>Statement B: Interest Income</b>		
<b>Statement B: Interest Income</b>		
<b>1990 Schedule B</b>		
<b>Interest Income Statement (1)</b>		
Attach to Form 1040 (after all other IRS forms)		
Name(s) shown on Form 1040	Social Security No. 531 12 1990	
Boys, M. Omyous		
<b>Check as Applicable</b>		
Federal interest (Exempt for State Taxes)		
0% Adjustment (Original Issue Discount)		

**ZERO ISN'T NOTHING**  
Double-clicking on a blank field gets you the worksheet for calculating the field entry. If the field shows a zero, the program sees that as a value and won't help you. When possible, calculate at the worksheet level.

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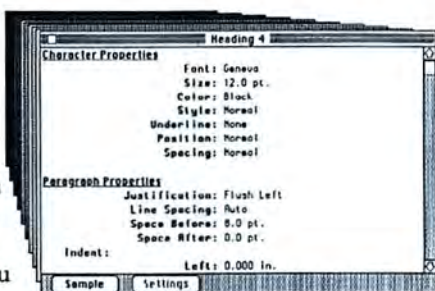
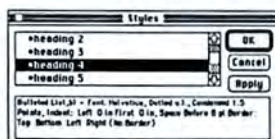


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tion. On line e, double-click in the data entry area to open a nested itemization, and continue entering data. These subitemizations are linked to the selected line, in this example line e. Note that you can select nested itemizations from any line in the itemization window. You can continue nesting itemizations this way as deeply as computer memory allows.

### Adding It Up


MacInTax itemizations won't do every type of arithmetic you might like. For example, if you want to keep separate categories of business expenses for subtotals, you will find itemization awkward. A helpful workaround is simply to run a spreadsheet along with MacInTax under MultiFinder. This gives you a workspace for separate subtotals (keep the spreadsheet file in your MacInTax folder); you can just cut and paste the subtotals into itemization fields.

### Identifiable Links

There's one more neat itemization trick: you can unlink an itemization and relink it somewhere else. This helps if, for example, you complete a worksheet and wish to discard it but want to keep one of the entries you itemized for use somewhere else in your return. All the information entered in itemization sheets is thus available for reference.

When you unlink an itemization and relink it elsewhere, MacInTax doesn't always update the description of the document in the new link, and MacInTax's brief descriptions are fairly cryptic. So write a short line somewhere to remind yourself where the new link is supposed to lead.

### Sharing the Wealth

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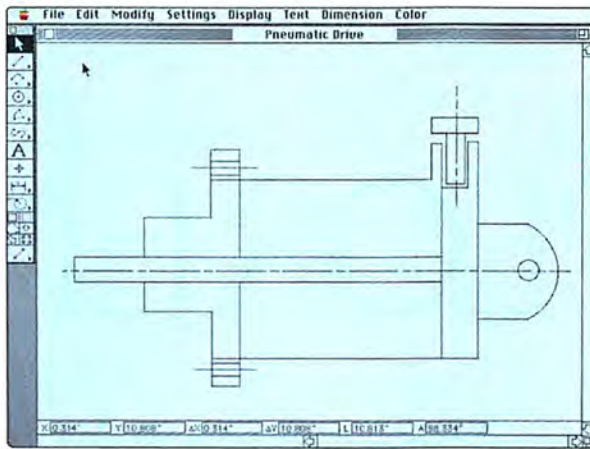
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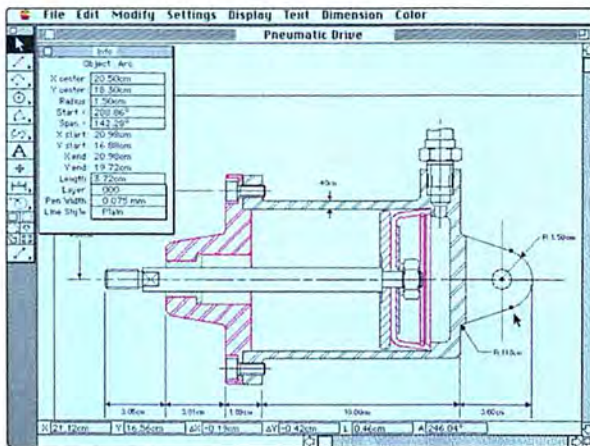
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*Charles Seiter is both a descendant and sibling of tax attorneys and a frequent reviewer of tax products for the Mac and other computers.*

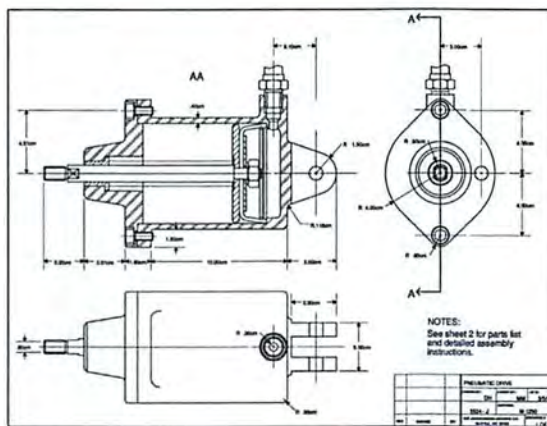




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# UPDATES

Here's our list of some of the latest versions of Mac software that were announced at the time we went to press. We hope you'll find it useful. The first price is the upgrade cost for registered owners; the second price is the current list price. (Send your update announcements to Updates, Macworld, 501 Second St., San Francisco, CA 94107.)

**AutoSave II version 1.1** is user configurable, with a Save option that can be set for time periods of from 1 to 99 minutes and lets you use automatic

saves for up to 50 programs. Also includes an Ask Before Saving feature that allows you to temporarily disable the auto-save feature on a per-document basis. Magic Software, 402/291-0670 or 800/342-6243. Contact vendor for update cost; \$49.95 new.

**BackFax version 1.5** adds the option to have Send and Receive automatically turn on at the time you start the computer. Also enables user to create a complex fax from several different programs. Solutions, 802/658-5506. Contact dealer for update policy.

**ScriptEdit version 2.0** lets you edit HyperCard scripts while the program is active. Has five Clipboards that can each store up to 32,000 lines of text; has a menu that displays all handlers or functions in the current script; and includes GREP searching, which allows user to search for script text based on a description of the text. Somak Software, 619/942-2566. \$25; \$99 new.

**Virex version 2.84** combats three additional Mac strains of the ZUC and nVIR viruses. HJC Software, 919/490-1277. \$15; \$99.95 new.

## PRODUCT UPDATES

Product	V.	Req.	Rev.	Price
1st Aid Kit ★	2.8	512K/3.0	*	
4th Dimension	2.1	1MB/6.0.2		Free
Aatrix CheckWriter II ★	2.01	512K/4.1		\$10
Aatrix TimeCard	2.0	512K/4.2		Free
Accountant Inc., Professional	1.0.4	1MB/6.0.3	9/90	\$19.95
ACCPAC Bedford	1.1	1MB/5.1		\$50
Simply Accounting				
AccuText	2.0	4MB/6.0.2	*	
Address Book	2.0	1MB/6.0.2	6/90	\$25
Adobe Illustrator	3.0	2MB/6.0.3	2/91	*
Adobe Type Manager ★	2.0	1MB/6.0.2		Free
AdWriter	2.0	1MB/6.0		Free
After Dark	2.0	512K/4.1	7/90	*
AgfaType	2.0	2MB/6.0.2		Free
Alchemy	1.1	1MB/6.0	10/90	\$25
Aldus FreeHand	2.02	1MB/6.0.3		*
Aldus PageMaker	4.0	1MB/4.1	9/90	\$150
Aldus Persuasion	2.0	1MB/6.0		*
AmPack Plus ★	4.2.2	512K/3.2		\$29.95
Analog Connection	3.0	1MB/5.0	5/90	\$50
WorkBench				
AntiToxin	1.3	1MB/6.0.2		\$15
Aperture	1.7	2MB/6.0.3	7/90	*
AppleShare File Server	2.0	512K/3.2		*
ArchIText	2.0	1MB/6.0.2		Free
Aristotle's Politics	2.0	2MB/6.0.3		Free
The Art Importer	2.0	1MB/6.0	5/90	\$20
ArtRoom	3.0	512K/3.2		\$199
AutoCalc	2.0	1MB/6.0		\$95
AutoSave II	1.1	512K/4.2	7/90	\$7.50
A/UX	2.0	4MB/6.0.5	*	
BackFax ★	1.5	1MB/6.0.3		Free
Back to Basics: Professional	2.0	512K/3.2		\$75
Bitstream Typeface Library	2.0	1MB/6.0		*
Blueprint	2.0	1MB/6.0		*
Bomber	2.0	1MB/6.0		*

**Bold** = first time the product is being listed.

★ = minor update

Product	V.	Req.	Rev.	Price
Bridge	6.0	512K/3.2		\$17
Business FileVision ★	1.5	1MB/6.0.2		*
Business Sense ★	1.2	1MB/6.0		*
Business Session ★	3.2	512K/3.2		Free
CA-Cricket Presents	2.0.1	1MB/6.0		*
Calculator	2.06	512K/3.2		\$25
Construction Set ★				
CanOpener	1.1	512K/3.0		Free
Canvas	2.1	1MB/6.0		*
Capture	3.0	1MB/6.0		\$15
Central System Manager	2.1	1MB/5.0x		*
Chameleon	3.0	512K/3.2		Free
Chemintosh II		1MB/6.0.2		Free
ChromaScan	2.0	6MB/6.0.5		*
Claris CAD	2.0	2MB/6.0		\$79
Codecheck	2.0	1MB/6.0		Free
Colorset ★	1.5	1MB/6.0	6/90	Free
CompileIt	1.5	1MB/6.0.2		\$30
CompuServe Navigator ★	3.0	512K/3.2		*
ConcertWare	5.1	512K/4.2		\$35
Control II	1.1	2MB/6.0.4		Free
CopyFlow	2.0	2MB/6.0	6/90	Free
Correct Grammar	2.0	1MB/4.2	9/90	\$29.95
Crystal Ball	2.0	512/4.2		\$75
Cue	3.0	1MB/6.0.3		*
DacEasy Light	2.0	1MB/6.0.3		*
Checkbook Accounting				
Data Desk	3.0	512K/4.0.2	6/90	\$125
DataMerge	2.0	512K/3.2		Free
dBase Mac ★	1.01	1MB/4.1		Free
Deluxe Music	2.5	512K/6.0.2		*
Construction Set				
DeskPaint ★	3.0	1MB/4.2	5/90	Free
Developer Stack	3.0	1MB/6.0		\$15
DiagramMaker ★	1.1	1MB/6.0.2		*
Digital Darkroom ★	2	1MB/6.0.2		*
DiskDoublers	3.0	1MB/6.0.2	12/90	*
DiskExpress II	2.04	1MB/6.0	11/90	*

**Req.** = min. RAM and system software required.

**Rev.** = last time (in past year) reviewed this or an earlier version.

Product	V.	Req.	Rev.	Price
DiskFit and Network DiskFit	2.0	1MB/6.0		*
DiskTop	4.0	1MB/6.0	7/90	*
Display AdBuilder	1.1	1MB/6.0.3		*
DocuComp	1.5	512K/3.0	12/90	\$19.95
Dollars and Sense	4.1	512K/3.2		*
Double Helix	3.5	1MB/6.0		*
DragonWave	2.0	1MB/6.0.3		Free
Dreams	1.1	1MB/6.0.2		*
DynaPerspective	2.0	2MB/6.0.4		Free
DynoDex ★	1.21	1MB/6.0	6/90	Free
Easy Color Paint	2.0	1MB/6.0.2	9/90	*
Empower II ★	3.03	1MB/4.2		Free
EndLink	1.1	512K/3.2		Free
EndNote Plus		512K/3.2		\$49
Exodus	2.0	1MB/6.0		\$50
Extender GrafPak	3.0	1MB/6.0.2		\$30
Falcon ★	2.2.1	1MB/3.2		\$3
Fastback II	2.1	512K/4.1		\$30
Fast Forms	2.0	1MB/6.0	11/90	\$25
FastLabel	2.0	1MB/6.0		\$36
FastTrack	1.5	512K/5.5		\$20
FaxGate ★	1.1.2	1MB/6.0		Free
Ferrari Grand Prix ★	1.6	512K/3.2		\$10
FetchIt	2.0	512K/6.0.1		*
FileMaker Pro	1.0	1MB/4.2	2/91	*
Filevision IV	1.1	1MB/4.2		\$15
FilmMaker	2.0	5MB/6.0.3	3/91	*
Finale	2.5	1MB/6.0.2	5/90	\$49
Financial Analysis	3.0	512K/3.0		*
Findswell	2.01	512K/3.2		*
Fontographer	3.1	1MB/4.2	5/90	*
FontShare	2.0	1MB/6.0		Free
FormsProgrammer ★	2.03	1MB/6.0.2		\$15
FountainView	3.0	1MB/6.0		\$15
FoxBase+/Mac ★	2.10	1MB/6.0		\$75
Freedom of Press ★	2.2	1MB/6.0		Free

(continues)

**Price** = cost for update to registered owners.

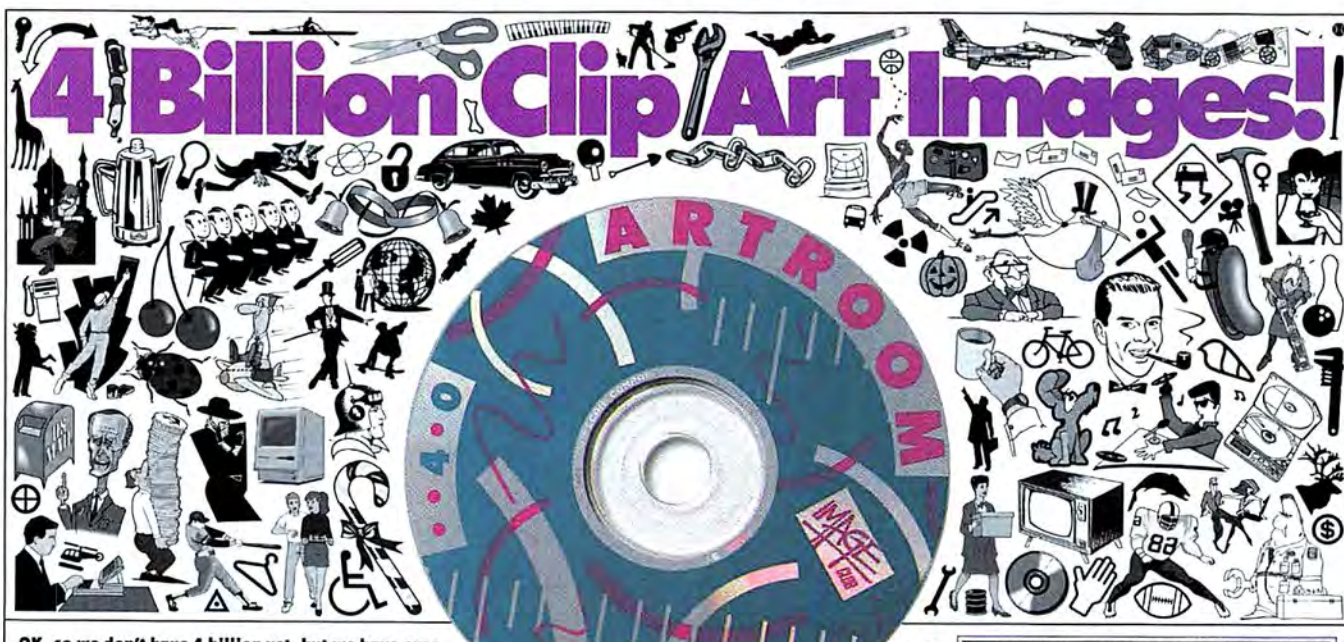
\* = contact your dealer for update policy.



## PRODUCT UPDATES

Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price
FreeFlow	3.0	1MB/6.0.3		Free	HyperTools	2.0	2MB/6.0.2		\$20	LaserPaint Color II *	1.02	1MB/6.0.3		Free
Full Impact *	2.0	1MB/6.0		\$50	HyperWindows *	1.2	1MB/6.0.2		\$20	LetraStudio	1.5	2MB/6.0		\$45
FullWrite Professional	1.5	2MB/6.0.2		*	Icon-It	2.0	1MB/6.0.2	9/90	\$29	LetrTuck+	2.0	512K/3.2		\$20
Gambler's Times	3.0	1MB/6.0	3/91	\$10	it:X Forms Designer	1.1	1MB/6.0	9/90	Free	Lightspeed Color	2.0	1MB/6.0		*
GeoQuery	2.0	1MB/6.0	10/90	*	ImageStudio	1.5	1MB/6.0		\$99	Layout System				
Golfer	2.0	1MB/4.1		\$25	ImageWriter LQ	2.0	512K/3.2		Free	Lookup	2.0	1MB/6.0	5/90	\$15
GOL	2.0	1MB/5.0		*	Print Driver *					Mac86	2.0	1MB/6.0.2		\$10
Grammatik Mac	2.0	1MB/5.0	9/90	Free	In-CAD	2.0	2MB/6.0		*	Mac286	2.0	1MB/6.0.2		\$10
Great Gantt	1.3	1MB/6.0	12/90	Free	InfoLogic Envelope *	1.1c	512KE/4.0		\$5	Mac3270	2.0	1MB/6.0.3		*
Great Plains	5.2	1MB/6.0		*	Insight Expert	2.2	1MB/6.0		*	MacAnalyst	2.0	2MB/6.0		\$125
Accounting Series					Accounts Payable					MacArchitron	4.0	2MB/6.0.3		Free
HandOff II	1.1	1MB/6.0.2		Free	Insight Expert	2.2	1MB/6.0.2		*	MacAtlas Paint	2.0	512K/3.2		\$35
Handwriting Analyst *	3.1	512K/3.2		\$24.95	Accounts Receivable					MacClassAds	4.0	1MB/6.0		*
Hard Disk Util	3.0	1MB/6.0		\$65	Insight Expert	2.2	1MB/4.2		\$99	MacConcept	3.0	1MB/6.0.3		*
Help DA	3.0	1MB/6.0		Free	General Ledger					MacDesigner	3.0	2MB/6.0		\$125
HFS Backup	3.0	512K/3.2		\$35	Inspiration	2.0.5	1MB/4.2	11/90	Free	MacDraft	2.1	2MB/6.0.2	12/90	*
HydroMac	2.0	1MB/6.0		*	Instant-Expert Plus	3.0	1MB/5.0		Free	MacDraw II	1.1	1MB/6.0		*
HyperAnimator *	1.5	1MB/6.0.3		\$29.95	JetLink Express	2.0	1MB/6.0		\$30	MacEnvelope	5.0	512KE/3.2		\$25
HyperCard	2.0	1MB/6.0.3		\$49	KidsTime *	1.2	512K/3.2		\$15	MacEnvelope Plus	2.0	512KE/3.2		\$50
HyperDA *	1.2	512K/3.2		\$10	KiviEnvelopes	3.0	512KE/4.1		\$10	Macintosh Yellow Pages	1.1	1MB/6.0		*
HyperEngine	2.0	1MB/6.0.3		\$25	Language Systems	2.1	2MB/6.0.4		Free	MacFalcon	2.1	1MB/6.0.3		*
Developer's Tool					Fortran *					MacFlow *	3.1.5	1MB/6.0.3		Free
HyperLibrary	2.0	1MB/5.0		*	LapLink Mac III	3.0	512K/2.0	7/90	*	MacFortran	2.4	512K/4.2		*

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Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price
MacFortran/020	2.4	512K/4.2	*		MapGrafic	2.0	4MB/6.0.3	Free		MindWrite ★	2.1	512KE/4.2	*	
MacFortran for MPW	1.1	2MB/6.0.2	Free		Maple	4.2.1	1MB/6.0	*		MiniCad Plus	3.0	1MB/6.0	*	
MacInUse	3.0	1MB/6.0	\$30		MarcoPolo	1.1	1MB/6.0	Free		MiniDraw	4.0	512KE/4.2	\$17	
MacLinkPlus/PC	4.5	1MB/6.0.2	*		MarketMaster	II+	1MB/6.0.3	\$25		MockPackage Plus Utilities	4.4	512KE/3.2	\$15	
MacLinkPlus/Wang VS	4.0	512K/3.2	\$45		MarkUp	1.02	1MB/6.0	5/90	Free	ModelShop	2.0	1MB/6.0.2	*	
MacLotto	2.1	512K/4.0	\$10		Master Tracks Pro 4	4.12	1MB/4.1	6/90	\$45	Modern Artist	2.0	2MB/6.0.2	\$150	
MacMainframe 3270/CUT	2.1	2.5MB/6.0.2	\$100		MathCAD ★	2.06	1MB/6.0.2	Free		Monte Carlo	2.2	1MB/6.0.3	\$60	
MacMoney	3.5	512KE/4.0	\$12		MathType	2.1	512K/6.0.2	*		More ★	3	1MB/4.1	12/90	*
MacPhonebook	3.0	1MB/6.0	*		Matlab	1.2	1MB/3.0	*		MSFL: Pro League Football	2.0	1MB/6.0	*	
MacProject II	2.1	1MB/6.0	Free		MaxPage ★	1.2	512K/3.2	Free		Multi-Ad Creator	2.2	2MB/6.0.3	*	
MacProof ★	3.2.1	1MB/6.0.2	\$30		McClint	2.0	1MB/4.2	\$25		MultiClip	2.0	512K/6.0.2	8/90	*
MacRascal	2.0	2MB/4.1	\$25		McCPrint	2.1	512K/4.2	\$25		MultiLedger ★	1.1	512K/3.2	Free	
MacRecorder	2.0	512K/3.2	*		McMax	2.0	1MB/5.0	*		MusicProse	1.01	1MB/6.0	Free	
MacroMind Director	2.0	2MB/6.0.2	10/90	\$100	MGMStation ★	2.5	512KE/3.0	*		Music Publisher	2.5	1MB/6.0	*	
MacSafe II		512KE/4.2	10/90	*	MIBAC Jazz	1.2.2	1MB/6.0	11/90	Free	M.Y.O.B.	2.0	1MB/6.0	*	
MacScan	1.6	1MB/6.0	\$35		Improvisation					MyDiskLabeler III		1MB/6.0	\$25	
MacSchedule	2.0	1MB/6.0	\$30		MicroPhone II	3.0	512K/4.2	7/90	*	MyTimeManager	2.0	1MB/6.0	5/90	*
MacSmarts	4.0	1MB/6.0	*		Microsoft Excel	2.2	1MB/6.0.2	*		NanoDisk	2.0	4MB/6.0.4	Free	
MacTell	3.5	512K/3.0	*		Microsoft File	2.0	512K/3.2	*		Navigate	2.0	1MB/6.0	Free	
MacTerminal ★	3.0	512K/3.2	\$65		Microsoft Mail	2.0	1MB/6.0.2	*		Nemesis Go Master	4.0	512K/4.1	*	
MacVision Video Digitizer	3.1	1MB/6.0.2	\$50		Microsoft PowerPoint	2.01	1MB/6.0	Free		Network Bundle	3.0	512K/3.2	7/90	*
MacWrite II	1.1	1MB/6.0	Free		Microsoft Word	4.0	512KE/3.2	*		for the Mac				
Managing Your Money	4.0	1MB/6.0.3	6/90	*	Microsoft Works	2.0	512K/6.0	*		(continues)				

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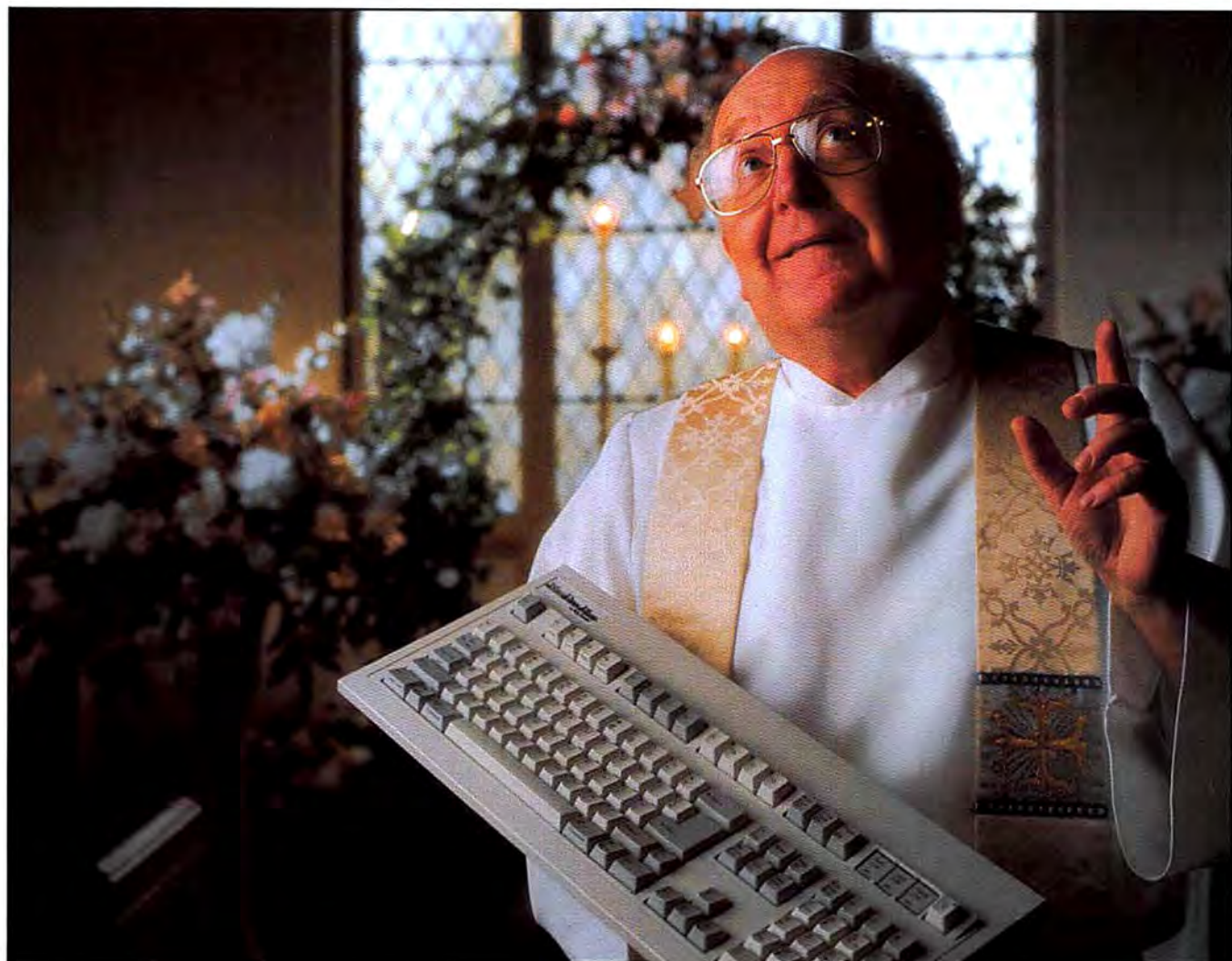


## PRODUCT UPDATES

Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price	Product	V.	Req.	Rev.	Price
NetMinder Ethernet	1.1	2MB/6.0		Free	QuickLetter	1.1.2	1MB/6.0		\$30	SuperLaserSpool	2.0.2	1MB/6.0		\$30
Network DiskFit	1.5	512K/4.1		\$30	QuickLock	2.0	512KE/3.2	10/90	Free	SuperPaint	2.0	1MB/6.0.2		\$50
The NightWatch ★	1.03	512KE/3.2		*	QuickMail	2.2	512KE/3.2		\$95	SuperSpool	5.0	512K/4.1		\$30
Nisus	3.04	1MB/6.0.2	2/91	Free	QuickShare	2.0	512KE/3.2		\$75	Sybil	2.0	1MB/6.0	11/90	*
Now Utilities	2.0	1MB/6.0.2		\$25	QuickShot ★	2.1	1MB/4.2		\$5	Synchronicity	2.5	512KE/3.2		\$10
NuPaint ★	1.04	512K/3.2		Free	RagTime 3	3.04	2MB/6.0	8/90	\$150	Systat	5.0	4MB/6.0		\$190
NuTools	1.2	1MB/6.0		*	Read-It OCR Personal	2.1	1MB/6.0.3		\$29	Teacher's Rollback ★	2.2	512K/3.2		\$17.95
Nutrition Stack	2.0	1MB/6.0.2		\$20	Read-It OCR Professional	3.0	2MB/6.0.3		*	Tempo II	1.02	1MB/4.2		*
OmniPage ★	2.1	1MB/6.0.2		Free	ReadySetGo	4.5	1MB/6.0		*	Tempo + Tools ★	1.1	1MB/4.2		*
Omnis 3 Plus/Express	2.0	512KE/3.2		*	Real Estate Edge	2.0	1MB/6.0.3		Free	Ternary Plot	3.0	512K/3.2		*
On Schedule	2.0	1MB/3.0		*	Rendezvous	2.5	512KE/4.1		\$15	TextPert ★	3.01	1MB/6.0		Free
PS1 Mustang Flight Simulator	2.80	512K/3.2		\$10	Reports ★	1.2	1MB/6.0		Free	TextScan	3.04	1MB/6.0		\$69.95
PacerLink	5.0	512K/5.0		*	Retail Engine	3.0	1MB/6.0		*	TGRAFF-07/Mac	2.0	2MB/6.0		*
Panorama	1.5	1MB/4.2		\$29.95	Sales and Market	2.0	1MB/6.0		\$49	Theorist	1.1	1MB/6.0		*
Paper Keyboard	1.2	2MB/6.0.3		\$25	Forecasting Toolkit					Think C	4.0	1MB/5.0		*
PEGASYS II	3.2	1MB/6.0.3		Free	Sales Associate	1.10	1MB/6.0.3		Free	Think Pascal	3.0	1MB/5.0	11/90	\$69
Performer Sequencer	3.5	1MB/6.0		Free	SAM	2.0	1MB/6.0	2/91	\$29.95	ThunderWorks	1.0.3	1MB/6.0.2		\$69
Personal Golf Stats	2.0	512K/3.2		Free	ScanMan Model 32		1MB/6.0	10/90	Free	Timbuku	3.1	1MB/4.1	10/90	*
Personal Phone ★	1.1	1MB/6.0		*	ScheduleMaker ★	3.01	1MB/6.0		\$25	Timbuku/Remote	2.0	1MB/4.1		*
Personal Reference Catalog	2.0	1MB/6.0	10/90	\$10	ScreenSnap ★	2.2	1MB/4.2		*	TimeMinder	2.0	1MB/4.2		\$50
Phononet Liaison	3.0	1MB/4.2		\$75	ScriptEdit	2.0	1MB/6.0.4		\$25	Timeslips III	2.0	1MB/6.0.2		*
PhotoMac	1.5	2MB/6.0.3		\$75	Sentinel	2.2	1MB/6.0		\$30	TML Pascal II	3.0	1MB/5.0		\$79.95
PhotoMacEdit	1.5	2MB/6.0.3		\$30	Shanghai	2.0	1MB/6.0.2		\$13	Trapeze ★	2.1	1MB/6.0		\$35
The Phrase Thesaurus	2.0	1MB/6.0		Free	Shortcut	1.5	1MB/6.0		Free	TrueBASIC ★	2.02	1MB/6.0		Free
PICT Detective	2.0	512KE/6.0		\$20	SimMac	3.1	1MB/6.0.2		Free	TrueForm ★	1.1	1MB/6.2		Free
PixelPaint	2.0	2MB/4.1		\$99	SimpleSpan	2.5	512K/3.2		*	TurboCASE	2.0	1MB/6.0		\$25
PixelPaint Pro	2.0	3MB/6.0.3		\$125	Smart Alarms &	3.1	1MB/6.0.2	12/90	\$25	Turbosynth	2.0	1MB/6.0.3		\$35
Plains & Simple ★	1.06	1MB/3.2		*	Appointment Diaries					Typeface Library	1.5	1MB/6.0.3		*
PostShow	1.1	1MB/6.0		\$35	Smart Alarms & Multi-User Appointment Diaries	3.01	1MB/6.0.2	12/90	*	TypeStyler	1.5	1MB/4.1	7/90	*
PowerDraw	3.0	1MB/6.0		*	SmartForm Assistant	1.1	1MB/6.0		Free	UNITize ★	1.3	512KE/3.2		\$20
PowerStation ★	2.5.2	512K/4.1		Free	SmartForm Designer	1.1	1MB/6.0		Free	UpBeat	2.01	1MB/6.0	8/90	\$75
PowerTools	3.0	4MB/6.0		*	SmartScrap & The Clipper	2.0	1MB/6.0.3		\$20	VersaCAD/	2.11	1MB/6.0		Free
Practica Musica	2.1	512K/3.2		\$10	Snap ★	3.1	1MB/3.0		*	Macintosh Edition ★				
Printer Interface III	2.0	512K/6.0.2		\$22.50	SnapJot	3.0	512K/4.1		*	Vietnam War	2.0	1MB/6.0		*
Pro-Cite ★	1.3	512K/4.1		*	SoftPC ★	1.3	2MB/6.0		*	Vrex	3.0	1MB/4.2		\$25
Professional Composer	2.3	1MB/6.0.3		Free	Sound Designer	1.5	512K/6.0.3		\$45	Virtual 2.0 for 030	2.03	1MB/4.2		Free
Professional Image II	2.0	1MB/6.0		\$22	Universal ★					Virtual 2.0 for Mac II	2.03	1MB/4.2		Free
The Programmer's Online Companion	2.0	1MB/6.0.2		\$10	Spelling Coach Professional	3.1	512KE/4.2		*	Virtual 2.0 for Mac Plus	2.02	1MB/4.2		Free
Prograph	2.0	2MB/6.0	8/90	*	Spellswell ★	2.2	512K/3.2	5/90	\$20	Vision	1.1	1MB/6.0.3		Free
Property Management III		1MB/6.0.1		\$100	Spinner Plus	2.0	2MB/6.0		\$45	VMacS	2.0	1MB/6.0		\$25
PropsForms	2.0	1MB/6.0.3		Free	Springboard Publisher	2.0	1MB/6.0		*	Voyager	1.2	1MB/6.0		*
Prototyper ★	2.01	1MB/4.1		\$79	Stepping Out II	2.0	1MB/4.1		Free	Wall Street Investor	3.0	1MB/5.0		\$150
Publish-It	1.2	512KE/5.0		*	StickyBusiness	1.06	512KE/6.0.3		Free	White Knight II	11.6	1MB/6.0.2	7/90	\$35
Publish It Easy	2.0	1MB/6.0	9/90	*	StrataVision 3d	2.0	2MB/6.0.3	4/90	\$99	Wild Things ★	1.1	1MB/6.0		Free
Publish or Perish	5.0	512K/4.2		\$10	StuffIt Classic	1.6	1MB/6.0		*	WillMaker	4.0	512KE/4.2	3/91	\$18.50
Pyro	4.0	512K/4.1	7/90	\$15	Suitcase II	1.2.6	512KE/4.1		\$25	Wingz ★	1.1	1MB/6.0		Free
Q-Sheet A/V	2.0	1MB/6.0	10/90	\$50	Super 3D	2.1	512KE/6.0.2		Free	Word Finder	2.0	512K/3.2		*
QuarkXPress	3.0	2MB/6.0.5	11/90	\$30	SuperANOVA	1.1	1MB/6.0.2	5/90	Free	WordPerfect for the Macintosh	2.0	1MB/4.2		*
Quicken ★	1.5	512K/5.0		\$30	SuperGlue II with GlueNotes	2.1	1MB/6.0		*	WorksPlus Command	2.0	2MB/6.0.3		\$35
QuickKeys?	2.0.1	1MB/6.0.2	1/91	\$49.95						WorksPlus Spell	2.0	1MB/6.0.3		\$35
										WriteNow	2.2	512K/4.2	9/90	\$49

To have products listed in this section, send upgraded software, an outline of changes since the previous release (indicate if it's a maintenance upgrade), upgrade price, minimum RAM and system software, suggested retail price, company name, mailing address, and phone number to *Updates*, Macworld, 501 Second St., San Francisco, CA 94107.





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# WHERE TO BUY

A Guide to Products Featured in This Issue

This listing provides companies and phone numbers for products mentioned in this issue. Allow several weeks for responses to reader service card inquiries. Asterisks indicate vendors who prefer to be contacted by phone.

## Reader Service

- A**
- 601 **Adobe Illustrator** Adobe Photoshop Adobe Systems; 415/961-4400, 800/344-8335; fax 415/961-3769.
  - 603 **Adobe Type Manager** Adobe Systems; 415/961-4400, 800/344-8335; fax 415/961-3769.
  - 604 **Aldus FreeHand** Aldus Corp.; 206/628-2320; fax 206/343-3360.
  - 605 **Alge-Blaster Plus** Davidson & Associates; 213/534-4070, 800/545-7677; fax 213/534-3169.
  - \* **Algebra I Homework Tutor** Missing Link Software; 201/721-2569.
  - \* **AutoMac III** Microsoft Corp.; 206/882-8080, 800/426-9400; fax 206/883-8101.

## B

- 606 **Ballet Tutor** Shan-Yee Poon Ballet School; 415/759-6199.
- 607 **Bayshore Blast** Duke University Press; 919/684-6837; fax 919/684-8644.
- 609 **The Book of MIDI** Opcode Systems; 415/369-8131; fax 415/369-1747.
- 610 **Brainstorm series** Brainstorm; 415/964-2131; fax 415/964-2135.
- 611 **Bubble Help for HyperCard** Randal Jones; 22307 65th Ave. W, Mountlake Terrace, WA 98043.
- 612 **Bus Adaptor Card** Pinnacle

## Reader Service

Sales International; 408 559-8544, 800/622-1722.

## C

- 613 **CD Companion to Beethoven's Ninth Symphony** The Voyager Company; 213/451-1383, 800/446-2001; fax 213/394-2156.
- 614 **Color MacCheese** Delta Tao Software; 408/730-9336; fax 408/730-9337.
- 615 **ColorStudio** Letraset; 201/845-6100, 800/343-8973; fax 201/845-4708.
- 616 **Cosmic Osmo** Activision; 415/329-0800, 800/227-6900; fax 415/322-0260.

## D

- 617 **The Dancing Mouse** Wondertree Learning Center; 604/876-5006.
- 618 **Deck** Digidesign; 415/688-0600, 800/333-2137.
- 619 **DeskPaint & DeskDraw** Zedcor; 602/881-8101, 800/482-4567; fax 602/881-1841.
- 620 **DesktopMike** Articulate Systems; 617/876-5236, 800/443-7077; fax 617/661-3278.
- 621 **Dialoger Professional** theResult Software; 919/490-3292, 800/365-5034; fax 919/490-2903.
- \* **Disk Accessory Plus** Vertical Solutions; 503/671-0511, 800/222-6032; fax 503/646-8248.
- \* **Display Net** Electronic Catalog Corp.; 513/241-5270, 800/777-7770.
- 622 **DoubleTime-16** Aox; 617/890-4402, 800/232-1269; fax 617/890-8445.

## E

- 623 **Earthquake Preparedness Stack** Gaia Systems; 415/854-8288; fax 415/854-8297.

## Reader Service

- 624 **Earthquest** Earthquest; 415/321-5838; fax 415/322-3817.
- 625 **Easy Color Paint** Creative Software; 201/665-9361, 800/367-6899.
- 626 **ELITE Professional Flight Simulator** AzureSoft; 408/947-1121, 800/654-2359; fax 408/947-8595.
- 627 **El Verbo Simple** Jason Sluzevich; 719/598-4670.

## ETHERNET PRODUCTS

- 628 **3Com Corp.** 408/764-5000, 800/638-3266; fax 408/764-5003.
- 630 **Apple Computer** 408/996-1010, 800/776-2333; fax 408/974-6726.
- 631 **APT Communications.** 301/831-1182, 800/842-0626; fax 301/874-5255.
- 632 **Asanté Technologies** 408/734-4844, 800/662-9686; fax 408/734-4864.
- 633 **Cabletron Systems** 603/332-9400, 603/332-4616.
- 634 **Cayman Systems** 617/494-1999, 800/473-4776; fax 617/494-9270.
- \* **Compatible Systems Corp.** 303/444-9532, 800/356-0283; fax 303/444-9595.
- 635 **Dayna Communications** 801/531-0203, 801/359-9135.
- 636 **Dove Computer Corp.** 919/763-7918, 800/622-7627; fax 919/251-9441.
- 637 **Everex Systems** 415/498-1111, 800/821-0806; fax 415/683-2151.
- 638 **Farallon Computing** 415/596-9100; fax 415/596-9020.
- 639 **Generation Systems** 408/734-2100; fax 408/734-4626.
- 640 **MacProducts USA** 512/343-9560, 800/622-3475; fax 512/343-6141.
- 641 **National Semiconductor Corp.** 408/721-5000; fax

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- 408/970-0905.
- 642 **Network Resources Corp.** 408/263-8100; fax 408/263-8121.
- 643 **NetWorth** 214/869-1331; 800/544-5255; fax 214/556-0841.
- 644 **Nuvotech** 415/331-7815, 800/468-8682; fax 415/331-6445.
- 645 **Racal Interlan** 508/263-9929, 800/526-8255.
- 646 **Shiva Corp.** 617/252-6300, 800/458-3550.
- 647 **Solana Electronics** 619/490-5050; fax 619/490-5055.
- 648 **Technology Works** 512/794-8533, 800/688-7466; fax 512/794-8520.
- 649 **Tri-Data Systems** 408/727-3270, 800/874-3282; fax 408/980-6565.
- 650 **Ungermann-Bass** 800/999-3236.
- 651 **Webster Computer Corp.** 408/954-8054; fax 408/954-1832.
- 652 **The Wollongong Group** 415/962-7100, 800/962-8649, 800/872-8649 in California.

## F

- 653 **FasTrack** Computer System Associates; 619/566-3911; fax 619/566-0581.

## H

- 655 **Hyper-ABLEDATA** Trace Research and Development Center; 608/262-6966; fax 608/262-8848.
- 656 **HyperMailbox** Kenji Takeuchi; 312/241-6322.
- \* **HyperRegister** George Pytlík; 604/533-4706.

## I

- 657 **interFACE** Bright Star Technology; 206/451-3697; fax 206/454-1062.

(continues)



## Reader Service

- L**
- 658 **La Cie Tsunami 80-Q** La Cie, a Plus Development Company; 503/691-0771, 800/999-0143; fax 503/692-8289.
- 659 **The Lazy Eye: A Primer of Neuro-ophthalmology** Howard Bregman; 215/898-9840.
- 660 **LCDevice, LCDisplay** Dynamac Computer Products; 303/296-0606, 800/234-2349; fax 303/296-9540.
- 661 **LessonCard** C.H. Love & Co.; 915/676-1109, 800/527-4248; fax 915/676-1534.
- 662 **Liberty 80** Liberty Systems; 408/983-1127; fax 408/243-2885.
- M**
- 663 **Mac Frog** Bob Doltar; 503/245-1898.
- 664 **MacGraphX** Bravo Technologies; 415/841-8552.

## Reader Service

- 665 **MacInTax** SoftView; 805/385-5000, 800/622-6829; fax 805/385-5001.
- 666 **Macintosh Ici Cache Card, Macintosh Display Card 8-24 GC** Apple Computer; 408/996-1010, 800/776-2333; fax 408/974-6726.
- 668 **Macintosh Upgrade Products** Apple Computer; 408/996-1010, 800/776-2333; fax 408/974-6726.
- 675 **The Mackerel Stack** Mackerel Design; 416/538-1676.
- 676 **MacList** JAM Software; 415/663-1041; fax 415/663-8217.
- 677 **MacPhoneBook** SYNEX; 718/499-6293, 800/447-9639; fax 718/768-3997.
- 678 **MacRecorder** Farallon Computing; 415/596-9100; fax 415/596-9020.
- 679 **MacroMaker** Apple Computer; 408/996-1010, 800/776-2333; fax 408/974-6726.

## Reader Service

- Macroscopic Ecology Project** 714/659-7811.
- 680 **MacSprint II** Orchid Technology; 415/683-0300, 800/767-2443; fax 415/490-9312.
- 681 **Marathon 030 Accelerator** Dove Computer Corp.; 919/763-7918, 800/622-7627; fax 919/251-9441.
- 682 **MasterColor** Preferred Publishers; 901/683-3383; fax 901/683-4983.
- 683 **MasterStrokes** Datadesk International; 818/998-4200, 800/826-5398; fax 818/998-0330.
- 684 **Metromorphosis** Wondertree Learning Center; 604/876-5006.
- Microsoft Excel Tour** Microsoft Corp.; 206/882-8080, 800/426-9400.
- 685 **MusiCard Maker** Intellimation; 805/968-2291, 800/346-8355; fax 805/968-8899.
- O**
- 686 **Oasis** Time Arts; 707/576-

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- 7722; fax 707/576-7731.
- Offline SNA**; 609/799-9605, 800/628-6442; fax 609/799-9639.
- 687 **Outdoor and Adventure Vacations** Tourism British Columbia; 800/663-6000.
- P**
- 688 **Photon Paint** Micro-Illusions; 818/785-7345; fax 818/787-7345.
- 689 **PixelPaint** SuperMac Technology; 408/245-2202, 800/624-8999; fax 408/735-7250.
- 690 **PixelPaint Professional** SuperMac Technology; 408/245-2202, 800/624-8999; fax 408/735-7250.
- 691 **Power Up** Total Systems; 503/345-7395, 800/874-2288; fax 503/343-6293.
- 692 **PowerCard 030** DayStar Digital; 404/967-2077, 800/962-2077.
- 693 **Professor Mac** Individual Software; 415/595-8855, (continues)

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800/331-3313; fax 415/595-5619.



694 **QuickKeys<sup>2</sup>** CE Software; 515/224-1995; fax 515/224-4534.

695 **Quik30** Novy Systems; 904/427-2358; fax 904/428-0765.



696 **Revolución** Hugo Rosatti, Pontificia Universidad Católica de Chile, Instituto de Historia, Santiago, Chile.



698 **ScuzzyGraph series** Aura Systems; 619/438-7730, 800/365-2872; fax 619/447-8982.

699 **Si3033** Siclone Sales & Engineering Corp.; 408/456-5060, 800/767-8207; fax 408/456-0107.

700 **Si3040** Siclone Sales & Engineering Corp.; 408/456-5060, 800/767-8207;

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fax 408/456-0107.

701 **Si3050** Siclone Sales & Engineering Corp.; 408/456-5060, 800/767-8207; fax 408/456-0107.

\* **A Simulation of Acute Myocardial Infarction** Lee Andrews; 419/381-3653.

702 **Software Bridge Macintosh** Systems Compatibility Corp.; 312/329-0700, 800/333-1395; fax 312/670-0820.

703 **SpeedCard** SuperMac Technology; 408/245-2202, 800/624-8999; fax 408/735-7250.

704 **StrataVision Paint** Strata; 801/628-5218, 800/678-7282.

705 **Studio/8, Studio/32** Electronic Arts; 415/571-7171, 800/245-4525; fax 415/570-5137.

\* **SuperImage** Image Analysis Research Center; 419/381-3653.



707 **Tempo II** Affinity

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Microsystems; 303/442-4840, 800/367-6771; fax 303/442-4999.

708 **Terremoto** Ian Bertie, Pontificia Universidad Católica de Chile, Instituto de Historia, Santiago, Chile.

709 **TypeChart** Octavo Productions; 604/987-5270; fax 604/987-5787.



710 **UltraPaint** Deneba Software; 305/594-6965, 800/622-6827; fax 305/477-5794.



711 **VideoPaint** Olduvai Corp.; 305/665-4665, 800/822-0772; fax 305/665-0671.

712 **VideoPaint Pro** Olduvai Corp.; 305/665-4665, 800/822-0772; fax 305/665-0671.

713 **Virtual** Connectix Corp.; 415/324-0727, 800/950-5880; fax 415/324-2958.

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714 **Wacom SD-510C Tablet** Wacom; 201/265-4226, 800/922-6613; fax 201/265-4722.

715 **WealthBuilder by Money Magazine** Reality Technologies; 215/387-6055, 800/346-2024; fax 215/387-2179.



716 **Your Personal Trainer for the SAT** Davidson & Associates; 213/534-4070, 800/545-7677; fax 213/534-3169.

Public domain software, freeware, and shareware are available through online information services; user groups (call 800/538-9696 ext. 500 for information on a local user group); or mail-order clearinghouses such as EDUCORP (800/843-9497, 619/536-9999), or the Public Domain Exchange (800/331-8125, 408/496-0624 in California).

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PCPC CGCH/32



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236	Aurora Industries	18	—	92	In Focus	5	800/327-7231	226-227	NEC Technologies	314	800/NEC-INFO
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71	Calcomp	3	—	157	Kensington Microware	6	—	208	Peachtree Software	100	800/247-3224
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16	Curtis Manufacturing	20	603/532-4123	159-164	MacAvenue	—	800/926-6221	46	SNA, Inc	—	—
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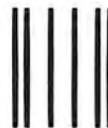
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*AT&T Computer  
Systems*  
Samuel H. Fuller  
*Digital Equipment  
Corporation*  
John Markoff  
*The New York Times*

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Captain  
*T/Maker Company*  
Dave House  
*Intel Corporation*  
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*Radio Shack*  
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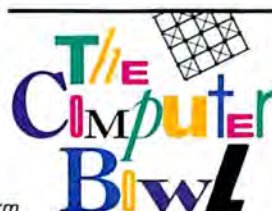
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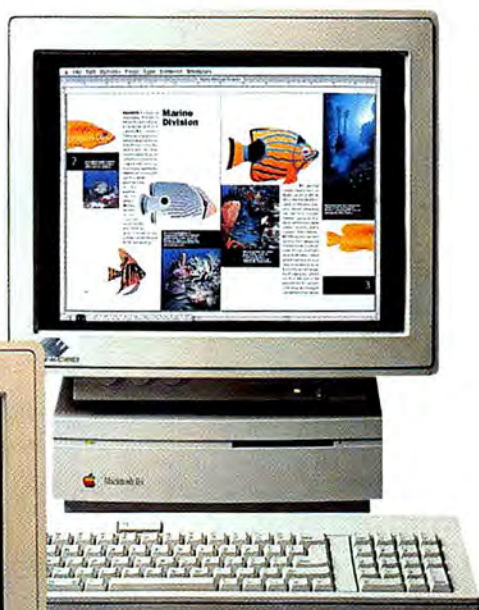
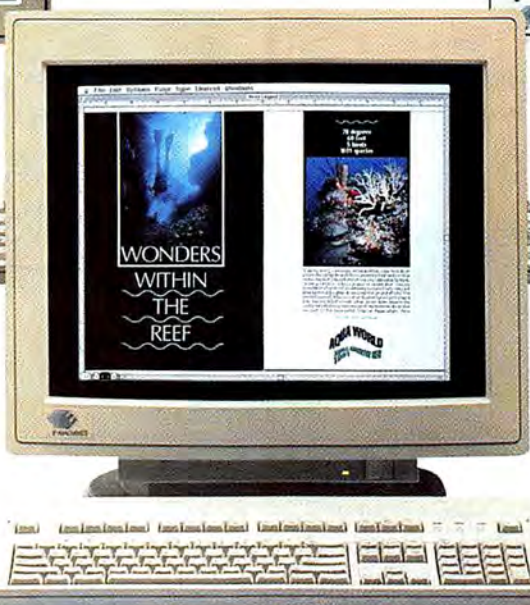


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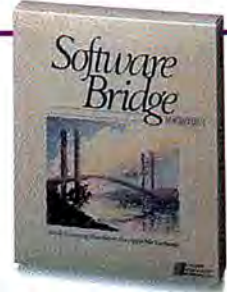
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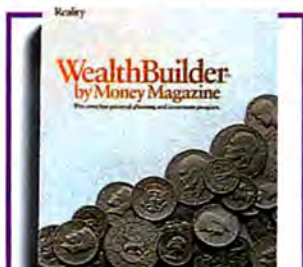
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105L	<17ms (<12ms with Cache)	519	619	649
120	<15ms (<10ms with Cache)	679	779	809
170	<15ms (<10ms with Cache)	749	849	879
210	<15ms (<10ms with Cache)	869	969	999
Seagate		Internal	Standard	Premium
173	18ms	\$999	\$1099	\$1129
300	16.5ms	1269	1369	1429
330	11ms	1519	1619	1679
330	14ms 3.5"	1599	1699	1729
425	16ms	1699	1799	1829
425	14ms 3.5"	1799	1899	1929
600	16.5ms	1729	1829	1889
650	15.5ms	2199	2299	2369
1000	15ms	2999	3099	3169
Syquest, Tape, DAT, Optical		Standard	Premium	
45R	(Syquest, one cart)	\$569	\$599	
45DR	(Dual Syquest, two carts)		1099	
60t	(Teac) w/Retrospect and one tape		569	
150t	(Teac) w/Retrospect and one tape		679	
DATadrive™	1.3GB WangDAT, w/Retrospect, one tape		1799	
OptiDisk™ 600	(Sony) w/one cartridge		3499	
OptiDisk™ 1000	(Maxtor) w/one cartridge		4399	

### Media

Teac CT600H (60mb)	\$17
Teac CT600N (150mb)	24
Syquest SQ400	74
4mm DAT Tape	19
Optical Cartridge (ISO/Sony)	159

### UltraCombos

300/45R	\$1999
300/1550t	2049
600/DAT	3799
650/Optical	5699
1000/DAT	4999
1000/Optical	6799
2000/DAT	7699
Over 30 combinations.	

### SIMMs

Mac SIMMs (1, 2, 4mb)	
11fx SIMMs (1, 4mb)	24
NTX SIMMs (1mb)	74
Portable (1 to 8mb)	19
Classic SIMMPack (1, 2.5, 3mb)	
Call for price quotes.	

### Combo Drives

105/45R	\$1049
170/150t	1419
170/DAT	2399
210/DAT	2499
425/45R	2399
425/DAT	3399

### Video, Printers, Add-ons

DayStar Fastcache	\$299
DayStar Powercards	Call
Radius Accelerators	Call
68851 PMMU w/Virtual	179
TI MicroLaser PS35	Call
Seiko ColorPoint PS	Call
Microtek 300ZS Color	1799
Epson ES300C (600 dpi)	1799
Asanté Ethernet Mac II/SE 30	379
Cayman Gatorbox	2049
RasterOps	
264-264 SE 30	399/649
364/364 Director bundle	949/1299
364 Audio Media bundle	1499
8L-24L Systems	Call
24Si	769
ClearVue II, GS, GS30	Call
Radius Pivot, TPD19, TPD 21	Call
SuperMac Video Systems	Call
Seiko Trinitron 14"	589
Sony 1304 14"	699
Ikegami Trinitron 19"	2195
Ikegami 8- & 24-bit Systems	Call



## Third Wave Computing

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Laser Printer**

**\$1,649**

- 10 Pages per minute
- 11 Font Families (35 typefaces)
- 3 megs of RAM
- Solid Blacks for graphics
- Letter, Legal and transparencies



**CrystalPrint  
Publisher I  
Laser Printer**

**\$1,899**

- 8 Pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Solid Blacks for graphics
- Letter, Legal and transparencies



**CrystalPrint  
Publisher II  
Laser Printer**

**\$2,395**

- 8 Pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Adobe type one support
- Solid Blacks for graphics
- Letter, Legal and transparencies



**PS17 Microlaser  
PostScript<sup>®</sup> Laser Printer**

**\$1,499**

- 1.5 Megabytes of RAM
- 6 pages per minute
- 17 typefaces
- Letter, Legal, and transparencies
- **AppleTalk Interface Included!**



**PS35 Microlaser  
PostScript<sup>®</sup> Laser Printer**

**\$1,799**

- 1.5 Megabytes of RAM
- 6 pages per minute
- 35 typefaces
- Letter, Legal, and transparencies
- **AppleTalk Interface Included!**



**QMS-PS<sup>®</sup> 410  
PostScript Laser Printer**

**\$1,999**

- 2 Megabytes of RAM
- 4 pages per minute
- Letter, legal, envelopes, and transparencies
- Auto switching between Macintosh and IBM.

PostScript<sup>®</sup> is a registered trademark of Adobe Systems Incorporated.

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional \$5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express

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# Sale

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Fast Cache IIci	\$269
PowerCache IIci 40 MHz	\$929
PowerCache IIci 50 MHz	\$1,649
25 MHz Powercard 030	\$1,125
33 MHz Powercard 030	\$1,275
50MHz Powercard 030	\$1,949
Radius	
Accelerator 16 for Plus/SE	\$599
Accelerator 25 for SE	\$999

## Fax Modems

**Special**

Abaton	
Interfax Modem 24/96	\$289
Dove	
24/96 Fax Modem	\$279
Orchid	
24/96 Fax Modem	\$419

## Hard Disk Drives

**Special**

Imprimis	
TWO YEAR WARRANTY	
Imprimis Drives Now Have A Two Year Warranty.	
Effective on all drives purchased after 3/1/91	
MacWren 300	Internal External \$1,349/\$1,449
MacWren 330	
Runner	\$1,499/\$1,599
MacWren 600	\$1,799/\$1,899
MacWren 1.2 Gig	\$2,799/\$2,899

**Special**

Quantum	
TWO YEAR WARRANTY	
Quantum 40	\$299/\$399
Quantum 105	\$399/\$459
Quantum 120	\$589/\$689
Quantum 170	\$679/\$779
Quantum 210	\$849/\$959

## Memory

**Special**

### SIMM SALE

**\$49**

FREE Installation Manual Included!

## UPS

Safe Power Systems	
Safe 250	\$189
Safe 400S	\$369

## Scanners

Caere	
The Typist	\$459

**Special**

Microtek	
300GS	\$1,249
300ZS	\$1,699
Abaton	
300GS	\$1,199

## Monitors

**Special**

Magnavox	
TWO YEAR WARRANTY	
14" Color Monitor	\$439
NEC	
MacSync 14" Color Monitor	\$439
Seiko	
14" Color Monitor	\$589

## Removable Disk Drives

**Special**

**SyQuest 42 Removable \$439**

cartridge not included



**SyQuest Cartridges \$68**

**10 Pak Only \$660**

## Printers

Kodak	
Diconix Color 4 Printer	\$1,169

**Special**

NEC SlientWriter 90	\$1,699
---------------------	---------

**Special**

QMS	
QMS PS410 PostScript	\$1,999

**Special**

Qume	
CrystalPrint Publisher I	\$1,899
CrystalPrint Publisher II	\$2,395
ScriptEN PostScript	\$1,649
Seiko	
Smart Label Printer	\$199

**Special**

Texas Instruments	
PS 17 Microlaser	
with Interface	\$1,499
PS 35 Microlaser	
with Interface	\$1,699

## Monitor Systems

**Special**

Magnavox	
TWO YEAR WARRANTY	
14" Color Monitor with 8 bit Video Interface Mac II family†	\$699
14" Color Monitor with 24 bit Video Interface Mac II family†	\$799
SE/30 8 bit Video System	\$799
Radius	
Two page display w/Interface	\$1,299
Pivot with Interface	\$1,199

**Special**

RasterOps	
264 ColorBoard*	\$399
364 ColorBoard*	\$879
8S ColorBoard	\$349
24S ColorBoard	\$549
24L ColorBoard	\$2,699
ClearVue Classic or LC	\$1,269
We carry the full line. Please call for the lowest price!	

**Special**

SamSung	
15" Full Page Monitor with Video Interface	\$449
Now Available for Mac Plus, SE, SE/30 and Mac II Family	
Isi with nubus adapter	\$549

## CD ROM

**Special**

NEC	
Portable CD with Interface	\$449
TOSHIBA	
External CD with Interface	\$499

\*while supplies last  
†requires nubus card



**For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)**



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Circle 264 on reader service card



# Aim with MacTel for your Apple solutions

## INDEX Hard Drives

**Economy series:** All INDEX Economy drives include MacTel HD Utilities and 14 Mb PD.

		internal	external
Quantum 3.5" ProDrive HD	40 Mb 12 ms	\$299	\$379
	52 Mb 12 ms	\$339	\$419 Slimline
	80 Mb 12 ms	\$479	\$559
	105 Mb 12 ms	\$499	\$579
	105 Mb 12 ms	\$529	\$609 Slimline
Imprimis 5.25" Wren Half-Height drives	170 Mb 12 ms	\$729	\$809
	210 Mb 12 ms	\$849	\$929
	425 Mb 15 ms	\$1699	\$1779
Imprimis 5.25" Wren Series HD	320 Mb 16 ms	\$1259*	\$1359*
	330 Mb 10.7ms	\$1619*	\$1719* RUNNER
	640 Mb 16 ms	\$1819*	\$1919*
	650 Mb 10.7ms	\$2900*	\$3000* RUNNER II
	1.2 Gb 16 ms	\$2999*	\$3099*

## Also ask for Removable & Cartridges system



**Elite series:** All INDEX Elite external HardDrives have an auto-Sensitive Power Supply and include MacTel HD Utilities "Chaufeur" Backmatic V-2 AutoSave II and 14 Mb PD software.

		internal	external
Quantum 3.5" ProDrive HD	40 Mb 12 ms	\$359	\$439
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	105 Mb 12 ms	\$599	\$689
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	210 Mb 12 ms	\$949	\$1039
Imprimis 5.25" Wren Series HD	320 Mb 16 ms	\$1499*	\$1559
	330 Mb 10.7ms	\$1749*	\$1849 RUNNER
	640 Mb 16 ms	\$1999*	\$2099
	1.2 Gb 16 ms	\$3199*	\$3299

All INTERNAL DRIVES include Bracket cables and software, everything to plug-N-go.

\*Fits only MacII, MacIIx & MacIIfx. All INDEX externals Harddrives are supplied with universal power supplies, for world-wide adaptability. Backmatic V-2 and AutoSave II are registered trademarks. All INDEX "ELITE" harddrives are bundled with Backmatic V-2 & AutoSave II software.

## VisionPro Monitor Systems

When purchasing Systems, compare the options and features. VisionPro Color Graphic cards are manufactured under license for MacTel Technology and support Macintosh graphical needs now and in the future.

### Video Graphic Systems

#### 8-Bit Business System.

8 Bit Video Card non Upgradable.  
20" Ikegami Trinitron (CT-20)  
75 Hz ..... \$2795

#### 8-Bit SystemPro 20",

VisionPro\* VideoCard.  
20" Ikegami Trinitron (CT20)  
75 Hz ..... \$3249



#### 8-Bit SystemPro SONY 19",

VisionPro\* VideoCard, 19" Sony Trinitron (GDM-1950)  
75 Hz ..... \$3625

#### 24-Bit VisionPro Interface Upgrade Kit

w/ purchase of any systemPro ..... \$600

\*All VisionPRO Interface cards have multi-monitor support (Sony 19" Ikegami 20"), support BlockMode transfer & acceleration, Upgradeable 8-Bit to 24-Bit cards, Pan/Zoom 2X & 4X and virtual desktop. Business system video card offers Pan/Zoom 2X & 4X and virtual desktop.

### Monitors

Apple 13" RGB ..... \$749

Seiko 14" Trinitron CM 1445

Hi-Res Monitor w/Tilt & Swivel ..... \$589

Hitachi 14" MVX Super

Hi-Res Monitor w/Tilt & Swivel ..... \$575



### Video Interface/cards

8-Bit Vision ST 813

for 13" or 14" Monitor ..... \$275

24-Bit Vision ST 2413

for 13" or 14" Monitor ..... \$375

Vision ST Upgrade Kit (8 - 24 Bit) ..... \$135

VisionPro 8 - 24 Bit Upgrade Kit ..... \$700



### Macintosh CPU and Systems

- Mac Classic (fully loaded)
- Mac SE/30
- Mac II LC
- Mac II SI
- Mac II CI
- Mac II FX
- "NEW" Backlit Mac Portable
- LaserWriter II NT, NTX and Personal LaserWriter's

- Also fax/call for quote on complete Apple Macintosh production and competitive pricing • Government • Universities • Corporations (on approval) - bids requested •

## Index Memory Modules

- 1 Mb Surface Mounted /low Profile 70/80 ns ..... \$43
- 1 Mb FX and laserwriter II SIMM 70/80 ns ..... \$44
- 2 Mb Surface Mounted /low Profile for Mac II SI/CI ..... \$159
- 4 Mb SIMM's (all Mac's) Surface Mounted /-80 ns -bundled with Maxima (min. 4 units for Maxima software) ..... \$209
- 1 Mb X 9 SIMM 70/80 ns ..... \$47

ALL INDEX SIMMS HAVE GOLD CONTACTS AND TRACES • LIFETIME WARRANTY • CALL FOR CURRENT PRICING •

**NEW:** 1 Mb TI Microlaser PS 17&35 memory upgrade (Increase printing speed and download more fonts) ..... \$139

Complete Memory production for PS/2, Compaq, Toshiba, DELL, Zenith, Sun ...fax/call for quote

## Hardware

MacTel Extended Keyboards : English ..... \$99

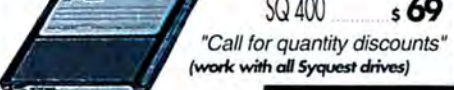
(delivered with French or German system software)

Golden Triangle : DiskTwin - CALL

Syquest Technology

SQ 400 ..... \$69

"Call for quantity discounts" (work with all Syquest drives)



## Texas Instruments

MicroLaser PS-17

w/ 17 fonts ..... \$1599

MicroLaser PS-35

w/ 35 fonts ..... \$1899

1Mb TI Microlaser PS card XL

17 & 35 memory upgrade ..... \$139

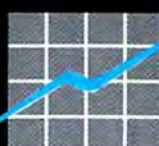
MicroLaser XL ..... \$149

(Increase printing speed and download more fonts)

**\$40 Bonus** Receive \$40 off the price of a 1Mb INDEX memory module for the TI microlaser when you purchase a PS17 or PS35 printer from MacTel!

MacTel carries hundreds of professional Mac peripherals (not listed) and the entire Macintosh line. Call or Fax for a complete catalog.

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Circle 142 on reader service card



# A Few Magic Tricks

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70, 80 ns, lifetime guarantee. Call for most current price.

1 MB fx SIMMs	\$47
4 MB SIMMs	\$225
4 MB fx SIMMs	\$225
3 MB Portable RAM	\$899
Portable RAM 1-8 MB	call
4 MB Classic upgrade	\$199

Magic  
57450

## RailGun 030 Accelerators

4 Times faster than Dove Marathon.

With new accelerated SCSI access!  
We can give your original Mac new speed and performance with our Magic RailGun 030 Accelerator for the Plus, SE, & Classic.

16.25, & 33 MHz RailGun	starting at \$499
16 MHz 68881/68882 coprocessor	\$99/\$149

## Magic Hard Drives

A/UX comp. Disk Manager Mac, 10Mb software, 2 year warranty, surge protect, Ext SCSI selector.

	Internal	External
Quantum		
40 MB hard drive	\$300	\$429
52 MB low profile HD	\$359	\$481
80 MB hard drive	\$479	\$599
105 MB hard drive	\$499	\$625
105 MB low profile HD	\$529	\$659
170 MB hard drive	\$628	\$939
210 MB hard drive	\$959	\$1150
300 MB CDC hard drive	na	\$1850
300 MB WrenRunner	na	\$1999
600 MB hard drive	na	\$2350
1.2 gig hard drive	na	\$2795

Internal kit \$29 New advanced replacement warranty!



## Magic 45R Removable

Portable, fast, & affordable removable media. Syquest mechanism. 2 year warranty.

45 MB removable drive	\$529
Syquest cartridge	\$69



## Magic Tape Backup

MagicTape 60	\$679
MagicTape 150	\$699
MagicTape 525	\$999
MagicTape 1.3 gig/ 2.4 gig	\$1895/\$2895



## Magic Video

MagicView 19" B&W Plus W/card	\$999
Magic 8-bit color card II/ SE30	\$269/\$329
Magic 19" 8-bit color card for II	\$499
14" NEC MacSync with tilt/swivel	\$449
19" Color Triniton Monitor	\$2099

## Magic Scanners

MagicScan 256 8-bit 300 DPI grayscale scanner w/ImageStudio Software	\$1099
--	--------

## Macintosh CPU's

Mac Classic	\$849	36 month lease \$30
Mac Classic 2/40	\$1299	36 month lease \$44
NEW! Mac LC	\$1899	36 month lease \$64
Mac IIs 2/40	\$2749	36 month lease \$92
Mac IIs 5/80	\$3399	36 month lease \$115
Mac IIs	\$4199	36 month lease \$140
Mac IIfx	\$6299	36 month lease \$210

Leasing prices reflect avg monthly rate. Businesses only. \$3000 minimum purchase.



## HARDWARE & SOFTWARE

### Accelerators

Daystar 25MHz 030 II, Ix/ Ixx	1099/ 1499
Daystar 33MHz 030 II, Ix/ Ixx	1439/ 1799
Daystar 40MHz 030 II, Ix/ Ixx	1639/ 1999
Daystar 50MHz 030 II, Ix/ Ixx	2159/ 2559
Daystar FastCache Ixi	269
Daystar PowerCache Ixi 40MHz	469
Daystar PowerCache Ixi 50MHz	1069
Daystar SCSI PowerCard	1109

### Connectivity/Network

3 Com EtherLink/NE	456
Alisa Alaskan 1/TK50	4249
Asante Macconn+ Ix/ Ixx	345
Asante Macconn+ II/ Ixx	359
Avator MacMainFrame Ix	859
Avator MacMainFrame II	714
Cayman Gator Box	2097
Cayman Gator Card Ethernet	452
CE Mail	329
CE Software QuickMail 5 User	221
Daniela MacSeeth	76
Dayna EtherPrint Card	359
Dynalinx	825
EC IRMA	699
Edobard Digichannel Nu/II	114
DCA R. PC MacTerm II	829
Farallon StarController	399
Farallon EtherNet Card	210
IBS DataClub 3 Pack	445
Novell EtherPort SE/30	285
Novotech Navolink II	315
Novotech TurboStar	1059
Novotech TurboStar	359
Oracle Mac Network	337
Rack-Interlan Mac Connect	1725
Shiva Ethergate	1999
Shiva Fastpath 4	285
Shiva Netbridge X232	359
Shiva Telebridge	439
Solara R Server	255
Solutions Fargate Plus	189
Tops/Siva FastBox	169
Tops/Siva FlashCard	169
Tops/Siva Network Bundle IEM	169
Tops/Siva Network Bundle Mac	169
White Line Mac 240	135

### CD Rom

CD Technology Porta Drive	685
Chicon CD Drive	599
NEC CDR-36 Drive/Interface	483
NEC CDR-73 Drive/Interface	699
NEC Port CDRom	399
Toshiba CD Rom Drive	799
Many Titles Available	call

### Digitizers

Calcomp 12x12 Tablet	395
Calcomp WIZ Tablet	139
Digidesign AudioMedia	719
Farallon MacRecorder	159
Kurita S/ADB 8.5x11	319
Summagraphics Bit Pad +	317

### Emulation/Translation

Dayna Dos Mounter	52
Insignia Access PC	81
Insignia SoftPC with AT/EGA	341

### Mouse/Keyboard

Abaton Pro Point	88
Appton Mouse Pen ADB	84
DEK RollerMouse	80
Curtis Mouse	89
Datadesk Mac 101 ADB	137
Kensington TurboMouse	110
Keytronic MacPro Keyboard NEMV	125
Mouse Systems LiteMouse ADB	115
Practical Solutions Cordless Mouse	105

### Modems/ Telecommunication

Abaton Interfax 24/96	355
AE DataLink External Fax/MNP	249
AE DataLink Internal 2400	199
AE Quadlink	859
Cypress FaxPro 96/24	289
Dove DoveFax Desktop	131
Global Village TelePort Modem	899
Hayes Ultra SmartModem 9600/tdt	715
Hayes V.42 Series 9600 V.42BIS x 25	439
Orchid Technologies Fax Modem	519
Practical Peripherals 9600 V.32/V.42	1429
Shiva Netmodem V.32	899
Telexbit Trailblazer Plus 19200 BPS	699
US Robotics Courier V.32/V.42BIS	695

### Display/Video Systems

19" Triniton Monitor	2399
Amdek 14 White Monitor	169
Amdek PowerPage Card I, SE, SE30	289
Calcomp 21 Color 24bit System	6199
Calcomp 21 Grey 8 Bit System	2299
Generation Systems Portable Publisher	465
Lapis DisplayServer Mac II	377
Mass Micro Colorspace II	1689
Mass Micro Easy Video 8	445
Mass Micro Quadimage 24	739
National Semi MacQuadimage 24 Bit	1789
NEC MacSync 14 Color HC	449
Radius Direct Color 24	2799
Radius Pivot	769
Radius Precision Color Calibrator	535
Radius Quick Color Graphics Accelerator	465
Radius Two Page Display 19	1069
RasterOps 24L	2839
RasterOps 24S	585
RasterOps 24SE	839
RasterOps 24/SE30	549
RasterOps 364	915
RasterOps 8L	1429
RasterOps 8LC 19	2799
RasterOps ClearVue Classic	359
RasterOps ClearVue ILLC/SE	1299
RasterOps ClearVue XL	499
RasterOps SE/30 Business Color	2799
Sonyt DataShow 480 Projection Pad	1369
Sigma ColorMax 8.2x14 19	4279
Sigma L-View MultiMode 19	1389
Sigma PageView GS 15	619
Sigma SilverView M21	1479
Supernac	call

### Printers

Apple Laser Writer Iitbx	4225
Apple Personal Laser Writer NT	2325
Calcomp 1023 Plotter	3699
Calcomp Raster Plotters	call
GCC Printers	call
HP DeskWriter	719
HP LaserJet IP	1119
HP PaintWriter XL	2379

Kodak Dconix Color 4	1129
Kodak Dconix M150	379
NEC Colormate PS	1799
NEC SilentWriter II Model 90	2129
Okidata OkLaser 840 PostScript	2399
Panasonic KX-P4455 LaserPrinter	2399
QMS ColorScript 100 8mb Deluxe	7619
QMS PS 410	2149
Sekosha 2000AAP Dot Matrix 8Pin	209
Sharp 7530 color inkjet	1999
Telextron ColorQuick Inkjet/Int	2059
Telextron 17 Postscript	1559
TI MicroLaser 35 Postscript	1699

### Accessories, Disks, Ribbons

150 Meg Backup Tape	35
80 Meg Backup Tape	17
HP DeskJet Cartridges	3
ImageWriter Black Ribbons	3
ImageWriter Color Ribbons	1
ImageWriter Multi Color Ribbon	10
Jet Fill Desk Jet Re-Fill	call
Kensington Complete Line	1
MacDisk DS/DO Bulk 50	0
Sony MegaDisk Bulk 50	1
Sony DS/HD Bulk	55
Sopris SE Carrying Bag	44
TI MicroLaser Toner Kit	55

### Scanners

Abaton 300GS	1350
Cenex TypeSet Hand Scanner	1079
Canon CanoScan w/Interface	1079
Complete PC Complete Page Scanner	789
HP ScanJet + w/Interface	1649
Magic ScanJet 250 Grey	999
Microtek ScanMaker	2499
Sharp JX-300	725
Sharp JX100	725

### Storage

AE 3.5 1.44K	224
Bermouli LaserSafe M0650	3999
Bermouli Portable 44mb	2799
Bermouli Transportable 44mb	1079
Dayna Dual Drive 1.2Mb/1.44Mb	789
Dayna Dual Drive 360K/1.2Mb	650
Dayna Dual Drive 360K/1.44Mb	719
Dayna Single Drive 360K	469
Dayna Single Drive 1.2Mb	610
Dayna Single Drive 1.44Mb	139
Kenneth Drive 1200	249
Kenneth Drive 24	319
Kenneth Drive 650	191
Kenneth Tech Report	1099
MassMicro DataPak II Removable	1189
Maynard MacStream 150	2799
Microdot 3.5GB Tape Backup	2999
Microdot CMO Readwrite Optical	5999
Microdot SBT 1174 MB Mintower	3799
Pinnacle Micro REC650 /Interface	769
PJ Infinity Turbo 45R	2129
PLJ Turbo Drive	479
Teclar LaserVault 650 R/W /Interface	91

### Software

911 Utilities	23
Adobe All Titles	call
After Dark 2	119
Carbon Copy Mac	45
Claris All Titles	212
Disk Doctor II	499
Dux Express II	499
FieldMaker Pro	391
FileMaker	436
FontBase Mac Multi	319
Freedom of Press Light	315
Freehand	359
Generic CAD Mac	329
Illustrator 3	69
Inside Information	596
Laser	449
Macromind Director	449
Media Vaker	345
MicroSoft Complete Line	call
MinCard	82
Norton Utilities	499
PageMaker 4	199
Personal Shop	505
PhotoShop	517
Quick Express 3.0	269
Retrospect Remote	399
SoftPC EGA/AT Bundle	124
StrataLight	319
StrataScan 3D	67
Swift Deluxe	485
Swivel 3D Pro	95
Timbuktu	65
TypeAlign	119
Typewriter	161

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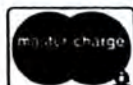
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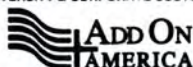
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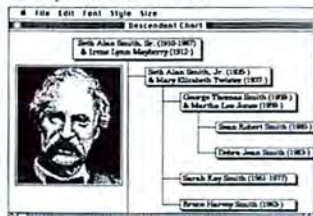
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FAST NEXT DAY SERVICE

We're MAC specialists dedicated to MAC Users. Call us today for • Repairs • Upgrades • Hard Drive Repairs

Mac Friends  
CALL NOW TOLL FREE **800-622-8804**

CIRCLE 513 ON READER SERVICE CARD

## HELL YES!

- PostScript® to Hell Color Scanning
- Commercial Quality Color & DTP
- 1200 & 2400 dpi PS Imagesetting
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24-HOUR BBS FAX  
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TRAINING

Master the basics of Photoshop with an easy and powerful self-paced audio tutorial.

TEACH YOURSELF PHOTOSHOP

**PHOTOSHOP BASICS**

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Call or Fax 408.358.7793  
Includes 5 photographic images on diskettes, cassette tape, Quick Card & Visual Tour  
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CIRCLE 522 ON READER SERVICE CARD

## Data Conversion

### TAPE/DISK CONVERSIONS

Conversion services to or from over 2700 computer systems:  
• Magtapes • Mini Computers  
• Micro Computers • Typesetters  
• Word Processors

CALL THE INDUSTRY LEADERS

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COMPUTING SERVICES, inc.

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Elegant Graphic Slide Service

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Software & Hardware  
Graphics specialists, Matrix & Lasergraphics Film Recorders, VIDI Presenter®, Photoshop®, Director®, Jobo film labs  
**LOW, LOW, LOW PRICES**

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Take Flight!™ gives you easy access to travel information and booking.

A new point-and-click interface to the Official Airline Guides® Electronic Edition

- No more codes to decipher or remember
- Save on connect charges
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Requires: modem and access to Compuserve®

\$149 • Call 800-253-5542

LATERAL THOUGHTS  
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CIRCLE 517 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
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- Expert Advice and Prices by Phone
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- Lifetime Repair Warranty\*

\*on many repairs. Visa/MC/AX. Fast overnight shipping available. We use genuine Apple™ parts.

1-800-MAC-SHOP

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## Desktop Publishing

**\$4 PER PAGE** CL TYPE **LINOTRONIC OUTPUT**  
Desktop Publishing • Cover Design  
Package Design • Typesetting  
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CIRCLE 466 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.



# The Macworld Catalog



## COLOUR POSTERS

- PC Mac Unix etc.
- Postscript formats
- Most vector & raster
- 42 in. X 12 ft., 400 dpi
- 24 hr, 19.2k Baud BBS

- Large illustrations
- Large renderings
- Courtroom displays
- Signage, Murals
- Architectural

**digital prism inc.**  
636 El Camino Real  
San Carlos, CA 94070  
(415) 508-8800

CIRCLE 465 ON READER SERVICE CARD

## Disk Duplication

## Multimedia

### FORMATTED DISKETTES BASF, VERBATIM, SONY

WITH FORMAT	QTY 250 MIX & MATCH	WITHOUT FORMAT
\$ .44	5.25" DS/DD	\$ .39
\$ .73	5.25" DS/HD	\$ .59
\$ .69	3.50" DS/DD	\$ .58
\$ 1.39	3.50" DS/HD	\$ 1.25

- **FREE FORMATTING** on First Order
- **TYVEC SLEEVES** & Labels Included
- **COLOR MEDIA** Please Add \$.05
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PO Box 1114, Issaquah WA 98027

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**Creativision at Telemation.**

Real Time  
Frame-By-Frame  
PICS, PICT, MacroMind Director and  
Accelerator, 3D Works, SuperCard  
and others

Output through state-of-the-art  
Lyon Lamb scan converter to 1/2" SP,  
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## Laser Recharge

HIGH QUALITY  
**SLIDES**  
FROM YOUR  
**MAC**  
•OVERNIGHT SERVICE•



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POWERPOINT  
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FT. LAUDERDALE, FL 33309

CIRCLE 511 ON READER SERVICE CARD

reconditioned **TONER** cartridges!  
for laser printers  
& Canon PC Copiers

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• 20% MORE TONER  
• DARKER PRINT  
• 100% GUARANTEED

From **\$44.95**  
We buy empties  
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Willow Products Corp.  
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**WILLOW**

CIRCLE 445 ON READER SERVICE CARD

## The Bottom Line:

There's no easier, faster, or more economical way to get your message in front of 385,000 Macintosh buyers than to advertise in

*The Macworld Catalog.*

**Call 800/888-8622  
to reserve your space today!**

## Repair

### MAC HARD DRIVE EXPERTS



**WE CAN SAVE IT!**  
•Repair •Recover •Upgrade

CIRCLE 510 ON READER SERVICE CARD

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# The Macworld Catalog

Accessories

Furniture

**FINALLY A MAC DESK THAT WORKS!**

**FREE CATALOG**

- STRONG
- COMPACT
- MOBILE

*"The best Mac workstation ever"*  
Mac Friends 1990

**AS LOW AS \$199**

**agio** **800-688-2446**

DESIGNS  
503 - 690 - 1400

agio JAPAN (03) 5682-9262

CIRCLE 402 ON READER SERVICE CARD

## Mouse Pads

### Your Logo Specialist

Qty. (Lexan— hard surface)

12	\$6.45 wo/logo	N/A
36	\$5.95 wo/logo	N/A
72	\$5.70 wo/logo	\$6.50 w/logo
144	\$5.15 wo/logo	\$5.20 w/logo
500	\$4.80 wo/logo	\$4.60 w/logo
1000	\$4.48 wo/logo	\$4.48 w/logo

Choose your color. Size 8 1/2 x 11

Ask for samples. We specialize in private label. Great promo item.

Satisfaction Guaranteed

Innovative Technologies

619/456-0722 Fax 619/456-2732

800/522-5654 (CA)

800/544-5654 (USA)

### Company Logo Specialist

Qty.	Canvas	Hard Surface
12	\$8.50 w/logo	N/A
72	5.90 w/logo	N/A
144	4.19 w/logo	5.69 w/logo
500	3.80 w/logo	5.30 w/logo
1000	3.49 w/logo	4.99 w/logo

Canvas or Hard Surface in a variety of colors. Size 9.5"x8"x3/8". Multi-color OK. SAMPLES with your logo \$12.50. ENTIRE pad imprintable and 100% guaranteed.

Computer Expressions

3833 Chestnut Street

Philadelphia, PA 19104

800/443-8278, 215/222-4400

## MACWORLD CIRCULATION REACHES YOUR MARKET

With the leading circulation in the market—385,000, Macworld delivers your advertising to a powerful audience—dealers, VADs and VARs, more newsstand buyers, corporate managers, the latest upgrade buyers, Macintosh buyers and premium paid subscribers. You simply can't reach a more qualified audience.

## ACTIVE BUYERS

63% of Macworld subscribers are active buyers and have purchased products directly as a result of seeing an advertisement in Macworld.

(Macworld Subscriber Study 1990)

## POWERFUL BUYERS

84% of Macworld subscribers have purchase involvement for personal computers and related products within their organization.

(Macworld Subscriber Study 1990)

For your ad to appear on *The Macworld Catalog* screen, call 800/888-8622.



# The Macworld Catalog



## Mouse Pads

Custom Printing Available.

Cloth: 13 Colors

Size: 8x71/4 8x91/2 81/2x11

12 Pads 3.25 3.50 3.75

72 3.00 3.25 3.50

144 2.85 3.00 3.25

PLASTIC: Blue, Platinum, Gray, Red &

Black Size: 81/2x11

12 Pads 6.50 36 6.00

72 5.75 144 5.25

ASK US ABOUT OUR PICTURE PADS!

Precision Line Inc.

14505 21st Ave. No. Ste. 206

Plymouth, MN 55447

612/475-3550, 1/800/328-0077

## Never buy another ribbon!

Over 150,000 sold!!



\$45.00

**MacInker™**, the Automatic Ribbon Re-inker, re-inks any printer ribbon (black & color) for 5 c. Lubricating ink cools printhead, extends its life and yields better-than-new printout. Average re-inkings per cartridge: 60-100. **Universal MacInker** (spec. printer) \$75. **Imagewriter I/II** \$45. Adapters available for multicolor cartridge, \$40. Complete range of black, color, heat transfer, special ink cartridges. Satisfaction or 30 day refund. Free key-beeper-flashlight for orders >\$100.00. Order toll free or call to get full information.

(800)547-3303

Computer Friends  
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fax (503)643-5379

Major credit cards accepted. POs from National Accounts accepted. Shipping \$5.00. cod add \$3.30

CIRCLE 473 ON READER SERVICE CARD



## The Best Case Scenario

Airline Check-in or Local Use

Zero Halliburton Aluminum Mac Cases:

Lightweight, Durable, Distinctive Styling

CLASSIC/Plus/SE II/cx/ci IIsi LC II/cx/ci

Portable Attaches Monitor & Printer Cases

from \$299.95 1-800-542-4591

1-213-578-9710

TCC 13101 Wash. Blvd., #110, L.A. CA 90066

CIRCLE 403 ON READER SERVICE CARD

**FREE CATALOG**

**COMPUTER SECURITY PRODUCTS**

• Theft Protection • Unauthorized Access/Use Control • Software Security

**1-800-766-LOCK**

**DOSS INDUSTRIES**

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CIRCLE 411 ON READER SERVICE CARD

## Pack your Mac in seconds!

Cordura case has internal padded pockets for mouse, keyboard and drive.

Available in six colors.

Extended Keyboard version also available.

For a dealer near you

call toll free

**1-800-548-0053**

West Ridge Designs

1236 N.W. Flanders

Portland, OR 97203

CIRCLE 444 ON READER SERVICE CARD

**3.5" DS/DD Bulk Disks**  
**39¢** ea. in lots of 25

**3.5" DS/HD Bulk Disks**  
**79¢** ea. in lots of 25

**3.5" Disk Cases** - Protects up to 50 Disks  
**\$2.97** each (for 2 or more)

**Apple ImageWriter I & II Ribbon**  
**\$1.67** each (In Packs of 6)

**4-Color Apple ImageWriter II Ribbon**  
**\$5.97** each (In Packs of 2)

**Mouse Pad** **\$2.99**

**3.5" User Labels** - In Assorted Colors  
(\$1.50 per pack of 50 labels)

Add shipping - 55¢ per 25 3.5" disks; 80¢ per disk case; \$1.60 per pack of ribbons; 55¢ per mouse pad; User Labels - No shipping charge

Add Order Processing, Packaging & Handling - \$3.00 Per Order

**MEI/Micro Center - 1100 Steelwood Rd.  
Columbus, Ohio 43212**

**Call 1-800-634-3478**

CIRCLE 477 ON READER SERVICE CARD

**DS/DD 3.5" Diskettes**  
**39¢** each

In lots of 25

**Lifetime Warranty**

**Best Buy**

**MWC15**

**1.44MB HIGH DENSITY**  
100% ERROR FREE  
BULK DS/HD  
**79¢** EACH  
IN LOTS OF 25

**800 KB DOUBLE DENSITY**  
100% ERROR FREE  
SONY BULK DD  
**49¢** EACH  
IN LOTS OF 50

**SONY HD 1.44 MB Box of 10 (1/2")** \$16.90 /Box

**SONY DD 800 KB Box of 10 (1/2")** \$8.49 /Box

**4800Bd Send FAX Modem & Software \$99.95**  
by 200M-Built-in 2400Bd 100% Hayes Comp Modem!  
Sends to any Group 3 FAX or modem. Schedules FAX times, keeps logs. Speaker, 8 LEDs, Suppresses Lighting & Line-Noise, w/Pwr Supply. Cable-\$9.95

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**FREE 48-Page Catalog!**

CIRCLE 524 ON READER SERVICE CARD

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For people going somewhere

Cordura exterior for durability. Thick, high-density foam padding for shock absorption. Padded pockets to protect keyboard, peripherals and drive. Color choices.



Mac Plus, SE  
MacClassic  
MacIIcx, ci,  
MacIIsi,  
MacPortable  
MacLC  
and others

**ComputerAid**

800-343-3388

401-274-0595

A Division of Karen Anne Mfg. Fall River, MA

CIRCLE 423 ON READER SERVICE CARD

## DUST COVERS

All Fabric Dust Covers

- Heat Ventilating. Unlike plastic, and Won't Dry Out.
  - Yellow or Crack with age! • Machine Wash & Dry!
  - Highest Quality, Custom-Fit Design! • For Apple, MAC, IBM, Compaq & many more! • Custom orders!
  - Available in Gray, Tan, Navy, Royal, Red or Brown.
  - Monogramming and Silk-screening Available!
  - 100% Satisfaction Guaranteed! • Service since 1983!
- |                                       |       |                                 |       |
|---------------------------------------|-------|---------------------------------|-------|
| 11-30 Mac Classic & Keyboard          | 24.95 | 11-32 Mac ILC, 12" Mini A4D     | 29.95 |
| 10-55 Mac Plus & Keyboard             | 24.95 | 10-86 Mac SE or II Ext Keyboard | 9.95  |
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| 10-75 Mac SE & Ext Keyboard           | 24.95 | 11-23 Radius Pivot Monitor      | 24.95 |
| 11-25 Mac ILC Computer Only           | 15.95 | 10-95 Radius 2 Page Display     | 24.95 |
| 11-36 Mac ILC 13"HP Ch. A4D           | 29.95 | 11-22 Super Mac 13" Ch. Mini    | 29.95 |
| 11-37 Mac ILC 12" Mini & Keyboard     | 29.95 | 11-04 Apple Scanner             | 15.95 |
| 10-73 Mac II, Ch. Mini & Ext Keyboard | 29.95 | 10-37 Imagewriter II            | 15.95 |
| 11-02 Mac IIcx/IIcx CPU               | 19.95 | 10-90 LaserWriter II            | 24.95 |
| 11-01 Mac ILC Computer Only           | 15.95 | 11-25 Personal LaserWriter      | 24.95 |
| 10-98 Mac ILC, Ch. Mini & Keyboard    | 29.95 | 11-40 T.I. microLaser PS        | 19.95 |
| 11-33 Mac ILC 13"HP Ch. A4D           | 29.95 | SPCL Special Orders             |       |
- Add \$3.50 Shipping & Handling (Chk, M/C, C.O.D., VISA/MC)

**GO-DU CO Computer Dust Covers**  
4802 W. Wisconsin Ave. Milwaukee WI 53208  
**800-735-1584** 414-276-1204 • 414-276-1279 FAX

CIRCLE 455 ON READER SERVICE CARD

**DUST COVERS** **100%** **ComputerWear**

**COTTON CANVAS**

**MAC, SE, II, & PRINTERS**  
Beige w/ Grey Trim Breathable! Static-Free!

**NEW! Seal-Skins**  
For Keyboards

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CIRCLE 507 ON READER SERVICE CARD

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MACWORLD

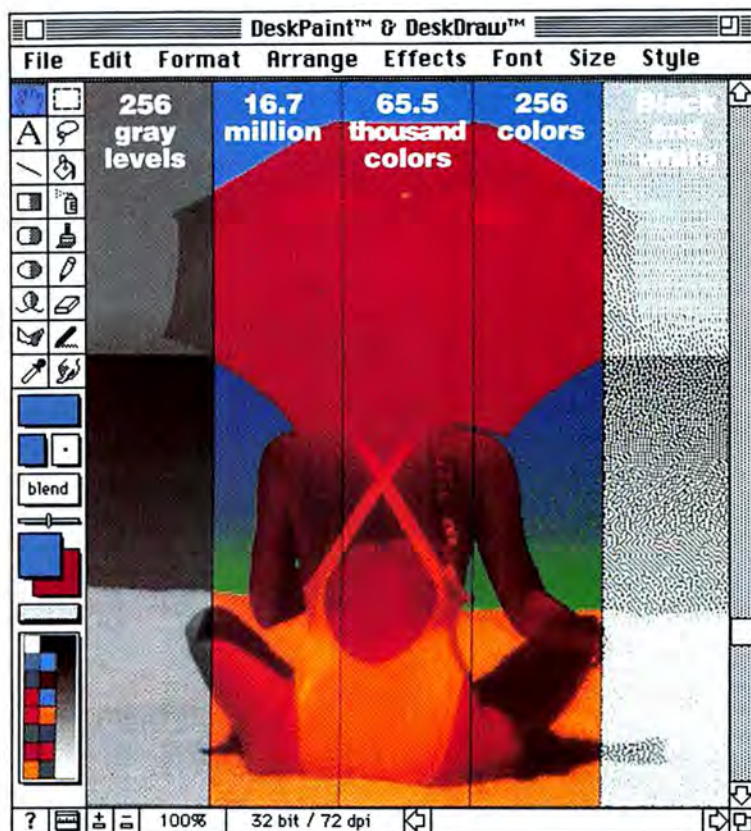
## PRODUCT LAUNCH SECTION

Turn to the Product Launch Section of Macworld for information on the new products in the Macintosh industry.

This is the premiere showcase for new product launches or 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



## DIDADADODAT?

Yes, a DA did do that! Introducing DeskPaint™ & DeskDraw™ v.3.0, the most exciting graphics package ever released for the Mac.

DeskPaint supports B&W, Gray Scale, and Color bitmaps (2, 4, 8, 16, and 24 bit), PICT2, TIFF, and MacPaint® files, filters, rulers, soften, blend, intelligent lasso and paint bucket, transparent paint, graduated fills, distort, free rotate, multiple windows, and more.

DeskDraw supports PICT2 object-oriented editing, rulers, ar-

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And as memory efficient DAs (DeskPaint is 1/10th the size of PixelPaint™), they're instantly available inside applications—even without multifinder or system 7.0.

To see dem DAs do dat, visit your dealer, or call us at 1-800-482-4567 for a free brochure.

DeskPaint & DeskDraw are trademarks Zedcor. Other products are trademarks of their respective owners.



Circle 55 on reader service card.

## Slow The Wind

You can create calm and beauty where you live, too. Join me and plant a tree. For your free booklet, write: Conservation Trees, The National Arbor Day Foundation, Nebraska City, NE 68410.



The National  
Arbor Day Foundation





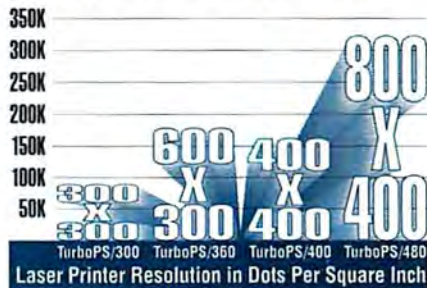
# Let NewGen satisfy your hunger for high-resolution with an affordable 800 dpi printer!

Text for the menu was created in PageMaker, saved as EPS files and placed in FreeHand.

Add powerful applications like PageMaker®, FreeHand® and Adobe® Type Fonts to produce typeset quality output at your own facility.

The NewGen TurboPS/480 can produce PostScript® language compatible output at 800 x 400 dpi, nearly four times the resolution of other laser printers. And when we say PostScript compatible, we mean it, including Type 1 fonts, special effects and EPS files from all your favorite applications and programs.

The NewGen TurboPS/480 is a complete printer with built-in AppleTalk®, parallel and serial ports. And unlike some printers, it works in mixed Mac-PC



The Images with Impact® clip art illustrations were edited with FreeHand and color was specified in cyan, yellow, magenta and black.

The Apollo logo was created in FreeHand where the various elements were edited and combined.

Resolution close up, 18 point Garamond Italic enlarged 500%



environments, and it doesn't require an internal PC processing board or dedicated server.

To show you how confident we are that you'll be impressed with 800 x 400 dpi output, we printed this page at actual size, including the menu which was output as color separations.

What does all this resolution and compatibility cost? Very little. The TurboPS/480 - with 800 x 400 dpi and RISC performance - lists for about 25% to 50% less than its competitors, while our TurboPS/400, TurboPS/360 and

TurboPS/300 laser printers cost less than slower 300 and 400 dpi PostScript language printers.

If you have an appetite for high-speed, high-resolution PostScript language printing, call 714/641-8900 today to get your TurboPS evaluation kit.

Dealer inquiries welcome.



This ad was created and separated on a TurboPS printer. For information about its production, contact NewGen Corporation.



## NewGen Systems Corporation™

17580 Newhope Street, Fountain Valley, CA 92708  
Telephone (714) 641-8900 FAX (714) 641-2800

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Dealers Circle 244 on Reader Service Card

End Users Circle 246 on Reader Service Card



# BEST-SELLERS

Months on chart

Last month

This month



## BUSINESS SOFTWARE

71	1	1	<b>Microsoft Word</b>	Microsoft Corporation
62	3	2	<b>Microsoft Excel</b>	Microsoft Corporation
50	2	3	<b>Microsoft Works</b>	Microsoft Corporation
58	4	4	<b>Aldus PageMaker</b>	Aldus Corporation
23	5	5	<b>FileMaker II</b>	Claris Corporation
24	7	6	<b>QuarkXPress</b>	Quark
47	8	7	<b>MacWrite II</b>	Claris Corporation
10	6	8	<b>Quicken</b>	Intuit
14	—	9	<b>Aldus FreeHand</b>	Aldus Corporation
18	9	10	<b>Adobe Illustrator</b>	Adobe Systems

## EDUCATION SOFTWARE

25	1	1	<b>Where in the World Is Carmen Sandiego?</b>	Broderbund Software
6	3	2	<b>Where in Time Is Carmen Sandiego?</b>	Broderbund Software
12	4	3	<b>Where in the USA Is Carmen Sandiego?</b>	Broderbund Software
38	2	4	<b>Reader Rabbit</b>	The Learning Company
51	5	5	<b>Math Blaster</b>	Davidson & Associates

## ENTERTAINMENT SOFTWARE

14	1	1	<b>Tetris</b>	Spectrum HoloByte
16	2	2	<b>SimCity</b>	Maxis Software
1	—	3	<b>SimEarth</b>	Maxis Software
8	3	4	<b>Welltris</b>	Spectrum HoloByte
24	—	5	<b>Falcon</b>	Spectrum HoloByte

## NETWORK/DATA COMMUNICATIONS

50	1	1	<b>TOPS</b>	Sitka Corporation
45	2	2	<b>AppleShare</b>	Apple Computer
9	—	3	<b>MicroPhone II</b>	Software Ventures
7	3	4	<b>Timbuktu</b>	Farallon Computing
4	4	5	<b>White Knight</b>	FreeSoft

Months on chart

Last month

This month



## MASS STORAGE\*

14	1	1	<b>MacStack SD40</b>	CMS Enhancements
29	2	2	<b>MacStack SD20</b>	CMS Enhancements
16	5	3	<b>MacStack SD30</b>	CMS Enhancements
2	—	4	<b>UltraDrive 45</b>	GCC Technologies
1	—	5	<b>MacStack SD45</b>	CMS Enhancements

## ADD-IN BOARDS

5	2	1	<b>Macintosh Display Card 8•24</b>	Apple Computer
7	5	2	<b>Radius TPD Interface</b>	Radius
6	1	3	<b>Pivot</b>	Radius
4	—	4	<b>Radius Direct Color24</b>	Radius
3	—	5	<b>Radius Accelerator 16/SE</b>	Radius

## UTILITY SOFTWARE

12	1	1	<b>SAM II</b>	Symantec Corporation
12	2	2	<b>SUM II</b>	Symantec Corporation
6	3	3	<b>The Norton Utilities for the Macintosh</b>	Symantec Corporation
11	—	4	<b>Adobe Type Manager</b>	Adobe Systems
4	5	5	<b>Macintosh Tools Deluxe</b>	Central Point Software

## PRODUCT WATCH

Recent or forthcoming products of particular interest.

**Meeting Maker** *On Technology*  
Group calendaring software

**SpaceShip Warlock** *Reactor*  
Interactive science fiction adventure on CD

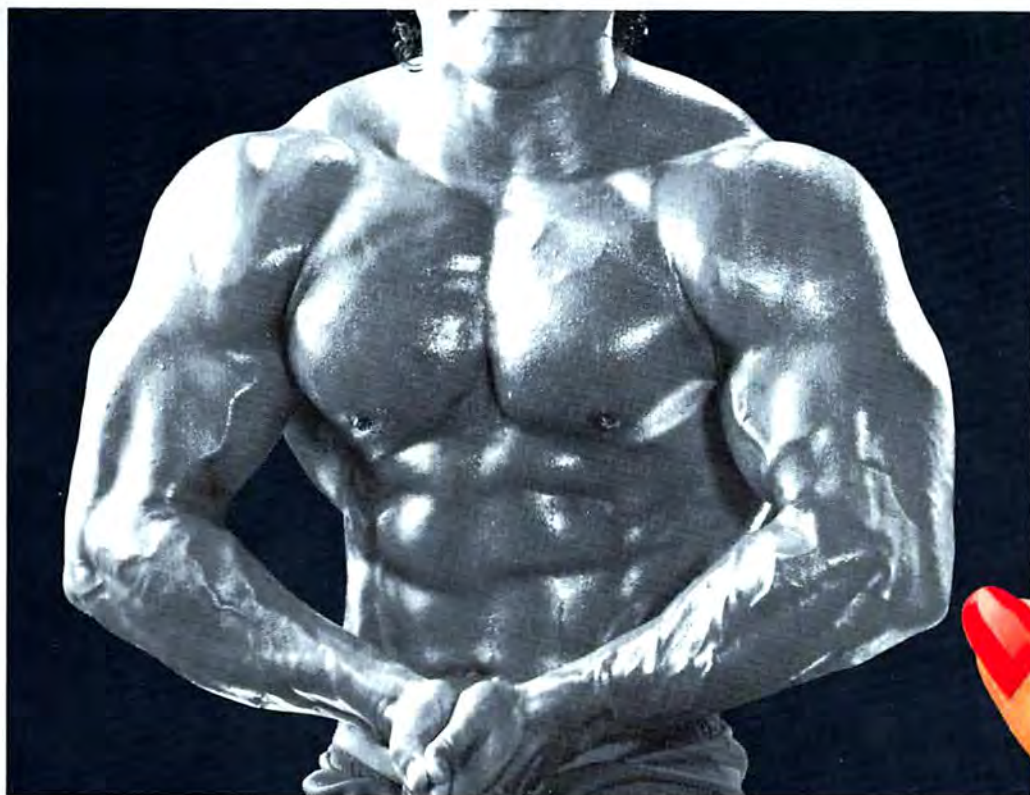
**FontMonger** *Ares Software Corporation*  
Font-format conversion between PostScript and TrueType

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during December 1990.

\*Does not include hard drives installed at the factory.



# "The Abaton scanner gave me great definition in just minutes."



*Scanned on an Abaton 300/GS*



Every issue of my newsletter takes shape easily now that I use the Abaton Scan 300/GS. Because this 8-bit scanner delivers 256 shades of gray. That's 240 more than the 16 shades you get from a 4-bit scanner. And that means each scanned image has more tone and better definition.

Abaton doesn't stop there. They make the body of my work easier to publish by adding Letraset's Image Studio software. With Image Studio, I can touch up, change, and rearrange my images so every issue of my newsletter looks

as good as the physiques I profile.

If you already have a 4-bit Abaton Scan 300/S or Apple scanner, Abaton also offers an 8-bit upgrade. It can be installed in your home or office in as little as 30 minutes, without any sweat on your part.

With all these choices, it's easy to get great definition without a heavy workout. If you want to see more, call Abaton at 1-800-444-5321 (In Canada, 1-800-663-5161). And let Abaton make your ideas easier to publish.

## Abaton

*We Make Your Ideas Easier to Publish™*

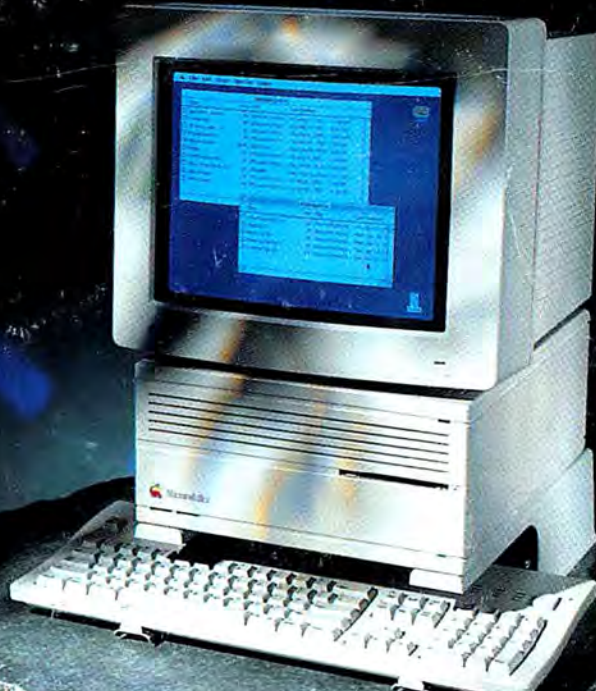
NOW AVAILABLE FOR  
PC, MAC, & NEXT  
MACHINES

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*Keyboard Shelf and SideClip with Macintosh SE/30.*



*Keyboard Slideaway with Macintosh IIx.*

## SPACE THAT WORKS

You're tripping over your keyboard. Your CPU needs its own desk. Your monitor is too low. That report you're working on has vanished. Paper is everywhere.

But don't give up.

What you need is some help from Kensington.

Increase valuable desk space with our new Keyboard Shelf for the compact Mac, or with Keyboard Slideaway® for the Mac II.

Both do more than just get your keyboard out of the way.

Keyboard Shelf's recessed storage compartment is ideal for holding pens, disks and other desk items. And Keyboard Slideaway extends a narrow desktop into a wider workspace.



Another way to increase your workspace is our sturdy Mac II stand. The perfect addition for anyone who wants to get their CPU off their desk and onto the floor.

For the compact Mac, there's Maccessories® Tilt/Swivel. With it, you can rotate your Mac up to 100° and tilt up to 16° for just the right viewing position. And unlike other tilt/swivels, we've combined heavy duty plastic and high density polyethylene for an ultrasmooth movement.



What's more, Kensington's products fit right in with the design of your Mac. The styling is complementary. The colors identical. Even the same materials are used.

Kensington.

Because you can't work efficiently if your space doesn't work.

For a free brochure and the dealer nearest you, call 800-535-4242. Outside the U.S., call 212-475-5200.

**KENSINGTON®**

Circle 255 on reader service card

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