OPEN!

Macintosh II—
More Speed,
More Memory,
More Storage—
and Color

Over 40 New Products—
Color Monitors, Huge Disk Drives,
Network Solutions, MS-DOS, UNIX,
New Applications
Borland software: technically superior

**SideKick**

**SideKick: The Desktop Organizer, Release 2.0**

Thousands of users already know that SideKick is the most complete and comprehensive collection of desk accessories available.

Well, with Release 2.0, the best just got better. We've just added two powerful high-performance tools to SideKick. We've added Outlook: The Outliner and MacPlan: The Spreadsheet. They work in perfect harmony with each other and while you run other programs!

---

**Outlook: The Outliner**

- It's the desk accessory with more power than a stand-alone outliner
- A great desktop publishing tool, Outlook lets you incorporate both text and graphics into your outlines
- Works hand-in-hand with MacPlan
- Allows you to work on several outlines at the same time

**MacPlan: The Spreadsheet**

- Integrates spreadsheets and graphs
- Does both formulas and straight numbers
- Graph types include bar charts, stacked bar charts, pie charts and line graphs
- Includes 12 ready-to-use templates free!
- Pastes graphics and data right into Outlook creating professional memos and reports, complete with headers and footers, in a snap

---

**Reflex: The Database Manager**

Why are so many critics praising Reflex?

Because Reflex is the high-performance relational database manager that every Mac user has been waiting for. Its simple spreadsheet approach makes calculations a snap. And creating database designs, forms, and reports is as easy as drawing them on your screen.

Reflex lets you organize, analyze and report information faster than ever before. Reflex is the full-featured database manager that everyone who manages mailing lists, customer files, budgets and almost any other set of business numbers needs today.

Whatever business you're in, whatever you manage, you need Reflex: The Database Manager.

---

**System requirements:**

Macintosh 512K or Macintosh Plus with one disk drive. Second external drive recommended.

*Introductory offer expires July 1, 1987*
Innovative, and easy to use

Only $99.95*

Turbo Pascal

Turbo Pascal: The fastest, most efficient and easy-to-use Pascal compiler!

Compiled source code races from Turbo Pascal at the astonishing rate of more than 12,000 lines per minute. Anything less than Turbo Pascal is an exercise in slow motion. You can expect what only Borland delivers: Quality, Speed, Power and Price.

Turbo Pascal at a glance

- Compilation speed of greater than 12,000 lines per minute
- "Unit" structure lets you create programs in modular form
- Multiple editing windows—up to 8 at the same time
- Options include compiling to disk or memory, or compile and run
- No need to switch between programs to compile or run a program
- Streamlined development and debugging
- Compatible with Hierarchical File System
- Compatible with Macintosh Programmer's Workshop Pascal (with minor changes)
- Ability to define default volume and folder names used in compiler directives
- Search and Change features in the editor speed up and simplify alteration of routines
- Unlimited use of available Macintosh memory
- "Units" included to call all the routines provided by Macintosh Toolbox

The Critics' Choice

Turbo Pascal is the true winner in the stand-alone Macintosh development environments... Turbo Pascal provides ease of use, extremely fast compilations, excellent documentation, great support and a company that is well known in the industry. To end it off, you get all of this for the paltry price of $99! Now isn't that a reason to get moving with Turbo?

Robert Forras, MacTimes

Turbo Pascal is already an industry standard in the IBM-compatible world and we're very excited to see Borland International's new commitment to provide this and other modestly-priced, high-quality software for the Macintosh computer.

John Sculley, Apple Computer, Inc.

System requirements:

Macintosh S12K or Macintosh Plus with one disk drive. (The complete Turbo Pascal package, including compiler and editor, occupies only 75K of memory.)

Introductory offer expires July 1, 1987

For the dealer nearest you, or to order by phone
call (800) 255-8008
CA (800) 742-1133
Canada (800) 237-1136

Turbo Pascal: Truly compatible, easy-to-use

Turbo Pascal is compatible with your Mac's Hierarchical File System, Macintosh Programmer's Workshop Pascal, and Inside Macintosh. You're in familiar territory, but going a lot faster.

What more can we say?
If you use a Mac, get Reflex: The Database Manager.

*Introductory offer expires July 1, 1987
Departments

13 Mac Bulletin  
   Late-breaking news.

21 David Bunnell

31 Letters

47 Commentary/Jerry Borrell

54 Contributors Notes

61 Steven Levy

85 Verbatim  
   Apple chief operating officer Del Yocum on the new Macs.

177 How To/Quick Tips  
   Screen savers, rounding in BASIC, direct LaserWriter hookup, and more.

187 How To/Getting Started with Telecommunications  
   The what's, why's, and hows of going on line.

199 How To/Insights on Red Ryder  
   Communicating tips and a look at the latest upgrade.

205 How To/Mac Desktop Tools  
   Finder shortcuts and strategies for clearing desktop clutter.

215 How To/Mac Troubleshooting Tools  
   Quick fixes for common glitches.

222 Updates  
   Keep up with Mac software upgrades.

235 Where to Buy  
   Information on products in this issue.

246 Best-Sellers

109 Macworld News

- Desktop Presentations - A mass market waiting to be mined?
- Project Victoria - Pac Bell pioneers a new communications concept.
- Supercomputers - Macs as Cray terminals.
- Graphics News Services - A new Mac wire service from the Chicago Tribune.

Plus, reports on RésuméWriter, the world's largest Mac peripheral, advertising on disk, doings in the Mac factory, and more.
Features

Special Reports:

126  Macintosh II: Opening to the Future
    The new master Mac silences the critics with expansion slots, color,
    bigger screens, a 68020, and more.

140  More than a Plus
    It may look familiar, but the Mac SE is an all-new machine inside.

144  An Open Forum
    An overview of Apple's biggest rollout ever.

150  Filling the Slots
    Make the most of the new Macs with expansion cards, peripherals, and
    other third-party products.

156  April Fooleries
    Utilities with no utility—a grab bag of public domain pranks, jokes, and
    diversions.

Reviews

160  Two Minds in One
    MindWrite word processor.

162  Turbo Pascal Arrives
    Pascal compiler.

163  Just Between Formats
    MacLink Plus file conversion.

164  A Porsche among Mac Disks
    DataFrame 40-XP hard disk.

165  Where the Wild Buffalo Roam
    Great Plains Accounting Series

167  Professional C
    Aztec C development system.

168  A Consumer's Guide to Disk Carriers
    Wallet, easel, and portfolio.

170  White Space and Black Bars
    PC-380 and TimeWand bar code readers.

171  Tomb It May Concern
    Arzock's Tomb adventure game.

172  Arithmetic Explosion
    Math Blaster educational game.

173  Shareware Communications for
    the Mac
    MockTerminal, FModem, TermWorks.

174  Home-Baked, but Pre-Cooked
    The Print Shop stationery printing.
A disk each month delivered to you... packed with programs for your Macintosh!

DISCOVER UPTIME. Build an exciting library of programs for less than one dollar each. You deserve value. At UPTIME value is yours. Each month over 30,000 people just like you enjoy UPTIME. Your disk arrives with eight programs and more every month...

Enjoy eight programs including two new desk accessories on each monthly disk. Make your life easier. Get more from your Macintosh. Organize and be more productive with home and business management programs. Learn with educational programs. Enjoy all the games and adventures. Using your Macintosh is now a snap with tutorials and desk accessories.

It's easy, inexpensive and fun. It's UPTIME! Too good to be true? There's even more! Each monthly disk has reviews of the latest software, hardware and peripherals. Save time and money. Learn the strengths and weaknesses of each item we evaluate. Shop "on the disk" in our Micro Discount Mall.

Subscribe now and save. You won't believe the low price! Satisfaction is guaranteed — or your money back. You'll be amazed at just how much comes on every UPTIME disk. Make the very next one yours. Fill out the coupon. For immediate service call toll-free:

1-800-437-0033 anytime, day or night.
Supports up to 150 lbs.
All steel frame construction
5½ square foot footprint

Mobile... a key reason why people like the AnthroCart. Share your hardware. Move it around. Take it room to room or floor to floor.

The AnthroCart is designed to move.
Designed so your workspace is as slick as your hardware.

Call us: 800-325-3841
Now check ours.

THINK Technologies proudly presents InBox™, winner of the MacUser Editors' Choice Award for 1986 as the best new desktop communications package. The InBox family of products can be used on AppleTalk and NetBIOS LANs to transfer spreadsheet, word processing, database, graphics, publishing and other files from Mac to Mac, Mac to PC, PC to Mac and PC to PC. Plus, you can create, send and receive memos and phone messages. All while running other applications. Now you can share information, communicate more and meet less. For more information or the name of the dealer nearest you, call 1-617-863-5595. Or write to us at the address below. And remember to check your in-box for InBox literature.

THINK Technologies, Inc.
420 Bedford Street, Lexington, Massachusetts 02173

InBox is a trademark of THINK Technologies, Inc. Macintosh is a trademark of Apple Computer, Inc. and is used by Apple Computer, Inc. with its express permission.

Circle 643 on reader service card
Finally, The Drive That Matches Your Ambition.

To succeed in business, you bought an ambitious, hardworking Macintosh™ Plus. Now you need mass storage that can satisfy your need for speed and convenience. AST delivers the solution with two high-performance storage subsystems—the AST-2000™ and AST-4000™.

AST-2000 For 20 to 60 MB of High-Speed Storage. The AST-2000 SCSI subsystem eliminates the need for tedious floppy disk swapping so that you can spend more time accomplishing your goals and less time waiting. Our 20 MB disk drive with 20 MB tape backup provides the speed and storage to increase productivity in a wide range of business and personal applications, including data base management, word processing, spreadsheet analysis and desktop publishing. For additional storage, simply plug in an expansion unit with single or dual 20 MB hard disks.

Fast and Easy Data Insurance. Archiving files and backing up information from disk drives is no longer a chore. In less than nine minutes the AST-2000 backs up 20 MB of data onto a single 20 MB tape cartridge.

AST-4000 for 74 to 370 MB of High-Speed Storage. The AST-4000 picks up where AST-2000 capacity ends with a 74 MB disk drive and 60 MB cartridge tape. And with its 30 millisecond average disk access time, 5 MB per minute tape transfer rate, SCSI interface and expandability to 370 MB, the AST-4000 provides unparalleled performance in single-user or multi-user AppleTalk™ network environments.

One Clear Choice—AST. Consider your alternatives: 1. Internal drives: if service is required, you must give up the use of your computer. 2. Floppy drives or drives connected to serial ports: painfully-low performance. 3. Plain wrap drives: don't include essential features, such as a tape backup. 4. Here today, gone tomorrow drives: offered by companies that have no history, or may soon be history. No other disk and tape solution comes close to offering the same performance, features or product reliability as the AST-2000 and AST-4000.

AST Quality and Reliability. AST Research, Inc. has earned a worldwide reputation for reliable, high-quality products that ensure customer satisfaction. And every AST-2000 or AST-4000 subsystem comes with a six-month warranty.

For more information about the clear choice for data storage, contact your nearest AST Authorized Apple® Dealer or call the AST Apple Products Group at (714) 553-0340. BBS: (714) 660-9175. FAX: (714) 660-8063. AST Research, Inc., 2121 Alton Avenue, Irvine, California 92714-4992.

We Make Apples Grow!

Circle 463 on reader service card
The Desktop Publishing Revolution Continues.

AST Research Announces The AST TurboScan™. It's the perfect addition to your Macintosh® desktop publishing system.

AST TurboScan optically scans and digitizes photographs, artwork, handwriting, text...anything that can be rendered on paper. It allows you to incorporate such images into newsletters, reports, letters, artwork...any type of document.

A Revolution In Resolution!
AST TurboScan's 300 dots-per-inch (dpi) resolution matches your LaserWriter®'s dpi for optimal visual clarity. So you can scan and print at near half-tone quality.

And we've included AST TurboScan Utility™ software to let you enlarge, reduce and merge scanned images with text and other graphics.

You can scan in either of three modes: Line Art Mode for images that are black and white without shading; Halftone Mode for photographs and other images with continuous shading; and, Mixed Mode for a combination of Line Art and Halftone modes. There's also resolution, contrast, brightness and gray scale controls. And advanced data compression reduces scanning time and saves disk storage.

AST—Leading The Revolution!
At AST we're in the vanguard of creating new solutions. And AST TurboScan is just one of the many quality products we offer to improve or enhance the performance of your Apple® computer.

Contact your nearest AST-authorized Apple Products Dealer today! Or send the coupon to AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992. Phone: (714) 553-0340. BBS: (714) 660-9175. FAX: (714) 660-8063.

---

AST Research Inc. 
2121 Alton Ave., Irvine, CA 92714
Phone: (714) 553-0340 
Fax: (714) 660-8063

AST NEWSLETTER 
AST TurboScan Utility 
AST Research Inc. 
2121 Alton Ave., Irvine, CA 92714-4992

Name: ____________________________
Title: ______________________________
Company: __________________________
Address: ____________________________
City: __________________ State: ______ Zip: ______
Telephone: __________________________

Send to: AST Research, Inc., 2121 Alton Ave., Irvine, CA 92714-4992.
Attn: Apple Enhancement Products Group
Macworld 487

Circle 463 on reader service card
On May 1, Target Software™ introduces its new desktop publishing program. Scoop™. It's going to run circles around the competition. For one thing, Scoop can wrap text around circular or irregular shaped objects with a single click of the mouse. PageMaker can't do that. But that's not the only reason to consider Scoop.

Scoop also allows you to create text and graphics simultaneously, without having to develop the two separately and then combine them. PageMaker can't do that, either. And Scoop is a totally self-contained program. It comes complete with the features you'd find in SuperPaint™ and MacDraw™, an excellent word processing program, and our own best selling spelling checker, MacLightning™. It also accepts scanned images and PostScript® files (like Adobe's Illustrator®). Scoop is...
fast, comprehensive and remarkably cost-efficient.

And PageMaker? Well, even if you bought all the supplementary programs, it still wouldn't do what Scoop can do. And you'll have spent more than twice as much.

Point is, if you want to produce first class brochures, catalogs, financial reports, newsletters and the like — and save time and money — you really ought to get the Scoop. Pick it up at your local dealer starting May 1st.

For more information call Target Software now at 1-800-622-5483; in Florida, 305-252-0892. Or write us at 14206 SW 136th St., Miami, FL 33186.

The creative publishing program. Coming May 1.
MacUser Magazine just confirmed what every user of MORE™ already knew...

MORE is the 1986 Product of the Year.

To find out why, call 1-800-822-3700. In California call 1-800-443-4310.

LIVING VIDEOTEXT
Software that people really use
2432 Charleston Road, Mountain View, CA 94043 415-964-6300

MORE is not copy protected. Suggested retail price $995. For all Macintosh systems with 512K or more. MORE, ThinkTank 312, ThinkTank 128, and ThinkTank are trademarks of Living Videotext. The names of the products above may be trademarks or registered trademarks.
Mac Bulletin

Word Processing Goes Hollywood
>
Adding to the variety of word processing options, two companies have introduced scriptwriting software and accompanying storyboard and production-planning aids. For $395, ScriptWright by American Intellware of Torrance, California, offers synchronized dual-column editing (with independent column formatting) plus other script formats and such features as automatic scene numbering and dialogue placement. Also from American Intellware for $495 is Storyboarder, a related drawing program for planning the visuals that bring a script to life. Specialized tools include transition effects, such as dissolves, fades, and wipes, as well as animation features. Each image in the storyboard panel is recorded in a spreadsheet to facilitate editing, reordering, and time-coding.

And a couple of French imports have arrived on the scene, marketed in the United States by a firm called MAX (213/276-7682). WriteWrite ($495), a scriptwriting program that incorporates storyboard features, including the ability to print back images in real time to preview the finished production, and Cinemac, a production management program.

CAD Advances
>
Now the IGES format used by mainframe CAD programs is coming to the Mac. Micro CAD/CAM's new MGMS Professional CAD for the Mac supports IGES, and Enabling Technology Graphics' of Chicago is putting the finishing touches on IGES and ASCII translator programs that work with Pro/3D and Easy/3D. MGMS, from the Los Angeles-based firm, retails for $799 and includes Cartesian, absolute, incremental, and polar measuring systems. It offers specialized drawing tools such as fillets, splines, and sections, 10 ways to create a line, 12 ways to define circles, rotation by thousandths of a degree, and up to 64 layers. There's also a library for storing symbols and drawings.

Save Your Memory
>
A power failure in a roomful of computer users—even a roomful of programmers—is sure to trigger a sudden chorus of moans and expiratives. We can all remember getting so wrapped up in work or distracted by a phone call that we forgot to save said work before disaster struck. Magic Software of Bellevue, Washington, produces a $20 desk accessory, AutoSaveDA, that automatically saves to disk at regular intervals, sparing the human user's memory for loftier tasks.

Solid Drawing Tools
>
EDO Communications, maker of LaserWorks, has introduced a PostScript drawing program called LaserPaint, the latest entry in a new wave of software that does away with the jaggies in Mac images. Adobe Systems itself was the first to announce its PostScript graphics program, Illustrator. And Cricket Software has launched Cricket Draw. The next wave? Look for other applications, such as page-layout programs, that import the 300-dot-per-inch PostScript images produced by these new programs.

Taking Stock
>
As the price of Apple stock rose toward its year-end high of $40.50, up 84 percent from the close of 1985, company head John Sculley made a highly publicized sale of 107,500 shares for $4.25 million. A bad omen? Not according to Apple spokesperson Marianne Lettieri, who said Sculley still holds 3777 shares and options to buy 392,000 more. Apparently the CEO and other Apple executives exercised their once-every-six-months option to sell at a profit before the higher 1987 capital gains tax took effect.

Desktop Engineering
>
MacNeal-Schwendler Corporation (MSC), a major supplier of engineering software for the IBM PC, engineering workstations, and mainframes, has announced MSC/pal, an engineering analysis program for the Mac. Applications include design and analysis of mechanical systems, stress analysis of mechanical components, servomechanism vibration analysis, stress analysis of pressure vessels, vibration analysis of printed circuit boards, automotive and aerospace structural-strength analysis, and machinery vibration analysis. Because of the large number of Macs in colleges and universities, MSC offers a special version of the program for the educational market.

(continues)
Big Screen on a Budget

- An innovative $95 program lets you break through the Mac's window barrier and move around at will in your document, no matter how large it is, without using scroll bars. Stepping Out from Berkeley Design Systems of Berkeley, California, simulates a big-screen monitor with a user-definable display size, and the Mac screen becomes a peephole into that expanse of work space. The program can simultaneously show actual-size and thumbnail versions of your document on screen, with an active cursor in each version. You can also zoom in on your work with 15 levels of magnification that provide a big-type version of the Mac display.

Scrabble

- Electronic Arts of San Mateo, California, has brought out a Mac version of Scrabble. This version of the classic word game sells for $39.95.

Your Basic Big Screen

- Micrographic Images of Canoga Park, California, has streamlined its original big-screen product into a cheaper — $2495 — MegaScreen II. It's basically the same 19½-inch, monochrome, high-resolution monitor, but with a single video signal and fewer options than its predecessor. The original, now called the MegaScreen Plus, is still available; it comes with a power supply and a fan and produces a second video signal that conforms either to NTSC or PAL standards. A 68881 coprocessor and a 20MB internal hard disk are optional on the $2995 MegaScreen Plus.

Bigger Is Better?

- The big news in mass storage this year: more of it. The realm of hard disk drives and tape drives (and combinations of the two) was the most crowded product category at the January Macworld Expo, with a bewildering array of product lines from AST Research, CMS Enhancements, General Computer, Jasmine, Kamerman Labs, Mirror Technologies, Peripheraland, Relax, Rodime, Sunol, and SuperMac Technology.

New this year are SCSI behemoths tilting the scales at more than 100 megabytes of storage, such as AST’s hard disk/tape backup combo that comes in 120MB, 240MB, and 320MB sizes (from $7995 to $11,995); CMS’s 140MB ($3995), 240MB ($4995), and 320MB ($6495) drives; Mirror’s 340MB drive (just over $10,000); Sunol’s 245MB drive that comes with a multiuser disk-server interface ($7695); and LoDown’s write-once-read-many (WORM) optical disks in 400MB and 800MB sizes. Other new wrinkles: Personal Computer Peripheral Corporation’s Mac-Booty SCSI hard disk with optional built-in Hayes-compatible modem and Bering Industries’ drives using Bernoulli technology in 5¼-inch removable cartridges. SuperMac has also announced new fault-tolerant software for its XP40 drive that is meant to protect the data on the disk from crashes of application and system software; it will go out as a free software upgrade for XP owners.

DTP Templates for Books

- McCutcheon Graphics of Toronto offers desktop publishers and traditional publishers a shortcut to book production: 50 design templates created in FTI’s MacTex that take edited Microsoft Word book manuscripts and automatically design and create the pages in a matter of hours instead of weeks. Called Page One, the $2000 package produces final printouts on any PostScript printer, from the LaserWriter to high-resolution typesetting equipment such as the Linotronic 300.

Four-Megabyte Macs

- Four megabytes for under $1000—now that’s the ticket. But in the meantime, memory chip prices are declining and memory upgrade pricing for the Mac is becoming more affordable. Dove Computer is selling the Plus 4H, a 4MB SIMM memory board utilizing 1-megabit CMOS chips for $1999, but with dealer discounts you can get the board for as little as $1300. Mac-Memory’s MaxPlus 4-Pak, a 4MB upgrade consisting of 1MB of 256K chips and 2MB of 1-megabit chips, is a product, and MaxSave, is priced at $1149.

Upgrade for Taxes

- Just in time, Monogram has released an upgrade of its financial-management program, Dollars and Sense, which exports data into the Mach1Tax version for the 1986 tax year.

Sun Outbids 3Com for Centram and TOPS

- At press time, Sun Corporation, maker of 68020-based workstations, announced it had signed a letter of intent to acquire Centram Systems West, developer of the popular Mac network software TOPS. The Sun announcement supersedes a previous bid for Centram by 3Com Corporation.

Three-Way File Sharing

- CMS Enhancements of Costa Mesa, California, has announced Data Exchange, a new system that will allow Macs to share files with Apple IIs and IIgs as well as IBM PCs. Files from the different machines are stored in separate partitions of the Data Exchange hard disk; a utility translates data among the operating systems. The system allows you to use all the computers together. For example, you might take data from a 1-2-3 spreadsheet, transfer it to an Excel worksheet, extract some figures to combine with a word-processed document from an Apple II, and lay it out in PageMaker on the Mac before laser-printing it. The Data Exchange disk connects to the Mac via the SCSI port, and it requires a SCSI adapter and an expansion card for connected IIs and PCs. CMS will market three models of the subsystem: a 20MB subsystem with a 65-millisecond access time ($995), a 40MB with the same access time ($1595), and a 40MB with a 29-millisecond access time ($1995).
See what you’ve been missing.

Full page views of your documents, for example. Unobstructed displays of several windows simultaneously. And dozens of other applications for which the Macintosh™ has been able to give you only part of the story. Until now, that is.

Introducing the Radius Full Page Display.
The Radius FPD™ works side by side with your Macintosh to make creating, editing, and laying out documents easier than ever — by letting you see a full 8½" by 11" page.

That means less scrolling. Less enlarging and reducing. And, because your Macintosh doesn’t sit idle, a much more useful way to work.

The FPD extends your investment in the Macintosh.

Lay out a page on the FPD, for example, while the Macintosh holds tools, palettes, desk accessories, and other windows. Or treat the two screens as a single, contiguous display, viewing large, horizontal documents. Even drag text or graphics between the two.

The FPD is in every way an extension of your Macintosh, from the electronics to the aesthetics. But then, there’s a good reason for that.

The team that developed the Radius FPD is the same group of experts that designed and built the original Macintosh. Which means you’re assured of the highest-quality product, from top to bottom.

Want to find out more? Contact your nearest authorized Radius dealer to get the full story. (Or call us at 408-732-1010 for the name of the dealer nearest you.) And see what you’ve been missing.

RADIUS
Radius, Inc.
1050 East Duane Avenue, Suite F
Sunnyvale, CA 94086
How to dramatically improve the way you manage meetings, ideas, time and people with MORE.

If you're like most people your time is valuable. You believe you should, and could, be more effective managing your daily tasks. Perhaps you've even tried conventional methods of increasing efficiency—making lists of priorities, delegating, keeping diaries, etc.—only to find little has changed because you're still wasting valuable time.

That's why we wrote this guide. We want to explain four ways to improve the way you work by using the power of MORE and a Macintosh.

1. Start a revolution at your next meeting.

How often do you come away from a meeting satisfied with the results? Probably not as often as you would like. Here are some simple ways to get more accomplished at your next meeting:

- Have a specific objective in mind: as the meeting progresses, be sure you're still dealing with the same problem.
- Only cover things that cannot be put across in other ways—bulletins, manuals, direct contact with supervisors, etc.
- Don't try to cover more ground than time will permit. You can't solve the world's problems in a 30-minute staff meeting.
- Prepare for the meeting. Find out what the other people attending need to know before the meeting.

Why MORE is so revolutionary in meetings.

Try taking a Macintosh and MORE into your next meeting. Start with an outlined agenda, develop the issues into a group action plan. The participants—even those who don't use a computer—can direct the content and organization of the plan. Graphic Tree Charts and Bullet Charts help you present the impact of your decisions. At any point, you can review what's been accomplished. Everyone gets a uniform set of meeting notes, on disk or printed. This frees the participants from having to take detailed notes. Everyone knows what was decided, so next time you sit down there won't be a debate. Spreadsheets started a revolution for people who work with numbers. MORE is starting a revolution for people who spend time in meetings.

2. Manage people and projects effectively.

Managing people and projects can be very difficult. Some managers apply common sense; others learn by doing; others simply avoid the problem altogether. In an effort to simplify a complicated subject, here are a few things that will help any manager:

- Managing requires a great deal of talking and listening. It sounds easy, but it is a constant job that requires a concentrated effort.
- Job descriptions and boundaries should be provided for every person's job.
- Feedback on performance and encouragement improve motivation. Doing and saying nothing leads to stagnation.
- Find the best people you can and support them.

Now there's a way to manage people and projects better using MORE. Managers, executives, corporate planners and personnel staff can use MORE to outline their management ideas and instantly transform them into a Tree Chart. You can use Tree Charts for organizational charts, project flowcharts, decision trees, block diagrams or time lines. MORE is also a powerful tool for writing job descriptions and preparing employee reviews. As a project management tool, MORE is fast and flexible.

3. Create a time-saving Status Center.

The first step in becoming more time-efficient is to identify how you spend your time. Naturally, once you've figured how and why time is spent, you begin to do things that give you higher payoffs and more satisfaction.

For you, MORE becomes a convenient and powerful electronic notebook and card file. You collect and organize the details of the next best thing to having a clock that runs backwards is having a Macintosh that runs MORE. With MORE you can set up a Status Center to organize the details of your daily work.
Some of the best ideas you have don't always happen in front of a computer. (That could change after you've used MORE.) For example, you can take your ideas from scraps of paper to a finished presentation in minutes.

daily work in an outline—your personal Status Center. You keep this outline up-to-date, using it to:

- List and organize your tasks
- Record names, addresses and phone numbers
- Keep your daily calendar
- Write and file notes and memos
- Track your expenses

MORE's power outlining lets you change and interconnect your lists with ease. You can use the Templates feature to store "boiler-plate" such as an address form and call it up at any time. The calendar feature will generate a daily schedule automatically. Most of your writing and word-processing work can be done right in MORE. You can even dial a phone, record the time and date, and calculate a sum—all by pressing a key. MORE is the ultimate tool for desktop productivity.

Process your ideas, then present them.

If you've ever had to prepare a presentation in a hurry, you know how frustrating and time-consuming the task can be. Technique is an important part of presenting your ideas effectively. Here are some simple steps that will take you from rough ideas to finished presentations:

- Make a "laundry list" outline of basic ideas.
- Become uninhibited with your ideas—don't edit on your first pass.
- Be generous with headings, callouts, charts and illustrations.
- Allow yourself the flexibility to change your presentation, even at the last minute.

Now you can prepare a presentation quickly and professionally, even at the last minute. For the first time, MORE integrates idea processing with idea presentation. You can outline your ideas and quickly transform them into attractive Bullet Charts. Add Tree Charts and pictures, and you have a full-fledged slide show. MORE is ideal for the entrepreneur writing a business plan—and also for anyone who develops presentations: managers and decision makers, executives, corporate planners, sales staff, educators.

There's more...

To experience the power and speed of MORE in person, visit your local computer dealer for a demonstration.

Suggested retail price $295

For Your Nearest Dealer Call 1-800-822-3700,
in California call 1-800-443-4310,
in Canada call 415-964-6300.
By the time you read this ad, Microsoft® Word 3.0 for the Mac should be at a store near you. Like the IBM program from which it was derived, it's a significant advance in word processing technology. Unfortunately, it's just not good enough.

Why? Because FullWrite Professional™ is about to be shipped, and compared to Word 3.0, FullWrite Professional is a superior word processor, at a better price. With all the standard features Word 3.0 has, including a spell checker, outlining, mail-merge, style sheets, table of contents, index and a thesaurus, and much more.

Simply put, FullWrite Professional is the most powerful word processor available, combined with desktop publishing layout features and graphics generation. Everything you could want and can't get with Word 3.0.

Based on information released at the 1987 MacWorld Expo in San Francisco, here's some of what you'll get with FullWrite Professional that you won't get with Word 3.0.

- **WYSIWYG multi-column display.** What you see on the screen as you're editing is everything that prints on the page. Word 3.0 makes you switch out of the editing mode to see what you'll get. And unlike Word 3.0, all special features (endnotes, etc.) are displayed as you type.

- **Automatic repagination as you type.** Not the slow, cumbersome exercise of Word 3.0.

- **Full desktop publishing look.** Automatic wrapping of columns of text around any shaped object. And multiple column sizes on one page.

- **A MacDraw™-like drawing environment with laser resolution bit maps.** No changing programs or disks to create or edit graphics right in the page you're working on.

- **Hyphenation as you type.** Word 3.0 makes you manually initiate hyphenation after you've entered text.

- **Thesaurus.** 470,000 definitions.
Posted Notes. A brilliant feature that lets you add comments or observations right to the document for reference during editing.

Highlighted revisions. FullWrite Professional automatically highlights changes you've made to a document between drafts.

Browser. Lets you browse through posted notes, footnotes, table of contents, endnotes, headers, footers, bibliographies, pictures, sidebars or index entries separately from the body of the document.

Search and replace by any attribute: Text, font, type style, case, type size and justification.

That's just a sample of what makes FullWrite Professional a faster and easier-to-use product than its slightly older competitor. There are other, equally unique features that are well worth checking into.

FullWrite Professional. We'll be at your store within 60 days. And we're going to change serious writing. Forever.
Finally, a Mouse that's really quick. One that doesn't require a lot of room on your desk. One that's easy to use, even on a desk full of papers. Turbo Mouse from Kensington. Turbo Mouse turns mouse technology upside down. It puts the mouse ball on top, rather than on the bottom like a standard mouse. You move only the mouse ball, not the whole mouse. That's why Turbo Mouse is quicker, quieter, and easier to use.

Turbo Mouse doesn't get its speed only from this ease of use. It has an automatic acceleration feature that senses the speed at which you are working and moves the cursor further when you move the mouse ball faster. Turbo Mouse has two mouse buttons - one for right-handed users and another for lefties. And, since it's only 4" x 6", Turbo Mouse will fit neatly at the end of your keyboard.

Turbo Mouse is compatible with Macintosh™, Apple IIe and Apple IIc. For more information, or a dealer near you, call 800-535-4242. In NY call 212-475-5200.
Last fall, I happened to bump into Dr. Timothy Leary at the Hackers 2.0 conference in the wooded hills of Saratoga, California. There, in that pastoral scene, I asked Leary what he was up to. He replied that he had started his own software company called Futique (the opposite of antique, get it?), and that he was under contract with the software game company Activision to make three “mind movies” based on the William Gibson cult novel *Neuromancer*, which is also being produced as a film.

First the book, then the mind movie, and then the movie movie? I must admit, I wasn't inclined to take Leary seriously at first because of his reputation as the acid king of the sixties.

I had never met the good doctor before, and I hadn't yet read Gibson’s *Neuromancer*, but as I listened to Leary explain his mind movie concept, I became more and more impressed.

It's apparent that his game represents a radical departure in the genre of interactive software entertainment. The central idea is that you, the player, become the producer and director of your own film—or mind movie—based on the *Neuromancer* book.

The mind movie will feature eight acts comprising 128 scenes, which the player can design and redesign. You choose the type of production: blockbuster, art movie, or documentary, for instance. Then you set the budget, pick the cast (from a selection of real-life actors and personalities, including Dennis Hopper, Grace Jones, Sean Penn—even Gordon Liddy), decide the story line, plan a marketing campaign, design the movie posters, and eventually release the film to algorithm-generated critical reviews.

Finally, you get to view the result of all the interactive choices you've made. After you've completed the game (it takes 2 to 10 hours), you can hit a screen mode and then sit back and watch 5 to 15 minutes of graphics and text scenes. Dig into your popcorn and enjoy your very own Mac film noir or software slapstick.

But what is it that makes Leary’s mind movie so different from other interactive games? "The star of most games is either the plot or the technology, but the star of this game is style," says Activision's director of product development, Brenda Laurel, widely regarded as one of the most scholarly and sophisticated producers for the home market. "In the last couple of years, the American public has come a long way toward understanding what style is. A trivial example of this is 'Miami Vice.' MTV has done a lot, too. Suddenly, style is a tangible thing to people who would never have used the word a few years ago. Culturally, this is the right game to be doing at this time."

As if to underscore this commitment to high style, Leary's *Neuromancer* software was a major production in itself. It involved the work of four writers, including prominent literary figure William S. Burroughs, as well as several technical experts—among them Kevin Piette, coauthor of *Multimate*, Jojo Jansen, one of the programmers for *NFL Challenge*, and Mickey Wozniak, director of project management at Ashton-Tate.

Leary also brought in artists Keith Haring and Peter Max, as well as noted fashion and portrait photographer Helmut Newton, to contribute graphics. And for the first time in computer game history, there will be a musical soundtrack by the original hacker group, Devo.

*Neuromancer*, the mind movie, will be coming to your local personal computer some time this summer or early fall. Initially, the game will appear in versions for the enhanced Apple IIGS, the IBM PC and compatibles, the Amiga, the Atari ST; then there will be a low-end version for the Commodore, and eventually, a Macintosh mind movie.

Since Tim Leary was so enthusiastic about William Gibson’s book, I naturally (continues)
How to get people who work together to work together.

Martha Pease
Vice President
Dir. of Marketing

Ivan Horvath
Group Product Manager

Lisa Doan
Assoc. Product Manager

Ken Segall
Assoc. Product Manager

Jay Morrison
Group Product Manager

Joe Sosa
Assoc. Product Manager

Marten Tonnis
Assoc. Product Manager

John Halleran
Group Product Manager

Laurie Brandalise
Group Product Associate

Michael Baldwin
Director of Advertising Services

Ami Green
Manager Ad Services

Ann Behnke
Manager Ad Services

Cynthia Sherry
Manager Ad Services

Sheila Berigan
Manager Ad Services

Pete Friedman
Manager Ad Services

Molly Gleason
Ad Services Coordinator

Dayla Quintal
Associate Ad Services

Rich Mironov
Associate Ad Services
INTRODUCING APPELSHARE.
You've heard the talk about the future of personal computing.
About how Desktop Communications will change the way we work together. Let us share important documents, and allow us instant access not only to information, but to each other.
Well, enough talk.
AppleShare™ is here today.

THE FREEDOM OF INFORMATION ACT.
Every time you create a document, AppleShare lets you decide how (or if) it's to be shared.
Thanks to AppleShare access control, you can grant rights to specific individuals, at three different levels:
1) see folder, 2) read documents within a folder and 3) make changes.
And each folder will contain the most recent versions of the work within. Because the system is constantly updating itself.
ALL TOGETHER NOW.
Apple Desktop Communications can do wonders for productivity, beyond merely sharing folders.
Using a program like InBox, one person can easily send electronic mail to anyone on the network. Or just as easily, to a pre-defined list of people. And these messages can include complete documents, such as those created by Microsoft Word or Excel.
With this new power, Apple Desktop Publishing becomes a whole new ballgame. Because quickly and electronically, you can collect the information you want to publish. Even from people who don't use Macintosh.

With Apple Desktop Communications, you can share information amongst a group of computers, including even those of the MS-DOS variety.

put a document into a folder, and it's available on the network. Instantly.
In fact, to use AppleShare, you need only a fleeting familiarity with two of the most basic Macintosh skills. Pointing. And clicking.

INTRODUCING THE APPLETALK PC CARD.
Now you can communicate with other forms of intelligent life.
Just plug our PC Card into an MS-DOS-based computer, and it too can become an active part of the AppleTalk network.
Then, using a program like InBox PC, ideas that are conceived
in the MS-DOS world can be painlessly transferred to a Macintosh.
Where they can be analyzed more deeply. Studied more insightfully.
And, with the able assistance of an Apple LaserWriter® printer, presented far more brilliantly.

TURN KNOWLEDGE INTO POWER.
Once you've begun sharing information within the workgroup, you'll likely thirst for greater power.
Which, as it just so happens, is readily available.
You can bring others into the group, via AppleTalk cabling, phone lines or fiber optic cabling. Link a number of workgroups together with options like Hayes InterBridge.
Or, with FastPath and EtherSC, even tie the whole company together on Ethernet cabling.
The full power of Apple Desktop Communications can be yours today.
And to get going, there's only one thing you have to do.

Call 800-538-9696, Ext. 700, for the name of a participating Apple dealer near you.
became curious about it. I had also heard about Neuromancer from a few friends in the personal computer industry who assured me it was a marvelous book. Unfortunately, it wasn't easy to find in bookstores. Either the cultists are grabbing copies off shelves, or it hasn't hit the mainstream market yet. I finally found a copy and snatched it up eagerly. I wasn't disappointed. In fact, I didn't get much sleep that night, as I couldn't put the book down.

First published as an Ace Science Fiction paperback in 1983, Neuromancer quickly won the three top prizes in the sci-fi field—the Hugo, Nebula, and Philip K. Dick awards. It also ushered in a new genre of science fiction writing that's come to be known as Cyberpunk.

To my mind, Cyberpunk echoes a kind of gritty techno-aesthetic. In a sense, it's a hard-edged vision of the future of micro-computing. It's a world in which the ultimate interface between human and machine has finally been achieved, through biotech implants and sensory links with universal databases.

At the last Macworld Expo in San Francisco, personal computer pioneer and Apple Fellow Alan Kay said he thought the portable computer will have "finally arrived when you can wear it on your T-shirt."

In Neuromancer, it's embedded in your skin. As Tim Leary commented to me, "In the future the individual will have access to all this high technology for his or her pleasure. You'll be able to have facelifts, muscle grafts, rejuvenation implants—your brain will bristle with implants."

"It's the ultimate techno-pagan society, where each individual's brain and body are controlled by that individual. Instead of amplifying and enhancing your machine, you'll be amplifying and enhancing your own software, your own tissueware."

Gibson calls the implants micros—data strips inserted into biosockets, like an organic disk drive in your neck. For example, you could insert a Spanish-language microsoft, a language template complete with a working vocabulary and grammatical structure, that would slip transparently over your verbal mind.

Gibson admitted that he'd had no hands-on experience with personal computers when he wrote Neuromancer. "I don't think I could have written it if I had," he confessed. He wrote the book on a 1927 Hermes manual typewriter, although he now does word processing on an Apple Iic.

It stunned me to learn that Gibson could create Neuromancer, which I regard as almost a blueprint of future information technology, in a state of virtual computer illiteracy. I guess visionaries don't need to know code. The only baud rate they need is their own imagination.

As with all good yarns, there is a basic conflict in Neuromancer that must be resolved. The hero, whose name is Case, is a code-cracking, techno-punk street kid who must break into a big-business AI matrix. In the process, he helps bring about a new intelligence entity—the sum of all known electronic data (aka Cyberspace, a futuristic version of personal computer visionary Ted Nelson's hypertext database, Project Xanadu).

There's an intriguing section at the end of the book in which Case chats with the artificial intelligence entity: "So what's the score? How are things different? You running the world now? You God?"

"The AI deity responds, "Things aren't different. Things are things." But what do you do? You just there?" Case persists. And the AI replies, "I talk to my own kind."

Of course, by now there are other AI matrices in the universe that communicate with each other. "From where?" asks Case. "Centauri system." "Yeah? No shit?" says Case, impressed.

And God answers (this must be a first for God in written literature): "No shit."

Leary's years of playing the high priest of mind expansion back in the sixties stand him in good stead as he strives to define this new electronic entity that has sprung from our rapidly escalating information revolution: "It's the living matrix of all the electronic facts we've been putting up there [in the earth's atmosphere] since Marconi invented the radio in 1897," he told me.

"We've been sending electronic signals—the 'Amos 'n Andy' radio shows, Hitler's speech in Nuremberg, all the television shows, all the military stuff. It's almost like an atmosphere around the world," Leary pointed out. "It's called the infosphere—and this infosphere is there, and it can be colonized, explored, and used by humans. And just as France, Spain, and England competed to colonize the New World, the big AI combines—the multinational corporations—will try to control the infosphere.

"Heroes like Case, representing the true human spirit of individuality, will be dealing with this higher level of intelligence once it's formed."

The Neuromancer concept, of course, is based on quantum physics. Everything is information—all the universe is data. Sunlight, starlight, the galaxies. You can even describe the sun as a temporary collection of information.

It is the role of the artist—and for that matter, of the personal computer visionary—to help the human species adapt to the notion that reality exists not just in heavy stone materials, in physical reality, but in clusters of off-on probability signals defined as the quantum mechanism.

In my opinion, and it's one I happen to share with Leary, that's what all jazz, modern literature, expressionism, cubism, pointillism, all the movies ever made, and all the software that's ever been written—the whole incredible heap of twentieth-century data—is all about.

If it takes a book or a mind movie to make us think about where we are heading—not only in terms of technology and personal computing, but collectively, as a human race evolving into a new and unknown electronic form—then all the more power to Gibson and Leary and all the other mind artists of Cyberspace.

Lights! Camera! Action! □
YOU WOULDN'T DRIVE A CLUNKER TO THE OFFICE.
What BMW has done for the automotive industry, Mirror Technologies has done for the hard drive industry. We don't simply crank out drives to meet current demands. We carefully engineer them to exceed yours. Our products are extremely quick—taking you from 0 to 60 pages in a heartbeat. They handle like a dream as they wind through deskloads of information. And their reliability is unmatched. Built to go full throttle day after day. So you can overtake the pack. Instead of just running with them. So don't settle for a hard drive riddled with compromise. But rather, choose a drive built by a company that looks on compromise as a 4-letter word.

WE'VE GOT A GREAT TRACK RECORD.
Before you buy a drive from a company, you should take a look at their history. Ours is quite impressive.
We were the first to introduce an 800k drive for the Macintosh. First with the 20 meg tape backup. And first with the 85 meg, 172 meg and 340 meg hard drives.
Our products are selling to companies like Honeywell, AT&T, 3M and Apple. Yet we've also pleased some companies that you probably haven't heard of. Like Don's Dog Service, Anderson's Nursery and Himalayan Expeditions. Who knows, maybe now that they have MAGNUM TAPE 20, INTRODUCING THE MAGNUM TAPE 40.

For the serious user who can't afford to lose data. These "safety nets" keep a portable, permanent record of your data. So reliable, the Library of Congress uses us to backup their most critical data. Free software update policy so your tape drive can be updated as we update ours. We're the only one to deliver file by file, volume and incremental backup. With incremental, you backup only the data you've changed since your last backup. These totally secure systems run silent and cool. When we designed the new Tape 40, we worked side by side with Apple and 3M so it would be compatible with any products released by Apple in the future.

THE MAGNUM 800.

MAGNET 20X, 30X AND INTRODUCING THE 40X.
Here are all the choices for storage you need (20, 30 and 40Mb). The 20X, perfect for everyday use. The 30X, 50% more storage for the price of our competitor's 20 meg drives. And introducing the 40X, offers all the storage you need for power computing. All cooled by our extra-quiet fan. They sit beside your Mac, so the system won't heat up. Daisy chain up to 7 units. They come with backup utilities and optional MacServe networking software (a $250.00 value). Preformatted, so just plug them in and run.
THE MAGNET 40/40.

A very fast 40 Meg hard with a dependable 40 Meg tape backup as a "safety net." Sits under your Mac so it doesn't take up extra space. The premier drive/tape backup combination in the market. Backup file by file, volume or incrementally. With incremental, you can usually backup your daily data in under 4 minutes. Comes standard with MacServe ($250.00 value) to allow you Multiuser, Multitasking. This drive is based on the NEC drive and the 3M Tape 40 -- two leaders in their respective industries.

MAGNET 85X, 172X AND INTRODUCING THE MAGNET 340X.

Three times faster than standard hard drives because we use voice coil technology. These combine blistering speed, enormous capacity with tape backup and Multiuser, Multitasking software (includes MacServe, a $250.00 value). All 3 are combination drives with integrated tape backup. Powerful, compact, quiet alternatives to the AST 4000. The 172 offers twice the capacity for the same price. (Based on the November 1986 suggested retail pricing.)

WE'RE REVVING UP FOR THE FUTURE.

The Macs of tomorrow are just around the corner. And with Mirror Technologies, you can hit the ground running when they arrive.

Currently, we're shipping more drives than any other company except Apple. Like the 85X, 172X, the MagNet 40/40 and tape drives, too.

When File Servers hit the streets in January, we were there with big enough hard drives to tie dozens of Macs together. Other drives would blow an engine trying to do that.

And it's no secret that Apple is about to introduce bigger and better machines. We're ready for them, too. Because we're not waiting for the future to come to us. We're going out half way to meet it. That way, we come back with products that'll let you blow the doors off all those who remained standing still.

Circle 406 on reader service card
7 Ways To Make The News.

The new PageMaker Portfolio gives you the ability to create professional looking newsletters on your Macintosh with PageMaker* desktop publishing software. Even if you’ve never designed anything in your life.

You’ll get disks containing seven collections of professionally designed newsletter templates, 21 in all, that need only your masthead, copy and graphics to be complete. Plus a 114-page workbook that teaches the basics of graphic design and gives you a set of tips for working with PageMaker, all for just $79.

Call toll free 1-800-33-ALDUS for order information, or see PageMaker Portfolio at your local Aldus dealer today.

And start making your newsletters look more newsworthy.

Aldus Corporation, 411 First Ave. S., Suite 200, Seattle, WA 98104.

PageMaker Portfolio: Designs for Newsletters will be available soon for PC AT™ and compatible computers.

PageMaker is a registered trademark of Aldus Corporation.

Maccintosh is a trademark of Apple Computer, Inc.

*AT is a trademark of International Business Machines Corporation.

Circle 306 on reader service card
MAKE A FAST $800.00

GET THE $800 APPLE SHARE™ FREE WITH OUR 172 MEG DRIVE.

Recently, when Apple introduced AppleShare to the market, they demonstrated it with our 172 meg drive. Obviously, they were looking for the biggest, best drive available to show off the capabilities of this new product.

For the same reason, you should run AppleShare with our big, sleek 172 meg drive. Otherwise you won’t be using the program to its full potential. (It would be like dropping a 12-cylinder engine into a go-cart.)

What’s more, our big drives have all the speed and storage capabilities needed to meet your growing needs. For example, our 85X can be upgraded to 172 or even 340 meg. It’s that kind of expandability that’s made our big drives so popular with some pretty big customers. Customers like AT&T, 3M and Honeywell. Isn’t that the kind of experience you want working for your office?

OUR BIG DRIVES ARE MADE TO RUN APPLESHARE.

Well it has finally hit the streets. It’s called AppleShare.™ And ladies and gentlemen, it’s nothing short of phenomenal.

But the story gets even better. Because right now you can get AppleShare for free. Gratis. Pay nothing. How?

Just order one of our 172 meg drives with AppleShare and we’ll send you a rebate check for $800. That’s a tough deal to pass up.

BUCKLE UP. YOU’RE ABOUT TO MAKE A FAST $800.00

INTRODUCING THE MAGNET 85/40. BUY NOW AND SAVE $400 ON APPLESHARE.

We’re quite proud of the newest member to our family. The Magnet 85/40. Extremely powerful. Very fast. And built to fit conveniently under the Mac.

This little beauty offers all the portability of our 40/40, but it does so with twice the speed and storage. It runs at a blistering 27ms access speed. That’s 3 times as fast as standard hard drives. And it’s warranted for one full year. So obviously, reliability is very important to us.

Finally, we’ll give you a $400 rebate to put towards AppleShare when you order the 85/40 and AppleShare. Which is just one more good reason to move up to all the storage and speed of the 85/40. So give us a call today. And we’ll give you all the information about your AppleShare rebate and the name of the Apple-Mirror Technologies dealer in your area.

MIRROR TECHNOLOGIES, Inc.
2209 Philips Road, Hugo, Minnesota 55038 (612) 426-3276

Circle 406 on reader service card
Guide takes the hype out of Hypertext

Guide is the first hypertext system designed specifically for the Macintosh. Now you can direct the power of the Mac with the most innovative principles of hypermedia for your personal information management.

Move through information at the speed of thought.

Guide provides virtually limitless flexibility in storing, retrieving and assembling electronic information. Unlike outline processors that force you to structure information according to a rigid format, Guide allows you to flow naturally through stored text.

Rather than emulating a printed page, Guide is designed to take advantage of the computer screen by allowing any number of windows containing graphics and text to be displayed. When windows are resized, graphics are automatically proportioned and text is reformatted instantly. Any displayed window can be activated and worked from.

Information management that's as flexible as you are.

A click of the mouse at any user-defined point in a body of text and a more comprehensive level is created on the screen for storage or retrieval of information, cross references and notes. If your Guide document cross references another document, Guide automatically opens a new window for it. Guide lets you tailor your information system to suit you ... not some programmer.

With Guide you can...

- build a scheduling calendar with whatever level of detail you require. Cross reference meetings with relevant documents. Click on any date and see your agenda for that day along with other pertinent information.
- create a graphics Guideline with MacDraw or MacPaint. Click on different parts of your graphic and create new levels of information or open other documents containing cross-referenced information.
- Use Guide for product specifications, research reports, personal information, legal documents, technical documents, electronic correspondence and a lot more.

Yes, I want to do more with my Macintosh!

Please send me copies of Guide at $134.95.

Total amount: ____________________________

Payment by: □ VISA □ MC □ AMEX □ Enclosed Check

Card Number ____________________________ Exp. Date __________

Name __________________________________
Address __________________________________
City ____________________________ State _______ Zip __________

To place an order, call 206-747-3203 or enclose a check with this coupon. Please add $2.50 for shipping within the U.S. Mail to OWL International, Inc., 14218 NE 21st Street, Bellevue, WA 98007

Foreign orders add $10. Washington State residents please add appropriate sales tax.

Circle 547 on reader service card
Letters

A forum for Macworld readers

A Surge of Interest

Won't you devote some space to reviewing surge suppressors? I'm sure many computer users would agree on the necessity of having one. Unfortunately, most dealers seem to sell you whichever one they have in stock rather than advising you on which is best. Finding out that your newly purchased surge suppressor is nothing more than a one-to-six outlet converter is an experience that can cost you plenty in repairs.

Paul A. Wrench
Houston, Texas

Great idea. We've already put somebody on the story.—Ed.

Further Miscues by Mail

Last year I became a member of PC Network in order to purchase equipment from them by mail. Delivery was delayed so long that I canceled my order but was told that the membership fee was nonrefundable. I accepted that; now I find that my Visa card has been charged another $8 without authorization—presumably to renew my membership. I have protested and wonder whether you've heard of other instances of such charges on their part.

Robert E. Moore
Ithaca, New York

We recently received a similar complaint from another customer who canceled his initial order but was still charged a membership fee. Steve Dukker of PC Network informs us that the membership charge is automatic unless you state that you do not want to join—a practice that apparently is legal. Dukker assures us that they will remove the charge at once if asked to.—Ed.

A Lovely Color

The ColorPrint (version 2.1) that I received with the FullPaint upgrade printed only four of five overlays. However, I/O Design, to which ColorPrint is licensed, acknowledged the problem and sent me a version 2.4 replacement. It works great now.

Bob Frost
Fort Worth, Texas

Market Forces at Work

The various Macintosh magazines have been full of editorials, letters, and even articles decrying the increasing cost of software, the falling prices of Mac upgrades and accessories (from those who bought too soon), software upgrade problems, bugs, the incompatibility of the 128K Mac (with internal 440K drive) with a Mac Plus, and other such woes. One gets the impression that Mac owners are doomed to run on an endlessly turning treadmill of increasing costs and complications, never to catch up.

However, there is also some good news—largely, we suspect, because marketplace forces have been at work. With software firms going out of business and new ones appearing, we've seen the variety, sophistication, and compatibility of programs mushroom. Ultimately, this adds up to a buying public that demands service and is chary of buying new products without a test. This necessitates that firms go the extra step to gain and retain customer loyalty.

The past year has been a good one for small-scale users of the Mac in this respect. Let's keep our eyes open and our standards high.

Bruce and Dolores Schoch
Williamsburg, Virginia

(continues)
You’ve put your finger on 3 key reasons to subscribe...

1. **SAVE SUBSTANTIALLY!** Your subscription means a handsome savings for you—check it out.

2. **GET THE MOST FROM YOUR MAC!** Your money-saving subscription also insures a steady flow of the practical information you want—reviews of software and hardware you can rely on, new applications, techniques, and practical “how-to” tutorials.

3. **GET THE MACWORLD GUARANTEE!** We’re so certain you’ll get what you need—and more—from MACWORLD, we guarantee it! If for any reason you’re not satisfied with MACWORLD, just let us know, and we’ll promptly refund the cost of your subscription for every unmailed issue.

MACWORLD
The Macintosh® Magazine
SUBSCRIBE NOW

□ YES! Please send me one year (12 monthly issues) of Macworld for only $24. I'll save $23.40 off the annual cover price of $47.40, a savings of almost 50%. (That's $6 off the regular subscription rate of $30.)

SAVE EVEN MORE!

□ $37.90 for 2 years (24 monthly issues)
□ Payment enclosed □ Bill me later

Name (Please print your full name)

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires September 30, 1987.

MACWORLD

The Macintosh® Magazine

Order Now to Take Advantage of These Special Savings.

Call TOLL FREE: 800/524-3200

Visa and MasterCard Accepted!

(New Orders Only)
FAST, RELIABLE SCSI STORAGE
MACINTOSH PLUS,
APPLE® Ile / Ilgs

THE CMS "S40" 40 MB SCSI HARD DISK SUBSYSTEM

QUIET • PORTABLE • RUGGED • RELIABLE • FAST
29 ms Average Access Time
20,000 Hours MTBF
Non-Operating Shock Rated to 100g
Vented Cabinet Requires No Fan
External SCSI "ID" Select
Automatic Head Park

CMS Enhancements, Inc. • 3080 Airway Avenue • Costa Mesa, CA 92626
Telephone: (714) 549-9111

Call CMS for the Name and Location of Your Nearest Authorized Dealer

Apple and Macintosh are registered trademarks of Apple Computer, Inc.

Circle 657 on reader service card
Letters

Right Roles or Wrong
Steven Levy made two mistakes about role-playing games in his recent article "The Game Hall of Fame." [Macworld, December 1986] that need to be corrected. The first is minor—there are no Vorpal Bunnies in the Mac version of Wizardry. Otherwise, I agree with Levy's conclusion that the Mac version is much easier to play than the Apple II version from the housekeeping standpoint.

But his choice for runner-up is outrageous; Xyphus is the worst role-playing game ever written. Movement around the board is very tedious; the Save and Restore functions (which are absolutely necessary) are too easy to interchange, which can wipe out your whole game. The programmers have built in a nasty time bomb, too—if you haven't included an Elf in your party, you can play through the game almost to the end and not be able to finish it.

The fact that Levy recommends this game convinces me that he gave it no more than a superficial evaluation. How about Ultima II or III instead?

Scot M. Loomis
Honolulu, Hawaii

Video Feedback
As a hardware developer for the Mac, I was particularly interested in "What's on TV?" [Reviews, December 1986], but I'd like to point out a few things about converting the Mac's image into TV video. The reviewer seems confused about information on the RS-170A video format, which is, in fact, standard for televisions, monitors, and projection systems with direct video inputs. The RS-170A standard spells out in detail amplitude, timing, and other specifications for the NTSC standard, which was created to deal with color encoding, so it doesn't apply to a monochrome signal; but "NTSC composite video" and "RS-170A" are usually used synonymously.

Macintosh composite video adapters, which provide a video output connector, don't even come close to meeting RS-170A specifications, so they won't work with VCR and most video equipment. And while many computers can output to a standard monitor, I don't know of any that meet RS-170A specs either. They usually output a noninterlaced signal to eliminate flicker like the MacVideo Processor has. If you want to hook up to standard video equipment, you need an RS-170A output.

Phil W. Doberenz
West Linn, Oregon

Reflex Action Requested
Our church purchased Borland's Reflex program to keep membership records, and now we find that dates prior to 1904 cannot be entered into the program. Must we tell our senior members that they may not have their "old" records put into our "new" computer? The Borland ads say that "Reflex lets you get your various acts together." I wish they'd get their act together and fix this needless bug.

Don Lund
Stillwater, Minnesota

A spokesperson at Borland says this is not a bug in the program but a result of the setting of the Mac's clock, which does not go back beyond 1904. Borland reports that a significant amount of extra development would be required to avoid this. Microsoft Excel and dBase Mac, for example, also have this limit, as does, according to Contributing Editor Jim Heid, any package that uses the Mac's internal date routines. One exception is FileMaker Plus.

Contribution Editor Lon Poole recommends the following methods to get around the date problem. If you want to sort according to birthdate, create separate fields for day, month, and year, then do a compound sort using all three fields. Or enter dates in reverse in a single field (year, month, day) and work with them that way. Be sure to fill in all necessary digits (entering, for example, 01 instead of 1 for January or the first day of the month).—Ed.

In Defense of the Scheme
I have several comments about "LISP in a Shoe Box." [Reviews, December 1986]. The reference to 2 megabytes being required (continues)
Built For Speed

Introducing TurboMax™ from MacMemory.
The company that’s been making affordable high-performance Macintosh™ products almost as long as Apple® has been making Macintoshes.
TurboMax is a high-performance “clip-on” accelerator board that comes with all the power features a power user needs. But with a price much lower than competitive products.
We started with sheer speed. In fact, the CPU in the TurboMax is nearly three times faster than the one in the Macintosh Plus. So database, graphics, and desktop-publishing programs all run faster than before. And TurboMax is 100% compatible with all Macintosh software.
We also added memory — 1.5Mb that brings your Macintosh Plus or Macintosh 512KE up to 2Mb, expandable to 4Mb. And our “super-speed” SCSI port that runs twice as fast as the standard Macintosh Plus SCSI, and allows internal or external SCSI disks to plug right in. (Including our optional 40Mb internal hard disk drive.)

We’ve even included some MacMemory standards. Like MaxSave™, a recoverable RAM disk that lets you work at RAM speed — without the risk of losing your data in the event of a system error. Plus an additional power supply, an internal fan, and a full two-year warranty.

And perhaps the most important MacMemory standard of all — our commitment to giving you the most for your money. Which is why we priced TurboMax at under $1300. Because, after all, power — and speed — do have their price.

But who said it had to be expensive?

SPECS:
16MHz 68000 CPU • 16MHz 68881 Math Co-processor (optional) • 1.5Mb additional RAM (Expandable to 4Mb) • “Super-speed” SCSI (adds SCSI to Mac 512KE) • MaxSave recoverable RAM disk • High-performance power supply and fan • 40Mb internal hard disk drive (optional)

MacMemory
The Macintosh Performance Family

2480 North First Street, San Jose, California 95131 • (800) 862-2636 • (408) 922-0140 in California

Circle 1 on reader service card
Here at Warp Nine, we manufacture Macintosh products that excel in 3 areas: Price, quality and price. You see, we refuse to sell through computer stores. Instead, we sell direct. Saving you about 40%. But when we left out the dealer's mark up, we didn't sacrifice the quality. For example, every Warp product comes with our Quality and Assurance Report detailing each step of production, signed by the person responsible for that step. Our commitment to quality continues with our special fans. They keep our drives cool as a cucumber. Some manufacturers think fans are too expensive to install. That's why you can fry an egg on their drives. And Warp drives are delivered preformatted, ready to go. Just give them some juice and take off.

So if you're hungry for some big savings, roll up your sleeves, lick your lips and feast your eyes on these prices. They're awfully easy to swallow.

**THE PHOTON 20 OR 30**

A 21 or 31 megabyte external SCSI hard drive. HFS and MFS compatible. Supports all your Mac software. Each can daisy chain up to seven SCSI devices. Photon 20 and 30 prices: For MacPlus—$589.00 and $795.00. *For 512K with our PlusPort—$739.00 and $945.00.

**THE WARP 20**

A 21Mb internal SCSI hard drive for the MacPlus or 512K. The quiet, powerful cooling fan helps insure optimal operation. Our intelligent design and step-by-step manual make installation very straightforward regardless of your technical expertise. MacPlus version. $849.00 *512K with internal PlusPort. $849.00

**THE PHOTON 40**

A 41Mb external SCSI hard drive. The newest in our line of hard drives. Designed for power users who need more than a 20Mb or 30Mb. Perhaps the best megabyte per dollar value of any large hard drive on the market. Average seek time under 50 milliseconds. Very fast. MacPlus version. $1195.00 *512K with our PlusPort. $1345.00

**COMPARE US.**

<table>
<thead>
<tr>
<th>Fan</th>
<th>Yes</th>
<th>No</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. Seek Time</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>SCSI Compatible</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>HFS Compatible</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Internal/External</td>
<td>External</td>
<td>External</td>
<td>External</td>
<td>External</td>
</tr>
<tr>
<td>Price</td>
<td>589.00</td>
<td>1095.00</td>
<td>1299.00</td>
<td>1195.00</td>
</tr>
</tbody>
</table>

**THE PHASER 800**

Whisper-quiet 800K double sided disk drive. Compatible with 128K, 512K, MacPlus and HFS. No hardware or software modifications necessary. Distinguishes 400K and 800K diskettes and will read and write to them accordingly. Features push button and automatic electronic ejection. Cable included. All models. $199.00
INTRODUCING OUR SOFTWARE PRODUCTS.

The Fullback—Called the best back up program for the Mac. Backs up text and graphics from your hard drive to floppy disks very quickly. Volume back up (everything), file-by-file and incremental (last changes). $39.95

Print Sprint—A print spooler. Allows you to work on your Macintosh while your ImageWriter is printing. $29.95

Special Bundle Price—Buy any Warp product and get both The Fullback and Print Sprint on one disk. $39.95

$795.00

store the valuable data from your hard drive onto cassette tapes. Ensures safekeeping of all your applications and data (both text and graphics). Features volume, file-by-file, and incremental back up. With the incremental feature, back up daily files in as little as three minutes. MacPlus version. $795.00

*512K with our PlusPort. $945.00

TWO NEW MEMORY UPGRADES FOR THE MACPLUS.

Simply clip on with no modifications necessary. Fully compatible with all your software.

DataRam—2Mb upgrade. Expandable to 4Mb. $259.00

MonsterRam—2.5Mb upgrade for the MacPlus. Uses 1 Megabit chips and SIMM technology. Compatible with internal hard drives and large screens. Low power consumption. Expandable to 4Mb. $595.00

* The Warp Nine PlusPort adapter puts a MacPlus type SCSI port on the back of your Mac 512K. It is included with each 512K price. This adapter allows you to connect our SCSI hard drive and tape back up to your 512K and transfer data at the high speed that the MacPlus does. No modifications. No soldering. Just Clip on. Very simple to install.

THE TRANSPORTER 20

A 20Mb SCSI tape drive. Back up and restore the valuable data from your hard drive onto cassette tapes. $795.00

THE PHOTON 2001

A 21Mb SCSI hard drive and a 20Mb tape back up in one convenient unit. Store data on the hard drive then back it up onto your tape. Will back up a full 20Mb of data in under twelve minutes or changes in your files in as little as three minutes. Priced over $1,000 less than the AST 2000. MacPlus version. $1495.00

*512K with our PlusPort. $1645.00

IF YOU’RE NOT HAPPY, WE’RE NOT HAPPY.

If you don’t absolutely love your Warp product after 30 days, send it back and receive a full refund. What’s more, if you have problems with your drive within 90 days, it’s completely covered by our warranty. Return it and we’ll send you a brand new unit. Immediately. And if you’d like a full one-year warranty, that’s available for the asking, too.

All our products are also backed by a hand-picked technical support team. If you run into problems, just give them a call. Toll free. Each of them is a Mac expert, and they’re here to answer your questions.

EASY TO ORDER. FAST DELIVERY.

Call any of these toll free numbers with your questions or an order. 1-800-654-5294 or 1-800-328-6795. In MN call collect 612-426-9769.

We accept MasterCard or C.O.D. orders. If you’d like a copy of our free brochure, send in this coupon along with your mailing address.

NAME
ADDRESS
CITY____ STATE____ ZIP____
DAY PHONE____
EVE. PHONE____

WARP NINE
ENGINEERING INC.

1751 W. County Road B, Suite 107, St. Paul, Minnesota 55113

Warp Nine, Warp Plus and Photon are trademarks of Warp Nine Engineering Inc; Macintosh and HD 20SC are trademarks of Apple Computer Inc. DataPort is a trademark of SupersMac.

Circle 439 on reader service card
Choosing a database manager is no easy task. It's by far the most confusing and fiercely competitive field in Mac software. But now your buying decision is crystal clear, because the editors of MacUser and the readers of MACazine have both selected OverVUE as the Best Database of the Year.

Said MacUser (Jan. 1986), in selecting OverVUE for its Editors Choice Award: "OverVUE 2.0 is a deceiving program in that the more you use it, the more you realize what it can do. Power, speed and logical menus make this a dream database."

When MACazine (Jan. 1986) bestowed OverVUE with its Readers' Choice Award, they wrote: "We selected OverVUE because of its ease of use, clairvoyance and statistical capabilities. The fact that OverVUE was subsequently selected by our readers as Best Database simply confirms our original assessment: the product is a jewel and the customer support a bonus!"

OverVUE's clean sweep of these two prestigious awards only confirms what everyone else has been saying all along:

- *InfoWorld* (July 8, 1985): "...it is Macintosh software done right."
- *Icon Review* (Fall 1985): "OverVUE 2.0 is our favorite database workhorse...it simply offers the best balance of power and ease of use available on the market today."
- *Nibble Mac* (Oct. 1985): "OverVUE is not only easy to set up, it's the easiest for data entry. Its tools for entering repetitive data minimizes typing time."
- *Online Today* (electronic version - Nov. 1985): "OverVUE 2.0 is a heavy-duty data management tool. It does all the things a good relational database manager should."
- OverVUE's features and power make it the ultimate database choice. Clearly, users and editors alike think OverVUE is something special. We think you will, too.

So visit your nearest software dealer and purchase your very own copy of OverVUE, the Best Database of the Year.

Write for information concerning our new Mail Management and Personal Finance Templates.

---

Letters

"for any serious work" implies that this is a "con" peculiar to MacScheme. Not so—LISP is often used for artificial intelligence (AI) applications, which sometimes present very big programs. All LISP interpreters face the same problem here. Nevertheless, LISP is useful for many other applications that aren't so memory-intensive. As to the robustness of MacScheme for commercial development, it provides access to the toolbox, and since Texas Instruments wrote AI applications for PC-Scheme (for the IBM PC), I'd bet the same can be done in the Mac version.

Your reviewer's statement that previous knowledge of LISP is required is somewhat misleading, since Scheme is the most intuitive and coherent dialect of LISP and the easiest system in which beginners can learn the language. In addition, several good tutorials have been published.

The benchmarks you listed had no explanations as to what they were or what aspects of the interpreter they purported to test, and so they contribute nothing of real value.

The stop-and-copy style, which is the simplest form of garbage collection, was made to sound like it detracts from the potential size of user programs, but since Scheme is not an obese program, there's plenty of space for programs.

In short, it seems to me not that MacScheme is LISP in a shoe box, but that other LISP's are needlessly large.

Andre van Meulebrouck
Denver, Colorado

A Surge of Interest

Won't you devote some space to reviewing surge suppressors? I'm sure many computer users would agree on the necessity of having one. Unfortunately, most dealers seem to sell you whichever one they have in stock rather than advising you on which is best. Finding out that your newly purchased surge suppressor is nothing more than a one-to-six outlet converter is an experience that can cost you plenty in repairs.

Paul A. Wrench
Houston, Texas

Great idea. We've already put somebody on the story. —Ed.
You might want to make a note to yourself.

You know those sticky yellow notes you're always making to yourself. Well, now you can do the same thing electronically. With Memorandum from Target Software.

Memorandum lets you attach electronic sticky notes to documents and files. You can use it for spreadsheets, reminding yourself of the details of a specific expenditure. Memorandum attaches itself to a spreadsheet cell, so it stays in place through repeated calculations.

It's also a great aid in word processing documents and database files. Because you don't have to stop work to check a source or verify data. Just make a note and attach it.

Notes are stored in a separate file. A single command can show all notes at once. Or a note on a specific cell.

Make a note to yourself to check out this invaluable Desk Accessory soon. It's just $99.95. And it's compatible with Excel, Multiplan, Jazz Works, and loads of others.

See your local dealer or call us at 1-800-622-5483. In Florida (305) 252-0892. Or, write Target Software, 14206 S.W. 136th Street, Miami, FL 33186.

The note-worthy new program from Target Software.
If you're among the inner-directed, we can mold a Macintosh in your own image.

Through HyperDrive 20—the first hard disk to be installed inside the Mac or Mac Plus and connected directly to its microprocessor.

The resulting Macintosh can, in its own quiet and unobtrusive manner, outperform any other Mac in its class.

It can not only store as much information as 50 diskettes. But it will also reduce power-up time by 66% over a Mac Plus. Load Aldus' PageMaker 150% faster. Microsoft's Excel 250% faster. And so on.

Which should more than satisfy anyone's need for speed. Unless, of course, you need something "lightning fast," which is how Macworld magazine described HyperDrive 2000.

This internal hard disk system also includes an additional microprocessor and a floating-point processor—turning the Macintosh into an authentic number-cruncher. In fact, a Mac with HyperDrive 2000 can perform computations from 10 to an astonishing 250 times faster than a Mac Plus.

Both of these HyperDrives can be linked with regular Macintoshes through HyperNet 2.0. Our new networking software that's universally compatible with any Macintosh and any hard disk, internal or external.

But sheer speed aside, what distinguishes all HyperDrives is the ingenious software package they're equipped with. Software you can learn more about by consulting the ad on the right.
The FX/20 and FX/40 are the most outgoing members of the HyperDrive family. They spend their time on desktops, in the company of other office tools, and connect directly to any Macintosh with an SCSI port.

The resulting Mac is extremely fast, which will come as no surprise to anyone familiar with HyperDrives. (If you aren't familiar, see the fourth paragraph of the ad to the left.)

Nor is it surprising that our FX series is extremely accommodating, providing a vast 20 or 40 megabytes of storage. The real surprise, at least for those familiar with external hard disks, is all the software the FX comes with. Such as a program that protects your documents by making back-up copies of them onto diskettes.

Another program protects your documents from certain excesses of sociability—denying access to anyone who doesn't know the password you choose.

Still another program automatically queues up documents for your ImageWriter or LaserWriter. So you can go on to other jobs without waiting for your printer.

In short, no other external hard disk does everything that HyperDrive FX/20 or FX/40 does. Which is a distinction it shares with the internal HyperDrives in the ad on the left.

Over 1200 authorized General Computer dealers will be more than happy to help you establish a meaningful relationship with either. For the name of the dealer nearest you, just call (800) 634-9737*
If your Mac can't
graph like this, it's
not quite Cricket.

Cricket Graph

- Get the 12 most popular business/scientific charts and
graphs in one package
- Plot 2000 data points per series (95% more than any other
Mac graphic package)
- Full color and 3-D capability
- Position up to 10 graphs on a single page
- Page layout for desktop publishing merges graphics with text

Only one software package arms business and science
with the tremendous graphic power of the Macintosh™. Cricket
Graph. The first Mac package to deliver all the impact of color presentation charts and graphs. And all the
possibilities of desktop publishing.
Transform data into graphics that
speak louder than words. Then, print
your creations out in crisp black and
white or brilliant color on any of the most
popular Mac-compatible printers, plotters
and film recorders.
Cricket Graph. Nothing else even comes
close. Just $195. Special versions available
for film recorders and other high end output devices.

Cricket Software
3508 Market Street, Suite 206
Philadelphia, PA 19104
(215) 387-7955
1-800-345-8112

Requires 512K Macintosh
with two disk drives, or Mac
Plus with one internal drive.

Macintosh is a trademark
of Apple Computer Inc.
Charts printed on LaserWriter™,
Hewlett Packard Color Pro™, and
ImageWriter II™

Letters

Static
I welcomed the article on Stat80 ["The Statistics Standard," November 1986] because
your readers should be made aware of the
powerful statistics packages available for
the Macintosh. However, author Terry Ward
was incorrect in saying that the new Stat-
View 512+ is Stat80's only rival in the
Macintosh market.
The Mac version of Systat, from Systat
Inc., has virtually all the features of Stat80,
and its reputation among statisticians has
been established in the IBM PC market.
Given the existence of these other prod-
ucts, Ward's article might be interpreted
to be more an advertisement for Stat80 than
a serious survey of possible "standards" for
statistical packages.

Reggie Schoonover
Charlottesville, Virginia

Font Response
While we appreciate the comments made
about our Fontographer in your review of
LaserWorks ["The Fountain of Fonts," Re-
views, November 1986], Richard Jantz
made one erroneous statement that may
prove confusing to your readers. Fon-
tographer does not generate PostScript fonts by way of QuickDraw; rather, it gener-
ates them directly from data entered by the
user. In fact, Fontographer's PostScript-
generating function supports advanced
features, such as gray characters, and has
an option to reduce the amount of memory
the font occupies in the printer, which al-
low more downloaded fonts.
The latest version of our product con-
tains new features that include improve-
ments to some of the weaknesses your re-
viewer noted; for example, its test-print
capability is quicker. In addition, the man-
ual now has expanded tutorial and refer-
ence sections.

Kevin Crowder
Alsys Corporation
Plano, Texas

Letters should be mailed to Letters, Mac-
world, 501 Second St. #600, San Fran-
cisco, CA 94107, or sent electronically to
CompuServe 70370,702 or The Source
BCW440. Include a return address. We
reserve the right to edit letters. All pub-
lshed letters become the property of
Macworld.
CRICKET DRAW

Draw has been around as long as the Macintosh. It took Cricket Software to perfect it. Finally, the Mac's graphics capabilities can truly be realized with Cricket Draw, the revolutionary new draw program from Cricket Software.

UNPRECEDENTED FEATURES

The kind of features you only dreamed possible, such as full rotation and tilting of any object, controlled shadowing, shading with a gray scale (0-100%), fountains (graded tints), starbursts, grates, bezier curves and much, much more. And with an Imagewriter II printer you can see it all in dazzling color.

UNMATCHED TEXT MANIPULATION

Special effects with text are Cricket Draw's forte. Place text on any arbitrary path; rotate, tilt, shadow, shade — YOU NAME IT!

PRECISE CONTROL

Precision drawings? How about vertical and horizontal rulers with your choice of inches, centimeters, picas or pixels? Also, you can show the measurements of any object, precisely align objects using grids or guidelines, zoom-in, zoom-out — Cricket Draw has it ALL.

A POSTSCRIPT CODE GENERATOR

High quality graphics output on a laser printer requires knowledge of PostScript. Cricket Draw is actually a PostScript code generator. It does all the work. You never have to come in contact with PostScript, UNLESS you want to. Then you can access a PostScript window to edit or create your own code from scratch.

ADVANCE TO CRICKET DRAW

Your current draw program is simply obsolete, why not advance to Cricket Draw, just $295, available at local dealers everywhere.

Requires a 512K Enhanced Macintosh or a Macintosh Plus.

3503 Market Street, Suite 206
Philadelphia, PA 19104
(215) 387-7955 1-800-345-8112

Macintosh is a trademark of Apple Computer Inc.
Imagewriter II is a trademark of Apple Computer Inc.
PostScript is a trademark of Adobe Systems, Inc.

Anything Less Isn't Quite Cricket

Circle 384 on reader service card
"MindWrite?"
"It's too easy to use."

"They make a big deal out of features we can't find on the standard comparison charts."

"And at $125, it's suspiciously inexpensive. How can we take MindWrite seriously?"

If you make up your mind about MindWrite software without looking beyond the obvious conventional criteria, you'll miss the point, too.

The more you write, the more you'll like MindWrite.

Like no word processor before it, MindWrite focuses the power of the Macintosh on the creative part of the writing process.

MindWrite goes farther than any product since the Macintosh itself to simplify and speed up the process of turning nebulous notions into matchless manuscripts.

Unlike any other software—including any other that touts "integrated outlining"—MindWrite lets your finished piece evolve smoothly and naturally from your outline.

Because whether you like to work from a quick list of catchwords or a precisely detailed blueprint, you can move effortlessly between outline and draft at any time. It's a simple matter of selecting a display option.

So if an effervescent phrase flashes off your fingertips, you're word processing.

If you need to note three ideas for the ending, you're outlining.

And if you think nothing can be this simple, you're almost right.

Nothing else is this simple.

The more you rewrite, the more you'll like MindWrite.

If you want to move a MindWrite paragraph, for example, just select it with the mouse and drag it to its new location.

If you want to make identical changes to several headings or paragraphs, just select them all at once (even if they're separated by other text) and make them italic or bold or whatever.

Or drag them to a new location—where they'll appear in the order you selected them.

Nothing else is this foolproof, either. MindWrite's exclusive "accumulating clipboard" stores everything you've cut until you're sure you won't need it.

Numbered sections are automatically renumbered when you move them.

If you're writing to fill a certain space, the word-count feature keeps you posted.

And time-and-date stamping lets you mark changed paragraphs, so it's now much easier to review complex revisions. Speaking of which:

The longer you write, the more you'll like MindWrite.

Now you can navigate through long or complex (or long and complex) documents faster than ever before.

No more tedious scrolling. A tap on the mouse-button shows the entire manuscript in outline form. Click on the chapter, section or sub-section you want and it opens. Work, click back to the outline, and move on.

Of course, you can view outline and text in separate windows, too. And have as many windows as you want.

Don't let the low $125 price pull the wool over your eyes.

MindWrite is full-strength Macintosh word processing. With easy learning. Integrated graphics. Its own unique features. Plus more we don't have space for here.

It's guaranteed, too: if within 30 days of purchase you find it doesn't live up to our claims, you can call us for a refund.

So ask for MindWrite at your dealer. Or order directly from us at 800-367-4334. (800-654-5599 in CA.) We accept Visa and MasterCard.

And if you must pay more for a word processor, that's okay. We'll take more.
Ten thousand pages, take it or leave it.

For those of you going places, here's a little something that solves big storage problems in the time it takes to say "who has the Barnsworth financial files?"

Introducing Totem™

A rather revolutionary Bering 20 mb Bernoulli compact disk drive system for Macintosh computers. And, the first truly portable 5 1/4" system. One that lets you tote around 10,000 pages of data on a sleek cartridge about the size of a piece of bread.

Translated, that's 25 times the storage you get on one standard floppy.

Yet unlike floppies, the Totem is no slouch for speed. It's just as fast as a hard disk. In fact, your computer will think it's a hard disk. You can even share it with co-workers. And its advanced Bernoulli aerodynamics make it resist head crashing. If you've ever used hard disks, you know what a pain that can be.

But the real beauty of Totem is that it fits perfectly right under your Mac. No mess. No fuss. And no extra hardware to buy. To add storage, just pick up another Totem cartridge.

Last, but certainly not least, there's a whole family of Totem drives to choose from. They're all in the brochure. To get yours, write or call Bering Industries, Inc., 280 Technology Circle, Scotts Valley, CA 95066. Inside California, call 800 533-DISK. Call 800 BERING 1 outside California. Just say "I'll take it."

TOTEM

BERING

Circle 627 on reader service card
Apple has done, as the enigmatic figure in the film 2010 reported, "something wonderful." So wonderful, in fact, that it's hard to keep all the new products straight.

That's a point of pride for Apple. "It's hard to put your arms around all of the potential," says Jean-Louis Gassée, Apple's vice president of product development.

What's he talking about? Two new Macintoshes, a host of peripherals from Apple, access to UNIX and MS-DOS operating systems, and a flock of new products from third-party developers. A lot of this new wave isn't ready to be shown, let alone used. Still, there are many real, working products. My quandary is what to say about them.

I've tried to resist the urge to gush, but I can't fight a gut-level desire to wax enthusiastic. So here goes; call the neighbors and wake the kids. Cynics should bail out now and check this space in June or July when the bugs and problems have become evident. This is a first-blush review.

The Macintosh II is on this month's cover; it's so good that it will overshadow the SE, which is a pity because the SE fulfills much of the Mac's promise, refining an already admirable product heritage. Moreover, the SE will be the first to roll off the assembly line in any quantity. I wanted to see how the box would perform, so I went over to a friend's house to "borrow" his SE for a couple of hours. First off, it wouldn't break. I loaded MacWrite, MacPaint, MacDraw, FullPaint, Microsoft File, More, MicroPhone, Maze Wars, OWL International's Guide, Beck-Tech's MacMovies, Think Technologies' Inbox, Diehl's Mini-CAD, and that invaluable desk accessory, Moose Phrases with MacN'Talk.

Then I dropped in about 5 megabytes of files. The SE bombed only once the entire time I was using the system, and I'm hard on machines: multiple System files, clicking the mouse too quickly and too many times, making errors. I connected my external SCSI drive, but it wouldn't boot because I had a system set to default for a large screen. The smiling face did come up, however, so I assume that I could have run the drive if I'd had the time to remove the default start-up system. I later found that extra hard drives (the SE I used had a 20MB internal drive) can be easily configured from a dialog box.

Overall, the SE is a pleasure to use and surprisingly quick to respond, like General Computer's HyperDrive 2000. The new keyboard feels good, and the mouse is speedy—much improved. Business users with spreadsheets should be pleased: I reorganized and manipulated files instantaneously. True, I only had an 8K file of 75 names and addresses; when I changed the font on a 39K text file I could easily have gone away for a coffee break.

In general then, the SE's speed improvements are in increments, not orders of magnitude. But the internal disk, the expansion slot, and the physical design changes make this the machine for the office. The SE keeps the original vision of the Mac alive by giving you everything you need in one small, well-designed, easy-to-use package.

The little touches—the Trash Can that fattens when full, better cleanup functions—made me feel that Apple cares enough (continues)
Re-ink any Fabric Ribbon automatically for less than 5 cents.

MAC INKER™

SUPERCHROMA™
Super Color for your MAC.

- 256 colors on screen from a palette of 262,144 colors.
- 640 x 480 Resolution, greater than the Macintosh.
- Connects directly to the serial port. No internal connections.
- If you know MacPaint®, you know Superchroma. Paint directly on the Color Screen or load & color any MacPaint file or Macintosh screen. Any business, scientific application, artist drawing or graphic design can be enriched by superb color with the ease and friendliness you expect from the Mac... and
- Print on the Imagewriter II using a 4 color ribbon...or get the
- Color Copier Option. Print on paper or create immediately professional OVERHEAD COLOR transparencies...or
- Connect to a Film Recorder. (i.e. Polaroid Palette).
- With the Enhanced Video Option, digitize, manipulate and color video images in real time!!!...
- Use any standard camera (NTSC, PAL), VCR, large-screen projectors, etc. This is just a fraction of what you can do with Superchroma. With the new color software available, the proverbial sky is the only limit. Beyond power, beyond belief, beyond expectation!

SUPERCHROMA System, including Chromapaint™ Software, Monitor and Superchroma® Color Engine $2995.00 + shipping

Color Copier Option $450.00

Enhanced Video Option $1995.00

RASCAL™ Color Development System $ 250.00

50 days warranty

Chromapaint and Rascal are Trademarks of the Reed College, Portland OR. The Reed College developed the new revolutionary RASCAL Color Language. Mac Paint is a Trademark of Apple.

Order Toll Free, Call or write for free brochure. 1-800-547-3303
In Oregon 503-626-2291 (24 hour line)

We are and always will be your

Computer Friends®

14250 N.W. Science Park Drive, Portland, Oregon 97229   Telex 4949559

Dealer inquiries welcome.

Circle 271 on reader service card

Commentary/Jerry Borrell

about the long-term health of the Macintosh to spend resources on the less obvious aspects of the machine. Sadly, there is no upgrade path for owners of previous Macintosh machines, because the entire machine has changed. No doubt third parties will prosper by devising upgrades for the 512KE and the Plus.

The first thing that struck me about the Mac II: the graphics. A lot of craft is evident in the software extensions to the Toolbox and QuickDraw. The technique that very effectively enables the Mac screen to simulate a photographic-quality color display shows real software panache. Gray scale is even more effective than color. We now have to recognize that display quality is determined by factors other than the dots per inch or the number of picture elements on a screen.

The sound chip is neat, too: Apple's engineers have the depth of talent to pull off designing a custom sound chip. I can't wait for voice synthesis, music, and games applications to exploit this capability. Graphics and sound—score two for the development team.

The most significant aspect of the Mac II's design, however, is a subtle one: Apple's selection of a little-known and relatively untried bus architecture. The choice of NuBus should be applauded. Apple could have gone the Intel/IBM route and chosen a nonstandard bus based on the signals of a microprocessor. Instead, the company chose to risk—and benefit from—a more ambitious approach. Because of the NuBus design, the Mac II's slots may last for a decade. Score three for the Mac II.

The machine itself is a pleasant package for those who can afford it—internal hard disk storage, easy access to the inside of the machine, easy-to-add memory upgrades, no irritating DIP switches to flip for different configurations, a simple upgrade to floating-point, and UNIX (which requires a memory-management chip). That's four.

And it's fast. A computer with horsepower...a hot-rod dream. No doubt engineers and designers out there will be (continues)
Introducing DataFrame XP,*
the SCSI hard disk that eclipses all others.

DataFrame's superiority has been clear since Apple chose it to introduce the speed and performance of the Macintosh Plus. And now, while other manufacturers are still working to emulate our best selling DataFrame 20, SuperMac Technology™ is proud to introduce the second generation hard disk that clearly outshines: DataFrame XP.

The fastest SCSI under the sun. DataFrame XP's advanced SCSI technology delivers virtually twice the speed of any other full SCSI drive—including Apple's recent release. Every program runs faster. And the programs that make frequent use of the disk run much faster.

Reliability that overshadows all others. DataFrame is far and away the critic's choice. The MACazine gave DataFrame its highest rating. And Macworld says "DataFrame was one of the few completely trouble-free drives tested."

Unbeatable reliability is the reason SuperMac offers the only full one-year warranty in the business.

A design so simple, it's brilliant. DataFrame XP comes with all the features of the original DataFrame. Preformatted for immediate set up and use, just stand the XP beside your Mac and plug it in. And it comes with free backup, print spooler, and self-test software plus free lifetime software upgrades.

DataFrame XP always stays cool because its vertical 'chimney' design efficiently vents heat without use of a fan (that's why it's quiet!). The XP sits beside your Macintosh, not inside or under it, so the drive won't heat your system.

How to make your Mac shine. Just add a DataFrame XP. Or upgrade your existing DataFrame to XP performance. Both are every bit the DataFrame THE MAGAZINE called "the best buy for a SCSI hard disk considering price, product quality, performance, warranty and technical support."

Compare the rest of the SCSI drives. Then test the XP. And prepare for something overpowering: A total eclipse.

SuperMac Technology
950 N. Rengstorff Ave.
Mountain View, CA 94043
(415) 964-8884

*DataFrame XP not compatible with Mac Plus.
Market Manager PLUS.™
The investment software that helps you stay ahead of the odds.

In today's dynamic market, staying ahead of the odds means staying on top of your investments—making sure you have the right information at the right time to manage your portfolio effectively.

Market Manager PLUS offers portfolio management for the active investor. By linking you with Dow Jones News/Retrieval™ it provides comprehensive automatic updating and reports.

Here's what it gives you:
- Automatic portfolio valuation updates.
- Automatic dividend distribution.
- Automatic stock-split routines.
- Automatic bond and treasury bill maturity alerts.
- Automatic option expiration and stock long-term alerts.
- Interest and dividend tax reports.
- Holdings reports by portfolio and security symbol.
- Plus much more.

Market Manager PLUS gives you easy access to the portfolio information you need to make informed investment decisions.

Demonstration disk. Just $5.™
We've prepared a demo disk to show you how easy it is to manage investment portfolios. Learn how you can stay ahead of the odds, call:
1-800-221-7700, extension 48.
(Alaska and foreign call 1-215-789-7008 ext. 48.)
Have your credit card information ready, including expiration date. VISA, MasterCard, and American Express accepted.

Act now—Offer good for a limited time only.
Please add $2.50 for shipping and handling.
Market Manager PLUS works with IBM® PC, IBM XT™, IBM AT™, Apple® Macintosh™, Apple IIe and IIe.

Circle 69 on reader service card
swearing by the Mac II before the end of the year. The scope of add-on cards for the machine will be dramatic: 8- and 16MB memory cards, image capture and processing cards, high-speed array processors, communications cards for multiple network connections. My techie cup runneth over.

Best of all, Apple seems to have learned from the problems of the IBM PC family of products, a confusing array that leaves users wondering which graphics card is required for a given application and which monitors work with it. Independent ROM software written by clone manufacturers in the PC market has reduced software developers to maintenance engineers. In short, the standard-setter lost control of its market.

Apple won't allow any clone manufacturers in the market, so the company enters the open-architecture fray with an advantage. It also has a development environment and support network for programmers, which will bring us products that we haven't even dreamed of yet.

Still, this will be a year of problems and promise. One equal to 1982 through 1983 in the IBM market, says David Winer of Living Videotext. Apple has had three years to establish standards and an orderly universe of peripherals. But the enthusiasm of third-party developers will be like a gold rush, which Apple will find hard to control.

BLINDLY FAST. By sending your print files to the background and returning control of your Mac to you, SuperLaserSpool lets you work and print at the same time. And it does this 5 to 40 times faster than its nearest competitor.

SuperLaserSpool gets your back to work fast. You never wait for the printer, no matter how many documents you have queued up or even if the network is busy. SuperLaserSpool automatically manages the entire printing process while you work.

WORKS WITH ANY APPLE® PRINTER. SuperLaserSpool can print to the LaserWriter and ImageWriter (either direct-connect or AppleTalk-connected).惩罚

INCREDIBLY COMPACT. Other spoolers require so much storage space that a hard disk is essential. Not so with SuperLaserSpool. You can use it with floppy-disk systems because its files are so compact.

DOWNLOADED FONTS. Unlike most of its competitors, SuperLaserSpool can handle files that have multiple downloaded fonts.

EASY TO USE. With SuperLaserSpool, you can view all the jobs in the print queue, change their priorities, delete jobs, receive on-screen help, and check on network activity. Your spool files are always safe, even if the system crashes.

SuperLaserSpool works with almost all Macintosh applications. You can even leave and enter different programs without disrupting the printing of documents.

And it's completely invisible: You can launch it and forget it's even there.

Get SuperLaserSpool at your local SuperMac dealer today, or order direct.
With Insight accounting software, you not only capture the numbers, you can interrogate them.
You need some serious cash by next Friday.

Can you get it in time from receivables?

Do some of your customers owe you a big chunk of money this week? If so, are they good for it?

If not, can you get it from the bank?

Your credit's been okay, but how will they view this current problem?

Speaking of which, just what caused it? Or who?

With Insight, you'll know. It's the accounting software that not only keeps track of your numbers, but gets them to talk.

For example, Insight tells you who's going to pay you and when—based on their actual payment history. So you'll be dealing with realistic projections, instead of pie in the sky.

The Interpretation window compares your results with industry norms for service firms, manufacturers, distributors, flags potential problem areas and people responsible, and suggests action you can take to improve your results.

The Definition window not only tells you what things mean (like "ratio") but also who's watching them (like your banker), and what accounting and business factors affect them.

Insight goes on to define and analyze your financial information and suggests possible actions to take. For example, Insight lets you know that your current ratio—your short-term assets compared with liabilities—is good and getting better for a company like yours. Yes, you could use a loan. But because Insight makes it clear that your inventory is turning nicely, your banker knows he's dealing with a temporary blip, not a lost cause.

Insight’s Accounts Receivable and Billing, General Ledger, and Accounts Payable packages are “packed with high-power capabilities guaranteed to satisfy any accountant's inborn need to analyze,” says InfoWorld. “In fact, we haven't seen any IBM® or PC packages … this powerful.”

Insight's innovative and unique capabilities have also impressed the world's biggest accounting firm—Peat, Marwick, Mitchell—who wrote the book on how to choose, implement, and make the most out of a small business accounting system.

For a free copy, as well as a free demonstration of Insight, call 1-800-262-6620 (or in Massachusetts, 617-423-9041) for the dealer nearest you.

And see what getting some real insight into your business is all about.

*InfoWorld, October 20, 1986
© 1987 Layered, Inc. Layered and the Layered logo are trademarks of Layered, Inc. IBM is a registered trademark of International Business Machines Corporation.
An investment in Sony disks could improve your cash flow.

FREE Illinois State Instant Lottery Ticket.

*You get a FREE Illinois State Instant Lottery Ticket with every 100 Sony boxed disks purchased from this ad.

SONY® 3½ Disks
Boxed in tens
50+ 100+
3½” SS 1.17 1.14
3½” DS 1.68 1.65

SONY® MAC • PAC
Packaged in fifties
100+ 400+
3½” SS 1.07 1.02
3½” DS 1.39 1.32

Labels available —Call today!

FREE ILLINOIS STATE LOTTERY TICKET*

Nashua
Boxed in tens
3½” Single Sided 1.04 ea., 100+
3½” Double Sided 1.32 ea., 100+

INCOMMER Turbo
External Modem
2400/1200/300 BPS
- Includes MAC Cable
- With Quicklink Software for 3½”

FREE

wabash
DATATECH
DISKETTES
Boxed in tens
LIFETIME WARRANTY
100% error free
Labels, write protects and envelopes

3½” SS .99 each, Qty. 100 +
3½” DS 1.29 each, Qty. 100 +

SURGE SUPPRESSORS
G-Outlet
$9.95
- Normal and common mode suppression
- Low let-thra voltage

CONTROL CENTER
Upfront, Individual switching for up to five devices
Total MAC compatibility
Built-in circuit breaker

APPLE IMAGEWRITERS
Black ............ $2.35
Color ............ $3.05
(one each red, green, blue, brown, purple, yellow)

RIBBONS
*Sold in sixes

CALL TOLL FREE
7 to 7 Central Time
10 to 3 Saturdays
1 800 USA-FLEX (1-800-872-3539)
135 N. Brandon Drive, Glendale Heights, IL 60139

1 800 FOR-FLEX (1-800-367-3539)

TERMS: Shipping/handling additional. Minimum order $100. Visa, Mastercard and Prepaid orders accepted. Corporations rated S&J or better and government accounts are accepted on a net 30 basis. COD orders add an additional $5.00 special handling charge, AP, FP, AK, HI & PR orders add an additional 5% to the total order amount to cover P&I and Insurance. No Sales tax outside of Illinois. All other countries add 22%.

Circle 134 on reader service card

Contributors

Daniel Ben-Horin ("Insights on Red Ryder") is a San Francisco journalist and computer consultant. His work has appeared in The New York Times, Redbook, and Mother Jones, and he is a regular contributor to Macworld.

Bencion Calica ("Mac Troubleshooting Tools") is president of Tools for the Mind, a firm that teaches business people in the New England area bow to run the Mac. He coauthored The Macintosh Advisor, published last year by Hayden.

Cynthia W. Harriman ("Mac Troubleshooting Tools") is coauthor of The Macintosh Advisor and director of the Boston Computer Society Summer Institute.

Erfert Nielson ("April Fooleries") has been fooling with the Mac since the dawn of Macworld. With this article, she has discovered a practical (or at least lucrative) outlet for her talents as a practical joker.

Lon Poole ("More than a Plus" and "An Open Forum") answers readers’ questions every month in his Quick Tips column. His Mac books include Mac Insights, a collection of tips recently published by Microsoft Press.

Tom Saxton ("Mac Desktop Tools") is a Ph.D candidate in mathematics at the University of Utah. He has taught math and computer science and has been using a Mac for more than two years.

Charles Seiter ("Insights on Red Ryder") telecommutes from his woodland home in Willits, California. His published works include The Skeptical Consumer’s Guide to Used Computers from Ten Speed Press, and books on Pascal and computerized financial planning for Addison-Wesley.

April 1987
There's a lot of Mac software on the market, and more coming every day. Choosing which program is right for your application doesn't have to be a gamble.

Try That Program First!
No matter how many reviews you read, no matter how many experts you consult, there's only one way to know whether a program will do what you want it to... run it on your machine, with your data.

Not just an hour or so in a store, and not with a "demo" disk. We're talking full-bore, flat-out, pedal-to-the-metal test drive.

FREE For Three!
Through April 30, 1987, when you try any three of the programs we offer, we'll send along a copy of SMART ALARMS, free for you to evaluate.

Think of all the competing programs you've been wanting to try... Superpaint/Fullpaint, Macdraft/Macdraw, Ragtime/ReadySetGo, Double Helix/Omnis3.

Pick any three for evaluation, and we'll send along for you to try, SMART ALARMS at no extra charge.

What are you waiting for? Pick your programs from any that we offer, and call us for prices. Trial prices apply towards purchase, if you decide to keep a program.

Select From Nearly 600 Titles!
We offer the most popular Mac software, under a trial use plan. We even include manuals. You pick the program, and you only pay for the trial. You decide whether it's worth buying. If it fits, keep it, and pay the discounted balance. If it doesn't, send it back. Either way, you'll know for sure.

Software That Fits™!
Call For Our Free Catalogue!
Remember, we have nearly 600 software titles in stock, so call and order the ones you've been thinking about. Get a hands-on tryout for a fraction of the purchase price... whichever ones you decide to keep, all you pay is the discounted balance. And, remember our Free-For-Three offer when you order.

Software That Fits™
1-800-972-3018
(713) 540-2300

Save on Sony Disks!
(SS—2 boxes) $1.10  (SS—100 bulk) $ .99
(DS—2 boxes) $1.58  (DS—100 bulk) $1.28

Why Pay More?
Save on disk drives and ribbons, too! Call us.

MacRENTALS™  P.O. Box 4028 • Humble, TX 77347
Circle 368 on reader service card
The Omnis 3 Plus Programmable Relational Database — a quantum leap in the development of business solutions on Macintosh.

At last Macintosh has crossed the great business divide.

Reliable, expandable Macintosh business solutions are popping up in companies big and small, everywhere. Most are based on the Omnis 3 database.

Hundreds of independent applications developers, and thousands of managers in companies, ranging from the smallest professional practices to the largest multinationals (like American Express, Citicorp, and Arthur Young), have lifted sales of Omnis 3 far beyond its closest competitor.

Why? Because Omnis is the most powerful tool available for developing textual/numeric, transaction intensive applications on a personal computer.

What exactly does “most powerful” mean? It means finding one of 100,000 records in an unbeatable .17 seconds. It means being able to grow from a single user to a 32 user system automatically, using any popular LAN. And being able to read files off all best selling programs, with full confidence in the security of your data.

It means an experienced Mac user can develop expandable, long term solutions in a very short amount of time. And they’ll be as easy to use as you’d expect on Macintosh.

For a demonstration disc, and a directory of applications already developed on Omnis 3, clip this coupon or call 1-800-843-8615. (Inside California call 1-800-223-8050).

*According to a study by Datagest published in InfoWorld 8/96, Omnis 3 outsells all other Macintosh databases combined.

Omnis and Macintosh are registered trademarks of Blyth Software Ltd. and Apple Computer Corp., respectively.
THE™ MODEMS
100% Hayes Compatible
These self-testing 1200 and 2400 Baud modems come with auto answer, auto dial, redial and a built-in speaker with volume control.

1200 BAUD EXTERNAL $119.00*
2400 BAUD EXTERNAL $259.00*

CALL TOLL FREE 800-621-SAVE UU47
Orders — Membership and Advice
In Illinois Call (312) 280-0002
Your Membership Validation Number
You can validate your membership number and, if you wish, place your first money-saving order over the phone by using your VISA, MASTERCARD or AMERICAN EXPRESS. Our knowledgeable sales consultants are on duty Mon.-Fri. 8:00 AM to 7:00 PM, Sat. 9:00 AM to 5:00 PM CST.

PERSONAL COMPUTER NETWORK
320 West Ohio Street
Chicago, Illinois 60610

PC NETWORK MEMBERSHIP APPLICATION
YES! Please enroll me as a member in the PC NETWORK™ and send my catalog featuring thousands of computer products all at just 8% above DEALER WHOLESALE PRICES. I will also receive "THE PRINTOUT", a special periodic update on merchandise at prices BELOW even those in my wholesale catalog and all the other exclusive, money-saving services available to Members. I am under no obligation to buy anything. My complete satisfaction is guaranteed.

Please (x) all boxes that apply:

U47

Basic Membership 1 Year 2 Year
With 14 Days Rental $15 $15
Business Software Rental Library $52 $52
Games Software Rental Library $10 $10
Special VIP Membership 1 Year 2 Year
With 30 Days Rental $52 $52
BOTH Business and Game Software Rental Libraries $30 $30
Account Number:

Exp. Date: mm. yy.
Check or Money Order Enclosed for $ 

Name: ____________________________
Address: ____________________________
City: __________________ State: ______ Zip: ______

My Computer(s) is: □ IBM □ IBM XT □ IBM AT: □ Apple Macintosh Other: __________________________

Telephone: _______________________

Signature: ____________________________
(Signature required to validate membership)

PC NETWORK
800K Double Sided Disk Drive $185.00*
YOUR MACINTOSH NEEDS!

OVER 30,000 PRODUCTS AT EVERYDAY LOW, LOW PRICES!

<table>
<thead>
<tr>
<th>GAMES AND EDUCATIONAL SOFTWARE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wholesale</strong></td>
<td><strong>Wholeale</strong></td>
</tr>
<tr>
<td>Activation Hacker/Mindshadow/Borrowed Time</td>
<td>$250*</td>
</tr>
<tr>
<td>Activation Hacker II</td>
<td>25.00</td>
</tr>
<tr>
<td>Ann Arbor Grid Wars</td>
<td>32.50</td>
</tr>
<tr>
<td>Apple MacDraw</td>
<td>125.00</td>
</tr>
<tr>
<td>Bluechip Barco, Millionaire or Tycoon</td>
<td>32.00</td>
</tr>
<tr>
<td>Broderbund The Adventurer</td>
<td>23.75</td>
</tr>
<tr>
<td>Broderbund Lode Runner</td>
<td>19.75</td>
</tr>
<tr>
<td>Broderbund The Shop Toy</td>
<td>34.50</td>
</tr>
<tr>
<td>Electronic Arts Chessmaster 2000</td>
<td>29.97</td>
</tr>
<tr>
<td>Electronic Arts One On One</td>
<td>36.50</td>
</tr>
<tr>
<td>Electronic Arts Ultra IV</td>
<td>39.97</td>
</tr>
<tr>
<td>Hayden Musicworks</td>
<td>24.75</td>
</tr>
<tr>
<td>Infocom Deadline</td>
<td>24.00</td>
</tr>
<tr>
<td>Infocom Enchanter, Planetfall or Cutthroats</td>
<td>20.00</td>
</tr>
<tr>
<td>Infocom Zork II or Zork III</td>
<td>22.00</td>
</tr>
<tr>
<td>Infocom Zork I, Wimsey or A Hitchhiker's Guide</td>
<td>20.00</td>
</tr>
<tr>
<td>Toshiba Spectrum Holobyte GATO</td>
<td>21.50</td>
</tr>
<tr>
<td>Toshiba Spectrum Holobyte Orbiter, or Falcon</td>
<td>24.00</td>
</tr>
<tr>
<td>Sublogic Jet</td>
<td>29.50</td>
</tr>
<tr>
<td>Toshiba Telarian Amazon/Dragon World/Farenheit 451</td>
<td>23.97</td>
</tr>
<tr>
<td>TimeWorks The Evelyn Wood Dynamic Reader</td>
<td>41.97</td>
</tr>
<tr>
<td>TimeMaker Click Art</td>
<td>29.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BUSINESS SOFTWARE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Please add 52.00 shipping and handling for each item ordered.</strong></td>
<td></td>
</tr>
<tr>
<td>Ann Arbor Full Paint</td>
<td>550.00</td>
</tr>
<tr>
<td>Apple MacTerminal or MacPascale</td>
<td>60.00</td>
</tr>
<tr>
<td>Ashton-Tate DBase for the Mac</td>
<td>249.00</td>
</tr>
<tr>
<td>Blythe Omni 3 Plus</td>
<td>265.00</td>
</tr>
<tr>
<td>Borland RelEx for Mac</td>
<td>58.95</td>
</tr>
<tr>
<td>Borland SideKick with PhoneLink</td>
<td>52.00</td>
</tr>
<tr>
<td>Borland Turbo Pascal for the Mac</td>
<td>59.95</td>
</tr>
<tr>
<td>Boston Software Ultimate Publisher</td>
<td>65.95</td>
</tr>
<tr>
<td>BPI General Accounting</td>
<td>115.00</td>
</tr>
<tr>
<td>Brainpower Statview Plus</td>
<td>159.00</td>
</tr>
<tr>
<td>Brandywine The Print Shop</td>
<td>215.00</td>
</tr>
<tr>
<td>Casady Software Laser Foints</td>
<td>ea. 41.97</td>
</tr>
<tr>
<td>Central Point Copy II Mac</td>
<td>24.00</td>
</tr>
<tr>
<td>Challenge Software On 3D</td>
<td>355.00</td>
</tr>
<tr>
<td>Creative Solutions MacForth Level II</td>
<td>110.00</td>
</tr>
<tr>
<td>Dwon Jones Software Spreadsheet Link</td>
<td>43.50</td>
</tr>
<tr>
<td>Dwon Jones Software StraightTalk</td>
<td>37.00</td>
</tr>
<tr>
<td>Dwon Jones Software StraightTalk II</td>
<td>139.00</td>
</tr>
<tr>
<td>Epson SmartType</td>
<td>78.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DISK DRIVES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple 800MB External Drive</td>
<td>$310.00</td>
</tr>
<tr>
<td>Apple SCSI Hard Disk 20MB</td>
<td>$90.00</td>
</tr>
<tr>
<td>Apple MacDisk 20MB</td>
<td>249.00</td>
</tr>
<tr>
<td>AST Double 20MB 10HD &amp; Tape Drive</td>
<td>1,065.00</td>
</tr>
<tr>
<td>DC Systems Easy Drive 20MB Mac HD</td>
<td>650.00</td>
</tr>
<tr>
<td>Iomega Dual 20MB Bernoulli for Mac SCSI</td>
<td>530.00</td>
</tr>
<tr>
<td>Paragon 530MB Disk for Mac</td>
<td>700.00</td>
</tr>
<tr>
<td>Paragon 1024 MB Hard Disk &amp; Subsystem</td>
<td>525.00</td>
</tr>
<tr>
<td>Paragon 20MB Hard Disk for the Mac</td>
<td>745.00</td>
</tr>
<tr>
<td>Rodime 20 Plus Internal SCSI HD for Mac</td>
<td>943.00</td>
</tr>
<tr>
<td>Rodime 45 Plus Internal SCSI HD for Mac</td>
<td>1,262.00</td>
</tr>
<tr>
<td>Rodime 80 Plus External SCSI HD for Mac</td>
<td>895.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PRINTERS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Imagerunner II 10&quot; carriage</td>
<td>$419.00</td>
</tr>
<tr>
<td>Apple Imagerunner III 15&quot; carriage w/Mac kit</td>
<td>475.00</td>
</tr>
<tr>
<td>Apple LaserWriter/Makes Mac a 15&quot; carriage</td>
<td>3,520.00</td>
</tr>
<tr>
<td>Apple LaserWriter w/Mac</td>
<td>3,520.00</td>
</tr>
<tr>
<td>Epson DX-15 Daisywheel 33cPML/20CL,10</td>
<td>590.00</td>
</tr>
<tr>
<td>Epson EX 850 300/600CP/Mac</td>
<td>410.00</td>
</tr>
<tr>
<td>Epson EX 850 300/600CP/Mac</td>
<td>410.00</td>
</tr>
<tr>
<td>Epson FX 660 15&quot; plate/160CPML</td>
<td>345.00</td>
</tr>
<tr>
<td>Epson FX 660 15&quot; plate/160CPML</td>
<td>345.00</td>
</tr>
<tr>
<td>Epson FX 660 15&quot; plate/200CPML/6c</td>
<td>687.00</td>
</tr>
<tr>
<td>Epson FX 660 15&quot; plate/100CPML</td>
<td>185.00</td>
</tr>
<tr>
<td>'Hanlon Taps Your Imagerunner into an Imagemaker'</td>
<td>60.00</td>
</tr>
<tr>
<td>NEC 3510 33cPML/Letter Quality</td>
<td>675.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
<tr>
<td>NEC 3510 35cPML/Letter Quality</td>
<td>999.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MODEMS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple 1200PS Personal Modem w/Mac</td>
<td>275.00</td>
</tr>
<tr>
<td>Apple Modem Cordless</td>
<td>16.00</td>
</tr>
<tr>
<td>Hayes Smartmodem 1200</td>
<td>340.00</td>
</tr>
<tr>
<td>Hayes Smartmodem 1200 w/Smartcom I/Mac</td>
<td>417.00</td>
</tr>
<tr>
<td>Hayes Smartmodem 2400</td>
<td>525.00</td>
</tr>
<tr>
<td>Hayes Smartcom 1200 w/Smartmodem</td>
<td>253.00</td>
</tr>
<tr>
<td>U.S. Robotics Password</td>
<td>172.00</td>
</tr>
<tr>
<td>U.S. Robotics Hayes Hayes Modem</td>
<td>2400</td>
</tr>
<tr>
<td>U.S. Robotics Hayes Hayes Modem</td>
<td>345.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HARDWARE</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Macintosh Carrying Case</td>
<td>369.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Typewriter</td>
<td>39.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ACCESSORIES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>569.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
<tr>
<td>Apple Macintosh Carry Case</td>
<td>39.00</td>
</tr>
</tbody>
</table>

**NEW! PC NETWORK ONLINE**

A 24 Hour Bulletin Board and Information Service Center

- FREE SOFTWARE: Over 20,000 downloadable shareware titles.
- NEWS FLASHES AND REVIEWS: Get all the latest on Apple, IBM, Mac, Unix and related subjects.
- LEAVE MESSAGES—DAY OR NIGHT—FOR TECHNICAL SUPPORT.
- LATEST PRICING: and Special Sales on PC Network Products.

PC Network improves on the benefits its members continue to enjoy...

- WHOLESALE +8% PRICING
- 10 DAY RETURN ON HARDWARE
- 500 PAGE NETWORK CATALOG
- PERIODICAL NEWSLETTERS
- FREE TECHNICAL SUPPORT
- 14-30 DAY SOFTWARE RENTALS

TOLL FREE (800) 621-SAVE Orders and Memberships
In Illinois Call (312) 280-0002 Validation Code 1047
Customer Service and Order Status (312) 280-1567
Circle 45 on reader service card
Whatever you write —

Bring it down to your software dealer and run it through Spellswell. THEN tell us you don't need a proofreading program!

SPELLSWELL™ THE BEST.

Works with MacWrite, Jazz, Works, Word (1.0 & 1.05), MORE, ThinkTank and text documents. Includes 93,000 word dictionary. Medical dictionary $99.95.

$74.95 $2.50 Shipping and Handling. California Residents Add Sales Tax.

For Information: (408) 375-2828 To order: (800) 331-4321 In California: (800) 851-1986

Spellswell is a trademark of Greene Johnson Inc. MORE and ThinkTank are trademarks of Living Videotext Inc. Apple is a registered trademark, and Macintosh and MacWrite are trademarks of Apple Computer, Inc. Microsoft is a registered trademark of Microsoft Corporation. Lotus and Jazz are registered trademarks of Lotus Development Corporation.

Circle 520 on reader service card
I have a hard disk and a Mac Plus. She has a 512K Mac and an antique 400K external drive. It is difficult, if not tortuous, for her to make frequent backups of the lengthy chapters of her book; it requires a lot of time-consuming, wrist-stressing disk swapping. The solution is for me to feed her disks into my Plus, copying them to my hard disk and then transferring the information to 800K floppies. Despite my sanctimonious lectures on the virtues of frequent backup, we collaborate on this process much more occasionally than is prudent.

Our most recent backup session took place almost a month after the previous one. Everything was proceeding nicely. I had it down to a science: shove in the floppy, select the files, drag them to a folder on the hard disk, and finally drag the floppy’s icon to the trash icon to eject the disk. Then to the next disk. I admit to a trancelike state that often comes with repetitive tasks. But the trance was abruptly terminated when I looked up and noted with horror that the disk I was just ejecting bad nothing on it, though a few seconds before, it did. I checked the trash icon: nothing. I put the disk back in and still, nothing on it. Nada. Ank-blay. A chapter was missing. A long chapter. Obviously, I had dragged the file to the trash instead of the folder, and then, when I had ejected the disk, the Mac had emptied the trash.

Have you ever had to break the news to a writer that you’ve mistakenly discarded an 80-page chapter of her book? I do not recommend it. The only thing that saved me from violent injury was the hope I held out to the victim: I had heard of a program that could magically rescue lost files such as this one. And if my hands were broken, I could not work my computer to perform that task.

The program was named Fedit, and as I remembered, it was a shareware program. Shareware is a system whereby software is distributed freely, through bulletin boards, user groups, and informal giveaways. But it is not free: those who keep the program and use it are expected to send the author a specified payment.

Considering the alternative, money was no object. So I used my modem to call CompuServe and sure enough, there was Fedit, which I immediately downloaded. But when I opened the program, the first thing facing me was a message that this version of Fedit was not the latest; the Mac Plus version of the program—named Fedit Plus—had been taken out of the shareware loop and was available only by mail order.

This was quite a blow. I needed the best recovery program, as soon as possible. I panicked and called up the gurus at Macworld, who told me that they had a

(continues)
Absolutely.
For the first time, a PC and a Macintosh™ can really talk together. Simply, transparently, reliably.
It's done with TOPS™, the easiest to learn, easiest to operate Local Area Network yet designed. You can now access Lotus 1-2-3™ files located on a PC, for example, and modify them on your Macintosh under Microsoft™ Excel™.
With TOPS you can have three Local Area Networks in one. Macintoshes can talk to Macintoshes, PCs can talk to PCs and PCs can talk to Macintoshes. All of these computers can be connected on the same LAN, sharing databases, text files, connecting up parts of your office that until now were barely on speaking terms.
Installation is quick and straightforward—less than four minutes for a Macintosh, fifteen minutes for a PC. It's all done so easily and success-
fully that within the first month TOPS was available, it was already installed in over 100 Fortune 500 companies.

This talk is also remarkably cheap. TOPS is $149 per Macintosh, $389 per PC.

As if that weren't enough good news, we are pleased to also announce one of this year's major advances in desktop publishing. Now, using TOPS PRINT you can have all your PCs share Apple's LaserWriter.

TOPS and TOPS PRINT are available at Businessland and other fine computer dealers. For the dealer nearest you, call 800-222-TOPS (in California call 800-445-TOPS).

And we'll do just what a Macintosh and a PC can now do. Talk.

TOPS Network

Centram
2560 Ninth St., Berkeley, CA 94710

PC Magazine has selected TOPS as the "Best of '86"

Circle 524 on reader service card
copy of Fedit Plus in the office, and there was a good chance that the program would help me out. They promised to Fed-Ex me a copy of the new version on the condition that I promise to pay the author, a fellow named John Mitchell. Though the magazine's policy has always been antipiracy, they made a point of repeating this condition, telling me that Mitchell had suffered in the shareware market.

Not to worry. "At this point," I said, "I would give him my firstborn."

Fedit Plus arrived, and within 15 tense minutes, the chapter was resurrected. Now I know how Ray Knight felt in last year's World Series—I had gone from goat to hero.

Fedit Be

John Mitchell was suddenly one of my favorite humans. But one thing puzzled me. I knew that his program had enjoyed wide distribution. And I had seen its incalculable value. So why had the program's performance in the shareware market apparently been so poor that he moved it into the commercial sector?

I called the author for the answers to these questions. Mitchell is an affable Englishman who came to this country in the late sixties and worked in the data processing division of a large company. The micro revolution of the seventies fascinated him, and he began working on personal computer products in his spare time. In 1984, he had just finished a contract project for Apple—designing the RGB monitor card for the IIE—when he became enamored of the new Macintosh. While learning to program the Mac, he developed a need to edit his files and perform recovery operations on his Mac floppies, so he wrote the first version of Fedit as a personal tool. He realized that others might benefit from that program, too. And that he might garner some well-earned remuneration from it.

"I talked to some publishers, but nobody wanted to release it commercially," says Mitchell. "They didn't think there was much of a market for Macintosh utilities. So I thought, 'What the heck, I'll put it on the market as shareware!' I had nothing to lose."

In fact, all of us had something to gain. Many people, myself among them, viewed shareware as a nearly utopian solution to the dilemma of programmers who feel that they lose control of both their work and their ideals when they turn over their products to commercial distributors. In the world of IBM-standard microcomputers, shareware artists/entrepreneurs with word processors, databases, and communications programs had been boasting impressive revenues from honorable customers. In light of the early success of the state-of-the-art Red Ryder communications program, the Macintosh looked like the machine that would make shareware a model for innovative capitalism.

Indeed, at the November 1984 Hacker Conference, shareware was one of the hottest topics. Bob Wallace, author of the PC-Write word processor, announced that his program would do $225,000 worth of business that year. In addition, he had total control of his program and the benefit of rich feedback from his users.

(continues)
THERE'S A NEW DRIVING FORCE IN DESKTOP PUBLISHING...
Today, it takes more than words to communicate effectively, because how you look on paper is just as important as what you say. Now you can get that professionally designed look in all your printed materials. Ready, Set, Go!3® from Letraset combines a fully functional word processor with the most advanced page layout capabilities.

With Ready, Set, Go!3, the words and visuals flow together like never before. It's a state-of-the-art combination that's been unanimously praised by reviewers and users alike! InfoWorld calls Ready, Set, Go!3 a “speed demon” and “the best value on the market today.” You'll call it the best publishing decision you ever made.

The most important features—speed, performance and true ease-of-use—are all built-in. So first-time users will be publishing like pros in no time. And experienced users will maneuver quickly through their most challenging projects. What might have taken days or weeks to produce can be created in half the time because Ready, Set, Go!3 puts you in control.
Just stop by your authorized Apple dealer and put Ready,Set,Go! through its paces. While you're there, imagine sitting behind the wheel of the "Ready,Set,Go Porsche"! Better yet, fill out an entry blank and you could turn fantasy into fortune and drive off with the Grand Prize in the Letraset "Ready,Set,Go Porsche" Sweepstakes.

**GRAND PRIZE:**
The Fabulous 1987 924S
Ready,Set,Go Porsche

**FIRST PRIZE** Winner will come away with an Apple® Macintosh® Plus computer.

**2 SECOND PRIZE** Winners will each receive a Radius® Full Page Display monitor.

**3 THIRD PRIZE** Winners will each receive a DataFrame XP40 40-meg external disk drive by SuperMac Technology.

**4 FOURTH PRIZE** Winners will each receive a Ready,Set,Go! software package!

OFFICIAL "READY, SET, GO" PORSCHE SWEEPSTAKES RULES
1. To enter sweepstakes, complete an Official Entry Form and mail it to: "Ready, Set, Go" Porsche Sweepstakes, P.O. Box 593, Lowell, IN 46399. No mechanically reproduced entries will be eligible. Enter as often as you wish, but mail each Official Entry Form separately. Entries must be received by July 1st, 1987. 2. Official entry forms are available at all participating Letraset dealers or by sending a stamped, self-addressed envelope to: "Letraset Entry Form Request", PO Box 626, Lowell, IN 46399. 3. Winners will be selected in random drawings by VENTURA ASSOC., Inc., an independent judging organization, whose decisions are final. Winners will be notified by mail. Winners must sign an affidavit of eligibility which must be returned and received within 21 days of the date mailed to potential winner. No winner will be awarded multiple major prizes and no substitutions for prizes other than as may be necessary due to availability. Taxes are the responsibility of the winners. Odds of winning are dependant upon the total number of entries received. All prizes will be awarded. 4. Sweepstakes open to residents of the United States. Void where prohibited by law and regulation. Not open to employees and their families of Estelle companies, Estelle Letraset, their affiliates, their dealers, their advertising and production agencies and VENTURA ASSOC., Inc. All Federal, State and local laws and regulations apply. 5. The Grand Prize Winner must be at least 18 years of age and have a valid driver's license. The prizes are: 1 Grand Prize, a 1987 Porsche 924S; 1 First Prize, an Apple Macintosh Plus; 2 Second Prizes, a Radius full page display monitor; 3 Third Prizes, a DataFrame XP40 40-meg hard disk external storage by SuperMac Technology; 4 Fourth Prizes, a set of Ready,Set,Go! software.
6. For a list of major prize winners, send a stamped, self-addressed envelope to: "Ready, Set, Go" Winners List, PO Box 744, Lowell, IN 46399.
**You’re Always in Control.**

- **Advanced Text-Handling Features**
  - Fully functional word processor lets you write-as-you-go
  - Automatic or manual kerning to improve text appearance
  - Real-time hyphenation and justification for better looking text
  - 72,000 word Spelling Checker eliminates proofreading
  - Imports MacWrite, Word and ASCII text files
  - Search and replace to speed updates
  - User-defined glossaries save you keystrokes
  - Global font, style and size changes save you time
  - Linked text blocks for automatic text flow

- **Advanced Page-Handling Features**
  - Unique grid design system for precise and easy page layout
  - “Master pages” handle repetitive elements
  - Automatic text runarounds
  - “Specification sheets” for precision placement in inches, centimeters, pica or pints

- **Advanced User Features**
  - Multi-document windows for easier cutting and pasting of graphics, text and even whole pages between layouts
  - Five page-viewing sizes for better layout control
  - Direct PostScript programming capabilities for special effects
  - Graphic primitives include a full complement of rules, borders, fill patterns, and more
  - Open MacPaint and PICT files directly

---

**LETRASET PORSCHE SWEEPSTAKES**

**OFFICIAL ENTRY BLANK**

Name_________________________ Title_________________________
Company________________________
Address________________________
City, State, ZIP________________________
Telephone________________________
Primary Use:________________________

Fill out and return to: Letraset “Ready,Set,Go Porsche” Sweepstakes,
PO Box 563, Lowell, IN 46359
Code #652
Great handling will help you speed through even the toughest tasks!

Whether it's lengthy documents or complicated layouts, everything you need to handle them is at your fingertips. You write-as-you-go... with automatic text reflow, kerning, real-time hyphenation and justification, even automatic text wraparound for specifically marked blocks.

With Ready,Set,Go!3 you can choose any document length—right to the limit of your system's memory. Powerful snap-to grids not only make layouts simple to create, they can easily be customized to suit your every need. Ready,Set,Go!3 will boost your productivity with dramatic impact.

Now you can take full advantage of downloadable fonts, laserprinter spoolers and special graphic effects created in PostScript. What's more, because Ready,Set,Go!3 uses the standard Apple LaserWriter driver, you can effectively combine desktop publishing with desktop communications.

Letraset supports you all the way.

At just $395, Ready,Set,Go!3 is the smartest investment of the year. Not only do you get a quick tour and concise tutorial, but the sticker price also includes:

- UNLIMITED TOLL-FREE TECHNICAL SUPPORT
- NO COPY PROTECTION—IDEAL FOR HARD DISKS AND NETWORKS
- HINTS AND TIPS NEWSLETTER, "COMMUNICATION BY DESIGN"

Better Brochures
Ready, Set, Go! 3 has everything going for it!

A unique rectangular grid system which lets you quickly and easily:
- Visualize and define the relationship between graphic elements on the page
- Lay out blocks of text and graphics using preset or customizable "snap to" grids
- Position text and graphics accurately
- Precisely align top and bottom, right and left sides of blocks

Full editing of text and graphics using any display size:
- Actual size • 75% • 50%
- Double-size • Size to fit

Easy-to-use Spec Sheets for precision placement and resizing:
- Measure in Inches, Centimeters or Pica/Points
- Show distance of objects from the top and side of the page
- Display block depth and width of the selected object
- Scale pictures to a specified percentage

An alignment feature so that you can line up blocks of text and/or graphics by:
- left or right side • top or bottom • centers

A remarkable system to link blocks of text with the click of a mouse:
- Blocks can be linked together into a chain throughout a document
- Linkages can be created before or after text is entered
- Form as many linked chains as desired
- Imported text can be manually or automatically flowed through the chain between pages
- Editing text in a single block automatically updates the entire chain
- Font, style or size can be changed throughout a chain of blocks globally with a single command
- Links can be modified to add or delete blocks from the chain, or change their order

Blindingly fast real-time hyphenation based on a sophisticated algorithm which includes:
- A provision for hyphenation exceptions, such as proper nouns
- A way to change the point at which hyphenation occurs
- The ability to turn off hyphenation for single words or entire text chains

Amazing kerning capabilities that let you:
- Kern manually or automatically
- Kern vertically as well as horizontally

Multiple windows which bring new power to desktop publishing:
- Compare multiple layouts at the same time
- Cut and paste text, graphics, or whole pages between documents
- Take full advantage of large screen displays

Extensive word-processing capabilities, including:
- Import of formatted MacWrite*, Microsoft* Word, or ASCII files
- Built-in 72,000 word Spelling Checker
- Glossaries with font attributes
- Search and replace

Extensive graphic and drawing capabilities, including:
- Direct import of PICT and MacPaint* files
- Bring to front/send behind
- Rectangles, rounded rectangles, and ovals
- 39 fill and pen patterns which can be applied to lines, object interiors or borders
- Six solid line widths, including hairline
- Five dashed line widths
- Two scotch rules
- One double rule

The ability to incorporate Postscript graphics directly into your layout using a built-in option:
- Just enter a Postscript program into a standard text block
- Select the Postscript option from the spec sheet
- Create a myriad of special effects like rotated or circular type, radiating lines, and more!

Run text around graphics or other text:
- Text automatically refinews around graphics placed on the page
- The runaround option can easily be enabled or disabled using the spec sheet
- Runarounds can also be used to automatically reflow text around other text

Powerful, yet easy page creation and modification features that let you:
- Add or delete pages; insert blank pages or duplicates, create global links between pages
- Specify repeating elements for right and left pages
- Automatically number pages
- Disable master pages, where desired
- Create as many pages as memory will allow
- Easily select pages using icons
For users, shareware was unbeatable. For no cost, they could test the program—the full-featured program, not a crippled demo—and see if it was worth the expense. In any case, the price of a shareware program—unburdened by expensive marketing and distribution costs—was almost always much lower than a comparable commercial program. All that was required from the user was honesty. If you use the program, pay for it.

By that measure, shareware could be seen as a test of the user. The marketplace gets the software it deserves. Is it worthy of a rich base of shareware software?

**A Question of Honor**

If [Fedit](https://example.com) is the example, the answer is no. In September 1984, John Mitchell made the program available. On it was a message to users: try the program, and if you want to keep it, send Mitchell $30. If not, erase the program from your disk.

Distribution was widespread. Macintosh users could get [Fedit](https://example.com) from bulletin boards, user groups, or friends. Apple Computer distributed it to developers with the shareware message on it. The program got positive mentions in relevant publications. Mitchell wrote updates, extending the program’s powers. [Fedit](https://example.com) saved thousands of people’s skins, much as it saved mine. Mitchell estimates that as many as 20,000 people used it between its release date and December 1985. And how many of those thousands sent in the reasonable $30 registration fee?

Two hundred and fifteen. Why the miserable response? Are Macintosh users ungrateful? John Mitchell refuses to be harsh with them.

“People have short memories. It’s difficult to send a letter and put money in. Most of the people who did respond were professionals, doctors or lawyers who have secretaries to do that kind of work for them.”

Other shareware developers concur: people don’t consciously stiff the authors. It just winds up that way.

“Procrastination is the biggest problem with shareware,” says Dick Skeie, who with Don Brown runs CE Software, the shareware publisher of the original Mac desk accessory [Mover](https://example.com) and the [Mock](https://example.com) series of applications. “With conventional products, you pay once, and if you’ve used it, you’ve used it. With shareware people say: ‘When I’ve used it significantly, I’ll pay for it.’ It’s a different concept.”

Even when use is significant, CE Software’s [MacHonor System](https://example.com) shows honor to be a rare commodity. Though Skeie and Brown are circumspect with hard figures, they admit that the revenues from those products do little justice to their widespread popularity in the Mac marketplace.

“I'd guess that between 2 and 5 percent of people actively using the programs pay us,” says Brown. “And that’s not good.”

Of all the major shareware developers, the only one who seems to be doing a land-office business is Scott Watson, creator of [Red Ryder](https://example.com). This is partly because people are more willing to send in money for applications that get frequent, perhaps daily, use. Also, those who rely on a program for their work are more likely to need the free or low-cost upgrades that are commonly provided to shareware owners who... (continues)

---

**LaserSpeed™, No-Wait Printing**

**LaserWriter Spooler**

Print while you work

It's true. No wait laser printing is here. Now print and keep working. LaserSpeed, the Macintosh software spooler with built-in queue management. You decide what to print. And when.

If you print one page or encyclopedia—get LaserSpeed

Simultaneously layout pages in PageMaker. Crunch numbers in Excel. Type away in MacWrite or Word. Dip into fat bits with MacPaint. All while your laser printer zips out dazzling pages.

Here's how it works:

LaserSpeed is always available. Just turn your Macintosh on. When you print, LaserSpeed holds your documents, leaving your machine free. Then it automatically waits in line for you. When it's your turn, LaserSpeed does the work not you.

You have total control

With LaserSpeed's desk accessory you can prioritize your important documents. Get instant "pop-up" notification when your printing starts or ends.

LaserSpeed, Apple, AppleTalk, LaserWriter, MacWrite, MacDraw and MacPaint, Excel, Word, and PageMaker are trademarks of THINK Technologies, Apple Computer, Microsoft, and Adobe. Macintosh is a trademark of Apple Computer, Inc and is used with its express permission.

---

**Crash proof**

Turn spooling off or on. No one else on your AppleTalk network can interfere. Even if someone accidentally turns off your Mac, LaserSpeed's "crash control" picks up right where it left off.

**Why wait**

LaserSpeed installs in a snap. Double-click once. That’s it.

It’s fast. It’s powerful. And it's available today. Join the thousands of others, who, like you, refuse to wait.

Get LaserSpeed for your own Mac for $99. Or LaserSpeed Office Pack for $499 to use on all Macs connected to a single designated LaserWriter. The LaserSpeed Office Pack includes five disk sets and manuals.

THINK Technologies, 420 Bedford Street, Lexington, MA 02173, 617-863-5595

Call 617-863-5595 or mail to:

THINK Technologies, 420 Bedford Street, Lexington, MA 02173

Name ____________________________

Address ____________________________

City ______ State ______ Zip ______

Phone ______

___ Copies of LaserSpeed for my Mac, $99

___ Copies of the Office Pack, $499

Circle Credit Card Name: MC VISA AMEX

Card# ____________

Expires ______

Signature ______

Circle 671 on reader service card
A Message to Creative People Everywhere: Your Software is Finally Ready!


Starting March 31, 1987, it becomes possible to Draw, Paint, Write and Paste-up using just one program. LaserPaint provides the creative tools you're familiar with, and goes on to introduce many new tools never before seen on a Macintosh.

Import Paint, Scanned, Text, Bit-mapped and PostScript® files, manipulate, alter and arrange them, and then output them in pure PostScript to the LaserWriter, Linotronic® or any other PostScript device for printing in resolutions of 300-2540 DPI.

Discover the speed and control of producing your own in-house 4-Color, 2-Color, and Line-Color Separations with the LaserWriter or Linotronic. The creative possibilities are endless.

Want to find out more? See your local computer dealer or call 800-367-6898, or in California, 415-453-9500.

LaserWare, Inc.
P.O. Box 662
San Rafael, CA 94904

LaserPaint is a trademark of LaserWare, Inc. Macintosh and LaserWriter are trademarks of Apple Computer, Inc. PostScript is a registered trademark of Adobe Systems Incorporated. Linotronic is a trademark of Allied Corporation. Copyright © 1987 LaserWare, Inc.

Circle 664 on reader service card
Most online information networks can zap your computing budget faster than you can say "lightning." Not so with GENie, the General Electric Network for Information Exchange. As part of the world's largest commercially available teleprocessing network of General Electric Information Services Company, GENie lets you experiment with all of the fun and excitement that online computing has to offer.

Evenings, weekends, holidays. Just $5 per hour.

With GENie, you can make friends, set up travel reservations, get the news, be entertained, even shop for a fraction of what other information services charge.

And you get a lot for your money.

With GENie's Coffee MUG, you can discuss the latest in Macintosh products and accessories; download thousands of public domain software programs, and participate in exciting and informative online conferences. And, UPLOADS ARE FREE on GENie! There's more!

Meet friends old and new with GENie's LiveWire CB Simulator or exchange messages with GENie's electronic mail service. Schedule a trip with American Airlines travel service. Fun and learning for the whole family with Grolier's electronic encyclopedia. Play classic and multiplayer games. Track stock market quotes, check market indicators and maintain an automatically updated personal portfolio online with GENie's Financial Services. All this and there's more to come. New services are being added each and every month!

$10.00 + per hour

$5 per hour

Only $18 to register! Save up to 60%!

Check out the chart. Compare the savings for yourself. You'll find GENie delivers all of your favorite services for an incomparable price, at incomparable savings.

<table>
<thead>
<tr>
<th>Service</th>
<th>Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel &amp; Shopping</td>
<td>$49.95</td>
</tr>
<tr>
<td>SIG/User Groups</td>
<td>$10.00</td>
</tr>
<tr>
<td>CB &amp; Mail</td>
<td>$8.40</td>
</tr>
<tr>
<td>Financial Services</td>
<td>$10.80</td>
</tr>
<tr>
<td>News</td>
<td>none</td>
</tr>
<tr>
<td>Games</td>
<td>$6.00</td>
</tr>
<tr>
<td>Monthly Minimum</td>
<td>$5.50</td>
</tr>
<tr>
<td>Non-prime time rates</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

*Prime rates and services shown in effect 11/88. Non-prime time applies Mon.-Fri., 10pm-3am local time, all day Sat., Sun., and major holidays. Subject to service availability. Additional charges apply for 56K and fax services.

With services and savings like these, now you can discover the friendliness of online computing without the high costs that can turn you into a downright monster. Get a happy ending going with GENie. Sign up today!

Sign up from your keyboard today.

4 Easy Steps:

1. Have your Visa, MasterCard or checking account number ready.
2. Set your modem for local echo (half duplex)–300 or 1200 baud.
3. Dial 1-800-638-8369. When connected, enter HHH.
4. At the UF# = prompt enter XJM1901,GENie then RETURN.

Need help or more information? No modem yet? We can help. In U.S. or Canada call 1-800-638-9636.

With GENie, you can make friends, set up travel reservations, get the news, be entertained, even shop for a fraction of what other information services charge. And, UPLOADS ARE FREE on GENie! There's more!

Meet friends old and new with GENie's LiveWire CB Simulator or exchange messages with GENie's electronic mail service. Schedule a trip with American Airlines travel service. Fun and learning for the whole family with Grolier's electronic encyclopedia. Play classic and multiplayer games. Track stock market quotes, check market indicators and maintain an automatically updated personal portfolio online with GENie's Financial Services. All this and there's more to come. New services are being added each and every month!

$10.00 + per hour

$5 per hour

Only $18 to register! Save up to 60%!

Check out the chart. Compare the savings for yourself. You'll find GENie delivers all of your favorite services for an incomparable price, at incomparable savings.

<table>
<thead>
<tr>
<th>Service</th>
<th>Pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel &amp; Shopping</td>
<td>$49.95</td>
</tr>
<tr>
<td>SIG/User Groups</td>
<td>$10.00</td>
</tr>
<tr>
<td>CB &amp; Mail</td>
<td>$8.40</td>
</tr>
<tr>
<td>Financial Services</td>
<td>$10.80</td>
</tr>
<tr>
<td>News</td>
<td>none</td>
</tr>
<tr>
<td>Games</td>
<td>$6.00</td>
</tr>
<tr>
<td>Monthly Minimum</td>
<td>$5.50</td>
</tr>
<tr>
<td>Non-prime time rates</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

*Prime rates and services shown in effect 11/88. Non-prime time applies Mon.-Fri., 10pm-3am local time, all day Sat., Sun., and major holidays. Subject to service availability. Additional charges apply for 56K and fax services.

With services and savings like these, now you can discover the friendliness of online computing without the high costs that can turn you into a downright monster. Get a happy ending going with GENie. Sign up today!

Sign up from your keyboard today.

4 Easy Steps:

1. Have your Visa, MasterCard or checking account number ready.
2. Set your modem for local echo (half duplex)–300 or 1200 baud.
3. Dial 1-800-638-8369. When connected, enter HHH.
4. At the UF# = prompt enter XJM1901,GENie then RETURN.

Need help or more information? No modem yet? We can help. In U.S. or Canada call 1-800-638-9636.
pay to become registered users. Perhaps most of all, Watson's near-obsessive efforts in supporting his product have put Red Ryder in a category somewhere between shareware and cult item.

Most shareware programs, though, are either utilities, disk accessories, games, or subsets of applications. The vast majority fall under the goodies appellation. This has helped to give shareware a reputation, however undeserved, as unprofessional software.

Also, though some shareware programs are as good as those available commercially, many have bugs. Still others are half-formed programs that an author would be happy to give away but, as a what-the-heck attempt to make a few bucks, labels shareware. Dick Skeie notes that as a result of this, "The word shareware has taken on a connotation of being second-class software."

Which gives the procrastinators one more disincentive to pay.

Arrivederci, Shareware

So Johri Mitchell quit shareware completely. "I decided it just wasn't worth it," he said. "I decided to release no more versions in shareware, and I took the shareware notice off the previous versions. It was time to change philosophy completely and make it a commercial program." Turning down offers from a few publishers, he began his own small company. He does mail-order sales and has worked out an arrangement with some dealers. He has even begun advertising, "trying to publicize the fact that it really is a commercial program."

Now, he says, he sells more copies of Fedit in a week than he did in the entire 15 months the program was in the shareware domain.

The folks at CE Software are not taking such a drastic step. "We exist for the people who do send in money, not for the ones who don't," says Dick Skeie. But the company has changed its approach. "We were forced to recognize reality. You can't just put something out there and sit back and wait for the money to come in. You have to provide incentives and make it as easy as possible for people to pay."

So CE has begun to assume a dual identity: while keeping a foot in the shareware world, it also packages its programs commercially and sells through dealers.

(continues)
3.5 Inch, 800K Drives
Only $195

Compatible with IIgs, //e, Macintosh and Laser 128!

Now you can add 800K of Apple compatible storage to your Apple at an affordable price. These 3.5 inch drives are functionally identical to Apple's Unidisk 3.5 and Macintosh drives but cost half as much!

**Works with an Apple II:**
Our 3.5 inch drives connect to an Apple //e, Apple II Plus, Apple IIcs, or Laser 128 via our "Universal Disk Controller." This remarkable interface card allows you to connect two 3.5 inch drives for a total of 1.6 megabytes of Apple Unidisk 3.5 compatible disk storage.

**Ideal Drives for IIgs**
These are the ideal drives for Apple's new IIgs. Save over $300 on a two-drive combination! If you're upgrading from an Apple II Plus or //e, you can even connect your current 5¼ inch drive without needing adapter cables. (Our Universal Disk Controller supports both 20 pin and DB-19 drive connectors.)

**Works with a Macintosh:**
These 3.5 inch drives directly connect to a Macintosh Plus or Macintosh 512 enhanced computer through the external drive port. No interface card is necessary.

**Available Now!**
Call today and order your 3.5 inch disk drives. Find out just how inexpensive it can be to add an 800K disk to your Apple!

- **Yes,** please send me the 3.5 inch 800K drives indicated below:
  - **800K, 3.5 inch drive** for Mac Plus, Macintosh 512 enhanced, Apple II Plus, //e, IIgs, or Laser 128. (Sorry, not available for //c). $195 & $10 s/h ($15 to Canada, $50 overseas)
  - **Universal Disk Controller card.** (Required to connect 800K drives to Apple II Plus, //e, IIgs, and Laser 128.) Controls 2 3.5 inch drives. Price includes our popular Copy II Plus disk utilities - free! $90

And ship them to me at this street address ASAP:

Name: ____________________________
Address: ____________________________
Daytime phone *( )

To Order By Mail: Simply send in this order form with a check, or provide your Visa/MC # __________ and expiration date __________ issuing bank __________

To Order By Phone: Just call us at 503/244-5782 8-5 (West Coast time), M-F, with your Visa/MC in hand!

---

Central Point Software
9700 SW Capitol Highway, #100
Portland, OR 97219
(503) 244-5782

Circle 607 on reader service card
### Game Software

<table>
<thead>
<tr>
<th>Title</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ace Adventure</td>
<td>20.00</td>
</tr>
<tr>
<td>Adventure of the Ancients</td>
<td>25.00</td>
</tr>
<tr>
<td>Indiana Jones</td>
<td>33.00</td>
</tr>
<tr>
<td>James Bond 007: A View To Kill</td>
<td>24.00</td>
</tr>
<tr>
<td>James Bond 007: Goldenfinger</td>
<td>24.00</td>
</tr>
<tr>
<td>Kaplan pursuit</td>
<td>32.00</td>
</tr>
<tr>
<td>Defender, S.D.I. or Defender of the Crown</td>
<td>32.00</td>
</tr>
<tr>
<td>The Unholy Land</td>
<td>42.00</td>
</tr>
<tr>
<td>Phoenix Software</td>
<td>38.00</td>
</tr>
</tbody>
</table>

### Software Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concepts Computerized Atlas</td>
<td>39.00</td>
</tr>
<tr>
<td>Spinsaker Tying Made Easy</td>
<td>32.00</td>
</tr>
<tr>
<td>Springtime</td>
<td>32.00</td>
</tr>
<tr>
<td>Early Games For Youthful Children</td>
<td>29.00</td>
</tr>
<tr>
<td>Easy as ABC</td>
<td>29.00</td>
</tr>
</tbody>
</table>

### Disk Drives/Hard Disks/Upgrades

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Sided 3 1/2&quot; Disks</td>
<td>12.00</td>
</tr>
<tr>
<td>Apple IIe</td>
<td>10.00</td>
</tr>
<tr>
<td>Apple IIc</td>
<td>24.00</td>
</tr>
</tbody>
</table>

### New Image Technology Magic Digitizer

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sony 3&quot; DD/DD Disk</td>
<td>23.00</td>
</tr>
<tr>
<td>Fuji 3&quot; DD/DD Disk</td>
<td>23.00</td>
</tr>
<tr>
<td>Maxell 3&quot; DD/DD Disk</td>
<td>23.00</td>
</tr>
<tr>
<td>Verbatim 3&quot; DD/DD Disk</td>
<td>23.00</td>
</tr>
<tr>
<td>3M 3&quot; SS/DD Disk</td>
<td>27.00</td>
</tr>
</tbody>
</table>

### New Image Technology Magic Digitizer

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac KB &amp; Floppy I/O</td>
<td>29.00</td>
</tr>
<tr>
<td>Mac IIx</td>
<td>37.00</td>
</tr>
<tr>
<td>ThunderCard</td>
<td>179.50</td>
</tr>
</tbody>
</table>

### Accessories

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double Micro Cabinet (holds 60 disks)</td>
<td>22.00</td>
</tr>
<tr>
<td>Kensington System Saver Mac</td>
<td>65.00</td>
</tr>
<tr>
<td>Turbo Mouse</td>
<td>89.00</td>
</tr>
<tr>
<td>A:B Box (Spool: Mac or MacPlus)</td>
<td>65.00</td>
</tr>
<tr>
<td>Passive Drive Case (holds 60 disks)</td>
<td>19.00</td>
</tr>
<tr>
<td>Disc Drive Kit</td>
<td>20.00</td>
</tr>
<tr>
<td>External Drive Cover</td>
<td>8.00</td>
</tr>
<tr>
<td>ImageWriter/ImageWriter II Cover</td>
<td>9.00</td>
</tr>
<tr>
<td>MacWriter II Cover</td>
<td>9.00</td>
</tr>
<tr>
<td>Mouse/Keyboard Kit</td>
<td>17.00</td>
</tr>
<tr>
<td>Mouse/Keyboard Kit</td>
<td>8.00</td>
</tr>
</tbody>
</table>

### Modems

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine Modem</td>
<td>99.00</td>
</tr>
<tr>
<td>MAK II</td>
<td>99.00</td>
</tr>
<tr>
<td>MAC II</td>
<td>99.00</td>
</tr>
<tr>
<td>MAC II</td>
<td>194.95</td>
</tr>
</tbody>
</table>

### Blank Media

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single sided 3 1/2&quot; Floppies</td>
<td>9.00</td>
</tr>
<tr>
<td>Single sided 3 1/2&quot; FD/DD Disk</td>
<td>13.00</td>
</tr>
<tr>
<td>Single sided 3 1/2&quot; DD/DD Disk</td>
<td>15.00</td>
</tr>
<tr>
<td>3M 3&quot; SS/DD Disk</td>
<td>19.00</td>
</tr>
</tbody>
</table>

### 365-Day Return Policy

All 365-Day return policies provide a full two-year warranty.
Give your Mac a great idea and experience a Brainstorm.

MAC PLUS POWER FOR YOUR 128K OR 512K MAC
Now you can expand your Macintosh to 1, 2, and 4 megabytes of memory with one upgrade. Brainstorm gives you multi-meg power at a price you can afford.

PRODUCTIVITY PLUS
Totally revolutionize your productivity with Brainstorm. Run all your favorite applications on a RAM disk up to ten times faster. Work with eight or more applications simultaneously with Switcher. Free yourself from frustrating disk swaps and needless restrictions on document size. Save the time you normally spend waiting for your Mac.

ADVANCED ENGINEERING TOTAL COMPATIBILITY
Brainstorm's innovative design incorporates the latest surface mount technology and custom chips. No more heat or compatibility problems. In fact, Brainstorm is the most compatible upgrade on the market. It runs 128K, 512K, and Mac Plus software and is fully compatible with all Macintosh hardware, including Hyperdrive, 800K disk drives, and all Apple ROMs.

POWER WITHIN REACH
State of the art manufacturing allows Mac Doctor to deliver Brainstorm at very affordable prices. In fact, you can expand your 512K Macintosh to 1 meg for only $379. Fully installed and ready to perform, with a one year warranty, Performance Software, and a readable user's guide.

MAC DOCTOR 512K
Still the industry standard 512K upgrade and still only $169. Now with a built-in future. Upgrade later to a Brainstorm and get an $89 discount. Gold sockets are standard as well as a complete 120 day warranty. Compatible with all Mac software and hardware.

1145 Terra Bella Ave.
Mountain View, CA 94043 • (415) 964-2131

An even better idea! Order Brainstorm before 5/15/87 and double the warranty! Send more info or call (415) 964-2131.

Steven Levy

Each of the packages sent to paid users contains a bonus program, which is not distributed through shareware channels. For instance, CE's Billboard graphics program is distributed by shareware, but only paid users are entitled to the accompanying MacBanner, which creates and prints large banners.

Al Evans, the creator of Captain Magneto, perhaps the most popular shareware game, takes a different approach. He intentionally bogs down his otherwise delightful program by embedding invoices; every so often, the game grinds to a halt and the player is forced to sit through a message urging users to cough up $20. Like many commercials, the messages are amusing once or twice and infuriating the twentieth time. Evans, who finds the shareware system emotionally if not fiscally rewarding, estimates that less than 2 percent or so of Magneto players have sent in the cash to get the passwords that eliminate the interruptions—and were it not for the commercials, the response would be even worse.

Even Scott Watson's handling of Red Ryder has evolved to give more incentives to pay up. Registered users are eligible for the latest upgrades weeks before they are available to everybody else. And whereas previously you obtained the documentation by printing out a file, now registered users receive a nicely bound, professionally printed manual.

All in all, I think these are reasonable responses from shareware suppliers—perhaps even overly generous. Check out the catalog of your local user group, the data libraries on CompuServe, or Where to Buy; you'll find that you can still obtain a wealth of shareware. This bespeaks a considerable optimism on behalf of software authors, an optimism that so far is generally unfounded. The problem is not theirs, though—it is ours. I need not strain for an example: it is two weeks since my disaster with the lost chapter and I have yet to purchase that copy of Fedit Plus that meant so much to me when I needed it.

I will buy it, though. Tomorrow. I promise. Meanwhile, the dream of shareware slowly fades away.

Circle 395 on reader service card
78 April 1987
You know John Kemeny and Tom Kurtz. They developed the original BASIC. Now they're back with an even better version: a flexible, easy-to-use structured programming language they call True BASIC.

True BASIC offers a full selection of control structures. External procedures can be compiled into libraries, making True BASIC faster and more powerful than any other programming language.

True BASIC has a complete matrix algebra package and the best graphics ever in a higher level language. And there are optional libraries for things like sorting and searching and 3-D graphics.

True BASIC programs run on any computer which runs True BASIC, good news for users with more than one kind of PC.

You'll love True BASIC. Whether you're programming for your own applications, teaching others, or developing products to go to market, send in the coupon below to receive a free demo disk.

Available for the IBM-PC™ and compatibles, Apple Macintosh™, and Commodore Amiga™. To order, talk to your local dealer or call (603) 643-3882 TODAY!

Circle 469 on reader service card
Now SearchLink puts a powerful new research tool right at your fingertips.

If you need instant access to news and information about your competition, your profession, technology, finance, law, or just about any other subject, SearchLink will give it to you.

SearchLink gives you easy access to more than 800 databases in just minutes!

And SearchLink gives you answers to all sorts of questions from these databases—like details about new products and services, or market facts, or emerging technologies. You can get information on computers, medicine, investments, law, chemistry, engineering and much more. Everything from accounting to trademarks to history or geography.

SearchLink is easy to use and inexpensive.
All you need is a credit card and a computer with modem. No subscriptions. No passwords. No difficult manuals to learn. Just call 800-843-7337 with your computer and log on. You pay only $7.99 per search (a few databases carry surcharges) plus 25 cents per minute for telecommunications and $2 for each abstract you want to see. (You can also get hard copies). You can charge everything to MasterCard, VISA, or American Express.

SearchLink provides 24-hour on-line assistance.

SearchLink even gives you free on-line tips from trained SearchLink search specialists if you have problems or questions about your searching. Just type "SOS" when you're on-line!

SearchLink gets you to the information you want.

If you've ever wanted to access databases offered by ADP Network Services; BRS; Data-Star; Datasolve; DataTimes; Dialog; G-Cam Serveur; NewsNet; Pergamon InfoLine; SDC; Questel; or VU/TEXT, SearchLink will access databases from all of them—without a special subscription or knowledge of special search languages.

We can't list all of SearchLink's more than 800 databases, but just to give you an idea, here are some of the databases available under the topic "COMPUTER":

<table>
<thead>
<tr>
<th>Database</th>
<th>Menu-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Software</td>
<td>The Interna-</td>
</tr>
<tr>
<td>Database</td>
<td>tional</td>
</tr>
<tr>
<td>COMPRENDEX*</td>
<td>Software</td>
</tr>
<tr>
<td>Computer Database</td>
<td>Database</td>
</tr>
<tr>
<td>COMPUTERPAT</td>
<td>Microcomputer</td>
</tr>
<tr>
<td>INSPEC</td>
<td>Index</td>
</tr>
<tr>
<td></td>
<td>Online</td>
</tr>
<tr>
<td></td>
<td>Software</td>
</tr>
<tr>
<td></td>
<td>SUPERTECH</td>
</tr>
</tbody>
</table>

And here are just a few of the other popular databases you can access with SearchLink.

<table>
<thead>
<tr>
<th>Database</th>
<th>Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABI/INFORM</td>
<td>Chemical Abstracts</td>
</tr>
<tr>
<td>Disclosure</td>
<td>PTS PROMT</td>
</tr>
<tr>
<td>(Selected databases)</td>
<td>TRINET</td>
</tr>
<tr>
<td>Donnelley Demographics</td>
<td>Trademarks</td>
</tr>
<tr>
<td>Dun &amp; Bradstreet</td>
<td>Standard and Poor's</td>
</tr>
<tr>
<td>(Selected databases)</td>
<td>Corporate Descriptions</td>
</tr>
</tbody>
</table>

Call 800-843-7337 now!

Put the power of knowledge to work for you right now. Call 800-843-7337 (THE-SEER) on your computer and get the answers you need to stay ahead.

*A complete list of the databases is available on SearchLink.

SearchLink is sponsored by the National Federation of Abstracting and Information Services. NFAB is a professional association of database producers.

Circle 649 on reader service card
Tri-Data's NETWAY® 1000A

3274 Gateway for AppleTalk™ - Provides IBM host system access for Macintosh systems connected on the AppleTalk LAN. IBM host system access is made easier with pull-down menus, copy/paste, and use of the mouse.

Multisession 3278 Terminal - The MacWindows™ 3270 software option provides multisession terminal support, allowing you to window up to four concurrent host sessions, each session from a different host computer if desired.

File Transfer - With the NETWAY file transfer desk accessory option, you can download IBM files or transfer Apple files to your IBM host and download them to other Macintoshes. MacMainFrame, developed by Avatar Technologies, allows binary and text files to be transferred to and from the IBM host while in a 3278 session.

Switcher™ Compatible - NETWAY 1000A's terminal personality operates under Switcher, allowing you to switch between an IBM host session and a Macintosh application without disconnecting from the host. Using copy/paste, you can transfer IBM host data into a Macintosh application with a few simple clicks of the mouse.

Enhanced IBM 3270 Workstation

Under $200 per terminal connection

The most cost-effective Macintosh™-to-IBM solution available

DEMONSTRATION PROGRAM

The NETWAY 1000A requires about 5 minutes to install. If you will provide the 5 minutes, Tri-Data will provide the NETWAY 1000A. Call us about our demonstration program and connect your Macintosh to your IBM host today.
There's no smarter, faster input device than PC Scan Plus. It can read words, illustrations or photographs into your Macintosh word processing or desktop publishing programs in seconds. At the click of a mouse. And it can do the same for an IBM PC.

If these look anything like the papers piling up in your office, you need PC Scan Plus, the new intelligent scanner from DEST. It's the fastest way to get information off your desk and into your Macintosh Plus, where you can use it.

You see, PC Scan Plus can read a typed page into your Macintosh's word processing program, completely formatted, in less than a minute.

PC Scan Plus works with MacWrite,® Microsoft® Word, and the others. It can read most office typestyles, including dot matrix, with accuracy no other scanner can touch.

What's more, if you're a desktop publisher, PC Scan Plus can do even more.

Besides words, you can scan photographs, line art, logos and other images into all the top desktop publishing software. PageMaker,® Ready; Set, Go® and the rest. And if all this isn't reason enough to take a closer look at PC Scan Plus, just give your in-box a quick scan.

Then call us for a free brochure or a demo.

800-538-7582
In California, 408-946-7100.

© 1987, DEST Corp. PC Scan Plus is a trademark of DEST Corp., not to be confused with PC Scanner, a product of Caere Corp. Other names indicated by ® or ™ are trademarks of their respective manufacturers.

Circle 615 on reader service card
Mac World

GLUE

*MacWorld

Glue also provides an easy way to capture graphics from applications like MacDraw, Jazz, or Excel and paste them into others, including page-layout programs like PageMaker. Glue captures graphics as large as a full page. One of Glue's most impressive features is its ability to store QuickDraw commands, allowing you to take advantage of laser fonts and smoothing...

-Erert Nielson, December 1986

*MacInTouch says: "It is the kind of program you don't realize you need until you have it, and then you wonder how you did without it... Another use for Glue is to create finished graphic images that can be sent by modem to other Macintoshs. For example, you can create a newsletter with ReadySetGo, and then send the finished work to a colleague, who can then view it even though he doesn't have ReadySetGo himself... The operation of Glue is amazingly simple." - Jan Eugenides, November 1986

*MACazine says: "Glue effectively frees the end user from having to maintain a large and costly software library in order to use documents created by others... Glue is a utility which belongs in every Macintosh user's software library." - C.J. Weigand, November 1986

*MacUser says: "Desktop publishers will find this a useful addition to their software library." - DB, December 1986

INFOWORLD says: "For those who have been longing for a method of transferring full page graphics, GLUE will seem a necessity. The utility opens up new possibilities for sharing electronic documents — whether by disk, file server or telecommunications." - K. Thompson, November 24, 1986

SmartScrap

A replacement for the dowdy old scrapbook accessory. With SmartScrap you can:

1. Find pictures easily in any scrapbook with a unique pictorial table of contents.
2. See all of large scrapbook pictures with horizontal and vertical scrolling.
3. Select any rectangle of a scrapbook picture for Copying.
4. Open any scrapbook file on any disk without moving or renaming.
5. Create new scrapbook files with unique names (SmartScrap works with your old scrapbook files as well).

The Clipper — a cropping and scaling tool. With The Clipper you can:

1. Determine the exact dimensions of an area where you are going to paste a picture with The Clipper's amazing transparent window.
2. Trim or Scale a picture to the exact dimensions you need before pasting.
3. See the contents of the clipboard even from applications which don't support Show Clipboard.

SmartScrap & The Clipper — a cropping and scaling tool.

Available from leading dealers or direct from:
Solutions, Inc., P.O. Box 989 H2, Montpelier, VT 05602 or call (802) 229 9146

GLUE $59.95 plus $4 shipping and handling
SmartScrap & The Clipper, $59.95 plus $4 shipping and handling

Visa, MC, check, COD, or PO from D&B rated US Corporations.
Runs on 128K, 512K, Macintosh Plus or Mac XL

Glue, SmartScrap & The Clipper are trademarks of Solutions, Inc. MacDraw is a trademark of Apple Computer, Inc. Macintosh is a trademark licensed to Apple Computer, Inc. ReadySetGo is a trademark of Manhattan Graphics Corporation. PageMaker is a trademark of Aldus Corporation. Excel is a registered trademark of Microsoft Corporation, Jazz is a registered trademark of Lotus Development Corporation.
An interview with Del Yocam, Apple Computer's chief operating officer

What is the role of the COO at Apple?

I like John Sculley's definition best—that John is responsible for the growth of Apple Computer, and I am responsible for running Apple—everything that's pertinent to the business. There are many things I focus on. One that I may go overboard on is ensuring that we keep intact in our second decade many of the characteristics that made us successful in our first: entrepreneurship, technology, creativity, and innovation. Risk-taking. We need to act as if we have not done it before, keeping imagination and ideas alive and dynamic.

You are known at Apple as a "people person."

I was part of the team that established our "corporate credo" in 1981—the nine values that we want to promote and live by. All employees receive a copy when they join Apple. I even make a presentation to some of our new employees at orientation. I tell them that we want people who work more than from 9:00 to 5:00, not because the number of hours that they work is important, but because we want their jobs and this company to be important to them personally. I tell them that we don't want to wait three months to discover this; that if they don't want to make a commitment to Apple, if they don't have a passion for changing the world, they shouldn't stay.

Of course, commitment has to go both ways. Not only do we provide an exciting work environment, but we celebrate our togetherness—our work family—with departmental parties, Friday beer busts, and company communications meetings. For example, John Sculley and I took all of the employees in Cupertino to see Star Trek IV in December; we loaded people into buses and drove them to theaters.

Will there be any more major reorganizations at Apple?

I don't see that now. When I got back from my sabbatical last August, I made several changes. Advanced technology was separated from product development—the appointment of Larry Tesler as vice president for advanced technology is succeeding wildly. My second effort in reorganizing was the elevation of the MIS department. This group has strategic importance for Apple as a Fortune 500 company—one that will continue to grow and need sophisticated management information systems.

Along with those efforts I began thinking about Apple as a new-style corporation. In the past many companies have employed a traditional management approach: the top decision-maker provides all the decision and the rest of us implement them. Well, that won't work in the future. Today, people have to buy into the work they perform, identify with it. Success in promoting this will make Apple a great company in 1990 and beyond. People need to have a commitment to create excellence.

Tell us how you feel about the new machines.

Excited as hell. I've always felt that the Macintosh should be open and expandable. We forgot our roots when we delivered a closed Macintosh. To deliver a product line...
Choose from our Collection of Select Macintosh Products

**MegaScreen II**
From Micrographic Images
**$2,159**
The new, lower cost MegaScreen II doesn't just magnify your Mac's screen; it gives you more image to see. Its 19 1/2 inch screen measures 1024 x 900 pixels — five times the Mac's. Its capacity for text is unequalled: use MindWrite to spread out windows of text like sheets of paper on a desk, so you can see how paragraphs and pages fit together. Lay out full-sized pages with room left over for palettes and pasteboards. Spreadsheet users will love being able to see an entire year's worth of data at once. Artists and engineers can view oversized designs with better resolution, more detail. And think of the flexibility you get for pasting from clip art libraries. Being able to see the whole picture frees you to be more creative. In fact, the more hours you spend in front of your Mac, the more valuable the MegaScreen is.

Requires 512K or Mac Plus, and installation by qualified technician.

**MacProof**
From ALP Systems
**$89**
How would you like to have a personal editor who checks your writing scrupulously for spelling, mechanics, usage, and structure errors? MacProof does just that! Its 93,000-word dictionary checks for misspelled words, typos, and double words, plus its four review menus and three instructional modes give you writing guidelines that explain and track common errors. Check punctuation, capitalization, sexist/racist language, confusing word usage, vague or overworked expressions; then fine-tune the very structure of your paragraphs and sentences. Find unnecessary "be" verbs, nominalizations, and weak constructions that add bulk, not meaning, to your writing. Avoid embarrassing mistakes and add punch to your message with MacProof, the most powerful and versatile electronic proofreader available anywhere. Buy it — you'll be amazed!

Requires Mac Plus; reads MacWrite, MS Word & Text Only files.

**Direct 1200 Modem**
From USRobotics
**$119**
A breakthrough in technology gives you remarkable 1200 bits-per-second (bps) speed at a remarkably low price. If you're still communicating at 300 bps, you'll be amazed at the difference speed makes: files that took you two hours to transfer can be sent in half an hour using the Direct 1200. This sleek modem has autodial and auto-answer capability, and it's fully Hayes compatible, so it works with all the best telecom software (it can communicate with 300-bps modems, too).

MONDAY THRU FRIDAY 6 A.M. TO 8 P.M.
SATURDAYS 8 A.M. TO 4 P.M. (Pacific Time)
Orders only
800/228-8910
In California
800/824-8175

These low prices good through April 30, 1987 only!
Ortho's Computerized Gardening

From Ortho
$33
This program teams your Mac to help you select plants for your home and garden. Simply type in your zip code, select any combination of color(s), blooming patterns, size, or sunlight accessibility, and you get a listing of plants that meet your specifications. Includes a database of more than 750 plants and a 192-page, full-color book illustrating gardening techniques.
Works with any Mac; does not support LaserWriter

SuperPaint

From Silicon Beach
$55
SuperPaint combines the capabilities of MacPaint and MacDraw, and adds exciting new features. Use bit-map and object-oriented options in the same drawing area, open multiple windows, and enjoy automatic scrolling that allows your pictures to exceed screen size easily. Choose three levels of magnification, 32 shades of LaserWriter grey, and more. This is the paint program you've been waiting for!
Requires 512K, Mac Plus, or Mac XL

Neos Mouse

From Qualitas Trading Company
$49
This mouse represents a natural evolution in mouse technology. It's designed with a reverse-tapered shape that fits your hand without tiring your wrist. Teflon pads combine with a slightly higher cursor ratio for a free-moving, smooth feel that lets you get around the screen faster. Buttons actuate true micro-switches (not stamped-metal springs) to give you the tactile feedback of a distinct "click." You'll work faster, more surely with the Neos Mouse.

bernoulli Box

From Iomega
$499
Get the unlimited storage and unrivaled security of removable Bernoulli cartridges at a very affordable price. This single-drive Bernoulli Box uses 3-meg 5 1/4" cartridges and plugs into a serial port on your Mac 512 or Mac Plus. It's 3 to 5 times faster than a Mac Floppy drive — gives you enough room to organize all your files in one place. A printer port on the back lets you use up to a megabyte of disk as a printer buffer. Comes with a backup utility and sets up in minutes. Supply is limited, so hurry!
Requires 512K or Mac Plus & Mac 5-meg cartridge, includes cable.

Courier 9600

From US Robotics
$769
The speed of this new Courier modem heralds a new age for communications. Files that took two hours to transfer at 1200 bps take only 15 minutes at 9600 — an 85% savings in telephone time that means this modem will pay for itself quickly. It adjusts to your phone lines automatically, ensuring peak performance. And it's Hayes compatible, so it auto-dials, auto-answers, and works at standard speeds with standard software.
Requires Mac (Plus)-to-Modem Cable & compatible software

Primers Software

Smash Hit Racquetball
NEW $19
Geo Information Systems
Tying Made Easy 
$55
Requires your typing skills

Religion

Dinner at Eight
$32
Silver Plate Collection
$29
Requires Dinner at Eight

Silent Beach

Dark Castle
$29
World Builder
$45
Create your own games

SuperMac Brightside

Ordinary
$27

Communications

CompuServe

Subscription Kit
$25
Put Icon Ronan in the Electronic Mall

Data Vis

MacLink Plus writeable
$159
We transfer BM to Mac

Farran

PhoneNet for 128/512K
$39
Commodore Mac & 1200 Lines

Applique devices

PhoneNet for Mac Plus
$39
Connects Mac Plus or applique to Network

PhoneNet + Ashampoo Adapter $6

Hayes

All Hayes products in stock; call for prices

Tradeover

Ancient Art of War
$27
Knights, Archers, Cloaks, and more

Davidson & Assoc

Math Blaster
$29
Speed Reader II
$49
First Byte

First Shapes SPECIAL $27
KisTalk SPECIAL $27
MathTalk SPECIAL $27
SmoothTalk SPECIAL $27
Speller Bee SPECIAL $27
Great Wave

Kidditime
$29

Infinity

Grand Slam Tennis
$27
Requires 512K or Mac Plus

Microsoft

Flight Simulator SPECIAL $32

Mindscope

Balance of Power
$30
ComWorks
$49
Sunsational/graphics tool

Unlimited
$32

Orto Computer Services

Ortho's Computerized Gardening
NEW $33
Practical Computer Applications
MacSoft SPECIAL $36
Requires 512K or Mac Plus

Orders only
300/228-8910
In California
800/824-8175
P.O. Box 911 • Dept. MW047 • Monterey, CA 93942-911
Voilà!
From Target Software
$59
Voilà! is a full-featured desk accessory outline that can be accessed from any program! Turn any document created with your word processor into an outline, then edit, expand, or print outlines easily. Voilà! gives you complete sorting and search capabilities, control over fonts and type styles, resizable windows, and 256 headline levels. You can even generate a Table of Contents and paste in pictures from graphics programs. Make the most of your outlines with Voilà!
Requires 512K or Mac Plus; compatible with Macintosh 2.0, MacPaint & PaintTank 3.12; supports ImageWriter & LaserWriter

GraphicWorks 1.1
From Mindscape Inc.
$69
GraphicWorks combines the capabilities of bit-mapped programs like MacPaint with the object-oriented approach of programs like MacDraw. The result lets you integrate graphics and text anywhere on a page for easy page layout. Version 1.1 works with PageMaker, and it's the only paint program to support high-res scanners. Plus, it includes on-screen rulers, color printing, rotation, skew and distortion tools, and more! Requires 512K or Mac Plus; not copy protected

PC MacKey
From Tangent
$119
The PC MacKey keyboard uses short-throw keys that have a distinctive action. As you type, your fingers feel a "click," which makes typing easier, faster, and a lot less stressful over a long period. PC MacKey's layout matches that of the IBM PC; and, you get a numeric keypad and function keys that can be assigned macros by programs like Tempo. New version makes installation simple.

Circle 272 on reader service card
New MacBottom Drives
From PCPC

PCPC is expanding their award-winning line of hard disks to include SCSI drives with larger capacity and optional 120Mbytes. Hayes-compatible modems. Lightweight and highly portable, they include print spooling, backup, and locator software. Order one today for an elegant solution to your mass storage and telecommunication needs.

All require Mac Plus; SCSI cable included

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD 2M</td>
<td>2M</td>
<td>$999</td>
</tr>
<tr>
<td>HD 40</td>
<td>40M</td>
<td>$1299</td>
</tr>
<tr>
<td>HD 32</td>
<td>32M</td>
<td>$999</td>
</tr>
<tr>
<td>HD 32M</td>
<td>32M</td>
<td>$1129</td>
</tr>
</tbody>
</table>

Modem Upgrade Kit
Requires installed by qualified technician

$19

FactFinder
From MindWork Software

$49

FactFinder is a text-retrieval system that will store, organize, and cross-reference all your phone numbers, recipes, and miscellaneous notes. Enter information without defining fields or choosing formats. FactSheets are created or last changed, or by keyword search. This program is an easy way to organize complex data — ideal for cross-referencing all kinds of information. Works with Mac.

Greene, Johnson Inc.
SpellWell 1.3

High Performance Systems, Inc.
Stella for Business

Idearam
MacLabeler 2.0

Impulse
Studio Session

InfoSphere
LaserServe (per user)

Interactive Data Design
MacDraft 1.2

Layered Notes

LexicalNote

LingoWriter

Living Videotext

MORE 1.1

MORE is a text-based word processor that gives you selective text styling, new outlining tools, and easy-to-use, installable templates. Select menus and commands from your keyboard; use the built-in calendar to stamp the time and date in outlines, or to generate schedule outlines for a specified time period. Comes with a database listing more than 2,000 U.S. agencies and businesses.

Requires 512K or Mac Plus & 2nd drive

MORE 1.1

From Living Videotext

$159

This new version of MORE not only automatically generates bullet or tree charts from outlines, it gives you selective text styling, new outlining tools, and easy-to-use, installable templates. Select menus and commands from your keyboard; use the built-in calendar to stamp the time and date in outlines, or to generate schedule outlines for a specified time period. Comes with a database listing more than 2,000 U.S. agencies and businesses.

Requires 512K or Mac Plus & 2nd drive
family (the Mac 512K, the Mac Plus, the Mac SE, and the Mac II) that includes open and expandable products fulfills our hopes (and my dreams) for the Macintosh. We're early in the cycle, but I believe that the new machines—the Macintosh SE with its disk option and expansion slot and the Macintosh II with its open architecture, the 68020, color, large displays, and high performance—will succeed in the market.

These products, along with our Apple II family, make up a very wide offering.

When do you expect to ship the new machines?

I think that it's fair to say that the schedule will be similar to our experience with other machines. The Macintosh Plus was an enhancement of an existing product, and we began shipment shortly after the product announcement. The Macintosh SE will follow the Mac Plus example; we'll have some SE machines at introduction and will be able to ship in quantity shortly thereafter.

The Macintosh II represents a quantum leap in technology and design, and we will probably experience some of the difficulty with it that we saw with the IIGS. We announced the IIGS in September and needed about six months to ramp up to full production. All during that ramping period, the demand for the machine exceeded supply. The Macintosh II is new technology, and some of the parts are single-sourced from manufacturers. It takes time to develop the second-source suppliers needed for larger numbers of machines.

Is the Macintosh II a workstation or a personal computer?

First and foremost a personal computer. Perhaps the technology suggests that it is a workstation. We think that its power and its graphics base, and the speed of its 68020 microprocessor, will take it into sophisticated technology areas. There is currently a lot of advanced software being developed to take advantage of the Macintosh II.

Won't people be concerned because there is no hardware upgrade path from the Mac Plus to the Mac SE?

Remember that there will be compatibility and upgrade through software. But to upgrade the Plus to the SE requires so much—hard drive, more power, new analog board, new system board, expansion slot, changes to the plastic. By the time we've finished making all of those changes, the only part of the Macintosh that hasn't changed is the display. It's actually cheaper to sell you a completely new computer. However, we'll continue to sell the Macintosh Plus. A Plus and a hard drive are actually very close to what we have incorporated into the Macintosh SE. We felt that application performance for an entire product line was the most important goal.

What about the big picture? How does Apple rank compared to other computer companies in sales?

Apple is now number two in sales of personal computers worldwide. But it may be more useful to note that we are one of the few significant computer companies dedicated solely to manufacturing personal computers.

Would you like Apple to be number one?

I want Apple to be known for the excellence of its products. For its advanced technology, for its user-friendliness, and for providing solutions not possible with other personal computers. You don't have to be the largest to be the best.

Apple sales are now at about $2 billion annually. How will the company grow to $5 billion?

(continues)
The Power of Color.
Until now desktop publishers could only

dream of it.

Great minds create powerful ideas in color. Their thoughts may be blue sky, wave a red flag or make the competition green with envy. But, somehow the reports and graphics that spring from these color ideas rarely convey the life and energy of the original thoughts.

Kroy® brings the power of color to desktop publishing and business communications with a simple process compatible with virtually every laser printer, including the Apple™ LaserWriter, and most photocopiers that apply dry toner to paper. Presentation graphics like these are created on a laser printer, then enhanced for visual impact with KroyKolor (which applies color to the dull toner image produced by laser printers and copiers).

Applying KroyKolor is an easy (and amazing) process. After your original has been printed on a laser printer or photocopier, you insert it into a sheet of KroyKolor transfer film, feed it through the processor, peel away the transfer film and you have vibrant color in seconds.

The real fun begins when you create multi-color business graphics (such as a pie chart with each slice a different color). To do this, cut pieces from various colors of transfer film and place the pieces onto the areas of the graphic you wish to highlight. That's how the multi-colored examples shown in this ad were produced. It's possible to produce multi-colored presentation graphics in a few minutes which would have taken several days (and several hundred dollars) to produce at a print shop.

Kroy, a leader in graphics technology for 27 years, also provides quality papers to make your color presentations look even better.

Fulfill your dream of desktop publishing in color today for just $995, the suggested retail price of the KroyKolor processor. KroyKolor film is available in boxes of 10 or 100 sheets and is priced at about 50¢ per sheet.

For information or to place an order call toll free:
800-521-4997
In Arizona 602-951-1593
Weekdays 8am-5pm MST

The KroyKolor processor accepts materials up to 12" wide. KroyKolor transfer films are slightly larger than an 8½x11" page, providing edge-to-edge coverage.

Apple LaserWriter is a trademark of Apple Computer Inc. Kroy and KroyKolor are trademarks of Kroy Inc. Arizona residents add applicable sales tax. Prices do not include UPS shipping. KroyKolor is available from computer retailers and as a service at the Krishna Copy Network and Kroy Copy Centers. Dealer inquiries welcomed.

Circle 658 on reader service card
"Our goal was simply capable writing too mind saying, we’ve

Charles Simonyi, Chief Architect, Applications, Microsoft Corporation.

We weren’t looking for incremental improvements. We were shooting for a quantum leap. Not a word processor but a document processor. A tool which would exceed every expectation and overwhelm every standard.

From now on, when people define what software should do for the production of documents, they’ll point to this: Microsoft® Word Version 3.0 for the Apple® Macintosh.*

On Word, everything you need to structure a document is integrated into the program. Starting up front with the outliner. Followed by style sheets which you can quickly set up to standardize and recall the formats you use repeatedly. Then a built-in spelling checker proofreads for you when you’re finished.

Because speed is of the essence, we made Word a rocket. It scrolls faster, saves faster. And you can’t out-type it.

Because there’s a big, diverse world out there, Word easily shares and automatically converts files created with the IBM® PC version of Word. And supports DCA protocols for exchanging formatted files with minis, mainframes, and dedicated word processors.

Finally, what you see on screen will look superb on paper. Word will set text next to graphics. And exploit the capabilities of laser printers beyond anything that has gone before.

But the most powerful feature of all is its accessibility. Word lets you run its menus in either Short or Full mode. The first, a concise, basic menu which gets new users producing instantly. The second, a comprehensive menu which taps into Word’s vast capacities.

That’s Word for the Macintosh. Not just the best word processor on any microcomputer, but the most effective tool of persuasion ever devised.

Microsoft Word is available for the IBM PC and compatibles and the Apple Macintosh.

For the name of the nearest Microsoft dealer or to upgrade to Version 3.0, call (800) 426-9000.


Microsoft is a registered trademark of Microsoft Corporation. Apple is a registered trademark and Macintosh is a trademark of Apple Computer Inc. IBM is a registered trademark of International Business Machines Corporation.
To create the most ever devised. I don’t succeeded.”

Introducing Microsoft Word 3.0

MICROSOFT WORD VERSION 3.0 is a powerful word processing program that offers an unprecedented range of choices for the look of your document. With Word, you can mix graphics and text, within a paragraph or side-by-side. It provides built-in support for snaking and side-by-side columns. And you initiate automatic hyphenation, for a tighter, more professional appearance.

For even more sophisticated capabilities use a page layout program, such as PageMaker 2.0 from Aldus. PageMaker can read and write Microsoft Word files, and you can easily transfer formats between them.
"I bought the APL*PLUS System to solve analytical problems. Now I'm using it to build models, write programs, and even develop applications!"

The APL*PLUS System is the most flexible problem solving tool available for the Macintosh. It combines a powerful APL language interpreter with your favorite Macintosh features to step up your problem solving and programming power.

Increase productivity with powerful concise notation
Concentrate on what you're doing—not how you're doing it. At the heart of the APL*PLUS System is a set of easy to use symbols that condense complex operations into a few simple keystrokes. One symbol can sort an array, invert a matrix, search for a string, or add up a table of numbers. And, the same command will work with small or large blocks of data. With its concise and compact notation, you'll solve problems as fast as you can think about them.

A flexible environment for handling data
The APL*PLUS System's unique analytical capabilities and natural mathematical orientation make it a popular choice for solving complex business problems. STSC builds in the quality extras that make APL work best with your Macintosh. Included are over 100 additional language enhancements for greater power and speed, and a library of tutorial and utility workspaces. Built-in terminal emulation with upload/download capabilities make it easy to move data and programs to and from other micros, minis, and mainframes. Full support is provided for the ImageWriter™ and LaserWriter™ printers, and you'll enjoy standard Macintosh features such as QuickDraw graphics, dialog boxes, cut-and-paste full-screen editing, plus common desk accessories, all within APL.

Put the power, speed, and flexibility of the APL*PLUS System to work for you today for only $395! See your local dealer or call STSC at 1-800-592-0050, ext. 700 (in Maryland or outside the U.S. call 301-984-5123).

To test-drive the APL*PLUS System, order our demo disk today. Send a check or money order for $10.00 to STSC, Inc., 2115 East Jefferson Street, Rockville, Maryland 20852.
A Plus and a hard drive are actually very close to what we have incorporated into the Macintosh SE.

What we have to do to ensure our success internationally is to recognize that we have eight very distinct markets abroad: the UK, France, Germany, Italy, GEA [Greater European Area], Japan, Australia, and Canada. And each of these markets has to be handled individually. For example, the Kanji Macintosh. We beat our heads against the wall in Japan for years until we finally understood what it takes to be successful there. Once we had Kanji in our product, people saw that we were serious about our machines. Since then we have exceeded all of our plans for Japan.

What role does the Macintosh play in international markets?

The international markets in general are Macintosh-oriented. Abroad it's primarily seen as a business tool, but it's also doing very well in university markets around the world, through the various Apple university consortia programs. The Macintosh Plus is also one of the most market-adapted personal computers in the world, since it is currently delivered in 21 versions (including Arabic and the aforementioned Kanji).

Recently it was reported that Apple's Swedish subsidiary sold some Macs to the Soviet Union. How did you arrange the sale, given the U.S. government restrictions on the sale of computers with more than 16-bit technology? Does this signal a new beachhead for Apple's marketing?

Apple applied for and received authorization from the U.S. Department of Commerce to ship five Macintosh Plus systems from our office in Sweden to a company in Moscow. These units are being used for evaluation. To make additional shipments we would need another authorization.

It has become apparent that the Soviet

(continues)
For people who aren't afraid of heights

If in the race to the top, you are not averse to taking major shortcuts, then we have something to talk about:

Microsoft® Excel for the Macintosh™

A financial analysis tool of unprecedented power, Microsoft Excel is first of all the most formidable spreadsheet ever to run on a personal computer.

A spreadsheet which is in turn linked in harmony with an extraordinary graphics program and a highly capable data filing application.

These already considerable powers
The only thing we expect you to take is advantage. Of Microsoft Excel’s simply potent capacity to make mountains of numbers mean something.

If you can imagine how such powers could accelerate your ascendancy, see your dealer for a demonstration of Microsoft Excel.

Once you’ve tried it, you’ll never look down.
We have made the Macintosh proprietary technology from day one, and we want to keep it that way.

Apple is sometimes criticized as being focused on Silicon Valley and not the rest of the United States.

Perhaps that has been true in the past, but in the last year or two we've become more involved with the rest of the country. For example, I was recently contacted by the Congressional Office of Technology Assessment to act as a member of a task force on how computers can or should affect education. Although I have a responsibility as the COO to act on behalf of Apple, I believe I was selected to serve because I also have a personal interest in education, especially in the K through 12 arena. I am also interested in supporting other educational tools, such as CD ROM, VCR, and other technologies.

I recently met with Secretary of Commerce Malcolm Baldridge, who asked me for input on decisions being made in Washington, such as my reaction to the Japan-U.S. semiconductor pact. I went armed with a lot of information on Apple's position as a purchaser of semiconductors. He asked me, "Where have you been?" This perspective from chip users in Silicon Valley had not been offered publicly in Washington before the signing of the pact. To remedy our lack of presence in Washington, we opened a public affairs office there this year. We need to have a voice on matters vital to the computer business. This is one of the ways that we add value to the country in which we live.

Apple's key identity is that we create great personal computer products. Why? Because we have a passion to change the world. Our products can actually do that.

How can Apple combat foreign legislation supporting indigenous manufacturers?

You have to do this from the standpoint of technology. From the standpoint of our system, we win. We are excited about our machines and we have supporters that feel the same way. In a government-controlled environment, we do what is required to be successful. We invest in foreign countries to show that we are not only there as a U.S. computer company, but also to add value to the country in question.

Will Apple continue to manufacture its own peripherals, or will that change now that the open machine is here?

Peripherals are very important to us. They are a large part of our revenue base, and Apple will continue to have a role to play in peripherals. But we do not want to chill third-party development. It is in our strategic interest to encourage third parties to make products for our computers that will open up new markets, products that will extend the computer far beyond what we have envisioned.

At one level, the competition between IBM and Apple reduces to a battle between the microprocessors. What distinctions do you see between Motorola- and Intel-based machines?

We chose the Motorola architecture because it is more robust than the architecture of the Intel family. As a result, applications will be able to migrate easily from one processor to another. Considering that the power of the 80386 and 68020 are equal, the distinctions that the Motorola chip offers in family compatibility and graphics flexibility make it the best choice for our systems.

With our 68000 line we can build in rules that take advantage of the strengths of the Macintosh—particularly for graphics. Specific advantages include features such as the general-purpose registers of the 68000 family. General-purpose registers offer the programmer more flexibility for graphics than the dedicated registers of the Intel architecture. We believe the result is better software.
The data that can fit in your pocket today can have an impact on what goes into your pocket tomorrow.

BASF QUALIMETRIC® 3.5" MICRO FLEXYDISKS™ CERTIFIED 100% ERROR-FREE AND WARRANTED...

FOREVER

Circle 21 on reader service card
Jasmine has the drive

80 MB Direct Drive
$1380.00*

The Direct Drive 80™
A true performance breakthrough!
This sleek drive designed by Quantum
blazes away with an amazing 26 millisecond access time. It features error
correction and media defect handling
to ensure long life and perfect per-
formance. This drive is so intelligent it
constantly scans and locates any de-
fective sectors and locks them out... automatically. We're so confident about
the superiority of this drive that we
offer a full 2-year warranty for only $100
additional. It fits into the same slim case
as the others in the Direct Drive series.

Exclusively Jasmine
- adds shock absorbers that protect your drive.
- adds two switched AC outlets at no extra charge.
- includes full 3-way electronic surge protection.
- features the original SCSI select switch that allows you to add another drive or tape backup with the push of a button.
- never requires you to open the box to daisy chain multiple drives.
- tests each drive with sophisticated real time diagnostics before shipping.
- ships your drive with a full public domain and Shareware library.
- 2' cable included with your pur-
chase. Add $8.50 for 6' cable.

*Prices effective March 15, 1987. Direct Drive 20, Direct Drive 40, Direct Drive 80, JasPort, Jasmine, are trademarks of Jasmine Technologies Incorporated. Apple is a registered trademark of, and Macintosh is a trademark licensed to Apple Computer, Inc. TOPS is a registered trademark of Centrum Systems West, Inc. Product specifications and prices are subject to change.
No SCSI Port? Try JasPort™
Jasmines $129 solution

When Apple added the Small Computer Systems Interface (SCSI) port to the Macintosh™ Plus, it allowed users access to high performance hard disks. Now the Macintosh 512 Enhanced can be SCSI upgraded with Jasmine's SCSI Port Adapter. You can purchase the JasPort Adapter, with any Direct Drive purchase, for only $129. No internal modifications, no soldering. In minutes your Macintosh 512E runs data at the speed of the Macintosh Plus!

Technical Support
The Jasmine technical support line answers all your questions about using your drive — no matter how simple or technical. Every drive is shipped with a technical hotline number to answer your questions.

Our prices include 30 Day Trial/Money Back Guarantee and Full One Year Warranty.
Before you buy, consider this — Others offer a much shorter standard warranty and force you to pay extra for a one year warranty.
At Jasmine we stand behind our drives. If for any reason, you are not satisfied with any Direct Drive you may return it within 30 days for a full money back refund.
The Direct Drive series is so easy to service that in the event of a malfunction, we can promise a maximum 48 hour turnaround on any drive that needs repair. We will recover any data, if possible, in the event you have forgotten to back up your files.

PC/TOPS™ Users
DOSPort SCSI PC board, only $179 with purchase of any Direct Drive.

Dial Direct and Save...
Jasmines Computer Systems is the fastest growing manufacturer of SCSI Drives for the Macintosh. By selling direct to you, our prices save you 40% or more.

To Order Call (415) 621-4339

The Direct Drive 20/40™
Our first product met with resounding success and we're still proud to put our name on it. The Direct Drive series satisfies your hunger for power and we know they fit your pocket book. Compare these drives to so-called "high performance" drives costing twice as much. So, if you're a power user, dial direct and we'll get you running fast.

Jasmine Computer Systems
Quality you can afford

A Division of Jasmine Technologies Inc.
555 De Haro Street San Francisco, CA 94107
I've always felt that the Macintosh should be open and expandable. We forgot our roots when we delivered a closed Mac.

Our ROM [for system software] also has room to grow. We have made the Macintosh proprietary technology from day one, and we want to keep it that way. I don't want this company to spawn clones.

For the first time, in the new machines Apple has made wide use of new semiconductor technology—semicustom silicon devices. Why?

The technology has allowed us to keep the machines small and reduce our footprint. The use of surface-mounting devices has also reduced our board sizes, and VLSI [very large scale integration] has contributed to a reduction in our number of components. That means lower manufacturing cost and more reliability. Finally, VLSI has benefits such as protecting our proprietary technology. Using VLSI also makes our machines faster.

The video/graphics card of the Macintosh II has new silicon, but it is not an "intelligent" card like some in the IBM PC market. Why--not?

Our card relies on the intelligence in the CPU to drive the graphics. This provides more flexibility to the programmer and reduces the cost of the system.

What do you feel about Microsoft (the largest seller of Macintosh software) supporting a standard for computing that competes with the Macintosh? I'm talking about Microsoft Windows.

It concerns me a great deal that products they develop may impact the Macintosh. Our relationship has to date been a partnership, and we continue to look forward to this kind of relation. But Windows has begun to look competitive. Bill Gates and I have begun to talk about everything from how our roles are changing to how we treat each other. I have a great deal of respect for all of the Microsoft products for the Macintosh.

Will Microsoft Windows provide the Mac's first real competition in the interface market?

There may be several computing engines running windowing environments, but look at the things that make the Macintosh different and give it a competitive edge: first, the number and quality of applications shipping today for the Macintosh are not equaled in any other windowing environment. Second, remember that the Macintosh has been shipping for more than three years now, and we have been enhancing it constantly. And third, Apple is in a unique position to be able to optimize...
MegaScreen II's 19.5" monitor gives you a 526% bigger picture than your Macintosh™ computer, at a new lower price! And MegaScreen II is bigger, brighter, and features the highest resolution of any big screen on the market today.

Compatible with all standard Macintosh software, MegaScreen II lets you see double page spreads, spreadsheets, drawings, plans, scans, CAD layouts, circuits, diagrams, medical files, and just about everything you ever wanted to see larger. 526% larger.

MegaScreen II can be dealer-installed in just 15 minutes, features extra enhancements, user updates, and rock-solid reliability backed by the people who pioneered the first peripherals for the Macintosh.

Find out how you can double your productivity. Ask your local Apple Dealer for a demonstration, or give us a call.

Circle 235 on reader service card

© 1987 MicroGraphic Images, Corp. All rights reserved. MegaScreen is a trademark of MicroGraphic Images Corp. Apple is a registered trademark, and Macintosh is a trademark of Apple Computer, Inc. PageMaker is a trademark of Adobe Corporation, and is being used with express permission.
Face it. You're a job hopper. Constantly skipping from one kind of crisis to another.

With that in mind, we are pleased to announce a program that can change gears as fast as you do: Microsoft® Works. A one disk program which gracefully integrates the four fundamental tools you need at work:

- **Word processing**, for writing memos, reports, presentations.
- **A database tool**, to keep track of clients, jobs, vendors.
- **A spreadsheet with charting abilities**, to compute, analyze, interpret, and then graph anything to do with finance or numbers.
- **Finally a communications tool which lets you get stock quotes, make travel reservations, do research, and send reports across the country, right over the phone line**
Microsoft Works lets you juggle all these jobs, move swiftly and easily between them, while transferring and combining their information as you please. Because you do all these jobs with one, easy to learn, totally integrated program.

Quick study. Quick change.

The first job is the easiest. Learning to use Microsoft Works.

It's a snap. The overall program and each tool within runs Macintosh™ style. Which, as you probably know, is a natural, common sense, point-at-what-you-want system.

And Microsoft Works is seamlessly melded together. You can have all four tools on screen at once. Jump instantly from one to another. And later combine work done in each part of the program on a single printed page.

This easy exchange of data makes jobs go faster and easier. One practical example being mass mailings of form letters where you need to combine names from the database with text written in the word processor.

All in all, Microsoft Works is a superb solution for day to day, get-it-done problems. An inspiring display of convenience, efficiency, and utility.

And, of course, it's a product of Microsoft, the preeminent developer of programs for the Macintosh. Which is not a claim, it's a fact.

If you're in a business that won't let you stick to one thing, check out Microsoft Works. The program that can change jobs as fast as you do.

Introducing Microsoft® Works
The High Performance Software
Considering that the power of the 80386 and 68020 are equal, the distinctions the Motorola chip offers make it the best choice.

The combination of hardware, software, and peripherals, more than anyone else in the industry.

You have said many times that you want Apple to lead in technology. How can you accomplish that?

First of all by staying entrepreneurially driven. We have doubled the amount of money given to our research and development efforts for both system and software engineering. We invested $15 million for the Cray supercomputer so that we could support better and faster research simulations. We have separated the two technology groups—advanced technology and product development—so that each is free from the constraints and goals of the other. And we support projects such as Vivarium, which pushes both technology and our corporate goal to better the role of computing in education.

Maybe most importantly, we foster an environment in which people are allowed to make mistakes, to learn from them, and to go forward.

The Macintosh is often called a portable, but now we are beginning to see several developers making truly portable Macs. When should we expect a portable from Apple?

First of all, the Macintosh was designed to be transportable, not portable. I can take my Macintosh with me when I go on vacation, but it wasn’t designed to allow me to use it on the airplane. However, some third parties have found innovative ways to rework Macintoshes in portable configurations. As far as an Apple product, all I can say is I would love to have one. It is reasonable to expect us to introduce new products and technologies for markets when we believe that both the markets and the technologies are ready.

We’ve talked a lot about Apple’s future, but what’s next for you personally?

This is next. I’ve achieved so much—you have all of these dreams during college: you think, “I want to be the head of a major corporation.” Well, here I am in top management. I’ll stay at Apple because I am able to learn and grow. And I have the potential to change the future. You can make the case that with technology one can influence the future. This is the first technology since books that can impact not only what we learn but how it is learned.

I have the most exciting job in the most exciting company in American industry today.  

Interviewed by Jerry Borrell

---

Denmark rethinks the computer table.

MacTable 42”

MacTable is meticulously built by Danish craftsmen, using pure beech wood, durable beige laminates, and carefully-enameled 14-gauge steel.

It has a place for everything. Disk drive, modem, keyboard, mouse, plus an Imagewriter. Yet even with a full complement of gear, there’s room to spread out for serious work.

Each of MacTable’s four surfaces are independently adjustable planes. You can even lower the Macintosh shelf to accommodate a hard disk. At just $339 (plus freight) you save with MacTable, because you buy direct.

And if you’re not satisfied with your MacTable for any reason, return it for a prompt refund (less freight).

So rethink the desk you use for your Macintosh. Then switch to the Danish solution. MacTable. Today.

MacTable design Patent Pending. MacTable is a registered trademark of Scandinavian Computer Furniture Inc. Apple is a trademark of and Macintosh is a trademark licensed to Apple Computer Inc.
Knowledge + Inference = Intelligence

Knowledge is a strategic resource of individuals and of corporations. Properly managed the impact can be tremendous. The substantial investment in developing expert systems has paid off in corporate savings of many millions of dollars to such companies as Digital Equipment, Westinghouse Corporation and Texas Instruments.

EASY TO USE
The innovative Logic Worksheet of MacSMARTS is laid out like a spreadsheet, with columns for FACTS, RULES and ADVICE. In its operations, users of Excel, Jazz or other Macintosh spreadsheet processors will feel quite at home. You don't need to master a complex syntax just to get started. And with the click of a mouse and a menu selection you can link graphics and text to rules and advice to elaborate and inform with geological maps, engine diagrams, or architectural plans; key contract paragraphs, laboratory protocols or balance sheets.

PRODUCTIVE
By making it easy to construct a knowledge base—consisting of facts, rules and examples—in the Logic Worksheet you can use deductive and inductive reasoning techniques to diagnose and advise, design, plan or trouble-shoot.

Some typical applications include:
- A partner in a major law firm is using MacSMARTS to advise a junior associate on the finer points of corporate law.
- A real estate developer used a MacSMARTS program to make certain no considerations were missed in the decision to build a new office complex.
- A medical laboratory director found that a MacSMARTS program could assist new technicians in performing diagnostic tests.
- A marketing director will use a MacSMARTS program to configure the best components to meet a customer's requirements.
- A financial consultant saw that a MacSMARTS program could assist him in strategic portfolio planning for more clients.
- An MIS director uses a MacSMARTS program to assist programmers to track down problems in systems software.
- A doctor is using a MacSMARTS program to analyze the implications of tests on his visually-impaired patients.
- The possibilities are bounded only by logic and human imagination. Our customer base spans two continents and a wide range of professions and businesses from individual consultants to the Fortune 500.

AFFORDABLE
Artificial intelligence is one of the most significant developments in the history of computer technology. Now you can access the power of this new technology and put it to work with MacSMARTS. MacSMARTS has the features of programs costing hundreds or even thousands of dollars more yet costs only $19.95. As a limited introductory offer order MacSMARTS direct risk-free now for only $9.95. A small price to pay you ahead of the competition and into the 21st Century. If MacSMARTS does not boost your personal productivity over the first 60 days, send it back for a full refund—not questions asked. We guarantee your satisfaction!

YES, I want to innovate today. Please send me MacSMARTS™!

MacSMARTS™, the Intelligence-Amplifying Software for the Apple Macintosh, was designed to facilitate similar successes in a wide range of businesses and professions using the new knowledge management techniques but with a much reduced investment.

Meet us in San Francisco at MacWorld Expo Booth #843

MacSMARTS™
The Intelligence-Amplifying Software™

©1986 Cognition Technology Corporation

Apple is a registered trademark of Apple Computer, Inc. Java is a trademark of Lotus Development Corporation. MacSMARTS, the MacSMARTS icon, the Cognition Technology logo and Intelligence Amplifying Software are trademarks of Cognition Technology Corporation, 55 Wheeler Street, Cambridge, MA 02138. (617) 492-0266.

Circle 619 on reader service card
Big Celebration

Get The Big Picture™ — the ideal way to see what the new generation of Macintoshes is all about. Whatever Mac you own, Macintosh™ 512, Macintosh™ Plus, Macintosh™ SE, or Macintosh™ II, add The Big Picture and get a two-page display that's a big improvement for just about any application: desktop publishing, CAD/CAM, spreadsheets, engineering drawings. The ideal display for any member of the Macintosh family. See your Apple® dealer and get The Big Picture.

THE BIG PICTURE™

E-Machines Inc.
7945 S.W. Mohawk Street
Tualatin, Oregon 97062
(503) 692-6656
Rob Swigart, author of several novels, and most recently of an electronic novel, Portal, believes that text adventures are moving toward more interaction between artist and audience.

Computer Literacy

Turning books into movies and vice versa is a common practice. Who could ever forget The Maltese Falcon—great book, great movie—or Valley of the Dolls—terrible book, terrible movie. Now literature and movies—including Bradbury's Fahrenheit 451 (Telarium), Douglas Adams' The Hitchhiker's Guide to the Galaxy (Infocom), Rambo (Mindscape), and Goldfinger (Mindscape)—have been transformed into electronic editions, or text adventures. However, the computer affords these narratives an added dimension—you become the central character in the story. While this interactive quality might foster role-playing fantasies, it also destroys most of the literary aspects of the original.

“The linear narrative of a book doesn't suit a computer,” says Roger Buoy, president of Mindscape, which publishes several text adventures. “Basically, you have to turn a flat surface into a cube. A story must be able to branch in different directions.”

Adapting books for the electronic medium or even the film medium requires a lot of judicious cutting. According to Ann Watson of AngelSoft, developer of Mindscape's book and movie conversions, the challenge is to let players become characters in 20 pages of text, rather than 120 pages, and keep the story moving. You drop the descriptive literary nuances and the introspective side of characters in exchange for a higher degree of player involvement.

Rob Swigart, author of Portal, an electronic novel published by Activision specifically for computers, views text adventures primarily as games—low on content but high on social interaction, matching wits with other players or the computer. Swigart feels that text adventures are moving toward art—high in content but low in social interaction, characterized by solitary communion between the artist and the audience—but they still have a long way to go.

Mindscape's Buoy believes the trend is moving away from strict text adventures toward graphics-and-text combinations. But even with these innovations, will hing on the availability of CD ROM, better graphics and sound, and improved animation, all geared for the computer medium.
PROJECT BILLING

Project Billing is a time billing package designed for ad agencies, graphic designers, architects and engineers. This package will track all aspects of your project billing including: budget for time and expense, actual costs and billed out amounts for both employee and expenses, and project profitability.

It will also automatically mark-up expenses and provide productivity reports by employee or project, plus print your client bills in a variety of forms.

This is how Project Billing can help you office:

- Tracks employee productivity by cost and billable rates
- Automatically marks up expenses
- Provides profitability analysis by project
- Tracks budgeting of time and expense
- Prints bills and adds interest
- Work-in-Progress holds detail from month-to-month
- Enables progress (partial) billing, while holding all detail
- Multi-user option available

$695.

LEGAL BILLING II

Legal Billing II is an easy-to-use, advanced system designed for small to medium size firms. Includes all features of the basic system plus much more!

- Full trust account reporting
- Archiving of billed services and costs
- Additional billing options
- Handles more employee and activity codes
- Multi-user option available

$895.

LEGAL BILLING

Legal Billing is a time billing package designed specifically for attorneys and accountants. Legal Billing is a full featured system, and yet it is incredibly easy to use. Most firms are up and running in 30 minutes or less!

Here's what Legal Billing can do for your office:

- Allows simple and fast entry of information, automatically sorted by date, client, employee and activity
- Productivity reports customized by employee, client, date and activity
- Automatic interest added to past due balances
- Client statements formatted in most any way
- Multiple billing rates for each employee
- Aging Report can be customized
- True Work-in-Progress feature holds activity details from month to month

$595.

BULK MAILER

Bulk Mailer is a powerful program specially designed for managing lists. Bulk Mailer does everything you want in a mail list program, including duplication elimination, zip and alpha sorts, 1 to 1 up labels printed, easy entry details, multiple label format, plus much, much more.

This is the only program to offer all these features:

- Duplication elimination
- Zip or alpha sort
- Easy entry details
- Coding and date expiration fields
- Large record capacity (up to 90,000 names)
- Hard disk compatible

$125. Bulk Mailer
- up to 8,000 names

$350. Bulk Mailer +
- up to 90,000 names

Call or write for more information or the name of your local authorized dealer.
If you're in the job market, Personal RésuméWriter allows you to customize résumés easily and quickly.

### RésuméWriter

Bootware Software's Personal RésuméWriter takes the drudgery out of producing and updating résumés. You simply type information into special windows, and the program formats the document to your specs. You can vary the content without having to delete any information from the database.

While Personal RésuméWriter only handles résumés for a single name and only costs about $30, Production RésuméWriter allows unlimited names to be used and is available for $595. The developer also publishes a book that includes over 100 sample résumés and instructions for creating templates. For more information contact Bootware Software Company, Inc., 5856 Parkmor Rd., Calabasas, CA 91302, 818/880-4877. Personal RésuméWriter is also available through the Academic Courseware Exchange.

### Coloring Mac

At Color Systems Technology in Marina del Rey, California, 100 Macs are part of a system used to apply color to such classic black-and-white films as *Miracle on 34th Street*, *Yankee Doodle Dandy*, and *The Maltese Falcon*. At Color Systems, vintage films are transferred to videotape and divided into separate scenes. Technicians assign colors to areas of each scene, and the colors are added by computers. While it may seem an ironic task for a computer with a black-and-white display, the Mac is used in two phases of the colorization process. The Mac's graphic user interface makes it an ideal front end for an Intel 186 processor, which in turn controls other devices. Instead of entering a command to fast-forward a tape machine, for example, an operator can click a fast-forward button on the Mac screen. The Macs are also used to define areas that will be assigned colors. Polygons depicting shapes in a scene are drawn on the Mac's screen and fed to a mixer via a camera set up in front of the Mac.

Colorization of another classic, *Casablanca*, is in the works. So when Bogey grins at you in living color, you can either thank the Mac or curse it, depending on your view of the controversial art of movie colorization.—Erfert Nielson

### Money for Nothing?

If a good way to gauge a personal computer's acceptance as a business system is by the number of investment management products for that computer, the Mac is well on its way toward mainstream business use. For portfolio management and investment tracking, the following products are available: The Stalker Portfolio System (Batteries Included, 30 Mural St., Richmond Hill, Ontario, Canada L4B 1B5, 416/881-9941); The Investor (P3 Inc., 949 Parklane Center, Wichita, KS 67218, 316/686-2000); and Dow Jones Market Manager Plus (Dow Jones & Co., P.O. Box 300, Princeton, NJ 08540, 800/257-5114).

Each of these three programs lets you download stock prices from a variety of on-line information services, calculate portfolio profits and losses, and perform other housekeeping tasks.

If you do stock-market historical trend analysis (technical analysis), check out Profit Stalker II (Button Down Software, P.O. Box 19493, San Di-
HOW TO BE
ELOQUENT, WITTY,
LOGICAL, FUNNY,
PERSUASIVE,
FORCEFUL, AND EVEN
VOCIFEROUS,

BUT ALWAYS
EFFECTIVE.

It's a presentation to the client, a financial report, a press release. The great American novel or a great company newsletter.

Your words are on the line. Give them the weight they deserve with one or more of the 45 classic type styles from the Adobe Type Library. They work on Apple LaserWriter® and any POSTSCRIPT® printer or typesetter.


Type styles are licensed from the world famous libraries of Mergenthaler and International Typeface Corporation. So you’re working with type the experts prefer. The stuff of which today’s most effective communication is made.

Turn your next business statement into a great success story. Talk to your Apple LaserWriter dealer about the Adobe Type Library today. Or call us directly at 800-29-ADOBE for more information.

P.S. Ask your LaserWriter dealer about POSTSCRIPT, Adobe System’s internationally recognized page description language.

PostScript is a trademark of Adobe Systems, Inc. LaserWriter is a registered trademark of Apple Computer, Inc. Glypha, Optima, and Palatino are all registered trademarks of Allied Corporation. ITC American Typewriter, ITC Avant Garde Gothic, ITC Benguiat, ITC Bookman, ITC Garamond, ITC Lubalin Graph, ITC Machine, ITC Souvenir, ITC Zapf Chancery, and ITC Zapf Dingbats are all registered trademarks of International Typeface Corporation.

Circle 552 on reader service card
Money for Nothing (continued)

ego, CA 92119, 619/463-7474), one of the first Mac investment programs. It allows you to download stock and commodity prices from CompuServe and Merlin, and then view a wide variety of trend graphs and plots.

For analyzing specific financial information about a company (called fundamental analysis), Value/Screen Plus (Value Line Software, 711 Third Ave., New York, NY 10017, 800/654-0508) lets you screen the 1,600 most actively traded stocks for certain conditions, based on up to 37 market variables updated every month or quarter, depending on your subscription terms. You can export various stock information to both Excel and Jazz for further analysis and tracking.

Market Pro (Pro Plus Software Inc., 2850 E. Brown Rd., #C-12, Mesa, AZ 85203, 602/830-8835) is one product that provides all three services (portfolio management, fundamental analysis, and technical analysis). Most stock market programs provide an interface to on-line services like Dow Jones/NewsRetrieval and CompuServe to retrieve stock prices and company information. Market Pro, however, uses an information service called I.P. Sharpe, which it claims provides a greater breadth of information than do other sources.—Steve Mann

Project Victoria

As Pacific Bell sees it, by late this year or early 1988, the modem will be obsolete, or at least outdated. By that time Pac Bell hopes to have deployed its new multiplexer developed under the code name Project Victoria.

Currently, the typical two-strand telephone line carries only one analog transmission at a time, either voice communication or data transmission via modem; simultaneous transmissions are impossible.

With Pac Bell’s black box hooking onto a single home-phone circuit, however, signals are digitized at the source, allowing one phone line to carry seven distinct transmissions at once: two voice channels, one 9600-baud data channel for high-speed access to information services and computer-to-computer connections, and four lower-speed data-transmission channels for data pertaining to, for example, interactive home-energy management, security systems, and community bulletin boards.

Pac Bell hopes the system’s high transmission speed, plus the appeal of simultaneous voice and data transmission, will help revive a sluggish videotex industry. Pac Bell also hopes that the product’s open architecture will encourage software and peripheral development, with Pac Bell itself positioned neatly, of course, as both the purveyor of the necessary hardware and the connecting link between information services and the end user.

In an initial four-month test concluded last August, two hundred homes were equipped with 512K Macs and Project Victoria multiplexers connected through Pac Bell to six information sources, including Dow Jones, MCI electronic mail, Bank of America’s home-banking system, and three community bulletin boards. After the test was concluded, 90 percent of the users said they’d be willing to pay “something” for the service. The Public Utilities Commission has not yet decided what it will allow Pac Bell to charge. As the plan is now conceived, users will lease multiplexers from Pac Bell and pay for the connection through Pac Bell to the information services, as well as for the services themselves. Michael Eastwood, Pac Bell’s director of network applications, believes that the total cost will be lower than that of typical modem-to-information-service connections now available.

Transmission of the multiplexer’s digital signals is limited to roughly 18,000 feet from any Pac Bell central switching office. Fortunately for Pac Bell, 80 percent of the technology’s potential users live well within those limits.—Eric Olsen

Software Ads

The SoftAd Group, a firm that specializes in developing computer-based marketing tools, has produced computer-based marketing materials for BMW, Chase Manhattan Bank, Chemical Bank, and Ford. One of the Sausalito, California-based company’s current projects is an animated, interactive program designed to promote General Motors’ 1987 Buicks. Originally developed on the Macintosh, this program has a database containing complete specifications for each Buick model, including optional features, technical fact sheets, and even purchase plans. The program allows consumers to select cars based on their primary concerns, such as price or trunk space. After you specify a set of features, the program displays the models that fill the selection criteria.

The software will be distributed through direct mail and direct response ads, but could be eventually be distributed through automobile dealers or downloaded via an on-line toll-free number.

SoftAd’s Paula George uses the Mac to create marketing tools for GM’s Buick division.
The inventors of the 3.5" drive recommend only one floppy disk. 

Their.

If your computer has 3.5" drives, it has a little bit of Sony. Because Sony invented the 3.5" drive technology that has taken floppy disk memory all the way to two megabytes.

So nobody knows better than Sony how important high standards are for producing 3.5" floppy disks. But then, Sony invented those, too, as well as the most demanding methods for making 3.5" disks.

Such as the Sony Vivax™ magnetic medium, with the high coercive force necessary to suppress the "noise" that can cause disk error. And the Sony DDL™ binder system for incredibly even dispersion of magnetic particles on the disk surface. Then there's Sony's burnishing expertise that eliminates microscopic projections as small as 1/1,000,000th of a millimeter.

But the best reason to trust only Sony is your irreplaceable data. After all, you'll be storing six times the information on a disk that's one-third smaller than a 5.25" floppy. That's why we recommend only one floppy disk for our 3.5" drives. The Sony.

SONY 
THE ONE AND ONLY®

© 1996 Sony Corporation of America. Sony, Vivax, DDL, and The One and Only are trademarks of Sony.

Circle 255 on reader service card
Mac Factory

Back in 1981, while Steve Jobs and the Apple dream team toiled through 70-hour weeks on the design of what became the Macintosh, a few team members slipped away to a separate lab to blueprint a factory for building Macs. It was then known only as “the machine that would build the machine.”

Jobs suspected that to produce Macs in the United States, he would need technology that was highly automated and roboticized. The result was the Mac factory. With its high-speed robots, which work 24-hour shifts, and rarely make a mistake, the factory requires less than half an hour of human labor to assemble a Mac, and about 90 percent of that is testing time. Analysts estimate Apple’s per-unit cost is between $300 and $400, but the exact figure will probably always be a trade secret.

A Mac rolls off the production line about every 25 seconds, a time Apple is trying to cut in half before the one-millionth Mac is sold. Before being boxed and shipped, each machine is run through a rigid 24-hour burn cycle, during which it is turned on and off repeatedly and run through a host of simulations designed to test each individual chip on the logic board.

Desktop Presentations

Presentations may soon follow publishing, communications, and engineering as the “desktop” theme trumpeted by Apple marketing campaigns, and Forethought’s PowerPoint is likely to establish itself as one of the leading products in this field. The developer estimates that 10 to 15 million people regularly give presentations, which translates into over a billion slides and overheads produced each year. Forethought also believes that because less than 1 percent of the materials currently used in presentations are produced with computers, there’s an obvious niche waiting for the right Mac software.

With full text editing and formatting capabilities, drawing tools, and patterns and lines for creating backgrounds and borders, PowerPoint is well suited to designing such presentation media as overhead transparencies and 35mm slides. You can import MacPaint, MacDraw, and TIF files directly into PowerPoint.

A slide sorter allows you to look at slides in a reduced view and to rearrange, cut, copy, and paste them. Alternatively, you can rearrange the order of slides by rearranging the list of slide titles. In addition, you can integrate slides and notes into a document, laying out the elements as you like. The $395 PowerPoint also lets you set up a slide show on the Mac, which can be output to a video projector. For more information contact Forethought at 250 Sobrante Way, Sunnyvale, GA 94086, 408/737-7070, 800/622-9273.

Super Computers

At the San Diego Supercomputer Center (funded by the National Science Foundation and located on the UC San Diego campus), “super” is a relative term. In the conjunctive, “supercomputer” refers to the cen-
Still drawing "Pretty Pictures" with MacProject?

Those in the know have switched from MacProject to MICRO PLANNER PLUS. Apple's own software and hardware engineers have switched to MICRO PLANNER PLUS for mainframe power made easy on the Macintosh™.

From the Venus Orbiter to business startups, managers are switching to MICRO PLANNER PLUS to get projects done on time and on budget.

R.D. Warshawer, Planning and Scheduling Manager, GTE/Government Systems, Strategic Systems Division — from his MICRO PLANNER review. "My evaluation of the software is that it is a superior package, very user oriented, with good documentation. . . . The structure makes the maximum use of the Macintosh™ interface, allowing the user to become adept rather rapidly. Users who are familiar with the networking techniques will find this product falls between MacProject (a low-end planning tool) and Artemis (a super powerful mini/mainframe tool). In fact, this product appears to have similar functionality to the Artemis system. . . . For those who find MacProject inadequate . . . and Artemis too much for their needs, MICRO PLANNER PLUS should be an excellent tool . . . . One of the most important features . . . is the ability to save the 'plan' and assess progress against the plan as the actual work progresses. The lack of this capability is what makes MacProject's use extremely limited."

From 'Project Management' by Barry Keating, Macazine, June 1986 — "Carl Sanchez, Chief of Planning for the Launch Control Systems Division of Martin Marietta . . . As an individual who must both plan and control projects, he has used both MacProject and MICRO PLANNER PLUS (as well as mainframe versions of project management software such as Artemis). While he 'cut his teeth' on MacProject . . . . Sanchez believes MICRO PLANNER PLUS to be a much more powerful tool for practitioners than MacProject. Many people at Martin Marietta use MICRO PLANNER PLUS not only for its power but because its learning curve is quite short . . . (less than a day for some people). . . . MICRO PLANNER PLUS has the best training curve of the project management software."

Another user who has switched from MacProject to MICRO PLANNER PLUS is Mike Krueger of Natural Intelligence . . . Krueger, like Carl Sanchez, started out using MacProject but soon found that his job required the sophistication found in MICRO PLANNER PLUS. MICRO PLANNER PLUS is . . . being used to develop the schedule for producing Natural Intelligence's first product . . . (software with an expert systems or artificial intelligence capability).

MacProject is a simpler tool . . . not designed to adequately handle . . . reconciling time . . . with resources. The logic of Macproject is nonstandard and may cause some early misunderstanding to experienced users.

Now it's easier than ever to move up to the power of MICRO PLANNER PLUS. MICRO PLANNER'S new PROJECT EXCHANGE module allows you to convert MacProject files to MICRO PLANNER projects. Move up from "pretty pictures" to sophisticated management.

Mainframe power made easy on the Macintosh™. $495.00 ($395.00 with MacProject trade-in)

For more information, contact your local dealer or the professionals at:
Micro Planning Software USA
235 Montgomery Street, Suite 840
San Francisco, CA 94104
(415) 788-3324

We offer full training and consulting. Available on IBM® and compatibles.
Super Computers (continued)

The San Diego Supercomputer Center's Serge Polevitzky is sold on the Mac as an intelligent workstation for the Cray.

"have-nots." In fulfilling its charter to educate researchers in supercomputer use, the center routinely sets up a classroom full of Macs for a week-long, hands-on course called "Supercomputer Users Training." Students come from the 25 member institutions that share access to the Cray through the Supercomputer Center Consortium. Intensive sessions alternate between lectures by world-class computer scientists and hands-on access to the Cray via the Mac.

Each monthly course offering sees a diverse cross-section of visiting researchers from such consortium members as the Salk Institute for Biological Studies, the National Optical Astronomy Observatories, the Scripps Institution of Oceanography, the Southwest Fisheries Center, the Agouron Institute, and the Research Institute of the Scripps Clinic, as well as a host of prestigious private and state universities.

The center now has 83 Macintoshes. When not outfitting the student lab, Macs enable the center's 90 full-time staff members to communicate with each other via Ethernet and AppleTalk networks and RS-232 cabling.

On center director Sidney Karin's desk is a Levo Prodigy that facilitates the transfer of his research from mainframe to Macintosh. The hope is that he'll get "spoiled" and want to upgrade many of the center's current Macs to Prodigies, giving SDSC the edge in accessing the capabilities of the next generation of Macs.

MathWriter

J. Robert Cooke and Ted Sobel, of the agricultural engineering department at Cornell University; tried using MacEqn, a mathematical typesetting desk accessory, to typeset part of a manual they were developing on finite element programs. But because MacEqn lacked some essential features, Cooke and Sobel were forced to develop their own program.

MathWriter, the fruit of their labors, automatically sizes and places superscripts, subscripts, parentheses, fraction bars, matrices, and integral and summation symbols. It is also quite adept at formatting equations; for example, you can stretch or shrink an equation to fit the available space while maintaining the width-to-height ratio, even after pasting an equation into a word processor document. You can also create overlay screens and manually superimpose multiple characters for closed-contour integral symbols. On-screen palettes provide quick access to the Greek alphabet and the most common mathematical structures; in addition, you can create a user-defined palette of expressions or symbols.

You can save MathWriter files as MacPaint or MacDraw documents and print them on the LaserWriter or ImageWriter. The current version of MathWriter isn't compatible with the widely used TeX mathematical typesetting language, but the program's developers are working on a conversion utility. For more information contact Cooke Publications at P.O. Box 4448, Ithaca, NY 14852.

More Graphics at Your Fingertips

Over two hundred fonts are now available from user groups and software libraries. Most of
Best New Word Processor for the Macintosh...

Introducing WriteNow™ For Macintosh,” the next step in word processing. WriteNow for Macintosh combines the power you would expect from a dedicated word processing system with the ease of operation that you’re used to with MacWrite.”

Performance.
This program is fast. Very fast. Especially with large documents. Saving, scrolling, finding and replacing, and printing happen lightning-fast. Regardless of document size, repagination is automatic and reformattting is instant.

On-Screen Multiple Columns.
You can do true WYSIWYG (What-You-See-Is-What-You-Get) editing in one, two, three, or four columns directly on-screen. Page breaks and characters from 4-127 points are displayed on-screen as well.

50,000-Word Spelling Checker.
A fast, on-line 50,000-word spelling checker is included. You can add or delete words and create “personalized” dictionaries. The spelling checker also has a handy “guess” feature that recommends the correct spelling of misspelled words.

Headers, Footers, and Footnotes.
Now you can display a unique header and footer for each page. Footnotes can be automatically numbered and edited on-screen as well.

Unlimited Open Documents.
Open as many documents as memory allows, making cutting, pasting, or reviewing between windows a breeze.

Embedded Graphics.
Graphic images can be part of a sentence, part of a paragraph, or a separate paragraph, and can be proportionally or freely sized.

And Much More.
To learn more, contact your local computer dealer today.

Suggested Retail: $175
Runs on any Macintosh.
(Macintosh 512K or larger recommended for spell checking.)

T/Maker
T/Maker Company
1973 Landings Drive,
Mt. View, CA 94043
(415) 962-0195

Circle 332 on reader service card
These fonts, which are free except for the cost of a disk or a downloading fee, are text or display fonts. Some of the fonts, like Cairo or Mobile (aka Taliesin), consist of pictures. And while many of these picture fonts are collections of miscellaneous, some are composed of graphics related to a central concept.

Cupertino-24, for example, is filled with such items as point-ers, (tiny) windows, dialog-box talking heads, check boxes, the sad Mac and Trash Can icons, and other desktop paraphernalia. Paint-18 concentrates almost entirely on MacPaint items, from the Spray Can to Brush shapes and the Hand tool.

Washington-12 (by Martin Bryan) is composed of various lines, intersections, and corners to use in the construction of simple forms containing boxes, fill-in-the-blanks, and so forth. Border-12, on the other hand, is designed for more decorative embellishments. Two other fonts are based on alternative forms of human communication. ASL Fingers contains hands signing letters and numbers in American Sign Language. And Braille-12 and -24 are, well, Braille.

Other fonts are one-of-a-kind. Boutn-24 is a collection of letters, numbers, and signs within buttons (including "Panic," of course). Floor Plan-9 and -24 (by Maurice Naragon) are collections of tables, chairs, sofas, bathtubs, hot tubs, pianos, swimming pools, and other household furnishings as viewed from above. States-24 displays the outlines of all 50 states plus a tiny drawing of the lower 48. Las Vegas-36 contains various views of dice, plus a complete deck of cards. And Zodiac-18 (by R. Ettore) has all the signs of the astrological calendar, rendered in a rather florid style. While few if any of these picture fonts are likely to be essential additions to your font menu, they can greatly expand your graphics repertoire.

—Robert C. Eckhardt

Prototyper

Transforming an idea into a working program can take years for a substantial application. SmethersBarnes of Portland, Oregon, has introduced a prototyping creator to help Macintosh software developers conceptualize programs without actually programming. Prototyper doesn't necessarily reduce coding time for a final design, but it does eliminate the months of programming required to build a demo, and lets you test out program design concepts easily. You build menus, windows, and buttons and specify actions using a set of menu commands and tools represented by icons.

Prototyper is primarily a communications tool that lets managers communicate design concepts to product managers, engineers, technical writers, and even potential investors. "Proposing an idea for a program graphically with the Macintosh user interface intact is clearly much more effective than a written specification," says Paul Smethers, one of the program's principal developers. For more information contact SmethersBarnes at 800/237-3611, 503/245-7270 in Oregon.

The HUMBLE

Prodigy

Xerox Special Information Systems (XSIS) and Levco have created a powerful microcomputer expert-system workstation. And while this state-of-the-art workstation probably offers a bit more power than you need, several scaled-down configurations allow any Macintosh owner to acquire this powerful yet user-friendly AI development environment. It is based on the XSIS software product HUMBLE, a Smalltalk-80 expert system shell.

Most Smalltalk-80 workstation owners pay several thousand dollars for the basic operating environment license, which they then enhance with the $500 HUMBLE expert system shell extension. Macintosh owners, however, can get started with only a $50 investment for the prerelease Smalltalk-80 (version 3) from the Apple Programmer's and Developer's Association (APDA).

Consistent with the open Smalltalk-80 environment, HUMBLE is delivered with complete source code on a sin-

(continues)
Now There's a Easy Way to go from Idea to Outline in One Step!

Take the step, drop that blister-causing carbon tool called a pencil. Oh, it's still useful for some things, but not when it comes to organizing ideas and opinions into outlines. We respectfully submit a better way, an easier way, a way some would even call a miracle. Voila!

Voila! is a Desk Accessory Outliner that provides you with all the third generation outlining features you've been waiting for ... and then some.

With Voila! there is no limit to the number of Headlines, Subheads or Expander windows you may create. And you have the ability to edit fonts, sizes and styles for a single Headline, a Level, an entire Family or the entire Outline. These unprecedented editing features, combined with Imagewriter and Laserwriter compatibility, allow you to create Outlines of unsurpassed quality. Voila! will even print your Outlines in one of four formats: Arabic, Roman, Standard or Symbol. And on top of all this a Table of Contents is instantly created for each Outline.

Perhaps the most innovative feature of Voila! is the ability to automatically transform any word processing document into an Outline, in seconds. Business plans, proposals and manuscripts are converted into Outline format with the click of a mouse! And Voila! doesn't limit you to the written word. Both text and graphics may be included as a part of any Outline.

Voila! reads and writes both ThinkTank™ and TEXT ONLY files. It requires a Macintosh 512K or Macintosh Plus and is compatible with all hard disks. For further information, or for the name of the dealer nearest you, call Target Software toll free.

Target Software
14206 SW 136th Street, Miami, Florida 33186
National 1-800-622-5483; In Fla. (305) 252-0892

ThinkTank™ is a registered trademark of Living Videotext Corporation.
The HUMBLE Prodigy (continued)

gle-sided Mac disk and a reference manual. Customized Smalltalk-80 editor/browsers give HUMBLE users hierarchically organized access to multiple knowledge bases. Each knowledge base can use shared rules in multiple contexts. HUMBLE's inference engine supports both forward and backward chaining and is capable of reasoning under user-controllable certainty models. Built-in explanation facilities provide complete, concise English-sentence and tree-structured graphic descriptions of the line of reasoning leading to the best solution. They also chart less likely alternatives.

Using the Macintosh Toolbox routines with HUMBLE allows you to create one of the fastest and most versatile expert-system display interfaces available on any commercial Smalltalk workstation.

With regard to hardware, you need a Macintosh with at least 1 megabyte (the more the better) of RAM; a hard disk is desirable. An ideal configuration would be a souped-up Mac like a Levco Prodigy (with 4 megabytes of RAM, a 16-MHz 68020 microprocessor, and a 68881 math coprocessor); an upgraded Mac SE or Mac II; a hard disk; and a large screen. The cost of a complete workstation is several times the cost of a basic Macintosh computer, but it is still far less expensive than traditional Smalltalk workstations.

For more information on Xerox's HUMBLE expert system shell, contact David Yorck, Xerox Special Information Systems, P.O. Box 5608, Pasadena, CA 91107, 818/351-2351.

World's Largest Mac Peripheral

At least five Macintosh software packages are being developed by researchers associated with IRCAM (the Institut de Recherche et Coordination Acoustique/Musique), the world's foremost music research facility. These packages include software for mixing digital recordings and automating MIDI-controllable analog mixers; an FM synthesis editor for Yamaha's popular DX and TX synthesizer series, which converts spectral information into patch data; and the porting of IRCAM's renowned Formes composition program to a special musical extension of Le Lisp (from Act Informatique) known as MIDI Lisp.

In addition, IRCAM is now using a Macintosh to manipulate the acoustic properties of its main performance hall, the Espace de Projections (ESPRO). The walls and ceiling of ESPRO have 171 three-part panels, each of which may be adjusted to exhibit one of three acoustic properties: reflection (the sound is reflected along a single plane), diffusion (the sound is reflected from a threesurface prism at different angles), and absorption (sound is not reflected). Three mixed positions, such as absorption/reflection, are also available. Furthermore, the ceiling is divided into three parts, which may be raised and lowered independently. All of this provides control of the inherent acoustic properties of the room, such as volume and resonance. The ESPRO can even be tuned to reinforce a specific musical key.

IRCAM's Adrian Freed and Mark Seiden have developed Automation de Prises, a Macintosh program designed to control the acoustics of the ESPRO performance space. The user literally paints (with patterns similar to MacPaint's) the acoustical properties of the walls on the Macintosh screen, which presents a two-dimensional view of the room's four walls and ceiling. Motors move the actual panels to the positions that provide the reflection, diffusion, absorption, or mixed properties painted on the screen—real-time interaction is also supported. The acoustic modeling of the panel configurations may have taken up to two days of dedicated VAX computation time to derive. The resulting design, exhibiting the desired acoustical properties, can be saved and recalled instantly. Well, almost instantly; the panels take about ten minutes to move, and although their settings are saved in the file, the lowest row of panels cannot be moved automatically. Anyone standing in front of one of the 75 nonmotorized panels could be injured when it moved. This is truly the largest Macintosh peripheral in the world.

—Christopher Yavelow

The HUMBLE Prodigy is used to manipulate the 171 acoustic panels of the main performance hall at IRCAM, the world's most prestigious music research facility.

The King of Chicago

The King of Chicago, a Cinemaware strategy game, is an interesting cross between a classic gangster-film plot, an interactive novel, and an animated adult cartoon. The personalities of your character and the characters you interact with change slightly every time you make a decision. For example, giving your moll, Lola, the cold shoulder makes your enemies and gang respect you more. On the other hand, Lola will be more vulnerable to the charms of your rivals. If The King of Chicago has an educational aspect—other than as a lesson in gangster behavior and history—it's that the only way to reach the top is to apply the right amount of violence, bribery, threat, betrayal, leadership, and savvy. For more information contact Mindscape at 800/221-9884, 800/942-7315 in Illinois. -Otto Waldorf
SOFTWARE

NCP denotes not copy-protected.
CP denotes copy-protected.

Affinity Microsystems ... NCP
Tempo (power user's macro utility) .......... $59.

Alsys ... NCP
Fontastic (create your own fonts) .......... 27.
Fontographer (Lasserwriter font editor) .... 249.

Ann Arbor ... NCP
Full paint (open four documents at once) ... 55.

ATI ... CP
Teach Yourself Multiplan or Excel .......... 39.

Batteries Included ... NCP
The Mac BatteryPak (9 desk accessories) ... 27.
Time Link (electronic calendar/diary) ...... 29.
Thundert (50,000 word spelling checker) ... 109.

Borland International ... NCP
Sidemak 2.0. .................................. 59.

Broderbund ... CP
Print Shop (open cards and menus) ...... 49.

CAMDE ... CP
Nutrical (diet & nutrition analysis) ........ 49.

CasadyWare ... NCP
Stad (two-inch disk) .......................... 29.

Central Software ... NCP
Copy II Mac (includes MacTools) ............. 20.

Challenger Software ... NCP
Mac3D (3D graphics, CAD features) ....... 129.

Chang Labs ... CP
Rags to Riches Ledger ........................... 25.

Cortland ... CP
TopDesk (7 new desk accessories) .......... 35.

Creston Development ... NCP
MacMail + (MacMail plus 512k) .............. 55.

Cricket Software ... NCP
Statworks (statistical package) .............. 79.
Cricket Graph (multiple windows) ........... 129.

DataViz ... NCP
MacLink Plus (transfer Mac/IBM data) ....... 159.

Desktop Graphics ... NCP
Desktop (compatibility with MacDraw) ....... 30.

Digital, etc ... NCP
Macaccountant (integrated accounting) .... 99.

Dow Jones ... CP
Straight Talk (access News/Retrieval) ...... 62.

Spreadsheet Link .............................. $65.
Market Manager PLUS 1.5 .......................... 159.

Dreams of the Phoenix ... NCP
Day Keep Calendar ............................... 35.
Quick & Dirty (Pascal compiler) .............. 35.

Twelve-C Financial Desk Accessory ......... 35.
Phoenix 3D (3D graphics) ...................... 35.
Phoenix 3D Level 2 (2D CAD) ................. 65.

Dubil-Clock Software ... NCP
World-Class Font! Vol. One or Vol. Two ... 29.
World-Class Font! (both volumes) .......... 49.

Calculators Communications ... NCP
EDO Communications .......................... 39.

Laserworks (requires 512k, Laserwriter) .... 229.

Electronic Arts ... CP
Deluxe Music Construction Set 2.0 ......... 69.

Enabling Technologies ... NCP
Easy3D (create solid 3D objects) .......... 79.

Rasta at Byte ............................ 29.

First Shapes (preschool learning tool) ...... 32.
Speller Bee, KidTalk, or MathTalk .......... 42.

GestureTalk (speech synthesis) .............. 52.

Forethought ... NCP
Facetinder (free-form into organizer) ...... 49.

FileMaker Plus (feature-packed database) ... 159.

Fortnum/Southern
Macnooga Choo-Choo .......................... 21.

Macchemist (CP) ............................... 89.

FNB Software ... NCP
Hard Disk Backup (protect hard disk info) ... 39.

Hard Disk Partition (speeds up hard disk) ... 39.

Hard Disk Utility (program backup) ......... 59.

Great Wave Software ... NCP
KidsTe (educational, ages 3-8) ............. 29.

ConcertWor + (music composition) ...... 29.

ConcertWor + MIDI ............................ 29.

Greens, Johnson ... CP
Spellcheck (spelling checker) ............... 52.

Hayden Software ... CP
I Know It (handy file) ......................... 20.

Hayden Speller (for Word & MacWrite) ..... 27.

MusicWorks (songs for your Mac) .......... 37.

DaVinci Building Blocks (NCP) ............. 46.

Home Design (NCP) ........................... 49.

Score Improvement for the SAT .............. 59.

VideoWork (video editing tool) ............. 59.

Idealform ... CP
MacLabel+ (print disk labels) .............. 29.

Imagine ... NCP
Smart Alarm (DA reminder system) ...... 39.

Impulse ... NCP
Comic Strip Factory (create cartoons) ...... 65.

Industrial Calculations ... NCP
Powermath (equation solving tool) .......... 59.

Infospheres ... CP
LaserServe (network software) .............. 95.

MacServer (network software) .............. 250.

Innovative Data Design ... NCP
Pascal-Case (requires Paint program) ...... 35.

MacDraft (new updated version, 512k) .... 159.

Kensington ... NCP
Graphic Accents (req. Paint program) ...... 29.

Type Fonts for Text (full fonts) .............. 49.

Type Fonts for Headlines (req. 512k) ...... 49.

Legisloft/Nole Press ... NCP
WillWrite 2.0 (propagate your own will) ... 32.

Linguist's Software ... NCP
Tech (1000 different symbols) .............. 59.

FOREIGN LANGUAGE FONTS

MacCyrilic ...................................... $39.
SuperFrench/German/Spanish ................. $39.

MacHroglogics, MacKana/Basik Kanji, MacHroglogics/Com... 39.
MacSource, MacKana/Japanese, MacHroglogics/Korean, MacHroglogics/MacJapane... 39.

MacExp ........................... 25.

MacGleek, MacHexcb .......................... each 59.

SuperGreek New or Old Testament .......... 79.

MacGreek/Hebrew almost 89.

MacHexcb ...................................... 79.

LaserCyrillic .............................. 151.

LaserPoll .............................. 151.

LaserCyrillic .............................. 115.

LaserCyrillic .............................. 125.

LaserCyrillic .............................. 125.

LaserCyrillic .............................. 125.

LaserCyrillic .............................. 125.

Miles Computing ... NCP
Mac the Ripper (req. Paint program) ...... 27.

Mindscapes ... CP
The Luscher Profile (personality profile) ... 24.

The Perfect Score: SAT ....................... 47.

ComicWorks (create your own comics) ...... 49.

GraphicWorks (newsletters, ads, posters) ... 49.

MacPhoto .............................. 49.

Forecast (tax planning) ...................... 41.

Dollars & Sense (home, small business) ... 81.

New Canaan MicroCode ... NCP
MDCFinder (requires 512k) ................. 20.

Mac Disk Catalog II (requires 512k) ...... 32.

Odessa ... NCP
Helix (req. 512k, external drive) ...... 105.

Double Helix (relational, custom menus) ... 289.

Pantilir ... CP
MathFlash or WordPlay ....................... 26.

MacType (typing instruction) ................ 26.

Inventor Control, GL, or AR ....... each 59.

inTalk (communication software, NCP) ...... 79.

PBI Software ... NCP
Icon Switcher (customized icons) .......... 14.

Icon Fun & Games or Business Libraries ... 14.

HFS Locator (DA organizer for HFS) ....... 27.

Hard Disk Backup (supports MFS, HFS) ... 29.

Peachtree ... CP
Back to Basics GL, AR, or AR ....... each 89.

Personal Computer Peripherals ... NCP
HFS Backup .............................. 39.

ProVUE Development ... NCP
OverVUE 2.0 (power-packed database) ..... 149.

Mail Manager Template ...................... 29.

Personal Finance Template ................. 29.

Rubicon Publishing ... CP
Silver Palace Collection (NY's finest!) .... 35.

Dinner At Eight (recipes to wines) ......... 35.
Putting out feelers.

They spend most of their time feeding, grooming, and interacting with friends. Their courtship dance consists of a lot of wing flapping, erratic running, and backing into things. The males tend to stay out late at night, and are much more obvious and vulnerable."

Sound familiar? Well, don't jump to any hasty conclusions. Contest winner Betty Faber is describing cockroaches. She is one of the foremost authorities in the world on their behavior. But any similarity between the characters in her research and personal friends of yours (or ours) is purely coincidental. We think.

Bugs 'R us.

Betty has been studying cockroaches for eleven years. She's spent endless days in the jungles of Trinidad, and endless nights in the greenhouses at the American Museum of Natural History in New York studying every gesture of her own tagged private collection. This lady knows from cockroaches.

But she didn't know from micros—until the Mac came along. Here at last was a machine that, like Betty, had the ability to make friends with the most unlikely life forms. She uses Excel extensively, particularly for analyzing "homerange" data—how far which roaches will roam to do what. She also uses Microsoft Word to write papers, and MacPaint to draw home-range maps for presentations.

Overall, the Mac has made it possible for Betty to spend a lot more time with her six-legged buddies. Which, from her point of view, is a good thing. And, what about you? Is there anything creepy or crawly in your Mac? Your story could be worth a grant of $500 in free add-ons and software. So bug us with your true Mac adventures soon!

"My Connection"

MacConnection

14 MILL STREET, MARLOW, NH 03456  1-800/Mac&Lisa or 603/446-7711

©Copyright 1987 PC Connection, Inc. MacConnection is a division and trademark of PC Connection, Inc., Marlow, NH.
MacConnection.

MacroMind ... NCP
Maze Wars+ (play via modem or network) $32.
Miles Computing ... CP
MacAttack (3D tank simulation) $27.
Harrier Strike Mission (3D flight simulation) $27.
MacWars (3D space simulation) $27.
Mindscape ... CP
Racket (converses with your Mac) $27.
Balance of Power (world politics) $30.
King of Chicago (req. minimum 512K) $30.
Birattacuse (great graphics, req. 512K) $30.
Unraveled (mystery adventure) $30.
Deja Vu (murder mystery) $33.
Origin Systems ... CP
Exodus: Ultima Ill (fantasy adventure) $38.
PBI Software ... CP
Strategic Conquest (multi-user) $35.
Psion ... CP
Psion Ogres and multi-lungual $31.
OWare ... CP
Orb Quest (graphic fantasy adventure) $29.
Sierra On-Line ... CP
Championship Boxing (knock 'em out) $25.
Silicon Beach Software
Airborne (CP, the classic) $22.
Enchanted Mosaic (MacServe) $19.
Dark Castle (NCP, arcade action) $28.
World Builder (NCP program creator) $42.
Simon & Schuster ... CP
Star Trek—the Kobayashi Adventure $24.
Sit-Tech ... CP
Mac Wizardry (high-rated fantasy) $36.
SPHERE, INC. ... NCP
(Formerly Spectrum Holobyte) $21.
GATO (submarine simulation) $26.
Orbit (space shuttle simulation) $27.
Telltale II (No. & So. hemispheres, req. 512K) $42.
XOR ... NCP
Star Trek—the Kobayashi Adventure $24.

Hardware
Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

Apricorn ... 1 year
Apricord Mac (Mac Plus parallel interface). $75.
Curtis Manufacturing ... lifetime
Diamond (6 outlets) $29.
Emerald (6 outlets; 6 ft cord) $36.
Sapphire (3 outlets; EMI/RFI filtered) $47.
Ruby (6 outlets; EMI/RFI filtered, 6 ft cord) $55.
Dove Computer ... 1 year
MacSnap Memory Upgrades see special
Ehmman Engineering ... 1 year
800K External Disk Drive $225.
Ergotron ... 1 year
MacTilt (includes external drive bracket) $75.
MacBuffer 512K call
MacBuffer 1024K call
Hayes ... 2 years
Smartcom II (communications software) $89.
Smartmodem 1200 or 2400 call
InterBridge (connect AppleTalk networks) $59.
IOMEGA ... 90 days
Bernoulli Box (dual 10 MB w/SCSI) $1649.
Bernoulli Box (dual 20 MB w/SCSI) $1895.
Bernoulli Box (dual 10 MB, AppleTalk) $2195.

Kensington ... 1 year
Apptalk Cable Clips or Connectors. each $1.
Mouseway (mouse tracking pad) $8.
Mouse Point (for your idle mouse) $8.
Mac Plus System Saver Cover $9.
Imagewriter (II) Dust Cover $9.
Mouse Cleaning Kit w/Mouse Pocket $17.
Disk Case (holds 36 Mac disks) $19.
Disk Drive Cleaning Kit $20.
Tilt/Swivel $22.
Universal Copy Stand $24.
Polarizing Filter $34.
Surge Suppressor $35.
A-B Box (for the Mac Plus) $65.
Control Center $65.
System Saver Mac (complete with fan) $65.
Turbo Mouse $69.
KOALA TECHNOLOGIES ... 90 days
KAT Graphics Tablet $139.
MacVision (digitizer) $175.
Kraft ... 1 year
3 Button QuickStick $49.

Mirror Technologies ... 1 year
FastPort ("SCSI" for your 512k Mac) $139.
Magnum 600k External Drive $229.
Magnum Hard Drive 20MB (SCSI) $849.
Magnum 20 Tape Backup $929.
MagNet 30X (w/MacServe) $995.
MagNet 40/40 (40MB, 40MB tape) $2695.
MagNet 85X (w/40MB tape) $4595.

Personal Computer Peripherals ... 1 year
MacBottom Hard Drive 20MB (parallel) $879.
MacBottom Hard Drive 20MB (SCSI) $879.
MacBottom Hard Drive 30MB (SCSI) $999.
MacBottom Hard Drive 40MB (SCSI) $1295.
Summagraphics ... 90 days
MacTablet 6" x 9" (stylus driven) $299.
MacTablet 12" x 12" (sketching) $369.

Systems Control ... 2 years
MacCard (surge protection) $55.
Thunderware ... 90 days
Thunderscan (high-resolution digitizer) $179.
Western Automation ... 1 year
DASCH RAMdisk 1000K $379.
DASCH RAMdisk 2000K $459.

Disks

Single-sided Diskettes
Sony 3½" Disks (box of 10) $15.
MAXELL 3½" Disks (box of 10) $15.
Verbatim 3½" Disks (box of 10) $16.
Full 3½" Disks (box of 10) $16.
3M 3½" Disks (box of 10) $16.

Double-sided Diskettes
Sony 3½" Disks (box of 10) $23.
MAXELL 3½" Disks (box of 10) $23.
Verbatim 3½" Disks (box of 10) $24.
Full 3½" Disks (box of 10) $24.
3M 3½" Disks (box of 10) $25.

Information Services
Compuserve Compuserve Information Service $24.
Dow Jones Dow Jones News/Retrieval Membership Kit $24.
Source Telecomputing The Source (subscription & manual) $30.

Accessories

Automation Facilities
Floppicline Drive Care Kit $15.
Floppicline ReFill (ten cleaning disks) $10.
MacPak Complete Care System $29.

Clean Image Ribbon Co.
Clean Image Ribbon Kit $12.

Computer CoverUp
External Disk Drive Cover $4.
Imagewriter (II) Cover $8.
Mac (Plus) & Keyboard (two covers) $10.

Diversions
Underware Ribbon (iron-on black transfer) $9.
Multi-color Transfer Ribbon $19.
ColorPack (includes Colorpens) $19.

I/O Design
Imagewriter II (imagewriter II carry case) $59.
Macinware Plus (Mac Plus carry case) $69.

Innovative Concepts
Flip & File Micro (holds 25 disks) $9.
Flip & File (holds 40 disks) $18.

Innovative Technologies
The Pocket Pak (holds 6 disks) $10.
The Essel (holds 20 disks) $15.
The Disc Servoctry (holds 32 disks) $18.
The Library (carousel, holds 90 disks) $29.

Kalmar Designs
Teakwood Roll-top Case (holds 45 disks) $15.
Teakwood Roll-top Case (holds 90 disks) $22.

Magnum
Mouse Mover (let your mouse ride) $14.

Moustak
Moustrak Paddle (standard 7" x 9") $8.
Moustrak Paddle (large 9" x 11") $11.

Ribbons Unlimited
Imagewriter Black or Color Ribbons $5.
Imagewriter Ribbons Six Pack $25.

Smith & Bellovs
Mahogany Disk Case (holds 90 disks) $28.

Our Policy
We accept VISA and MASTERCARD.
No surcharge added for credit card orders.
Your card is not charged until we ship.
If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
No sales tax.
All U.S. shipments insured; no additional charge.
APO/FPO orders usually shipped 1st Class Mail.
Allow 1 week for personal and company checks to clear.
UPS Next-Day-Air available.
COD max. $1000. Cash or certified check.
120 day limited warranty on all products.
To order, call us anytime Monday through Friday 9:00 to 5:30. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30.

Shipping
Note: Accounts on net terms pay actual shipping.
Continental US: For printers and drives add 2% for UPS ground shipping (call for UPS Blue or UPS Next-Day-Air). For all other items, add $2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. Hawaii: For printers and drives, actual UPS/Blue charge will be added. For all other items, add $2 per order. Alaska and U.S. Overseas: Call 603/446-7711 for information.

Note on Disks:
Sony 3½" Disks (box of 10) $15.
MAXELL 3½" Disks (box of 10) $15.
Verbatim 3½" Disks (box of 10) $16.
Full 3½" Disks (box of 10) $16.
3M 3½" Disks (box of 10) $16.

Double-sided Diskettes
Sony 3½" Disks (box of 10) $23.
MAXELL 3½" Disks (box of 10) $23.
Verbatim 3½" Disks (box of 10) $24.
Full 3½" Disks (box of 10) $24.
3M 3½" Disks (box of 10) $25.
Dinner At Eight-Silver Palette Bundle ........ $59.
Satori ... NCP
BulkMailer (mailing lists) ................. 75.
BulkMailer Plus (up to 90,000 names) .... 225.
Legal Billing (attorneys to accountants) ... 389.
Project Billing (architects to engineers) ... 449.
Silicon Beach Software ... NCP
Accessory Pak 1 (useful utilities) ........... 21.
Silicon Press (printer utility, 512k) ......... 42.
SuperPaint (advanced graphics program) .... 55.
Simon & Schuster ... NCP
Mac Art Department (req. Paint program) ... 24.
Typing Tutor III (learn to type) ............. 35.
SoftStyle ... NCP
Colorcomer Art (Colorcomer images) ....... 29.
Colorcomer (color printing utility) ......... 49.
Laserstart (Hewlett-Packard Laserjet) ....... 59.
Decision Map (make better decisions, CP) .... 79.
Software Discoveries ... NCP
Record Holder (data manager) ............. 42.
Software Ventures ... NCP
Microphone (communications) ............. 59.
Solutions, Inc ... NCP
SmartSketch & The Clipper ............... 45.
Glue 'n' Lines "print to disk" capability .... 48.
Softview
MacInTax (Federal income tax prep) ....... 69.
MacInTax (California supplement) ......... 29.
Springboard
Art a la Mac Vol. 1-People & Places ........ 23.
Art a la Mac Vol. 2-Variety Pack (NCP) .... 23.
Easy as ABC (ages 3-6, internal) ........... 29.
Early Games (ages 2-6, counting, CP) ....... 29.
State of the Art ... CP
Electric Checkbook (print checks) ......... 29.
Survivor Software ... NCP
MacMoney (financial planner) ............. 45.
Symmetry ... NCP
Acta (outlining/writing desk accessory) ... 39.
PictureBase (clip art manager, 512k) ....... 45.
T/Maker ... NCP
ClickArt Personal Graphics ............. 29.
ClickArt Effects ................................ 29.
ClickArt Publications ....................... 29.
ClickArt Letters Vol. 1 or Vol. 2 ........... 29.
ClickArt Holidays (Easter) ............... 29.
ClickArt Business Image .................... 29.
Bombay, Plymouth, or Seville Laser font .... 59.
Write Now (word processor) ............. 119.
Target Software ... NCP
Merriam Webster's Thesaurus ............. 29.
MacLightening (interactive spell checker) .. 53.
Medical or Legal Dictionary .............. 53.
Voilà! (desk accessory outline) ............ 53.

MacConnection Special of the Month through April 30, 1987
DOVE COMPUTER
MacSnap Memory Upgrades
Designed for either a 512k Mac, or a MacPlus, MacSnap memory upgrades offer "greater productivity." Several models are available. all 100% compatible with your Mac's operating system and the new Apple ROMs.
- up to 60% increase in performance
- easy installation, no soldering required
- full one year warranty
- includes a RAM disk, and Apple's Switcher™
MacSnap 524 (512k to 1MB) ........ 149.
MacSnap 548 (512k to 2MB) ........ 399.
MacSnap Plus 2 (MacPlus to 2MB) .... 269.
This is a partial listing. Please call for additional MacSnap specials.

Tuttle Software ... CP
Business Filevision (512k, external drive) ... 199.
Think Educational ... CP
MacEdge II or Mind Over Mac ............. 28.
Think Technologies ... NCP
LaserSpeed (Laserwriter utility) ........... 69.
Lightspeed Pascal (includes debuggers) .... 89.
Lightspeed C (top-rated C Compiler) .... 129.
TML Systems ... NCP
TML Source Code Library ............ 59.
TML Pascal (compiler, req. 512k) ........ 69.
TrueBasic ... NCP
True BASIC (fast, flexible & portable) .... 89.
TrueSTAT (statistics) .................... 59.
Runtime (create stand-alone applications) .... 59.
Unicorn ... CP
Animal Kingdom (ages 6-12) ............. 29.
Deluxe Decision (math, ages 9 and up) ...... 29.
Fraction Action (arcade style math game) ... 29.
Mac Robots (pre-school program) ....... 29.
Math Wizard (math games, ages 5-10) .... 29.
Read-A-Rama (reading, ages 5-8) ....... 35.
William & Maclans ... NCP
myDiskLabeler (design & print labels) ... 25.
myDiskLabeler w/LaserWriter (req. ImageWriter II) .... 34.
myDiskLabeler w/LaserWriter option .... 39.

GAMES
Acolade ... CP
Hardball (baseball simulation) .......... 27.
Activation ... CP
Championship Soccer League Baseball .... 22.
Mind Shadow (Who am I?) ....... 27.
Hacker (you're on your own!) ............ 27.
Hacker-2 (break Russian computer) ...... 30.
Borrowed Time (murder mystery) ....... 27.
Shanghai (Mah Jongg strategy) .......... 27.
Alter Egg (male or female version) ....... 36.
Addison-Wesley ... CP
Puppy Love (your dog will love it) ...... 15.
Ann Arbor Software ... CP
Grid Wars (3D graphic arcade) .......... 22.
Artwork ... CP
Bridge 4.0 (sharpen your skills) ....... 21.
Avalon Hill ... CP
MacPro Football (req. 512k) .............. 32.
Blue Chip ... CP
Millionaire (stock market) ............. 35.
Tycoon (commodities) .................... 35.
Baron (real estate) ........... 35.
Squire (personal finance, req. 512k) .... 35.
Broderbund Software ... CP
Lode Runner (over 150 levels) ......... 24.
Ancient Art of War (military strategy) .... 27.
Toy Shop (create working models) ....... 39.
Bulleye ... CP
Ferrari Grand Prix (Formula One racing) . 35.
Pokker TriPlane Flight Simulator .......... 35.
Electronic Arts ... CP
Archon (arcade strategy, req. 512k) ..... 27.
Super Soccer (3D graphics) .............. 27.
One on One/Dr. J vs Birdy Rice (req. 512k) .... 27.
Patton-vs-Rommel (req. 512k) ........... 27.
Pinball Construction Set .............. 27.
Epyx ... CP
Rogue (strategy dungeon classic) ....... 29.
Temple of Ahsa (4 levels) .............. 24.
Winter Games (olympic events) ......... 27.
Hayden Software ... CP
Perplex (scramble-type game) .......... 24.
Sargon III (9 levels of chess) ........... 29.
Infinity Software ... CP
Grand Slam (tennis, req. 512k) ....... 28.
Infocom ... CP
Simmelng (expert) ..................... 29.
Invisibles (hint booklets) .... each 6.

1-800/Mac&Lisa 690C

MacConnection, 14 Mill Street, Marlboro, NH 03456 800/622-5472 603/446-7711

©Copyright 1987 PC Connection, Inc. MacConnection is a division of PC Connection, Inc. MacConnection is a trademark of PC Connection, Inc.

All items subject to availability. Prices subject to change without notice.

*Defective software replaced immediately. Defective hardware replaced or repaired at our discretion. Some items have warranties up to five years.
Special Report

Macintosh II: Opening to the Future

Apple introduces a high-performance Macintosh and charts a course for the open sea
by David Usbija

Start small, then expand. Apple has taken a sound business practice and applied it to the Macintosh. For years, Mac owners have wondered if Apple would ever deliver a Macintosh with a large color screen, more powerful graphics and sound capabilities, and, most of all, slots that would give owners the freedom to expand their machines. Even without these amenities, the Macintosh has established
Special Report: Macintosh II

TJie Mac II Development Team—1
The Mac II's designers: (back row, from left to right) Michael Blanchard, Bruce Lee, Dave Wilson; (front row) Dave Turnbull, Jennifer Weinstein, Ralph Pastor, Mark Lenticzner.

First Look
When you first see the Macintosh II, you'll wonder whether it's really a Macintosh. The machine breaks out of the Mac mold in favor of the more traditional approach—the familiar compact cabinet is gone, and in its place is a handsomely designed base unit and monitor whose sculpturing resembles that of the Apple IIGS. Unfortunately, the base unit leaves a LaserWriter-size footprint, making its presence sorely felt on your desktop.

Because the Mac II sacrifices a small footprint for more space inside the cabinet, it overcomes one of the limitations of its predecessors: internal disk storage. While earlier machines had no provision for a second floppy drive and only limited space for internal hard drives, you can configure the Mac II with either a second 3.5-inch 800K floppy disk drive or an internal 20-, 40-, or 80-megabyte hard disk from Apple. Of course, you can still add external SCSI drives, and with the existing drives from third-party companies, there will be plenty of disk drives to choose from.

Under the Hood
The Macintosh II, powered by a Motorola 68020 running at 16 megahertz, comes standard with the Motorola 68881 floating-point coprocessor. In addition, you get 1MB of RAM, an internal 800K floppy drive, and six expansion slots that conform to the NuBus standard (see "Looking at the NuBus"). To configure a minimal system, you must add a keyboard—you can now choose from two—and a color or monochrome video card and monitor. The video card plugs into the NuBus, so you can add various color or monochrome cards and displays from third-party manufacturers, as well as from Apple. Beyond that, you can add hard disk storage, memory, and NuBus cards from third-party manufacturers (see "Filling The Slots" in this issue).

With previous Macintosh models, your choices were limited; with the Macintosh II, however, you can choose from an abundance of options. You can configure a minimal system with a monochrome display and floppy disk storage for under $4300; or, for under $6000, you can build a color hard disk system that will rival the performance of color workstations costing twice as much.

Horsepower to Spare
Immediately after you press the power switch on the keyboard, you get a tantalizing preview of the goodies to come. The start-up sound I heard could have passed for a chord played by a steel drum quartet. (Apple engineers had not decided on a final sound.) The new machine produces stereo sound with amazing clarity; and the machine I used sounded all the more impressive with the addition of two Bose speakers attached to the stereo sound port.

After a few seconds of wondering whether this was a Macintosh or an entirely different animal, I saw the familiar start-up screen followed by the desktop. With all that has changed on the Mac II, it's somehow comforting to know that it is still a Mac at heart. Even the desktop is basically unchanged from its previous incarnation.

Although you can run Apple's UNIX System V operating system (A/UX) or the familiar Mac operating system on the Mac II, you can't run them at the same time (see "An Open Forum" in this issue). Apple foresees a separate market for engineers, scientists, designers, universities, programmers, and businesses that need a standard UNIX workstation, while the majority of users will opt for the familiar Mac operating system.

The new Mac I ran had a preliminary version of a revised Finder and System, although they differed little from the Mac Plus Finder and System. The Trash Can bulges when you throw something in it, and the hands of the watch spin while you are waiting—though Apple engineers said that the software shipped with the machine might not implement the spinning hands. The Mac II's Finder menus underwent only minor changes: the Shut Down command now turns the machine off and a Restart command has the same effect as pressing the programmer's Reset switch on a Mac Plus. Also, Cleanup Selection and Cleanup Window commands have been added to the Special menu.
Looking at the NuBus

The NuBus, first developed at the Massachusetts Institute of Technology, was later used by Western Digital in the Nu-Machine. Subsequently, Texas Instruments incorporated the NuBus into its Explorer artificial intelligence workstation. Representatives from Texas Instruments, MIT, AT&T, and Apple, among others, formed a committee to standardize the bus under the auspices of the Institute of Electrical and Electronic Engineers (IEEE). The NuBus used in the Mac II is actually slightly different from the specification developed by the IEEE Microprocessor Standards Committee.

Exploring the Bus
The NuBus was designed to transfer information, in the form of electrical signals, between elements of a computer system like the CPU, memory, and various controllers. NuBus signals travel synchronously at a rate of up to 10 megahertz. The bus consists of 96 signal lines, including 32 bits of address and data, utility, and control lines, as well as power and ground signals.

One of the strengths of the NuBus is that it defines simple rules, called the bus protocol, by which up to 16 boards, or devices, can coexist on the bus. Apple chose to include only 6 slots in the Mac II.

Unlike boards for the IBM PC expansion bus, the boards you plug into the NuBus slots do not require any address jumpers. In fact, each board includes a configuration ROM that contains information, such as an initialization program and device drivers. The system reads the contents of the configuration ROM and installs the board automatically when you turn on the machine.

Since only one device, called the bus master, can control the bus at any one time, the boards vie for control of the bus through a scheme called bus arbitration. Unlike other bus arbitration methods, the NuBus gives each device a fair chance to become the bus master. Even the Mac II's CPU vies for control of the bus just like any of the six NuBus devices. Because the Mac II's NuBus was designed to coordinate the operations of up to seven processors, including the 68020 on the motherboard, very powerful systems can be built by combining cards with processors dedicated to functions like communications, graphics, and array processing.

Slots, Super Slots, and the NuBus
Each NuBus card can access the full 4 gigabytes of memory, including the Mac II's program and system RAM. In addition, a NuBus master can control any of the Mac's peripherals: the SCSI port or the AppleTalk or modem port, for example.

The Mac's CPU communicates with the NuBus cards by reading and writing to and from memory locations that have been set aside specifically for the NuBus. When you are running Mac system software, the top 256MB of the 4-gigabyte address space bits, called slot space, are divided into 16 areas of 16MB each. In this mode, Mac software can only access 1MB of the six areas reserved for the Mac II's slots.

When the Mac runs 32-bit mode software, like UNIX, or when a NuBus card has control of the bus, a much larger area, called super slot space, is set aside for each of the six NuBus cards. Each super slot space contains 256MB.
The Mac Shows Its Colors

With the color machine powered up, the only major change you'll notice (and you'll have to look closely) is the small Apple icon displayed in color. Currently the Finder doesn't take full advantage of color. In December, Apple engineers were still finalizing guidelines for the use of color in menus and on the desktop. Until they reach a conclusion, the Finder you'll see on the Mac II will be black and white. However, because the Toolbox has been revamped for color, any application, including future versions of the Finder, can use color.

The Mac II's graphics display depends entirely on the video display card and monitor you choose. Using Apple's 4- or 8-bit color card, you can show off the Mac's screen graphics in either razor-sharp monochrome or color that is nearly photographic in quality (see "A Mac of a Different Color").

I saw several demonstrations of color images that had been digitized on a $15,000 color scanner and then processed on a VAX. Although the images were dithered, they were displayed with incredible clarity and accuracy.

And this is only the beginning. The Mac II's color drawing routines are capable of recording 32 bits per pixel (over 4 billion colors). Because the video card plugs into a NuBus slot, other manufacturers can produce their own cards, which could extend the Mac II's video capabilities to rival the best graphics displays and image processors available today.

Unlike the IBM PC, which can only run graphics applications written for the video card installed, the Mac II's color graphics applications need not know which video card is installed. This is what makes the new Mac so powerful: its color display system is totally independent of the application software.

A Competitive Performer

If you've ever wished for a Macintosh with more speed, you'll have fun keeping up with this one. After I opened a few windows and started two or three applications, the difference in performance was energizing. Windows snapped open and shut, menus responded instantly, and I could scroll through text and graphics documents much faster than I ever could on a Plus. The Macintosh II's 68020 CPU offers at least a fourfold increase in performance over the Mac Plus, and the 68881 coprocessor can implement applications that rely on numeric calculations up to 200 times as quickly. If you use three-dimensional graphics or other calculation-intensive applications, you'll have cause to celebrate.

The new CPU's increase in performance results from its ability to read 32 bits at a time—twice as many as the 68000—and the fact that it runs at twice the speed of the previous generation of Macs. In addition, the 68020 contains a built-in instruction cache, thereby storing 256 of the most recently used bytes in fast memory, and an efficient coprocessor interface that off-loads numeric calculations to the 68881 coprocessor and address translations to the 68851 Memory Management Unit.

The Mac II has the power and sophistication that until recently could only be found in a minicomputer or workstation.

Just for the sake of comparison, I ran a few standard benchmarks. Even though the machine I ran had a preliminary version of the system software, the results can give you an idea of the kind of performance to expect. I ran the Whetstone; a test that measures a machine's floating-point performance, the Dhrystone, an overall test consisting of a balanced mix of a CPU's instructions, and the sieve of Eratosthenes, a simple test using integer math, arrays, and branches. The results are shown in Figure 1. An alternative comparison would pit the Mac running UNIX against other machines running the same operating system, but that will have to wait until Apple releases its version of UNIX.

![Figure 1](image)

Benchmark comparison of the Macintosh Plus, the Macintosh SE, and the Macintosh II.
As a general test of the prototype Mac II's performance with existing applications, I ran Excel, Microsoft Word 1.05, and WriteNow 1.0. Apple claims that 95 percent of the existing Mac applications will run on the Mac II. A few programs, like MacWrite, will not, because they don't use the 68020's TRAP instructions properly. Games like Microsoft's Flight Simulator directly access the Mac's hardware and, as would be expected, won't run. However, the premature state of the system software made accurate compatibility testing impossible.

Room to Accelerate

Having plenty of horsepower does you no good without the room to run at full speed. Unlike the previous Macs' video RAM, the Mac II's is separate from the memory area where programs run. As a result, the CPU spends more of its time executing programs—it doesn't have to wait for the video-refresh circuitry to repaint the screen.

(continues)

UNIX Comes to the Mac

Never before has Apple sold and supported a nonproprietary operating system for any of its computers. That will change this summer when Apple starts shipping UNIX for the Macintosh II. Apple's A/UX UNIX conforms to System V, version 2, with many of the Berkeley 4.2 extensions added.

Apple also gives UNIX programmers access to the Mac's User Interface Toolbox, a feature that will encourage developers to write Mac-like applications for UNIX. Other enhancements that Apple has made include provisions for configuring the system on the Macintosh II and recovering files after system crashes.

Equipped with a NuBus Ethernet card, the Mac II will be able to connect to Ethernet networks. To further encourage the use of the machine in standard networking environments, Apple has added the Network File System protocol developed by Sun Microsystems, which lets the Mac II share files stored on over 35 other manufacturers' machines.

Apple's intent is to provide a UNIX that runs on the Mac II and completely adheres to industry standards. The product is aimed at users who need UNIX's multitasking environment, strong communications and networking capabilities, and the abundant software development tools that are available. Although Apple's UNIX will manage up to 16 users, the company expects the machine to be used more as a powerful single-user UNIX workstation than as a multiuser system with "dumb" terminals attached.

Apple doesn't foresee A/UX replacing the Macintosh operating system. In fact, although UNIX is a multitasking operating system, you won't be able to run Macintosh applications as UNIX tasks. You will have to restart the Macintosh II in order to switch between the Mac's graphic user interface and the command-line interface employed by UNIX. A minimal single-user UNIX requires the 68851 PMMU, 2 megabytes of RAM, and a 40-megabyte hard disk. Apple recommends 5 megabytes of RAM and an 80-megabyte hard disk for a workable system.—Lon Poole
A Mac of a Different Color

Part of the excitement of the Mac II is its color graphics. Apart from its ability to display beautiful "ray cast" images generated on Apple's new Cray computer, the Mac II has surprisingly powerful graphics capabilities of its own.

What's on the Card
At present Apple offers a single graphics card, capable of supporting color and black-and-white displays. The card addresses 640 horizontal and 480 vertical pixels and operates with the number of bit planes selected by the user: 1, 2, 4, and (if an additional 256K of RAM has been added by the dealer or user) 8 bits. In color mode, then, the card may display black and white or 4, 16, or 256 colors simultaneously. Similarly, in monochrome mode the card may display black and white or 4, 16, or 256 shades of gray. The memory upgrades come in the form of eight 256-kilobit dynamic RAMs (DRAMs), which may be added by the dealer or by the user. The different modes of memory operation are selected in the color chooser (its name was still undetermined at press time) in the Apple menu.

The color chooser will incorporate functions that allow users to mix hue (the choice of a primary color), value (the mixture of primary colors), and chroma (the brightness or grayness of a color). The color chooser will also allow users to create and store palettes of color of their own choosing. The accompanying photograph demonstrates the range of 256 colors that may be selected and displayed from 16 million available colors.

Besides the half-megabyte of memory that can fit on the card, one chip is of particular interest—the custom graphics chip designed by Apple. The graphics chip and two separate timing crystals allow the video card to run in two modes: the interlaced mode, in which the electron gun of the CRT redraws the entire screen 30 times per second (like standard television), and the non-interlaced mode (similar to the Macintosh, which redraws the entire screen 70-plus times per second). By selecting the interlaced mode, users will be able to drive video screens and displays that accept RGB or RS-170A signals.

At present it is not possible to drive devices such as video cassette recorders or commercial televisions (those that use NTSC—North American Television Standards Commission—signals) directly from the Mac II. Rather, Apple hopes that third parties will supply the cards that will condition the electronic signals for "sync" and "gen-lock" requirements of commercial television. In fact, at present Apple supplies only two color monitors that can be operated with the video card: a 12-inch Sony monochrome display (capable of gray scale) and a 13-inch Sony color monitor (capable of both color and gray scale).

Use of color presents special needs, so software designers have developed two new data structures to handle them: color patterns and Pix Maps. Color patterns define the dither, or color combinations, available with color QuickDraw. They are particularly effective because 4 bits of memory, for
example, can simulate 125 colors, and 8 bits can simulate 256 colors. In short, the Mac II can display more color with less memory than a similarly equipped IBM PC, which at 4 bits of memory has only 16 colors to display. You have to press your nose close to the screen to see that colors are dithered and not displayed in continuous tones, as with color television.

Pix Map is a bit-map extension that describes how pixels are stored. When Pix Map commands are used, other routines, such as Copy Bits, may be applied to multiple bit planes with a single command. Again, the result is more graphics capability from less memory.

It's Smart, but Is It Fast?
As with previous Macintoshes, the computer's microprocessor processes all graphics functions. The video card supports screen display memory, color, bus arbitration/communications, and alternate video operation modes. This approach diverges from that taken by many "high-performance" graphics cards, such as those supplied for IBM PC-family computers, which have their own graphics microprocessors (see "The Graphic Mac," Macworld, November 1986).

Apple defends the decision to burden the microprocessor with all graphics functions, pointing out that the Mac Plus already performs well in areas like drawing speed, even when compared with an IBM PC AT and an IBM-supplied graphics card.

It remains to be seen, however, whether graphics applications, such as mechanical design or animation, will be able to wring sufficient speed from the processor, given all the tasks it must handle. Should secondary processors be supplied for graphics, the high capacity of the NuBus will prove advantageous. Moreover, developers will not be able to rush in with a surfeit of graphics accelerators, as they did in the IBM market, because of the need to adhere to Macintosh resources, and because much of color QuickDraw has been incorporated into 125K of a 256K proprietary ROM. Certainly for graphic arts, some image processing, and paint applications, the existing graphics card is far ahead of any products supplied by IBM for its market. —Jerry Borrell

Sunset in Color
Apple's video card enables the Mac II to display images in 16 or 256 colors. The original image from which these screens were computed was digitized using 24 bits of color information per pixel. The top photo was created by replacing each pixel in the original image with the nearest matching pixel chosen from one of 16 colors. The bottom image was created in a similar fashion, using 256 colors.

Dithering for Effect
Although a Mac II equipped with Apple's video card can display up to 256 colors, a technique called dithering, in which neighboring pixels alternate between two available colors, creates the illusion of many more.

GRAPhICS BY MIKE POTEL AND JIM RAYNO

Macworld 135
Naturally, the new Mac's memory is expandable. The Mac II lets you expand RAM by adding Single In-line Memory Modules (SIMMs) like those used in the Plus. You can insert up to eight SIMMs into the Mac II's motherboard. The standard base unit comes with four 256K SIMMs, totaling 1MB of RAM; a second bank of four SIMM sockets is empty. You can expand memory to 2MB by adding four more 256K SIMMs. Apple expects 1-megabit RAM chips to be available in quantity in late 1987. At that time you'll be able to purchase the base unit with 4MB and plug in four more 1MB SIMMs to get a total of 8MB on the main board. Apple predicts that as higher-density chips become available, you'll be able to plug in 4MB and 16MB SIMMs that will let you put up to 64MB and 128MB, respectively, on the main board, although Apple's marketers don't foresee the higher-density chips being available until at least 1990.

If you need to go beyond 8MB, the NuBus expansion slots will let you add 1MB per slot when running the Macintosh system software. NuBus memory cards will be available from third parties like AST Research, but because of the NuBus address restrictions with the standard Macintosh system, most cards will be designed to run with software that uses 32-bit addressing, for example, the UNIX operating system.

SCSI Inside and Out
Apple has not forsaken the SCSI port it introduced on the Mac Plus. In fact, Apple engineers claim that the SCSI port, still the primary connection for peripherals like hard disks and tape drives, now transfers information about three times faster than the Plus's CII port. The Mac II's SCSI port reportedly transfers over 1MB per second; the Mac Plus transfers only 320K per second. The major difference is the addition of hardware handshaking. Whereas earlier SCSI implementations required the CPU to access the SCSI controller continually when transferring blocks of data to and from a SCSI disk, the Mac II's implementation synchronizes the CPU with the SCSI controller. During what are called blind reads or blind writes, (operations that quickly transfer blocks of data between the Mac's memory and a SCSI disk drive), the CPU accesses the SCSI controller only when the chip is ready to transfer data, thereby avoiding unnecessary CPU activity.

The Mac II's internal hard disk drive attaches to an internal SCSI connector. You can also connect up to six more SCSI peripherals via the SCSI connector on the back panel. The floppy drives connect internally to two disk drive connectors; however, because the connectors are not brought out to the rear panel of the machine, you can no longer attach external floppy drives.

The Integrated Woz Machine (IWM)
used in earlier machines still controls the built-in floppy drives. But the revised IWM will be able to read 1.6 MB floppy drives when 1.6 MB drives become available.

Peripheral Expansion and Networking

In adding new features to the Mac II, Apple hasn't broken with the Mac's peripheral past. The Mac II still offers the same modem and printer ports for connecting existing serial devices. The only change to the two ports is the addition of a new signal on a previously unused pin. The signal can be used on either port to receive a modem's carrier-direct input, or on the modem port as an external clock signal from a synchronous modem.

The Mac II's AppleTalk implementation has not changed beyond the addition of several new AppleTalk protocols in ROM. According to Apple engineers, the Mac II is compatible with existing AppleTalk hardware and software.

Since the AppleTalk protocol is not tied to the Mac's serial port—the serial port, or physical layer, is independent of the message-passing and connection-oriented protocols of higher layers—AppleTalk programs will be able to take advantage of other AppleTalk devices attached to the NuBus.

By plugging a network card into the NuBus, you will be able to replace AppleTalk's physical layer with a higher-performance layer like Ethernet. Doing so will allow AppleTalk software to take advantage of Ethernet's 10-megabit-per-second transfer rate. AppleTalk normally transfers only 230.4 kilobits per second. The implications will be important, particularly for college and university environments or office-networked machines where, because of the number of networked machines and the heavy communications traffic, users demand a higher throughput than the Mac's built-in printer port can provide.

Also, equipped with a communications board, the Mac II can act as a bridge between a local AppleTalk network and a larger, area-wide network like Ethernet or IBM's Token-Ring network.

Dueling Keyboards

The Mac II now offers a choice of two keyboards, both of which connect to the Mac via the Apple Desktop Bus (ADB) introduced with the Apple IIGS. You can choose from the standard 81-key unit, which resembles the Apple IIGS keyboard, or an expanded 105-key unit, which includes 15 function keys, a 10-key numeric keypad, and a T-shaped cursor pad.

The ADB, a low-speed serial communications bus, lets you connect up to 16 devices to the Mac II. Currently only the Mac II's keyboard and mouse attach to the ADB, but you can just as easily attach other devices: graphics tablets, trackballs, and speech input devices, for example. Any devices that attach to the Mac II's ADB should work with the Apple IIgs.

Both the keyboard and the mouse attach to the ADB connectors at the rear of the machine. Alternatively, the mouse can plug into the keyboard. Each device that connects to the ADB has its own microprocessor so that it can send and receive messages to and from the Mac II's CPU.

Music to Compute By

Although the Mac II can't match the 16-voice harmony of the Apple IIgs, it plays a fairly mean tune with its four built-in voices. The Mac II's sound capabilities are based on a custom sound chip designed by Apple's engineers. The Apple Sound Chip (ASC) contains two 1K sound buffers that allow sounds to be played independently of the Mac II's CPU. The ASC feeds two Sony sound chips that handle the filtering and amplification. If you listen through headphones or attach a stereo amplifier or external speakers, you get an unusually clean stereo sound.

The key to controlling the Mac II's sound is a Toolbox routine called Sound Manager. Just as QuickDraw contains drawing commands that insulate the application program from the graphics hardware, so the Sound Manager insulates sound applications from the sound hardware. Programs that use the Sound Manager will be able to take advantage of NuBus sound cards with no modifications. In fact, musicians and audiophiles will undoubtedly add advanced-function sound boards to give the Mac II professional-quality sound capabilities.

Images that had been digitized on a color scanner were displayed with incredible clarity.

Network Options

For the first time, Mac users will be able to plug in an Ethernet card (left) to send AppleTalk messages over Ethernet. IBM PC users can connect to AppleTalk via Ethernet or the AppleTalk PC card (right).
The Sound Manager controls four types of sounds, produced with the built-in sound synthesizers. Note synthesizers can play a melody made up of single notes. Wave Table synthesizers play more complex sounds based on a sound stored in a wave table. MIDI synthesizers allow the Mac II to control a musical synthesizer through a MIDI adapter connected to either of the Mac II’s serial ports. Finally, the Sampled Sound synthesizer can play pre-recorded sounds stored on disk files. Unlike previous Macs, the Mac II can play a sound continuously from a sound file stored on disk while the CPU runs another application.

**Mapping Out Memory**
The Mac II’s CPU can address 256 times more memory than the CPU in previous Macs. The 68020, with its 32 address lines, directly addresses up to 4 gigabytes (4,294,967,296 bytes). The 68000 used in the previous Macs has only 24 address lines and addresses only 16MB.

The Mac II accommodates two addressing schemes. When you run the Macintosh system software, the Mac II runs as if the 68020 were sending out 24-bit addresses. When you run the UNIX operating system, the Mac uses all 32 bits, and programs can address the full 4 gigabytes of memory.

**Behind the Mac II**
Looking at the rear panel you see (left to right) the power switch, sound port, Apple Desktop Bus connectors, printer port, modem port, external SCSI port, openings for six NuBus cards, and AC power connectors.

**Dueling Keyboards**
The 81-key Eastwood keyboard (front) has the power switch on top and a 10-key numeric keypad. The 105-key Saratoga keyboard also features 15 function keys and a separate cursor-control keypad.

To allow existing programs to run on the Mac II, and new system software, such as UNIX, to utilize the larger memory space, the Mac II will accept one of two memory-management chips: the H-Memory Management Unit (HMMU) or the Paged-Memory Management Unit (PMMU).

The HMMU or PMMU sits between the CPU and the rest of the Mac II’s internal bus (see “Looking Inside the Mac II”). It translates the addresses from the CPU, which are called logical addresses, into 32-bit physical addresses. The Mac II’s main memory, the NuBus, and peripheral controllers like the SCSI and the disk port look at the physical address. Therefore, it is the Memory Management Unit, not the application program, that controls actual access to the physical portions of the Mac II’s hardware.

If you’re going to run the Macintosh system software, you’ll install the HMMU in the base unit. The HMMU translates the lower 24 bits of the 68020’s addresses into 32-bit addresses that correspond to the standard Macintosh memory areas (see “Mapping the New to the Old”). Software can also direct the HMMU to pass all 32 bits onto the Mac II’s internal bus.

The PMMU operates in either a 24-bit or a 32-bit address mode, so that the Mac II can run Macintosh system software as well as UNIX. If you are going to run the UNIX operating system, you must install the PMMU. Because UNIX divides memory into separate areas called pages, many of which may reside on a hard disk, it requires the PMMU to translate the logical addresses from the CPU into physical memory addresses, which correspond to individual pages. Pages that are not in physical memory are loaded into RAM from disk as needed. Future multitasking software for the Macintosh system would also require the PMMU.

It is interesting to note that should the Mac’s CPU ever be upgraded to the 68030, the software written for the PMMU would be compatible, since the 68030 contains the PMMU on the chip.

**System Software**
Despite all its new features, the Mac II doesn’t abandon its software heritage. Though the Mac II comes with a new version of the System file and Finder, unless
Looking inside the Mac II

The 68020 CPU and the 68881 coprocessor communicate via 32-bit address and data buses. The MMU translates the CPU’s logical addresses into physical addresses for RAM, ROM, the NuBus, and the 8-bit input and output controllers.
Special Report: Macintosh II

Mapping the New to the Old
The HMMU or PMMU maps the 24-bit logical addresses into 32-bit physical addresses when the Mac system software is running. This allows existing Mac software to use the 4-gigabyte address space of the Mac II.
you run the machine in 32-bit address mode, it still runs most of the existing Mac software.

The key to the Mac II's compatibility with its predecessors is, of course, the Toolbox—routines stored in ROM. The Mac II now contains 256K of ROM space, twice as much as the Mac Plus has.

The Mac II's Toolbox contains all the routines the previous 128K ROM contained plus provisions for coloring Mac applications and managing devices that reside in the NuBus slots. In addition to a color QuickDraw, the ROM contains new versions of

- Control Manager, which lets programmers use colored dialog boxes and other controls;
- Window Manager, which allows applications to display color windows;
- Menu Manager, which can add color to menus; and
- Text Edit, which lets applications incorporate colored fonts.

To manage the NuBus cards properly, the ROM now contains a new Start Manager and a Slot Manager; even the Device Manager has undergone changes. When you first turn the machine on, the Start Manager tests the Mac II's hardware, then looks for the start-up device. You select the start-up device, a NuBus card or disk drive, from the Control Panel. The Slot Manager uses the Device Manager to read in the resources stored on the NuBus card's configuration ROM. This may be a driver or start-up code. Additionally, the Device Manager can route information to a NuBus card.

The Standard Apple Numerics Environment (SANE), also in the ROM, has been completely rewritten for the 68881 coprocessor and is ten times faster than previous versions. Math operations that previously relied upon SANE routines now are routed to the math coprocessor. Programs compiled with tools like Apple's MPW assembler and Pascal, Consulair's 68020 C compiler, or Absoft's 68020 Fortran run even faster, since they access the 68881 directly (see "New Ways to a Faster Mac," Macworld, August 1986).

The Mac II's ROM also contains code for the AppleTalk, Session, and Echo protocols, as well as the recently defined AppleTalk Filing Protocol. The routines for the ADB also reside in the ROM. Whatever space is left is filled with foreign-language fonts and other resources, depending on the localized version of the machine shipped.

Developers can take the machine in a thousand different directions.

One to Grow On

Continuity has been the hallmark of the most successful computers. Mainframes like IBM's System 370, as well as personal computers like the IBM PC and the Apple II, owe their longevity to their ties with a series of machines that offered users a range of performance options without abandoning the growing base of existing software.

The Macintosh II now gives the Macintosh user room to grow. Mac Plus and Mac SE owners looking for a higher-performance alternative will have no doubt turn to the Mac II. And they can do so without sacrificing their existing software.

The Macintosh II will appeal to users needing more power than previous models can offer. Graphic designers will benefit from the Mac II's color and improved displays. Scientists, engineers, and business users will revel in the Mac II's processing power and expansive memory.

The one feature the Mac II doesn't offer is the ability to run more than one application simultaneously while using the current Macintosh system software. By adding intelligent NuBus cards, however, you may be able to download files from another computer or print a document in the background. And although UNIX provides a multiuser and multitasking environment of its own, currently you can't run Mac applications under UNIX.

Perhaps the most significant addition to the Mac II is the NuBus. Because Apple finally opened up the machine, developers can take it in a thousand directions, something that Apple alone could not do. The NuBus's simple yet powerful approach to coprocessing will pave the way for much more powerful and complex add-on products. The beauty of it all is that any added complexity will be hidden behind the familiar Macintosh interface.

For details about new Apple products, see your local Apple dealer.
The Mac's New Face
The Macintosh SE measures 13.6 inches high, 9.6 inches wide, and 10.9 inches deep. It weighs 17 to 21 pounds, depending on which disk drives are installed internally.
More than a Plus

Apple redesigns the Plus and adds expandability and a hard disk to its mainstay

by Lon Poole

At first glance, the Macintosh SE looks like a restyled Mac Plus. Both machines have the same compact footprint, are light enough to be carried from place to place, and have an integrated floppy disk drive and a 9-inch black-and-white display screen (see “The Mac’s New Face”). A closer look reveals some substantial differences between the two machines. The Macintosh SE has space for a second internal disk drive, no battery compartment, a repositioned power socket, an access door on the back panel, and Apple Desktop Bus (ADB) connectors for keyboard and mouse. All these new features are symptoms of major interior design changes.

In fact, the only elements the Macintosh SE and the Mac Plus have in common are the display screen and the 800K internal floppy disk drive. The logic circuits, analog circuits, and power supply are all new (see “The SE Revealed”). In addition, the Macintosh SE uses the new 85-keyswitch or 105-keyswitch ADB keyboard and the ADB mouse.

Microprocessor and Memory

One vital component retained from the Mac Plus is the MC68000 microprocessor, still running at the same 7.8336-megahertz clock frequency. The Macintosh SE logic board, like its Mac Plus counterpart, has no socket for a 68881 numerics coprocessor.

A standard Macintosh SE has 1 megabyte of RAM on four Mac Plus-style SIMMs (Single In-line Memory Modules). Dealers and stouthearted users can increase Macintosh SE or Mac Plus RAM capacity to 2-, 2.5-, or 4- MB by snapping out standard SIMMs and snapping in high-capacity SIMMs, such as those in Apple’s 2MB memory upgrade kit (see “Macintosh SE Memory Configuration”). SIMMs must be removed or replaced in pairs on both the Macintosh SE and the Mac Plus.

ROM capacity is 256K on a Macintosh SE, twice that of a Mac Plus. The Macintosh Toolbox (the programming that implements graphic user-interface ob-
Behind the SE
The back panel of the Mac SE includes (from left to right) the Apple Desktop Bus connectors, the external disk drive port, the SCSI port, the printer port, the modem port, and the speaker jack. The cutout at the upper left can be removed to mount connectors from internal plug-in boards.

The SE Revealed
A look inside a Macintosh SE shows it has an all-new logic board, analog board, and power supply. Only the picture tube and the floppy disk drive are the same as those on a Mac Plus.

Two Ways to Expand
You can expand the Mac SE by adding memory via SIMMs (left) or by connecting an internally mounted board to the SE’s 96-pin expansion connector (shown at the top right of the SE’s motherboard).

Special Report: More than a Plus

Macintosh SE Memory Configuration
The Macintosh SE has two banks of two SIMMs on the main logic board. Each bank may have 0, 0.5, or 2MB.

Connections
On the back panel of a Macintosh SE are two RS-422/RS-232 serial ports, a disk drive port, a SCSI port, and a speaker jack, all like the ones on a Mac Plus. Two ADB connectors on the back panel replace the Mac Plus mouse port and the keyboard jack. In addition, the Macintosh SE has a second internal floppy disk drive connector and an internal SCSI connector to accommodate a second internal disk drive.

The SCSI interface on the Macintosh SE transfers data 1.75 to 2 times faster than the one on the Mac Plus. A number of factors contribute to the speedup. For one, the SCSI driver program in the Macintosh SE ROM has been rewritten for speed instead of space considerations. Also, the SCSI controller hardware now provides a working hardware handshake that permits graceful recovery in the event of an error at the maximum data-transfer rate. Additionally, more microprocessor time is now available for nonvideo tasks. The microprocessor spends half its time on video tasks with a Mac Plus but only one quarter with a Macintosh II. The increased efficiency arises from circuit re-design and parts consolidation. A new VLSI (Very Large Scale Integration) ASIC (Application Specific In-
An integrated Circuit) chip in the Macintosh SE, called a gate array, replaces 19 chips in the Mac Plus and makes the difference.

The Macintosh SE has another important feature that the Mac Plus doesn't, namely, an internal 96-pin connector that gives expansion card developers direct access to the 68000. This connector makes it easy to install an accelerator card with a numerics coprocessor even a card containing the faster 68020 microprocessor used in the Macintosh II.

Card developers also plan to market other types of expansion cards, such as internal modems, external video, and MS-DOS coprocessors (see “Filling the Slots” in this issue). Expansion cards that require outside connections can pass cables or mount sockets in an access door on the back panel. Installing expansion cards on the 96-pin connector does not void the Apple warranty or AppleCare maintenance contract.

**Power Supply**

An expansion card and an internal disk drive both require power, so the Macintosh SE has a newly designed 80-watt power supply. It works on 120 or 240 volts AC from 47 to 63 Hz. Unfortunately, it generates enough heat to require forced-air cooling from a thermostatically controlled, variable-speed fan.

A lithium battery on the main Macintosh SE logic board keeps the SE clock and parameter memory alive for about seven years.

**Disk Drives**

Every Macintosh SE has at least one internal drive that handles 3½-inch 800K floppy disks and also has room for a second internal disk drive—either another floppy or a 20MB SCSI hard disk drive. Note that the Macintosh SE is the only Macintosh that can have three floppy disk drives—two internal and one external.

The floppy disk controller, called the IWM (Integrated Woz Machine), is clocked at twice the Mac Plus speed (now 16 MHz), to accommodate higher-capacity (1.6MB) floppy disk drives in the future. Furthermore, the IWM is socketed to facilitate future changes.

**Performance and Compatibility**

We couldn’t spend much time with a Macintosh SE, so a complete performance evaluation will have to wait for a formal review. The Macintosh SE seems to be perceptibly faster than a Mac Plus, but not by an order of magnitude. Several benchmark programs corroborate this impression (see Figure 1 in “Macintosh II: Opening to the Future”). Apple claims its tests show that the Macintosh SE is 97 percent compatible with Mac Plus software. None of the applications we tried failed. We successfully ran WriteNow for Macintosh, Microsoft Excel, Microsoft Flight Simulator, and MacWrite 4.5, though we didn’t have time to use any of the applications extensively.

For details about new Apple products, see your local Apple dealer.
Special Report

An Open Forum

Apple brings color and power to the Macintosh line with a host of offerings

by Lon Poole

The wait is over. After months of speculation and anticipation, Apple has announced two machines and over 25 new products that it hopes will propel the Macintosh family into the forefront of the personal workstation market. The new machines have filled out the Macintosh line, which now offers a broad spectrum of performance and features while maintaining compatibility with existing Macintosh software.

The big news is the Macintosh II, a machine that combines color with expansion slots. There's also a completely reworked version of the Mac Plus called the Macintosh SE. Apple will simultaneously ship 15 localized versions of the Macintosh SE and the Macintosh II with interfaces and documentation in ten languages: English, French, German, Spanish, Flemish, Norwegian, Japanese, Dutch, Swedish, and Italian.

To support the two new computers and the unchanged Mac Plus and Mac 512K Enhanced, Apple is introducing seven new disk drives, a tape drive, two display screens and a video adapter, two new keyboards, three memory upgrades, and upgrades of the System file and the Finder. Several other new products provide varying levels of compatibility with the MS/DOS operating system. Apple also says it will sell and support a non-Macintosh operating system, UNIX, for the Macintosh II.
Macintosh SE
The Macintosh SE retains the familiar integrated configuration of the Mac Plus but has new styling and completely redesigned electronics. It uses the Motorola 68000 microprocessor, comes with 1 megabyte of RAM and 256K of ROM, and has a universal power supply. Inside the machine are a single expansion slot and sockets for two internal floppy disk drives or one internal floppy and an internal 20-megabyte SCSI hard disk. External connections are the same as the Mac Plus's, except that the keyboard and mouse now attach to the Apple Desktop Bus (ADB), a simple serial communications bus originally introduced on the Apple II GS (see "More than a Plus" in this issue).

Macintosh II
The Macintosh II features more expandability, speed, and sound than any other Macintosh model and breaks new ground by offering color. The system unit houses a Motorola 68020 microprocessor, an optional 68881 numerics coprocessor, an optional 68851 memory manager, 1 to 8 megabytes of RAM, 256K to 512K of ROM, and a universal power supply. A custom digital sound chip provides 4-voice stereo sound through a small internal speaker, external "Walkman"-style stereo headphones, or an external amplifier and speakers. There's room inside the system unit for one or two internal floppy disk drives, a 20- to 80-megabyte SCSI hard disk drive, and six expansion cards. Expansion cards use the NuBus archi-
Monitors on Display

Two monitors for the Mac II. The 13-inch color RGB monitor (left) displays 69 dots per inch. The 12-inch monochrome monitor (right) displays 76 dots per inch.

The new keyboards connect to the Mac SE or Mac II via the ADB. The ADB is a simple local area network used for connecting the computer to up to 16 low-speed devices such as a keyboard, a mouse, a graphics tablet, and a bar-code reader. Each device may be connected directly to an ADB socket on the computer or daisy-chained to another ADB device.

**Upgrades**

Apple has always tried to provide an upgrade path when bringing out a new model of an existing computer, but clearly there is no way to upgrade a Macintosh to a Macintosh II. And while it may seem that Mac Plus could be upgraded to Macintosh SE, that is also impossible. The Macintosh SE's interior components are so different that only the screen, disk drive, and SIMMs from a Plus could be reused. Everything else would have to be replaced, even the case. Therefore "upgrading" to a Macintosh SE or Macintosh II means selling your existing Mac and buying the complete new model.

If you do trade up, chances are good that your application programs and peripherals will work on your new Mac. Apple has tried hard to make every member of the Macintosh family fully compatible with earlier versions of the Mac. Of course, third-party software and hardware are more likely to work, especially on a Macintosh II, if they follow Apple's guidelines. Not all manufacturers follow the rules, however, so expect a period of adjustment while they update their products to work with the new machines.

**Disk and Tape Drives**

During the last year, third-party developers have shipped more than three dozen different disk drives and tape drives for the Macintosh. Now Apple joins the free-for-all with seven more disk drives and a tape drive of its own. You can get a second internal 800K floppy disk drive from Apple for either the Macintosh SE or the Macintosh II.

Internal SCSI hard drives include a 20-megabyte model for the Macintosh SE or the Macintosh II, and 40- and 80-megabyte models for the Macintosh II. In addition, Apple now offers 40- and 80-megabyte external SCSI hard disk drives. These and the Apple HD-20SC, introduced last fall, work with any Mac that has a SCSI port.

For hard disk backup, you can use Apple's 40-megabyte SCSI tape drive. The removable tape cartridges are also convenient for transporting as well as distributing multiple megabytes of information.

**MS-DOS Compatibility**

More than a year ago, Apple president John Sculley announced Apple's intention to provide IBM PC and MS-DOS compatibility for the Macintosh. Apple and third parties have now announced several products designed to make that compatibility a reality. The elements necessary for sharing files, disks, and printers...
among MS-DOS and Macintosh machines over local area networks have been available from third parties for some time. Apple has now added its long-awaited AppleTalk card for IBM PCs.

The next level of MS-DOS compatibility is supplied by several new Apple products. A 5¼-inch floppy disk drive and controller permit direct loading and saving of MS-DOS files from the Finder or other Macintosh applications. A few Macintosh applications can directly load or save files formatted for MS-DOS applications. In addition, Apple is providing a file conversion application, Passport.

The final level of compatibility makes it possible to run MS-DOS applications on a Macintosh SE or Macintosh II. Apple supplies the keyboard and the disk drive, while third parties provide coprocessor cards and software that runs MS-DOS applications in a Macintosh window. (For more information on third-party products, see “Filling the Slots” in this issue.)

Apple also announced file transfer software for use with the Mac when it is emulating an IBM 3270 terminal, a terminal commonly used with IBM mainframe computers.

System File and ROM
The System file and ROM have been changed in order to support new hardware, improve performance, and provide new features. The Macintosh SE and Macintosh II both have 256K of ROM with similar though not identical content. Both include all the Macintosh Toolbox routines, except for the List Manager and International packages, in some of the additional memory. Some system resources have been moved from the System file to the new ROMs, including the 9- and 12-point sizes of the Geneva and Monaco fonts.

The new ROMs also contain extensive interactive diagnostic tests. With these diagnostics, a repair technician can quickly and accurately troubleshoot an ailing Mac from another Mac via the serial ports. These programs use about 160K of the 256K ROMs; the remaining space is used differently on the Macintosh SE and the Macintosh II. (See “Macintosh II: Opening to the Future” in this issue for details.)

A new version of the System file is now being shipped with the Macintosh SE, and an even newer version will be distributed when the Macintosh II is shipped. The new System file may retrofit other Macintosh models with some of the Macintosh SE ROM changes. However, complete retrofitting would use significant amounts of the System Heap area of RAM, which could cause some applications to fail. At press time, Apple had not decided which ROM changes to include with the new System file. New System files should work with all Macintosh models except the 128K Mac.

Toolbox Improvements
Several of the Toolbox routines in the new Macintosh ROM have been improved. Standard text editing that uses the TextEdit routines now includes style information. Text that was formerly limited to a single font, size, and style can now incorporate a variety of fonts, sizes, styles, and colors (on the Macintosh II). In addition, the Clipboard can now retain those text attributes when you cut, copy, and paste text between applications. However, applications must include some method for choosing mixed text attributes, or be revised to take advantage of this new capability; otherwise, they will still limit each text block to a single font, size, style, and color.

The AppleTalk local area network now has echo, session, filing, and data-stream protocols. These enhancements were announced in January along with Apple’s file server.

QuickDraw has been rewritten for Macintosh II color. It adjusts itself to the screen size, number of colors available, resolution in pixels per inch, and so on, enabling applications to run regardless of the type of video card or monitor installed. The new QuickDraw supports the original QuickDraw method for specify-

Reading MS-DOS
Apple’s 5¼-inch disk drive and controller allow the Mac II to read and write MS-DOS files directly from the Finder or an application. The Passport software will provide file conversion between different file formats.

Matched Pair
Apple’s Tape Backup 40SC stores up to 38.5 MB on a single DC2000 tape cartridge. The Apple HD40SC can locate a track in an average of 30 milliseconds. Both drives connect to the SCSI port on a Mac Plus, a Mac SE, or a Mac II.
**New Finder**
The latest version of the Finder has restyled Info windows; three variations of the Clean Up command, a new Restart command, and a modified Shut Down command. The Trash icon also shows whether there's anything in the trash.

**Control Panel 3.0**
The latest version of the Control Panel desk accessory is modular. You choose the module whose settings you want to change by selecting an icon at the left side of the window.

The Macintosh II has more computing power than any Macintosh before it, but it can handle only a limited number of devices. The Macintosh SE and Macintosh II broaden the Macintosh family to provide four distinct levels of power, flexibility, and cost. At $1699, the Mac 512K Enhanced is the low-cost, entry-level machine. Another $500 buys the flexibility of a SCSI port and the power of more memory in a Mac Plus. Both of these models will continue to be available as long as there is demand for them.

**Finder**
Many observers in the Mac community had hoped to see a new type of application launcher and file utility from Apple by now; one that would permit running more than one application concurrently (perhaps based on Andy Hertzfeld's *Servant*). But for now, Apple is only refining the familiar Finder (see "New Finder"). For multitasking, you'll have to use UNIX on the Macintosh II.

In the new Finder's Special menu, the original Shut Down command is replaced by a Reset command. A new Shut Down command helps you switch off a machine connected to a hard disk. On a Macintosh II, the Shut Down command now turns the power off. On a Macintosh SE or Plus, a dialog box appears telling you when you may safely turn the power off.

The Clean Up command in the new Finder's Special menu has three variations. You may clean up a selected group of icons, leaving other icons alone; you may clean up icons on the desktop; or you may clean up all icons in the active window.

When you choose Get Info from the File menu, a redesigned information window is displayed. This command also tiles information windows so you can see two at once. And the Trash icon changes shape when you drag items into it, visually indicating that it's not empty.

**Control Panel and Chooser**
Apple has redesigned the Control Panel desk accessory. It is now modular, since some peripherals and accessory cards may have settings you can change. On a system with more than one hard disk attached, for example, you can now designate which will be the start-up disk. All settings from Control Panel version 2.0 are included except the keyboard, mouse, and AppleTalk settings (see "Control Panel 3.0"). Keyboard and mouse settings now reside in two separate modules, while AppleTalk settings have been moved to the Chooser desk accessory. The first version of the Control Panel included menu blinking, time, and date settings, all of which are in Control Panel 3.0.

A new Chooser desk accessory was introduced with the file server in January 1987. The new Chooser can handle more than six devices. If more than six devices are present, you scroll through a list of icons to select them.
Each member of the Macintosh family provides a different balance of power, flexibility, and cost. For maximum performance and flexibility where price is no concern, a Macintosh II is the clear choice. A Macintosh SE may be your best bet if you only need to expand in one direction and want to keep costs down. If you don’t care about expansion but do need lots of memory applications such as page layout or database, you may not need to spend more than the price of a Mac Plus. The lowest-priced Mac, the Mac 512K Enhanced, still has plenty of power for writing, filing, drawing, and communications. No matter which Mac you pick, the Macintosh technology is the same. You get the same graphic user interface, what-you-see-is-what-you-get display, and consistency between applications on all models.

For details about new Apple products, see your local Apple dealer.
Filling the Slots

A survey of new products for the Mac SE and Mac II

by Daniel Farber

The introduction of the Macintosh SE and the Macintosh II has developers rushing to fill the slotted gaps and other ports of entry with expansion cards and peripheral devices. Several types of cards are in various stages of development by third parties, including video display cards that allow you to hook up a variety of monitors; communications cards that provide modems, terminal emulators, or processors for supporting networks such as Ethernet; coprocessor cards that let you run MS-DOS applications on the Mac; multifunction cards with coprocessors; and memory for printer spooling and other tasks. High-capacity hard disks, display monitors, and input devices such as graphics tablets will also proliferate, along with new and revised software applications that take advantage of the Mac SE and II hardware.

The open Mac finally dispels the notion that Apple computers do not belong on the desktops of corporate America. Big business is now looking at the Macintosh family of computers as a legitimate alternative to the IBM standard. The best evidence supporting this view is the steady stream of established vendors from the IBM PC world joining the ranks of Mac developers to take advantage of the Apple's upgraded status among the Fortune 1000 companies. For example, AutoDesk, whose AutoCAD package dominates the IBM PC CAD market, is reportedly developing products for the new Macs. And WordPerfect, the most popular word processing program for the IBM PC, is being released in a version that will run on the new Macs.

The product descriptions that follow represent only the products announced at press time. As other products become available for the Mac SE and II, we'll keep you up to date.

The Mac SE Enhanced

Although the Mac SE cannot use Mac II cards (unless they're connected through a NuBus expansion chassis), the machine's expansion connector supports a wide spectrum of products. Several types of boards will vie for the SE's single expansion connector. The SE begs for an upgrade to the Mac II's faster 68020 microprocessor, with options for the floating-point 68881 coprocessor. A number of companies are developing accelerator boards that connect to the system expansion connector, as desktop publishing, engineering, and graphics applications for the Mac can all benefit from the speed gained by installing an accelerator board. Developers are also adding multiple features to the boards to maximize use of the SE's single expansion connector.

AST Research, a major vendor of add-on boards for the IBM PC, has developed the MacPak, an accelerator board with a 68020, a 68881, and 1 megabyte of RAM. AST offers two options for the MacPak board. The first provides an SCC (serial communications controller) chip with two AppleTalk connectors and a floppy disk controller for a 5¼- or 3½-inch disk drive. The other option is a video-display adapter that allows you to hook up high-resolution, large-screen monitors to the SE.

Levco, the leading vendor of 68020 upgrades for the original Mac, has introduced the Levco Prime, which includes the 68020 and the 68881 with 1-, 2-, or 4MB of memory. Optional features include the 68851 coprocessor for memory management and a high-speed SCSI port with a DMA (direct memory access) controller. Levco also plans to provide an optional video-display adapter.

Radius has incorporated the Radius Full Page Display (FPD) and a high-performance 68020 on a single board. The Radius accelerator is unique in offering a high-speed data cache to supplement the on-chip instruction cache of the 32-bit 68020. The high-speed (40 nanosecond) static RAM cache allows the 68020 to run with no-wait states when accessing the cache, thus providing high performance with existing memory. The board also has an option for the 68881 coprocessor. A version of the Radius accelerator that's compati-
Special Report: Filling the Slots

ble with the Mac Plus and Mac 512K Enhanced will be available to owners of those machines, and current FPD owners will receive a discount.

SuperMac Technologies is planning a 68020 and 68881 upgrade board for the SE, as well as Mac-Memory and Dove Computer.

Another way to expand the capabilities of the SE is to use an expansion chassis. The external device provides a NuBus and expansion slots so that you can use Mac II cards on the SE. Adding a NuBus to the SE will be an expensive but still very appealing option as an upgrade path. Several companies are expected to begin work on such a product.

MS-DOS Coprocessors

Some people consider MS-DOS compatibility critical to the Mac's success in big business. To that end, Apple commissioned Phoenix Technologies to develop coprocessor cards that let the Mac emulate the 8086 and 80286 (similar to a 6-MHz IBM AT with Hercules II monochrome and color graphics adapters) MS-DOS environments. MS-DOS applications will share all peripheral and I/O services of the Mac II, and the MS-DOS file system will be mapped onto the Mac's Hierarchical File System (HFS). Apple will probably line up an independent company with experience in the MS-DOS world to market and support the cards, but at press time a marketing decision had not yet been made.

Dayna Communications has developed an MS-DOS coprocessor that can be used with the Mac SE. Dayna's MacCharlie provided an MS-DOS environment on the original Mac. The company's new product is an IBM AT-class file server running MS-DOS that connects to AppleTalk. The unit contains an 80286 coprocessor and eight expansion slots with the full AT-style bus. The coprocessing device, which is designed to lower the cost of MS-DOS compatibility, also works with the Mac Plus and the 512K Enhanced. The company plans to support Ethernet with a future version of the product.

Although the ability to run IBM PC applications on the Mac is an important part of Apple's overall strategy, it's more political than practical. Running MS-DOS programs on the Mac will save space on the desktop, but applications like Lotus's 1-2-3 can't take advantage of the Mac's graphics and user interface. Rather than turn the Mac into a PC clone, it would be more economical to transfer 1-2-3 files into Excel or Jazz and thus also receive the benefits of the Mac interface. Programs like TOPS, MacLink Plus, and PassPort, plus hardware like 5¼-inch drives and Dayna's FT100, already provide adequate media and file-transfer compatibility solutions.

Communications Cards

The architecture of the new Macs, especially the II, allows the Mac to be easily connected to various networks and function as a workstation, a file server, or a terminal emulator. Several companies are developing networking cards for the most prominent networks: Ethernet, StarLAN, Token-Ring, TOP, and MAP. Kinetics has developed an Ethernet card for the SE that connects to the expansion connector. If you need the slot for an accelerator or video board, you can connect to the network via the company's Ether-SC, an external device that provides a direct line between the Mac's SCSI port and Ethernet networks. Lutzky Baird plans to introduce an Ethernet card for the SE, and 3Com has introduced one for the Mac II. Dove Computer also plans to develop an Ethernet card. Think Technologies is developing a Token-Ring card that runs AppleTalk, and Touch Communications is working on TOP (Technical Office Protocol) and MAP (Manufacturing Automation Protocol) for the Mac II.

Running AppleTalk under UNIX networks on the Mac II taxes the resources of the 68020. AST has developed the ICP (Intelligent Communications Processor), which can relieve that burden. The card includes a 68000 coprocessor and a half-megabyte of RAM, and it provides four additional serial ports for the Mac II. In addition, the AST ICP lets you run multiple AppleTalk networks and uses direct memory access (DMA), which improves the throughput over AppleTalk. AST is offering the X.25 protocol—which allows local-to-wide-area network communications—as a software op-
tion. Eicon Technology is providing an AppleTalk-to-\textit{X.25} protocol on a card for the Mac II. Reach Technologies has developed an AppleTalk server card for the II. The card includes two 68000 coprocessors for handling the disk I/O and file management tasks plus up to 4MB of memory.

Modem cards and terminal emulators will also find a home in the Macintosh SE and II. SuperMac Technology will offer 1200-baud and 2400-baud modem cards for the two machines, and Hayes will undoubtedly develop smart modems for the new Macs. Tri-Data's Network 1000, a gateway box for AppleTalk with 3274 and 3278 emulation, can be adapted to work on the Mac SE and to take advantage of full-screen color terminal emulation on the Mac II. In the fall AST expects to ship a 3278/5251 emulation card for the SE and the II. The 3278/5251 includes both twin axial and coaxial connections on a single card. In addition, Avatar is developing terminal emulation products for the new machines.

**Memory**

Most memory upgrades will be SIMM modules placed on the motherboard. Because the Mac operating system can't address more than 1MB of RAM per NuBus card, most of the RAM will exist on the motherboard. However, NuBus memory cards for UNIX will be available, especially since UNIX requires 1.5- to 2.5MB for the kernel alone on the Mac. AST, for example, offers the RM4, a 4MB memory card consisting of 256K chips, with a full 32-bit interface. When 1-megabit chips become available at reasonable prices, AST plans to upgrade the board with 8MB of SIMM memory. Laser spooling, which allows you to print in the background, is another feature that could be included on a memory card.

**Video Cards and New Screens**

A wide range of high-resolution, large-screen monitors will be available for the new machines. Existing large-screen monitors—the Radius FPD, E-Machines' The Big Picture, and Micrographic Images' MegaScreen—have been upgraded to work with the Mac SE. Since the SE has only one slot, the video-display hardware has been combined with the accelerator board to improve performance for graphic-intensive applications, as in the Radius accelerator board. Color capability for the SE will become an option, just as on the original Macs. Boards with graphics coprocessors for the SE will allow you to work in color on a separate monitor, similar to Computer Friends' SuperChroma system.

For the Mac II, SuperMac Technology is developing two color cards. One provides 480- by 640-dot-per-inch resolution with up to 8 bits per pixel, while the other provides 1024 by 768 resolution with up to 8 bits per pixel. SuperMac also has a card for high-resolution black-and-white monitors, providing from 480 by 640 to 1024 by 768 resolution (with 1 bit per pixel) for use with the Mac II or the SE. Micrographic Images is also working on a high-resolution color display card. AST is developing a video card with 640 by 480 resolution and 8 bits per pixel, similar to Apple's video card. In addition, AST will offer an 8-bit-per-pixel video digitizer, which grabs a video image and puts it into memory at high resolution. Video cards with 16-, 24-, and 32-bit planes for high-resolution color monitors are a
Great Expectations

Most software developed for the Mac Plus (and earlier versions that follow the user interface guidelines) should not only run on the SE, but should run faster on it than on the Mac Plus. Applications that run on the II or an upgraded SE will run much faster if they exploit the 68020 coprocessor. Obviously, the faster processor speed and expanded memory will improve the performance of applications and allow for more ambitious programs, such as sophisticated image-processing software and integrated, multiuser office applications. Existing products will be enhanced so that they can take advantage of the new capabilities. Cricket Graph and More, for example, have already been modified to run in color on the Mac II. New programs will be developed for the Mac, such as graphics, engineering programs, business simulations, and applications that run under UNIX.

We can expect to see new applications ported from the IBM PC environment in specialized areas such as law and real estate, as well as general applications like spreadsheets and project management. Some of the big names in the MS-DOS world will challenge the Exceis and Microsoft Words of the Macintosh world, using the new Macs as a platform.

Speed enhancements, scanners, and large high-resolution screens that support both color and black-and-white with gray scaling will improve the overall performance of desktop publishing systems. In addition to the new features that megabytes of memory can buy, existing Mac desktop publishing programs and UNIX-based electronic publishing programs like Interleaf may be adapted to run on the Mac II.

And of course, graphics software will offer more precision, larger arrays, floating-point calculations, color, and faster imaging. The new Macs will also bring about advances in programming tools. Sophisticated hardware debuggers, in-circuit emulators, hardware probes, and source code debuggers for languages like C and Pascal will undoubtedly be developed by companies like Think Technologies and Consular. Existing program-development tools like Steve Jaski's MacNosy and ICOM Simulation's TMIG have been retooled and enhanced for the 68020 and new ROM, and other programming tools are bound to follow in their wake.

In the area of sound applications, the Mac II has the power to become a professional recording tool. Companies like Southworth and Opcode are customizing existing products for the 68020 and Apple's sound chips. The Mac II works as a synthesizer as well as a sequencer, playing out through the machine's sound channels as well as through a MIDI adapter connected to the printer or modem port. Various types of interface boards that provide processing assistance and interface to more than two MIDI devices will soon be developed.

The UNIX operating system also presents a host of possibilities. Lutzky Baird is porting its UNIX-based processor to the Apple's UNIX environment. The system will use the Mac II as a UNIX file server. And Eurosoft International is adapting its Macintosh-style UNIX front end, MacNIX, for Apple's command-line-oriented UNIX implementation.

The potential use of the Mac II's color, animation, and independent sound-processing features for games is likely to make current Mac games seem primitive. Although most developers may not view the Mac II as an appropriate vehicle for selling games, a few enterprising entrepreneurs are sure to provide some thrills and chills on the Mac II.
priority for the Mac II, especially for producing high-quality color graphics. Many of the major IBM developers have expressed interest in providing video cards, but first they will have to learn the intricacies of the Mac's user interface Toolbox.

**Data Acquisition**

The Mac II is an ideal machine for laboratory research that involves data acquisition and control. National Instruments has developed a four-channel DMA card, which includes the company's GPIB-Mac interface. The multiple channels allow you to link to other cards on the NuBus. National Instruments is also planning to offer a 12-bit analog-to-digital conversion card with 16 input channels, 2 output channels, digital-to-analog conversion, digital I/O, and a timing function. In addition, the company plans to introduce a multi-channel digital-to-analog card, a digital I/O card, and a low-cost GPIB card.

**Hard Disk and Input Devices**

The new machines will be used in businesses and research facilities, where several users share data and applications. Medium- and high-capacity hard disks, ranging from 40MB to a gigabyte, and optical storage devices will be available. Adon, AST, Corvus, DCC, General Computer, Iomega, LoDown, MacMemory, MDldeas, Mirror, PeachFree, Reach, Rodine, SuperMac Technology, Univation, Western Computer, Whisper, Xebec, and other hard disk manufacturers are producing medium- and high-capacity internal and external hard disks and tape drives for the new machines. Digitizing scanners from Abaton, AST, Datacopy, Dest, and Microtek will work with the new machines. In addition, Matrix Software has introduced a color-camera interface for producing slides from the Mac screen.

The Apple Desktop Bus (ADB) paves the way for a variety of input devices. Graphics tablets, mice, trackballs, alternative keyboards, bar-code readers, and joysticks connect to the Mac via the ADB. And most important for game lovers, multiple-player games are now possible on the Mac; the ADB lets you attach two or more mice or joysticks for real arcade-style action.

Apple's optional 105-keyswitch detachable keyboard will not be the only IBM-style keyboard. Datadesk, which coincidentally developed Apple's keyboard, has introduced the Turbo-ADB keyboard, which, like Apple's keyboard, includes 15 function keys. Applications like Microsoft Word 3.0 that have several levels of keyboard shortcuts can make extensive use of the keyboard's function keys. The Turbo-ADB comes with a software utility for creating and assigning macro functions to any Macintosh application, thereby reducing keystrokes and mouse movement.

**A Look Ahead**

Hardware and software developers are always pushing the technological envelope, and the new Macs present some interesting challenges and new standards. Presently, all SE accelerator boards put the 68000 to sleep, because no protocol like the NuBus exists for two CPUs sharing the same address, data, and other bus lines. But the next generation of accelerator boards will turn the SE into a dual-processor machine—the 68020 will take charge, while the 68000 functions as an I/O processor. Intelligent peripheral cards will improve the machines' performance. Including a processor like a 68000 or even an 8-bit processor on a communications or graphics card, for instance, makes it possible to off-load some I/O tasks and improve performance. The Macintosh operating system is not a multitasking one, so a coprocessor could implement features like an intelligent modem or image processor that would work in the background. Also, DMA disk controllers will become common in intelligent peripheral cards. Specialized coprocessors for PostScript and QuickDraw that dramatically speed up printing and display will eventually become available.

To accommodate some vertical and scientific applications, enterprising developers will make chassis for buses such as VME and Multibus II. With the flexible ADB, the Mac now has potential as an input device for point-of-sale tasks and factory materials inventory planning. For example, convenience stores could use the Mac as a cash register or for monitoring and controlling gas pumps. In essence, the Mac has been given a license to go out into the world and solve problems in innovative ways. And it won't be going naked into the world: hundreds of hardware and software options will let you dress the Mac for almost any occasion.

For details about products mentioned here, contact the companies; see *Where to Buy* for phone numbers.
April Fooleries

An electronic jokester opens her trick bag of mostly public-domain pranks

by Erfert Nielson

I'm easily amused.

At least I used to be. Not so long ago, you could give me a whoopee cushion or a joy buzzer and I'd be ready for fun. But now that I'm more mature, and computer literate to boot, I'm above such sophomoric shenanigans. In the spirit of technological sophistication, I recently decided to transfer my practical joke collection to magnetic media. After hours of painstaking research, I filled an entire 800K disk with unusual utilities and weird hacks to give the rest of you jokers an idea of the entertaining software that's available.

Although the following collection includes a few commercial and shareware utilities, most of the programs described are in the public domain. If you have access to an on-line bulletin board or a Macintosh user group, you'll be able to put together your own disk of amusing applications.

The Start-up Scream

Normally when you turn on a Mac, the computer emits a cheery beep to indicate it's been switched on. Shortly thereafter, a little "happy face" Mac icon appears, followed by the message "Welcome to Macintosh," which is displayed for a few seconds while the system boots. Personally, I can't stand such an excess of cheerfulness first thing in the morning, before I've had a few cups of coffee. When I turn on my Mac, it emits a piercing shriek just after the beep, followed by a brief display of Edvard Munch's "The Scream."

The screen display is made possible by Bill Atkinson's ScreenMaker, a public domain application that lets you install a MacPaint illustration as the start-up screen—the picture that appears immediately after you insert a disk. You can alter the sound you hear while the disk is loading by using Fractal Software's Sound Init, a public domain utility that lets you play a digitized recording—vocal, musical, or other sound effects—when a disk is inserted. Another Fractal utility, Beep Init, replaces the double beep that sounds when you make an error, such as clicking outside a dialog box before you've entered the appropriate response. My favorite sound patch is a message that bears an eerie resemblance to the voice of HAL, the pathological computer from the movie 2001: "I'm sorry, Dave, I'm afraid I can't do that." A number of sounds are available on bulletin boards and user-group disks, but if you don't find the sound you're looking for—and you're willing to invest some time and money—MacNifty's Audio Digitizer, which includes Fractal's SoundCap software, allows you to record your own beep-replacement sounds.

A Personalized Desktop

Once you've started up with a bang (or a whimper), it would be anticlimactic to arrive at a drab desktop. Although the Mac's Control Panel lets you edit the desktop pattern (the background screen that appears when you insert a disk), it limits your editing options to patterns produced in an 8- by 8-pixel square. But don't let that stop you. With DeskScene, from PBI Software, you can make any MacPaint image the desktop background. Applications function as usual, but pushing aside a window reveals the desktop underneath. And DeskScene is easy to use. You simply select a MacPaint illustration (several are provided on the DeskScene disk, or you can draw your own or cull a drawing from a clip-art disk) and then select Install. The utility lets you replace one background with another customized one or with the "plain vanilla" desktop.

To further personalize the desktop, you can use Icon Switcher, another PBI utility. Icon Switcher lets you modify existing icons or create your own (see Figure 1). Icon Switcher customizes both application and document icons. You might want to re-
place the MacPaint application icon with an easel, for example, and the MacPaint document icon with an artfully rendered Campbell's soup can.

Let's Talk
Once you settle in for a hard day's work on your Mac, it's refreshing to receive an occasional visit from Talking Moose (see Figure 2). A popular public domain desk accessory by Steve Halls, the moose is a must for Macintosh monkeyshines. The moose itself is installed as a desk accessory; two additional files, Moose Phrases and Apple's MacinTalk speech driver, must be on disk before the moose can operate. When you select Talking Moose from the Apple menu, a dialog box appears with a number of options. You select speech settings, such as pitch and volume, and close the dialog box. Then, at a specified interval, an animated moose pops into the upper-left corner of the screen, uttering endearing comments like "You sure are funny looking when you're tired" or "That's quite a nose you have there!" I prefer to make the moose appear only rarely, causing the uninitiated to say sheepishly, "Um, a little moose just appeared on my screen, and said 'I could learn to love you,' then disappeared." After smiling condescendingly, I gently suggest that my unsuspecting victim take a short break.

If you tire of the moose's built-in phrases (and you soon will, since it has only thirty or so), you can use Moose Frazer, a public domain utility by Jan Eugenides, to add your own phrases. Moose Frazer conveniently accepts English phrases, sparing those of us who don't speak AppleTalk the agony of writing gibberish such as "AOR YUW6 STIHL DHEH7R#X" for "Are you still there?" The English-to-AppleTalk converter works pretty well but will occasionally mess up, for example, pronouncing "paste" as "past." Unfortunately, Moose Frazer doesn't allow you to remove a phrase in order to edit and replace it (what do you want for free?)

A distant relative of Talking Moose is TalkingKeys, a shareware desk accessory by Brady Graham. TalkingKeys, which also requires MacinTalk, has several options: selecting Say Letters causes the Mac to pronounce the appropriate letter aloud as each key is pressed (one of the program's functions is teaching young children the alphabet), while choosing Say Words causes each word you type to be spoken. TalkingKeys has a handy sideline probably unforeseen by its author; you can use it to test Talking Moose phrases before typing them into Moose Frazer. (Like many relatives, Talking Moose and TalkingKeys don't get along too well. I suggest rebooting before switching from one to the other to avoid a possible system crash.)

Cursors, Foiled Again!
A number of utilities alter various pointers, making for some humorous effects. Bouncy, for example, is a public domain desk accessory that causes the cursor to bounce crazily about the screen, making it almost impossible to catch. Select this one and ask an office mate to help you highlight some text with your new word processor. One of my favorite public domain applications is Bob Finch's MacWait, a subtle but enjoyable utility that makes the hands on the wristwatch pointer spin whenever the watch is displayed.

Screen savers for the Mac abound. These accessories blank the screen if the keyboard and mouse aren't touched for a given period of time, preventing unsightly screen burn-in. Therefore, if you drop dead at your desk working late one night, your screen saver will kick in, protecting your screen until someone discovers you in the morning and turns off the Mac. My favorite screen saver is Gone Fishin', a public domain desk accessory by Wade Blomgren. When you select Gone Fishin', the screen blacks out and a cursor appears in the shape of a pen. Use the pen to scrawl a message concerning your whereabouts, draw a picture, or simply doodle on the

Don't get paranoid if your Mac starts calling you "Dave" in the smoothly modulated tones of HAL, the disturbed master computer in 2001: A Space Odyssey—some joker has probably installed a file of HAL's voice in your system using Beep Init. Now, if the Mac starts warbling "Bicycle Built for Two," it may be time to get out the tool kit.

Figure 1
Two applications from PBI Software—Desk-Scene and Icon Switcher—allow you to customize your Mac's desktop with images from MacPaint.
screen while you’re talking on the phone. The accessory even provides an eraser in case you make a mistake. Press any key to return to your application.

Curiouser and Curiouser
Most software has at least one bug. As a small diversion, you might install the public domain desk accessory called The Bug. When The Bug is selected, a small beetle scurries up the screen. The more often you select The Bug, the more insects are unleashed. The creatures won’t interfere with the document being worked on, but they can be distracting. A more destructive form of vermin inhabits the desk accessory Crabs. When you choose Crabs from the Apple menu, a hoard of voracious crustaceans scuttles onto the screen and devours a document, menu bar and all (the pesky things even eat dialog boxes!). The crabs are finicky about one thing, though—they won’t eat the bugs (see Figure 3). Unfortunately, neither Crabs nor The Bug work on the Mac Plus.

After your entire spreadsheet has been chewed up by crabs, you might find it necessary to take a coffee break before beginning a new one. (You can retrieve saved documents, but you needn’t tell your supervisor that.) While you’re away from your desk, why not open Aquarium, a charming public-domain program that displays a lifelike fish swimming back and forth across the screen. If Aquarium doesn’t strike your fancy, you might prefer Gone Fisbin’.

When you return to your desk, perhaps you have some phone calls to make. If you’re like me, you can never remember what time it is in Brussels when it’s 3 p.m. local time. With Clock, a public-domain program by Mark Wall, you’ll never again have to consult time-zone charts. When you open Clock, a facsimile of a digital clock appears. You initially set the top location to your local time, then enter the number of hours difference (forward or backward) for each of the other five locations, which can be set to any cities you choose. Then, when you click one of the cities, the clock displays that area’s current time. (This application borders on the superfluous, but I like it, so I decided to include it anyway.)

If you’re occasionally nostalgic for the old days, before your office typing pool was replaced by a roomful of Mac-equipped knowledge workers, you’ll enjoy Typewriter, another public-domain sound utility from Fractal Software. When installed in a disk’s System file, Typewriter makes the Mac’s keyboard sound like an old-fashioned typewriter, complete with a “ka-chung!” each time you hit Return.

After a hard day of churning out practical jokes, your Mac (which, as we all know, lacks a fan) may become overheated. As a finale you can select Meltdown, an amusing public domain program that melts the entire screen into a puddle, oozing slowly to the bottom of the screen. This one has been known to cause quite a few double takes when viewed from a distance.

Musing on Amusing
While you may find many of these applications humorous for your own system, keep in mind that tampering with other people’s disks is a sin that ranks right up there with opening someone else’s mail. Some of the applications I’ve described occasionally cause crashes, which are decidedly unfunny, especially if a hard disk is involved. I suggest asking for a copy of a friend’s disk before “enhancing” it, calling your colleagues over to your Mac to observe strange phenomena, or simply installing strange accessories on your own Mac and letting people discover them at random. A little subtlety never hurts in the realm of practical jokes. Whichever method you choose for displaying your pranks, you’re bound to raise a few eyebrows. Have fun!

See Where to Buy for product details. □
Reviews

Two Minds in One

MindWrite 1.0
Word processor with integrated outlining.
Pros: Smooth integration of outlining tool and word processor; comprehensive searches; user-defined preferences; automatic table-of-contents generation. Cons: Retains no formatting for Microsoft Word files; restricted font sizes; unable to create multicolumn documents. List price: $125. Requires: 512K. Copy protection: None.

In recent months the veteran outliner ThinkTank has been joined by the more full-featured More and desk accessory outliner tools like Acta and Volta. As proficient as these products may be at creating outlines, each falls short when it comes to expanding an outline into a full-fledged document. The convenience of using an electronic outlining tool for writing projects diminishes when you have to alternate between the outline application and a word processor.

MindWrite, from MindWork Software, offers a solution to this problem by combining an impressive outlining tool with a moderately powerful word processor. The program operates in a single mode, allowing you to move freely between outline and document. You can convert a picture or a paragraph into a heading and change it back at any time. In fact, you can mix outlines and paragraphs within a single document. You can also insert graphics, but you can't wrap text around them. At present, MindWrite's word processor lacks such features as multiple columns, footnoting, mail merge, and spell-checking (although it works with MacLightning and Thunder). In saving and loading files, scrolling, and inserting and deleting words, MindWrite's performance on a Mac Plus is comparable to MacWrite 4.5, faster than Microsoft Word 1.05, but slower than WriteNow. On a 512K Mac the performance is slower than MacWrite.

Minding Your Windows
MindWrite's opening document window has specialized window-control buttons in its lower vertical scroll bar. The program permits you to keep multiple document windows open simultaneously, depending on how much memory your Mac has. You can also open several views of a single document or keep your entire outline in one window while you work on a section of the document in another window.

Each time you open a new document you can specify font, formatting, or viewing preferences. You can save a set of default preferences to be used on start-up, as well as alternate sets you can link to specific documents. The program also lets you create a Stationery template for any folder (in HFS), eliminating repetitive typing and setup.

MindWrite embellishes the standard Macintosh user interface. For example, an accumulating Clipboard enables you to save an unlimited number of text snippets; you can then selectively cut or copy material from the Clipboard back into your document. Another practical feature is discontiguous selection; MindWrite allows you to select many separate pieces of text throughout a document. You can then invoke format, search, or print commands for only those selected groups of text.

Changing Forms
To create an outline with MindWrite, you follow the same basic conventions as other Mac outlining applications—simply type your ideas in any order, then select...
and drag them into the outline using the mouse. Ideas of lesser importance are placed in deeper, subordinate levels; you can always reorganize topics together with their subordinates. As you create an outline, you can show or hide different subordinate ideas, keeping the salient points in perspective without viewing unnecessary detail.

MindWrite allows you to choose and show markings for headings as section numbers, bullets, or diamonds. However, these marks hang outside the outline's margin, and you cannot reformat them. If you move a heading with a section number, MindWrite instantly rennumbers the outline for on-screen review. You even can mix and match heading markers within a document, a feature that other outliners lack.

MindWrite offers several organizational aids for rearranging topics. You can sort selected headings, shuffle headings in random order, and rearrange items in any order you specify. The program automatically creates a table of contents for each document.

Borrowing a concept from MacWrite, MindWrite embeds format rulers within the document. Instead of inserting a new ruler for every format change, you can use one ruler to set parameters for each text level in a document. For example, a single ruler can format several indented tables with identical formats. This capability makes it easy to experiment with different formatting—change one ruler and those changes ripple through the document to all the other text governed by that ruler.

Like most word processors, MindWrite lets you search forward or backward, through all or selected text, for a whole or partial word. You can even choose to review passages that have changed since your last review. A correlative feature for quick reference lets you mark any portion of text with a bar at the left margin. The search command can even incorporate wild-card characters, to find and change text that contains patterns instead of absolute matches (for example, you can find all occurrences of a single word, whether it's spelled correctly or not).

MindWrite keeps statistics for each document. The Word Count command summarizes the number of characters, words, and paragraphs—an invaluable feature when you're writing to a predetermined length. By circumventing the Finder, the handy Launch feature saves time when you're switching between applications. The program directly reads and writes MacWrite files as well as ThinkTank outline files.

MindWrite is easy to learn and use. Whether you create an outline first or jump right into word processing, it doesn't interrupt your thought processes. The program performs best on a Mac Plus or 512K Enhanced. Although not as full-featured as Microsoft Word, MindWrite is a good choice if you prepare highly standardized documents like manufacturing plans, engineering specs, or legal papers, or if you want the combined power of an outliner and a word processor within a single application.—Keith Thompson

See Where to Buy for product details.
Turbo Pascal Arrives

Turbo Pascal 1.0

Borland International has a reputation in the CP/M and PC(MS)-DOS market for low-cost, functional Pascal compilers. With the introduction of Turbo Pascal, Borland now offers the same for the Macintosh. This long-awaited product gives programmers an extremely fast compiler with a built-in editor and linker.

Because Turbo Pascal is highly compatible with Lisa Pascal and MPW Pascal, Mac programmers can build on a large base of existing software. Students and hobbyists will want to use Turbo Pascal to compile and run textbook examples, which do not require a knowledge of Inside Macintosh. To run the basic Pascal programs found in textbooks, Turbo Pascal emulates a standard 80-character by 25-line terminal. Turbo's Console unit converts standard Pascal input and output statements for the Mac's bit-mapped screen. The Console unit can handle commands that position the cursor or clear the screen, such as GoToXY and ClearScreen.

For those who wish to write full-fledged Macintosh applications, Turbo Pascal provides complete access to the Macintosh ROM Toolbox. Turbo Pascal also includes TurtleGraphics, a collection of simple graphics routines that are easier to use than QuickDraw, though less flexible. And the package also includes Apple's RMaker, a resource compiler with carefully documented methods for creating desk accessories.

Turbo Pascal allows programmers to compile most Lisa Pascal programs, virtually without change. Turbo Pascal maintains source-level compatibility with Lisa Pascal in most situations, including compiler options. In terms of compatibility with Lisa Pascal, MPW Pascal gets an A+ (they are based on the same compiler), TML Pascal gets a B+, and both Lightspeed Pascal and Turbo Pascal get Bs. Although it is not mentioned in Turbo Pascal's documentation, Turbo Pascal and Lightspeed Pascal are almost completely compatible at the source level.

The differences between Turbo Pascal and Lisa Pascal are documented in the manual. Turbo Pascal has a slightly modified UNIT statement that ignores segmentation. Generalized function returns are not allowed (for example, you can't dereference FrontWindow and InfoScrap). The EXIT statement doesn't accept a parameter, and CONST expressions are not allowed.

Working with Turbo
Turbo Pascal's editor function is fairly standard, providing search and replace, cut, copy, paste, and so on. Two additional functions are Home, which returns you to the beginning of the file, and a command to scroll directly to the line containing the cursor.

The compiling and linking processes are exceptionally fast with Turbo Pascal (see "Compiled-Time Comparison"). When you create a program with Turbo, you have the option of compiling to RAM or to disk. If you compile to RAM and run the program, a message will appear in a dialog box when an error is found. If the error is in the source, you can click the Resume button and instantly return to the editor at the line containing the error (as long as the error doesn't destroy the program in memory). Turbo Pascal's debugging facilities are, for the most part, standard. You can either insert written statements to trace a program's execution, or you can run the MacsBug or TMON debugger programs. Turbo Pascal's ability to recover from most run-time errors greatly facilitates the debugging process.

The linking process is very fast. Any reference to a unit procedure or function links the entire unit with your program. Using programs I took from the literature or wrote myself, I ended up with larger programs in Turbo Pascal than in Lightspeed Pascal, MPW Pascal, or TML Pascal (see "Code-Size Comparison"). With small programs, this overhead is significant, but with larger programs it is negligible. The programs I compiled were MiniEdit by S. Chernicoff, FileDemo by C. Morgan, CatchMe by B. Perez (which I translated from C to Pascal), and HFSList by J. Halleck.

Turbo Pascal generates very efficient code, and the execution times for various

Execution-Speed Comparison

<table>
<thead>
<tr>
<th>Compiler</th>
<th>Progress Output</th>
<th>No Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightspeed Pascal</td>
<td>177 seconds</td>
<td>0.9 seconds</td>
</tr>
<tr>
<td>TML Pascal</td>
<td>22 seconds</td>
<td>0.8 seconds</td>
</tr>
<tr>
<td>MPW Pascal</td>
<td>25 seconds</td>
<td>0.9 seconds</td>
</tr>
<tr>
<td>Turbo Pascal</td>
<td>27 seconds</td>
<td>0.3 seconds</td>
</tr>
</tbody>
</table>

Code-Size Comparison

<table>
<thead>
<tr>
<th>Compiler</th>
<th>MiniEdit (S. Chernicoff)</th>
<th>CatchMe (B. Perez)</th>
<th>FileDemo (C. Morgan)</th>
<th>HFSList (J. Halleck)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightspeed Pascal 1.0</td>
<td>12,017</td>
<td>5156</td>
<td>8501</td>
<td>10,874</td>
</tr>
<tr>
<td>TML Pascal 2.0</td>
<td>10,611</td>
<td>3894</td>
<td>6809</td>
<td>4576</td>
</tr>
<tr>
<td>MPW Pascal 1.0B</td>
<td>11,102</td>
<td>4012</td>
<td>7017</td>
<td>6218</td>
</tr>
<tr>
<td>Turbo Pascal 1.0A</td>
<td>17,007</td>
<td>10,932</td>
<td>13,527</td>
<td>13,912</td>
</tr>
</tbody>
</table>

Code-Size Comparison

The amount of disk space (in bytes) that the final application will take up after being compiled and linked. MiniEdit and FileDemo are text editors with full Macintosh interface support. CatchMe is an icon chasing game. HFS List is a basic Pascal program that reads the directories on all mounted volumes and prints them (using writeln) to a file.
benchmarks, such as the Sieve of Eratosthenes (an array indexing and integer math benchmark) and the Towers of Hanoi (a test of recursive procedure calling), are consistently faster in Turbo Pascal than in any of the other compilers tested (see “Execution-Speed Comparison”).

Borland has a lot of experience in documenting compilers and languages, and it’s put to good use in Turbo Pascal’s 460-page manual. The manual’s style is informal without being silly, and the material is covered concisely. A good table of contents and index make it easy to find what you’re looking for. The manual first discusses the use of the editor, then the compiler. After the manual takes you through the logical progression of creating textbook programs, you learn about writing a Macintosh application, and about units and how to create and use them. The user’s guide includes a reference section and appendices that provide a comparison of Turbo Pascal with other Pascal dialects (primarily Lisa and American National Standard), a complete list of all compiler and run-time error messages, a summary of compiler options and unit interfaces, and a discussion of TurtleGraphics.

Borland’s Turbo Pascal is a quality product at a reasonable price. For those who wish to move programs from the MSDOS or UCSD Pascal worlds, Turbo Pascal has no equal. And for those who want to create stand-alone Macintosh applications, Turbo Pascal is very competitive and lower in price than all but TML Pascal (which is only $1 less). - Denis Cohen

See Where to Buy for product details.

Just Between Formats

Compiled-Time Comparison

<table>
<thead>
<tr>
<th>Product</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lightspeed Pascal</td>
<td>61 sec</td>
</tr>
<tr>
<td>TML Pascal</td>
<td>89 sec</td>
</tr>
<tr>
<td>MPW Pascal</td>
<td>192 sec</td>
</tr>
<tr>
<td>Turbo Pascal</td>
<td>11 sec</td>
</tr>
</tbody>
</table>

Compiled-Time Comparison

The time it takes to compile and link MiniEdit, thereby creating a stand-alone application.

MacLink Plus 1.0a


One of the Mac’s great strengths is that its friendly interface insulates users from the underlying technicalities of file organization. But when you need to convert files between programs, that insulation is stripped off, exposing you to the chilling cold of field delimiters, SYLK, DIF, and text attributes. And when you exchange files with an IBM PC, you’re in the tundra of telecommunications technology: protocols, modems, and cables. With DataViz’s MacLink Plus, file transfer is not reduced to a single keystroke, but the program minimizes the number of procedures involved in transferring a file. The manual contains helpful conversion basics organized according to spreadsheet, word processing, and database documents. DataViz also provides a troubleshooting section and a quick-start guide.

The Jump

MacLink Plus includes a cable and communications software for both the Mac and the IBM PC. An 800K Macintosh disk contains the MacLink Plus application and various settings documents, which store translator and communication settings for a particular conversion task. The PC disk is a 5¼-inch MS-DOS disk with a communications transfer utility. The PC program is menu-driven, with only a few commands for adjusting communications settings. Whether you’re converting a file from a PC to the Mac or vice versa, you use the Macintosh application to select the formats of the original and converted files and initiate the translation process; the PC program simply acts as the sender or receiver.

MacLink Plus works on three levels. “Local desktop mode” lets you convert documents that are on Mac disks or made to appear on the Mac’s desktop by such network products as MacServe or TOPS. “MacLink mode” lets you convert docu-converted document: MultiMate, WordStar, text-only, and document content architecture (DCA), a format readable by such PC programs as IBM’s DisplayWrite 3 and WordPerfect Corporation’s WordPerfect.

After you choose a format for the destination document, click the Select Files button to display a list of available files. Finally, select the file you want to convert, choose a PC drive and subdirectory if you like, click the Convert and Transfer button, type a name for the converted file, and sit back. (If you are converting to a PC, MacLink automatically suggests a file name by
taking the first eight characters of the Mac file name and adding the appropriate PC document extension.) MacLink Plus converts the file into the selected format (leaving the original unchanged), then transfers it to the PC. You need not choose any commands on the PC to begin receiving the file. MacLink Plus tells its PC counterpart to begin receiving. Similarly, when transferring a file from the PC to the Mac, MacLink Plus controls the PC, telling it when to send the file you selected on the Mac.

MacLink Plus translates spreadsheet data to let you transfer documents between 1-2-3, Multiplan, and Symphony on the PC, and Excel, Jazz, Microsoft Works, and Multiplan on the Mac. That sounds impressive, but MacLink Plus cheats somewhat by relying on the data-interchange features built into the programs. To convert an Excel worksheet to 1-2-3 format, for example, you must use Excel's Save As command to save the worksheet in WKS format, which 1-2-3 reads directly. Similarly, to convert a PC Multiplan file to Excel format, you save the Multiplan file in SYLK format, which Excel can read. Because MacLink Plus supplies well-matched communications software for both machines, the transfer is easier than using separate communications packages.

More impressive is MacLink Plus's ability to translate word processing documents and retain formatting information such as tabs, margins, and indents, as well as character attributes such as boldface, underlining, italics, superscripts, and subscripts. Footnotes and page breaks aren't translated, although DataViz says those capabilities are being added. MacLink Plus fully supports MacWrite, but support for Microsoft's Word was minimal in the version I tested. You can translate between Mac Word and PC Word, but not without using Microsoft's Convert utility first—an example of relying on built-in translation software. DataViz also says improved Word translators are in the works. I encountered one quirk in text-to-WordStar translation: MacLink Plus ignores single carriage returns at the ends of paragraphs and instead runs paragraphs together. To work around the problem, place an extra carriage return between each paragraph.

Communications Is the Key
MacLink Plus is also a serviceable communications program. It lacks advanced communications features such as terminal emulation and an autodial facility for creating auto-log-on sequences, but it does support the MacBinary Xmodem protocol for sending and receiving applications and formatted documents.

The ability to transfer files between the Mac and the PC is nothing new; you can do it with an ImageWriter cable and a pair of communications programs (see "The Mac-PC Transfer," Macworld, October 1985, and "The Macintosh Data Exchange," Macworld, December 1986). MacLink Plus's strengths are its automation of the transfer process and its support for formatting and text attributes in word processing documents. Although most spreadsheet programs let you save worksheets in formats that permit document exchange, MacLink Plus simplifies file transfer with an easy-to-use communications facility. MacLink Plus is most useful to people transferring word processing documents between the Mac and the PC.—Jim Heid

See Where to Buy for product details.

File Translators
MacLink Plus's Translators window shows the direction of a data transfer and lists the supported file formats in two boxes. Selecting the format of the original file causes MacLink Plus to narrow the list in the other box to show only the appropriate destination formats.

A Porsche among Mac Disks

DataFrame 40-XP

Using a program on the Macintosh is like staging a relay race where the 68000 Microprocessor runs the first leg, the memory runs the second, and the disc drive runs the last. If one of these team members is out of shape, so is your Mac.

SuperMac Technology's DataFrame 40-XP speeds up that final leg. The 40-megabyte hard disk is fast, and SuperMac's driver program accelerates large data transfers. Although it's expensive, the compact size and low noise level help make the 40-XP a good choice for a personal hard disk, while the speed and capacity make it powerful enough for multiuser applications.

Inside the Disk
The hardware is well designed. The DataFrame 40-XP sits alongside the Macintosh rather than underneath it, which helps to avoid heat buildup. It's very compact and can easily be carried in a briefcase. (SuperMac sells a carrying case for $49.95.) The disk is louder than average when reading and writing to disk, otherwise it's quiet. There is no fan. The power supply is on top, where its heat won't bother the other components, and there are plenty of cooling slots.

The DataFrame is easily disassembled. This is particularly convenient when you're removing the internal SCSI terminating resistors to hook up more hard disks. Chaining multiple SCSI hard disks to a Mac is something of a black art, and I had a problem using the DataFrame chained together with other disks. If a DataFrame in the chain is turned off, the Mac will not start up from another disk; if all the disks are turned on, however, it will.

Utility Software
The DataFrame comes with a complete set of utility programs. On-screen procedures aren't as clear as in other utility programs, such as the HyperDrive.
Performance Tests
This graph shows the performance of the Data Frame 40-XP working with MacWrite on a newly initialized hard disk. Details of the test may be obtained from Macintosh Touch, P.O. Box 786, Framingham, MA 01701.

<table>
<thead>
<tr>
<th>Disk Type</th>
<th>Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>HyperDrive 2000</td>
<td>10</td>
</tr>
<tr>
<td>DataFrame 40-XP</td>
<td>15</td>
</tr>
<tr>
<td>HD-20SC</td>
<td>20</td>
</tr>
<tr>
<td>HyperDrive FX/20</td>
<td>25</td>
</tr>
<tr>
<td>MacBottom SCSI</td>
<td>30</td>
</tr>
<tr>
<td>800K floppies</td>
<td>35</td>
</tr>
</tbody>
</table>

and adding the capability to back up to another hard disk, as well as to floppy disks. Unfortunately, SuperMac has a more awkward approach to selecting files and folders for back up. Also, the version I tested changed the modification date when it restored a file from backup. This can be a problem if you rely on the modification date to distinguish file versions. Default settings for the file filter present another problem. If you're not careful, your System and Finder files, including your personal desk accessories, will be excluded from your backup.

SuperSpool will save a lot of time printing to the ImageWriter; it's flexible and fast, with a desk accessory that lets you pause, resume, delete, and reorder printouts. It won't print through AppleTalk to the LaserWriter or ImageWriter, but SuperMac Technology plans to release a LaserWriter spooler.

**Support when You Need It**
Every hard disk manufacturer has defective units that escape the company's quality control procedures. SuperMac offers a one-year warranty and supplies replacement units quickly, either from the company or through its many dealers. This response has earned the respect of Mac owners in user groups and on electronic networks, like CompuServe and Delphi. In addition, SuperMac has a program that will actually try to recover the data from your Data Frame if something goes wrong.

The Data Frame 40-XP is quiet, compact, and fast, and it performed reliably during the month I tested it. SuperMac Technology has steadily improved its software, since the introduction of the Data Frame 20. I'd probably use PCPC's HFS Backup instead of SuperBackup. Still, while chaining multiple drives together may be awkward at times, I liked this hard disk so much that I may even buy one.

— Ric Ford

See Where to Buy for product details.

Where the Wild Buffalo Roam

**Great Plains Accounting Series 4.1**

**Accounting software.** Pros: Feature-rich; good audit trails and controls; flexible. Cons: Marginal Mac interface; expensive. **List price:** $695 per module (Purchase Order $395); various support costs. Available modules—General Ledger, Accounts Payable, Accounts Receivable, Payroll. Planned modules—Inventory, Job Costing, Order Entry. **Purchase Order:** Requires 512K, Mac 512KE or Mac Plus; HFS, hard disk, keypad or Mac Plus keyboard. **Copy protection:** None.

I really tried hard to like the Great Plains Accounting Series. After all, the company has extensive experience with accounting software, and each module in the series has most of the features anyone is likely to need. Unfortunately, it's tough to enthusiastically endorse software with a marginal Macintosh interface, a price about double the cost of the hardware the program runs on, and expensive support costs.

The Habitat
Version 4.1 of the Accounting Series is the latest update of the Great Plains Hard Disk Accounting Series. Basically, the manufacturer has added many enhancements, removed the multuser capabilities, and repackaged the software. The user interface has been modified quite a bit in an effort to make it more Macintosh-like, but it still looks and feels like it was converted in the days before pull-down menus and point-and-click operation.

It's impossible to describe all the features of the four modules I looked at (General Ledger, Accounts Payable, Accounts Receivable, and Payroll) in a review of this length. Here are some highlights:

---

**Performance Tests**

This graph shows the performance of the Data Frame 40-XP working with MacWrite on a newly initialized hard disk. Details of the test may be obtained from Macintosh Touch, P.O. Box 786, Framingham, MA 01701.
Reviews

General Ledger. A flexible chart of accounts adaptable to almost any organizational structure; provides good control over the format of financial statements; integrated with all other modules in the series.

Accounts Receivable. Transaction types include invoices, debit and credit memos, sales returns, and prepayments. Stores customer information and historical transactions; handles freight, sales commissions, discounts, and finance charges; accepts open-item and balance-forward customers; prints invoices and statements.

Accounts Payable. Transaction types include manual and computer-generated checks, debit and credit memos, prepayments, finance charges, and flexible invoice payments. Handles detailed vendor information and historical transactions.

Payroll. Generates checks and lets you enter manually prepared checks; supports flexible deduction types and tax withholding; tracks personnel-related information such as sick leave and vacation time; voids and reprints checks; performs comprehensive reporting and tracking to meet various tax requirements; covers a variety of pay and deduction categories.

Each module is flexible and adaptable to a variety of business needs. All let you create recurring transaction batches so that you don't have to reenter information every month (see "General Journal Window"). Great Plains provides accurate and complete audit trails and thorough data-entry error-checking. A useful set of reports is included for each accounting program.

Adaptation

Compared to other accounting packages available for the Mac, Great Plains Accounting Series has as many features and undoubtedly more modules. If features were the only issue, I'd have few complaints. But Great Plains falls short of its competitors in the user interface. The series was designed to run on both Macs and MS-DOS systems. The desire to fit into both system environments results in some unusual program characteristics. For instance, when you enter batches of transactions, the screen refreshes every time you enter another line. This slows down data entry, the most common operation in an accounting product.

Great Plains makes substantial use of special function and alphabetic command keys. In fact, you must have a keypad or a Mac Plus keyboard with the built-in keypad to use this software. In addition, there's a Special menu to the right of the Edit menu with choices for Page Up, Page Down, Home, and End. The use of the four functions found on the standard IBM keyboard, which are used to scroll windows in which all the items are not visible at once, strikes me as a user-interface design problem, not a limitation of the Mac keyboard.

Probably the most notable annoyance is the absence of pull-down menus. While the program includes standard File and Edit menus and the Special menu just described, all program functions are activated by clicking screen icons (see "General Ledger Module Window"). There are nested windows of icons, much like in character-based menu-driven systems, that force you to navigate through a series of screens to make your next choice. Eventually you get to the data-entry or report-selection screen you're searching for. These icon-based choices would be more usefully presented in a series of pull-down menus.

In my biggest complaints are with Great Plains' pricing and support policies. The full set of modules, which should be available by the time you read this, will cost $5260, about twice the cost of a 512K Mac with a hard disk. But that's not all. Toll-free support, after 30 days, costs $50 plus either $25 per phone call or $600 a year. Maintenance fees for federal plus three state tax tables are an additional $150 per year. Also, you're only entitled to 30 days of free support if you've never bought a Great Plains product before. But I never once got through to the support people.

The Accounting Series is not easy to use. You may well need a trained consult-

General Journal Window
The General Ledger transaction-entry window is typical of many of the Accounting Series' data-entry windows. Each line is added or edited using the fields at the bottom of the window. You enter command codes, listed at the bottom, to initiate an action.

General Ledger Module Window
Accounting Series program functions are activated by clicking a series of icons. Each click leads to another set of icons in another window until a data-entry or report-selection window appears.
Professional C

Aztec C 1.06

Development system. Pros: Completely integrated environment; UNIX-like tools; symbolic and source-level debuggers. Cons: Difficult to learn if you don't know UNIX. List price: Commercial $499, Developer $299. Requires: 512K. Copy protection: None.

Aztec C from Manx Software Systems was one of the first native Macintosh development environments. The Aztec C system consists of a UNIX-like shell, a C compiler, a 68000 assembler, and a linker. It includes comprehensive Macintosh and standard C libraries, sample source code, utility programs, and the first C source-level debugger on the Macintosh.

The Shell

The entire Aztec C development system revolves around its shell. UNIX users have an advantage; the ability to work with a command-line interface is essential if you hope to fully exploit the capabilities of the Aztec C system.

By operating from within the shell, you speed up the development cycle, since the output of one tool can feed directly into another. You can add functionality to the system by writing utility programs or tools that run under the shell, such as an enhanced printing program. Manx also provides a number of utilities such as grep, a sophisticated string-searching tool.

Text Editor and Compiler

The primary text editor in the Aztec C system is a utility called z, which is based on the UNIX text editor vi. The Aztec editor supports parenthesis and bracket matching and allows you to jump quickly to the next or preceding function. Through the use of regular expressions, you can search for character-string patterns and literal character strings. Series of commands can be grouped into macros. By using the utility program z, you can build a macro that cross-references your code by automatically finding and opening files based on the names of functions. For those not inclined toward a command-line-based text editor, the Aztec C system also comes with Apple's window-based text editor.

The C compiler fully implements C; supports recent additions to the language, such as enumerated types; and generates symbols for Aztec's source-level debugger. The compiler operates quickly and produces tight code. To further reduce compilation time and optimize code, you can precompile your #include files and compile down to an assembly-language listing. Aztec C supports the Pascal declaration, eliminating the need for assembly-language "glue" routines, however, in-line assembly language is supported in C source files.

For most C programmers, the assembler will be transparent in the development cycle, since the C compiler automatically invokes the assembler after completing compilation. The macro assembler generates relocatable 68000 object code, which is then used by the linker. The linker can create stand-alone Macintosh applications, drivers, desk accessories, and tools that run under the shell. To minimize the size of the final application, the linker doesn't include unused code in the final application. The linker is also capable of linking relocatable modules created by the Macintosh Development System (MDS).

The Aztec C development system includes a number of libraries, several in source code, which implement both standard C and Macintosh functions. These libraries include floating-point and transcendental functions, standard C I/O, console I/O, and implementations of AppleTalk and SCSI routines.

A Complete System

The real strength of the Aztec C system is that it is a complete development environment with numerous utilities. The make utility helps streamline the development cycle by recompiling only those source-code files that have been modified. Some other text manipulation utilities allow you to compare two source files and print out the differences between the two, or to search through multiple files for complex text patterns. Aztec even provides its own resource compiler, called rgen.

The Aztec C system has two debuggers. The first, dlh, is a symbolic assembly-language debugger that lets you reference memory locations by name or address and list the calling sequence of functions. Sequences of commands can also be combined into macros to be executed later. One feature helps you isolate problems in your code by displaying the parameters and return values of functions. The second debugger, sdb, is the first C source-level debugger on the Macintosh. It debugs your code at both the C and assembly source level. Memory can be referenced and displayed via C source names or using C expressions. You can trace on either a line-by-line or a call basis, where the parameters and return values of a function are displayed upon entry into and exit from the function. The source-level debugger lets you inspect the values of your C data structures, making it easier to catch errant values.

Aztec C's strength comes from the completeness of the system as a whole. The system handles large projects very well and produces efficient, compact code. The final release version (1.06i) will run under the Macintosh Programmer's Workshop shell and will support the 68881 floating-point coprocessor. Aztec C's biggest strength and its biggest weakness are both, paradoxically, its shell. The beauty of a shell environment is the efficiency with which you can invoke the various programming tools and the control you have over the interaction of the tools. In addition, the environment can be readily expanded by simply adding more tools. Unfortunately, a command-line interface is difficult for the novice to learn. Aztec C is on the pricey side compared to other development environments, but you get one of the most complete development environments available, with a year's worth of free updates to boot.—Jim Takatsuka

See Where to Buy for product details.
A Consumer's Guide to Disk Carriers

This review compares wallet, easel, and portfolio disk carriers. Overall design and construction are evaluated for 15 products ranging in size from 4 to 32 pockets and priced from $7.95 to $29.95.

Anyone who uses a Macintosh as a work tool builds a large collection of floppy disks, even hard disk drivers. Eventually you may feel inundated and wonder how to organize, store, protect, and transport all these 3½-inch squares of plastic.

Some Solutions
Disk carriers were invented to help users transport their disks conveniently and safely, but they also serve to store disks at home. They come in a range of colors and three sizes (wallet, easel, and portfolio), and are priced from $7.95 to $29.95. All are made of water-repellent nylon, stitched in nylon seam binding, with Velcro fastener strips. Here the similarities among disk carriers end and comparative shopping begins.

Manufacturers design wallet carriers to be lightweight and slim. Usually a carrier holds a disk or two per pocket. Only the Executive Wallet from West Ridge has a firm inner construction—a stiff plastic support. All companies use 400-denier nylon, a particularly tough and durable type of material; Executive Wallet comes with an outer shell of heavyweight ballistic nylon, leather trim, and a thin 400-denier interior. These antistatic disk wallets take up little space and are fairly smooth to the touch, which limits snagging. However, this smoothness can be a problem if the pockets are too wide for the recommended number of disks, making it easy for them to slide out. Only Floppy Wallet from American Covers has a flap to prevent disks from falling out.

The Traveller-4 wallet carrier from MicroStore is really a billfold: it measures 4½ by 9½ inches when open, has two pockets that open toward the centerfold line, and holds up to four disks. Like all MicroStore carriers, the Traveller-4 has no exposed seams or stitching on which disk shutters can catch; the Velcro strips are stitched to the outside of the pocket and the ends are tucked under the nylon seam binding, which has mitered corners. When full, the Traveller-4 weighs only four ounces and fits in the inside pocket of a man's suit coat.

Grander Designs
Like a painter's easel, disk easels stand up on your desk and double as holders and carriers. They have interior stiffeners and hold 20 to 24 disks in two columns on two sides. When you set up the easel on your desk, it gives you a full view of each disk label. ITC's Easel has the thinnest stiffener and its fastener is unstable, consisting of ⅜-inch strips of Velcro. When loading this

### Disk Carriers Compared

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Item</th>
<th>Maximum # of Disks</th>
<th># of Pockets</th>
<th>Do Disks Slide out when Holder is Open?</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wallets</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Covers</td>
<td>Floppy Wallet</td>
<td>18</td>
<td>9</td>
<td>yes, even when full</td>
<td>Velcro too close to fold; edge sharp</td>
</tr>
<tr>
<td>CompuCover</td>
<td>DiskWallet</td>
<td>6</td>
<td>6</td>
<td>yes</td>
<td>Velcro strips not aligned</td>
</tr>
<tr>
<td>Computer Cover</td>
<td>Pak Ups</td>
<td>8</td>
<td>4</td>
<td>yes, from one pocket</td>
<td>good value for the price; corners can be sharp</td>
</tr>
<tr>
<td>ITC</td>
<td>Pocket Pak</td>
<td>10</td>
<td>6</td>
<td>no</td>
<td>Velcro strips not aligned</td>
</tr>
<tr>
<td>MicroStore</td>
<td>Traveller-4</td>
<td>4</td>
<td>2</td>
<td>no</td>
<td>heat-sealed edges sharp</td>
</tr>
<tr>
<td>MicroStore</td>
<td>Traveller-8</td>
<td>8</td>
<td>4</td>
<td>no</td>
<td>excellent overall design; smooth, rounded edges</td>
</tr>
<tr>
<td>MicroStore</td>
<td>Traveller-12</td>
<td>12</td>
<td>6</td>
<td>yes</td>
<td>smooth, solid construction; disks fall out</td>
</tr>
<tr>
<td>West Ridge Design</td>
<td>Executive Wallet</td>
<td>8</td>
<td>4</td>
<td>yes</td>
<td>pockets too wide to hold disks in safely when open</td>
</tr>
<tr>
<td><strong>Easels</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CompuCover</td>
<td>DiskWallet</td>
<td>20</td>
<td>20</td>
<td>no</td>
<td>antistatic nylon</td>
</tr>
<tr>
<td>ITC</td>
<td>The Easel</td>
<td>20</td>
<td>20</td>
<td>no</td>
<td>stiff fabric; water-repellent</td>
</tr>
<tr>
<td>West Ridge Design</td>
<td>Disk Easel</td>
<td>24</td>
<td>24</td>
<td>no</td>
<td>lightweight; good closures; solid stand-up support</td>
</tr>
<tr>
<td><strong>Portfolios</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MicroStore</td>
<td>DiskBook-10</td>
<td>10</td>
<td>10</td>
<td>no</td>
<td>excellent design and construction</td>
</tr>
<tr>
<td>MicroStore</td>
<td>DiskBook-Plus</td>
<td>16</td>
<td>16</td>
<td>no</td>
<td>see above</td>
</tr>
<tr>
<td>MicroStore</td>
<td>DiskBook-32</td>
<td>32</td>
<td>32</td>
<td>no</td>
<td>see above</td>
</tr>
<tr>
<td>ITC</td>
<td>Disc Directory</td>
<td>32</td>
<td>32</td>
<td>yes</td>
<td>fabric too thin for such large portfolio</td>
</tr>
</tbody>
</table>

168 April 1987
CompuCover's DiskWallet has a heavy interior stiffener that rattles when you move it; its fastener has ample 3 inches of Velcro contact, but the pockets are shallow and cover only the bottom 2½ inches of the disk. West Ridge Design's Disk Easel has the deepest pockets (3 inches); the edges are folded over once, stitched without heat-sealing or binding, and smooth. This model alone provides soft padding in addition to the firmer plastic structure, yet it is also the most lightweight.

Portfolios are notebook-style holders. When closed they resemble small, padded binders and are easy to carry or store on a shelf. These portfolios range in size from 4½ by 8½ inches to 9½ by 11¼ inches, and hold from 10 to 32 disks. The DiskBook-10 from MicroStore is small enough to fit in a handbag, and all four portfolios I tested fit in a briefcase. The DiskBook-Plus has room for 16 disks, a notepad, two manuals, and two pens. Its fabric is designed to take lots of wear and tear, and the foam padding and plastic interior stiffeners protect disks better than wallets or easels do.

### The Winning Edge

Binding is important for protecting edges and providing durability. Every manufacturer binds nylon trim around the outer edges, and most cut and heat-seal the bindings at each corner. Only MicroScore and American Covers fold and miter their binding around three corners, giving a smooth and rounded touch. Heat-sealed edges, when made well, prevent fraying and snagging. Most of the edges I examined were sufficiently smooth, with two exceptions: American Covers' Floppy Wallet and Computer Cover's Pak Ups.

For stitching, 100 percent nylon thread is more durable than cotton-polyester thread, which deteriorates and can stretch out of shape. CompuCover and ITC products are stitched with polyester threads, whereas the other manufacturers use nylon. Products that have 7 to 9 stitches per inch resist most snags, while seams with fewer than 6 stitches per inch, particularly of cotton-polyester, can easily come loose.

Pocket edges are particularly important with Macintosh disks. Their movable metal shutters can snag on sharp or flimsy edges; sometimes they even catch on folded and stitched edges. This can of course seriously damage the surface of your disk. Manufacturers use a variety of techniques to bind the pocket edges. The
The best design is MicroStore's; its products are made from single-piece fabrics, with folded fabric edges on the wallet pockets and heat-sealed edges on the portfolio pockets.

**The Final Score**

I have rated each disk carrier on an ascending scale of 1 to 3 based on quality, design, function, and value (see “Disk Carriers Compared”). Products scoring 2.5 or higher have excellent overall design and functionality, hold disks securely, have smooth edges and mitered seams, and are constructed from high-quality materials. Products with sharp edges, dangling threads, pockets that don’t hold disks securely, or poor Velcro receive the lowest ratings.

For wallet design I like the Traveller-8 because it securely holds even a few disks, and its seams are smooth, rounded, and kept to a minimum; it has no edges to snag disks and is thin and lightweight. A slightly less expensive choice is Pak Ups: disks don’t fall out when it’s full, and its bindings are smooth except for the sharp corners. It also has a clear plastic pocket for your business card.

Among the easels, each priced at around $20, the padded Disk Easel is the superior product. It holds up to 24 disks and has better protection and greater stability when propped up on your desk. The pocket edges, although only turned over once and stitched, are smooth. Both West Ridge and MicroStore guarantee their products.

Among portfolios, the DiskBook-Plus is my favorite because I occasionally want to carry more than ten disks, pens, notepads, and a manual. I like the DiskBook-32 (priced the same as other larger portfolios—$29.95) for storing my disks on a shelf. The 100-denier cordura nylon and 100 percent nylon stitching will last a long time, and MicroStore guarantees your disks will stay put regardless of whether the DiskBook is open or closed.

Whether you want a carrier to hold 1 disk or 32, or something in between, there probably is a product to fit your needs and budget. Remember to get one that will hold disks securely and that won’t jab you with sharp edges; ask the dealer to let you examine it before you buy. If you have special requirements, don’t hesitate to contact a manufacturer and see if the company can supply what you need. —Barbara J. Chan

See Where to Buy for product details.

---

### White Space and Black Bars

**PC-380 Bar Code Reader**


**TimeWand Barcode System**

**Bar-code reader.** Pros: Reader is portable. Cons: Requires one of the Mac’s serial ports. List price: $198 (2K), $228 (8K), $248 (16K). Requires: 512K. Copy protection: None.

---

Bar codes—those rows of tiny vertical stripes with numbers underneath—are now de rigueur on product labels. Their secret? Both the white spaces and black bars represent a sequence of numbers that can be optically read by a scanning device.

Now you too can use bar codes—to streamline inventory, to develop accurate methods for tracking sales and production, or even to manage files. Two new products bring this technology to the Macintosh user: PC-380 Bar Code Reader by TPS Electronics and TimeWand, a portable, time-based bar-code reader by Videx, Inc.

**PC-380 Bar Code Reader**

PC-380, a long wand the size of a fat ballpoint pen, doubles as an input device and requires no special driver. This means it will work with any application that expects keyboard input. The wand connects by coiled cord to a small aluminum interface box, and the box converts scanned bar codes to keyboard data. Since it draws power directly from the keyboard port, PC-380 doesn’t require an electrical outlet or any of the Mac’s data ports. However, the trade-off for direct data input is its nonportability. While useful for applications like retail point-of-sales, file management, library control, and production tracking, PC-380 would be inappropriate for taking inventory throughout a warehouse or any other application requiring mobility.

PC-380 does allow you to collect or enter data quickly and accurately without having to type, but you can’t manage or manipulate it without the aid of a database manager like Blyth Software’s Omnits 3 Plus or Odessa’s Helix.

PC-380 comes equipped to read both Code 39, the most popular code for business and manufacturing concerns, and the UPC bar code used in retailing. Since it can discriminate between the two kinds of codes, you needn’t reprogram your bar-code reader to read both.

Although a simple procedure, scanning does take a little practice. To use PC-380, hold the wand upright, then sweep the code evenly with the wand’s tip. It will softly beep confirmation when it’s able to read, and the results will appear on the screen. However, it won’t beep or register entries if you scan improperly or if it doesn’t recognize the bar code as Code 39.
or UPC. PC-380 may be purchased with software that allows you to generate your own bar-code labels, with or without a description of the code. You are given the choice of using existing text-file information or creating a new sequence of bar codes. You can enter your own label specifications in inches and print to either an ImageWriter or a LaserWriter. The printing program may also be purchased separately.

If you only want to read bar codes, ready-made labels are available from companies such as Seton Name Plate or Data Composition.

**TimeWand Barcode System**

The battery-charged TimeWand Barcode System is portable and resembles a credit card in size and shape. It is one component of a larger system that includes a downloading-recharger unit and software.

Although TimeWand's portability is an important feature, especially for inventory applications that can't be accomplished through a control point, the extra steps of configuring your TimeWand, downloading, and then converting raw bar-code data to a useful format can be tedious and intimidating.

TimeWand automatically time- and date stamps each scan, which makes it useful for time-management applications.

Although TimeWand is activated simply by pressing a button, maintaining this pinch-grip for any length of time might become a strain. Like PC-380, TimeWand beeps in response to a successful bar-code read. However, it also beeps for other reasons: when hardware fails, when memory is almost full, and so on. Although the manual contains a complete listing of these beeps, chirps, and clicks, they can be confusing. We prefer the simplicity of PC-380's single confirmation beep.

TimeWand is programmed to read Code 39 (3 of 9), but any other bar-code system can be used, and Videx will update software that may not include the option you require.

Depending on the model, TimeWand can hold from 2 to 16K memory (nearly two thousand bar codes for a 16K reader before you have to download). Although its batteries hold a charge for three to five days, leaving the TimeWand in its recharge during periods of inactivity guards against the 10- to 14-hour work delay a complete recharging requires.

The downloading-recharging unit, which is small enough to sit comfortably on your external drive, requires its own power supply and plugs into either of the Mac's serial ports. Download raw bar-code data by inserting your TimeWand in the unit. Press the scan button, open the down-loder desk accessory, and turn it on. You can monitor the activity from the TimeWand Downloader window (see "Activity Monitor") and if that's not enough reassurance, a light will flash on the downloader, you'll hear a clicking noise, and the Mac's internal drive will begin to whir. This indicates that data has been transmitted and is automatically saving to a Scan File, a text file that should be imported to TimeWand Manager for cross-referencing and formatting before it's exported to your preferred database, which might not recognize the time and date data. TimeWand Manager can sort, perform calculations, and print limited types of reports. The next release will be faster, able to batch up to 16,000 scans, and include macros.

If you already have some sort of software system for tracking or managing data, you may feel that bar codes would only complicate data entry. Videx offers an alternative to using TimeWand Manager, which simplifies an otherwise tedious process. The PhraseMaker is an accessory program that allows you to enter data directly from TimeWand to your software application by storing scripts that transform your Scan File and then enter the data—seemingly from the keyboard.

Implementing a bar-code system for use with your Macintosh may cost you over $1000 just for the hardware and software, so plan carefully. While TimeWand is better suited for applications that require mobility, remember that the nonportable PC-380 allows you to input directly to your Mac and may be less troublesome to set up and use. —Eileen Drapiza and Christopher Osburn

See Where to Buy for product details.

---

**Tomb It May Concern**

**Arazok's Tomb 1.0**

*Graphics and text adventure game.*  **Pros:** A good, long-playing comic book that won't let you turn a page until you've solved its puzzle.  **Cons:** Pointless sound effects, frustratingly slow reverts from many inevitable deaths; no help for players who get stuck.  **List price:** $49.95  **Requires:** 512K  **Copy protection:** Not copyable.

Your wisecracking associate at the newspaper brings word that your friend Daphne and her uncle have vanished while investigating rumors of evil magic in Scotland. The rescue effort begins in a densely drawn forest surrounding Caer Arazok, ancient lair of the dreaded, Druid-like priests/hackers—a place of magic portals as well as abandoned, hidden, high-tech cities. Although a few fierce enemies must be defeated in order to challenge Arazok, this is not a game of battle but a game of tricks and traps, won by wits.

Since Arazok's Tomb, from Aegis Development, is virtually self-explanatory, the thin manual is barely necessary. You find numerous objects along the way, including weapons and magic items that may or may not be useful and may even be fatal. Most objects (and all important clues) are described (or hinted at) in the scrolling text window as
Reviews

Clock Ticks vs. Facial Tics

Arazok's Tomb features sound effects and voice synthesis that you can turn on or off from the pull-down menu. But neither the ticking of the clock (which is the main sound effect) nor the voice synthesis (which usually just repeats a command you have entered) contributes much to the game. In a couple of places where you really expect a nifty sound effect, like whooshing through an underground transport tube, there is none. This game would have been better with no sound and more motion. Motion always adds something, even when it is only one movement in a given scene, such as the passage through a magic portal or the flicking tongue of a giant snake.

The graphics of Arazok's Tomb may lack the elegance of Antonio Antiochia's work in the Transylvania games, but the drawings playfully suggest Indiana Jonesian adventure maps. Some hallway scenes are obviously recycled, but there are dozens of different locations with things to discover and examine, carry around, wear, consume, and, of course, die from.

Arazok's Tomb is one of the best text adventure games, thus no easy win. Determination finally does lead to victory in Arazok's tomb, but there's no 800 help number or hint option for those (probably many) who get seriously stuck. Until this is remedied, "stuckees" should call Aegis Development at the number listed in Where to Buy.

Math Blaster

Math Blaster from Davidson & Associates has been around for some time and has made its mark in the field of educational software. It's been a best-seller (and has won several awards) on Apple II, Commodore, and IBM computers.

What's new is that it's now available for the Mac.

Math Blaster doesn't pretend to teach complex reasoning skills, creativity, or even advanced arithmetic skills like long division. Instead, it focuses on helping students memorize basic arithmetic relationships for quick and accurate recall. The lessons in Math Blaster range from the simplest addition problems taught in early grades to percents and fractions generally studied in the upper grades of elementary school. But the program is probably best suited for first-, second-, and third-grade students who spend much of their school time memorizing addition, subtraction, multiplication, and division tables.

Choose Your Calculation

The drill-and-practice exercises in Math Blaster are displayed as icons in a menu that dominates the main screen. This main menu allows you to select an icon representing the skill you wish to practice. Your choices are Addition, Subtraction, Multiplication, Division, Fractions, Decimals, Percents, and "Your Data," a special icon that allows you to open customized problem files created with the program's editor.

Once you've chosen a skill, the main menu screen is replaced by an activity screen, from which you choose a level of difficulty, a format, and an activity. Format choices are vertical (stacked numbers with
a line above the answer), horizontal (such as $6 \times 6 = 36$), or mixed. There are four types of activities: Look and Learn pauses after displaying each problem and then gives the solution. Speed is adjustable. Build Your Skill displays each problem and waits for you to type the answer (or click on digits with the mouse). Your score appears at the end of the session, and you have an opportunity to try the problem again if you got it wrong the first time. Challenge Yourself shows the same problem with a different part of the equation missing (such as $7 + \_ = 11$). It's your job to fill in the blank. And finally, Math Blaster, the program's namesake, is a multiple-choice arithmetic drill dressed up as an arcade-style circus game (see "Fracturing Fractions"). This entertaining and playful option is largely responsible for the program's present popularity.

Your mission is to maneuver the on-screen character over the cannon that's aimed at the correct answer to the problem; when you click the button, he blasts the answer and you earn points. A seal with a ball on its nose acts as a timer for each problem, and a sinking balloon times the game as a whole. Quick-witted players can buy extra time by watching the balloon and pushing it up when it approaches the pin.

Two distinctive features are the program's editor and its individual-student data files. The editor allows you to create supplementary problem sets tailored to a particular child's needs. And the individual data files allow teachers and parents to track the progress of students as they work through lessons at their own pace.

Is Math Blaster an effective educational tool? As you might expect, it's certainly no substitute for skilled teachers or patient parents, but it does provide an efficient and engaging way for students to practice basic arithmetic skills in school or at home. And the Math Blaster game option is especially useful for motivating students to practice at home, where schoolwork typically runs into heavy competition with toys and television for kids' attention. Math Blaster may not hold a laser to Lode Runner for arcade action, but it's light-years ahead of flash cards and worksheets as an entertaining way to learn math tables.

---

George Beekman

See Where to Buy for product details.

## Shareware Communications for the Mac

### MockTerminal 4.3


### FModem 0.97


### TermWorks 1.28


With so many sophisticated communications programs available for the Macintosh, why would anyone bother with simple shareware products? For starters, because they're less intimidating to a novice than more powerful offerings that have a bewildering array of options for all occasions. They're also small enough to coexist in memory with a RAM disk, or to share a single-sided disk with another application and a System file—so, you can cut the time you spend switching between programs.

Additionally, you can experiment with shareware products before you buy them and then pick the one that best suits your needs. The bottom line, though, is that for the price of a meal for two at your favorite restaurant you can get products that handle most communications jobs surprisingly well.

For this article, I looked at three small programs: the desk accessory MockTerminal, by CE Software, and two stand-alone applications, FModem and TermWorks. FModem and TermWorks have more features and better interfaces, but tests showed all three programs download Xmodem files at about the same speed. The programs can be learned on screen, and helpful documentation is available for them, although it may not be distributed with the programs.

### MockTerminal

MockTerminal is part of CE Software's MockPackage of four desk accessories, which includes a word processor, a text-file printer, and a chart maker. MockTerminal's DA format and compact size (12,903 bytes) make it ideal if you must interrupt other tasks to communicate. It fits comfortably in a System file and, once invoked, can continually redial a number in the background until the connection is made. Early versions could only transfer text files, but the latest (4.3) adds Xmodem capability.

The MockTerminal menu shows 11 items. The first 5 are for selecting speed (300, 1200, or 2400 baud, Full or Half duplex). A Dial command lets you pick one of up to seven numbers from a separate Terminal Number file or enter a new number. Play Back refers only to text files: Send File and Receive File cover Xmodem transfers. As you might expect in such a compact program, there are some performance limitations. Settings that rarely change can be set only by the separate MockPackage Utility program. MockTerminal does not automatically save screens; what falls off the top is lost unless you pick Start Recording beforehand. Furthermore, disk space is
### A Few Specifics

<table>
<thead>
<tr>
<th>Feature</th>
<th>MockTerminal</th>
<th>FModem</th>
<th>TermWorks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prints</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Edit commands</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Archives screen</td>
<td>no</td>
<td>yes, memory</td>
<td>optional to disk</td>
</tr>
<tr>
<td>Text save and send</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>XModem</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Alternate protocols</td>
<td>no</td>
<td>FModem</td>
<td>no</td>
</tr>
<tr>
<td>Emulates</td>
<td>TTY</td>
<td>TTY, VT52, AppleII</td>
<td>TTY sets of 10</td>
</tr>
<tr>
<td>Macros</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Shows transfers</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Auto log-on</td>
<td>no</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Hangup command</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Dial command</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Documentation</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
</tbody>
</table>

FModem, MockTerminal, and TermWorks offer the same basic terminal functions, but they differ in features such as support for the Clipboard, automatic log-on capabilities, and automatic redialing of a series of numbers.

not automatically checked before a download, running out of space aborts the transfer while you're still on line and paying for the time.

**FModem**

The FModem menu shows a double row of ten clickable macro keys that you can use to designate strings of characters. Clicking on a macro key sends a string, or modem command, on its way. If ten keys aren't enough, you can store and load as many others as you like, although only one set of ten can be used at a time. Additionally, the file-transfer dialog box is quite informative, giving the file name, the number of errors, and how long it will take to complete a download or upload.

The Dial menu lets you pick several numbers for FModem to dial serially until it makes a connection— invaluable when trying to reach perpetually busy bulletin boards. Also, the program keeps incoming text in memory, so you can scroll backward to view it and print the recalled text. Parameter settings and the macro file in use are identified at the right end of the macro bar; you click on the setting to change parameters.

At 60,499 bytes, FModem is much larger than MockTerminal, but only a quarter the size of Smartcom II. It has many features of larger programs, and it automatically sets speed and terminal emulation mode for each service dialed. Minor limitations include the absence of command keys for menus or macros and no support for Edit commands. The version 1 reviewed (0.97) works with System 3.2 but bombs with the old System 2.0.

**TermWorks**

The TermWorks interface resembles FModem's, but macros and settings are controlled by menus rather than shown on a status bar. It opens to a file named Untitled that is stored on the program disk, where it saves dialog from successive sessions. Thus, you may be surprised by dialog from a long-forgotten session on your printouts, unless you change the default to Stop Recording, save input as a titled text file, or trash the Untitled file.

Even at 37,182 bytes, TermWorks has a few features the larger FModem lacks. The most important is an auto-log-on facility, which can respond to input signals. It can't handle long dialogs, but it works with services such as GEnie and Dialcom. Other helpful touches include an indicator of space left on the program disk (but not on other disks) and a session timer. One strength TermWorks shares with FModem is the informative display of file transfer progress.

The program has some annoying quirks. Although TermWorks' ten macros can be invoked by &-key combinations, they do not have mnemonic names. More seriously, TermWorks bombs if it tries to download an Xmodem file to a disk without enough room for it.

**Fast Food for Thought**

MockTerminal fills a special niche as a time-saver for short communications that interrupt other work. You should have the MockPackage anyway, if only for the invaluable MockWrite. (A license for MockWrite also covers MockTerminal.) If you need more functions than MockTerminal provides, FModem or TermWorks are both good choices, since they are easy to use and supply virtually everything you'll need for day-to-day communications. Try both and pick one. For the $20 license fee, it's a bargain.—Jeff Hecht

See Where to Buy for product details.

---

### Home-Baked, but Pre-Cooked

**The Print Shop 1.0**

**Stationery printing program.** Pros: Good combination of sample projects, graphics, and graphics editor. Cons: Some graphics cartoonish; command buttons placed in different locations on different screens. List price: $79.95. Requires: 512K. Copy protection: Key disk.

If you try designing letterhead or greeting card graphics using MacPaint or MacDraw, you may find yourself praying to the Hallmark deities. Hours of cutting and pasting often yield less than inspired results. The Print Shop by Broderbund, however, lets amateurs assemble greeting cards, banners, letterheads, and signs with the help of a library of more than 135 borders and graphics. More proficient users can add their own home-baked drawings and digitized pictures using an ImageWriter II equipped with color ribbons or a LaserWriter with toner cartridges.
Your Own Hallmark
You begin your project in one of four project screens: Greeting Card, Letterhead, Banner, or Sign. Greeting Card, for example, gives you a blank card, which you toggle between Front and Inside. A dialog box lets you choose from a library of borders, graphics, and text, or you can pull down the graphics menu and load the small to full-panel graphics. You can insert text in 17 fonts, in point sizes from 9 to 72. The Sign project screen provides features similar to the Greeting Card; the Banner screen gives you a long horizontal display; and the Letterhead screen allows for top and bottom borders.

Each project screen permits you to preselect graphics—four small, four large, and one full-panel. You can select one of five fixed sizes for small graphics, one of two sizes for large graphics, and one full-panel size. As you'd expect, the large versions of the small graphics have poorer resolution, but you can refine them somewhat via the graphics editor.

The editor works like MacPaint, with four pointillistic paint brushes, an eraser, a pencil, a paint can, and 37 background fill patterns. There are also clever Tiled and Staggered features, which allow you to replicate your picture over the whole layout or combine any two of the four loaded graphics. Unfortunately, the workspace is smaller than a MacPaint window, since an image of the full page is also displayed on screen.

There's no ruler, and you have a limited palette of drawing tools (no forms, such as ovals, rectangles, and so forth). Although you can invert and flip graphics horizontally and vertically, you can't rotate them at odd angles. Furthermore, to import drawings you must use a size box, which distorts the drawings. You can export your letterhead with text and graphics into MacWrite, but MacWrite treats text as bit-mapped graphics, so you're unable to edit the exported text.

Constraints
Printing can be slow, especially in color. Using a 512K Mac and a hard disk, you can print a greeting card in approximately 1½ minutes with a LaserWriter or ImageWriter II (color printing takes 2 minutes). The color output was appealing, but the ImageWriter II doesn't mix colors evenly, and smeared lines appeared. This problem could be solved with a better printer, but The Print Shop can only be used with an Apple or a 100 percent ImageWriter-compatible printer.

Since the two program disks are packed, disk swapping is inevitable unless you have an external drive. Fortunately, the program includes a preloading feature, so that fonts, borders, and graphics can be loaded selectively, minimizing swaps. And although The Print Shop is Switcher compatible, it still takes up at least 300K of RAM, so it's possible to run out of memory on a 512K Mac if your System file is too large.

One minor irritation is that the Undo and OK commands are in different places on different screens. A major one, however, is that The Print Shop is not compatible with the Mac XL, despite the manual's claim.

Even with these drawbacks, Broderbund has done a good job of combining predesigned projects and graphics with a workable editor. In fact, with more programs like these, the Mac could re-create a cottage industry. And if that happens, watch out, Hallmark.—Mary Cadloni

See Where to Buy for product details.
Introducing FileMaker Plus.

Now, the only Mac database ever to get both MacUser's and InfoWorld's highest ratings does even more, with even more ease.

Humble, ordinary-but-necessary forms like mailing labels, purchase orders, invoices, credit memos or packing lists. Pain-in-the-rear forms like expense reports and insurance inventories. Hard selling forms like proposals and quotations. Indispensable forms like phone messages, address books and sales contact records.

FileMaker" Plus lets you do these any way you want, or does them for you if you want. An extra disk full of templates gives you a whole set of typical formats, so all you have to do is fill in the blanks.

And in addition to doing what a database is supposed to do — calculations, summary reports, sorting — FileMaker Plus does everything you wish a database would do. View multiple records on a screen. Pull information from different files together. Include graphics in your fields and reports. Print mailing labels 3 or 4-up, or more.

Your information takes much more human form. It makes more than sense. It makes an impression.

With FileMaker Plus, you can put information in any way you want, without arbitrary limitations. It automatically indexes every word, number and date. You design your output right on the screen, so you can see exactly what you (and your clients, staff, suppliers, publishers, board of directors) are going to get.

You can exchange information with other programs, like MacWrite, MacPaint, MacDraw, Microsoft Word and Microsoft Excel. You can share applications or formats you've created with other members of your team, or consolidate group efforts into one database. And FileMaker takes full advantage of the Macintosh" family, including the Mac Plus, Mac 512, Imagewriter and LaserWriter.

So, for a mere $295, you can watch as your data takes on all kinds of interesting and profitable new forms. Call 1 800 MACWARE today for the name of your nearest dealer.

We guarantee it.

If FileMaker Plus doesn't completely fulfill your expectations, call 1 800 MACWARE and we'll solve your problem or arrange a refund.* From Forethought, Inc.
Quick Tips

Answers to your questions

by Lon Poole

With some applications, what you see is not always what you print. This month I take a closer look at a couple of word processors that accurately display boldface characters. If you are worried about burning out the Mac's screen, you'll want to read about screen-saver utilities. And given the new round of hardware introductions from Apple, I will try to make it easier for you to identify a Mac's vintage. I also have two tips from readers—one that can help you recover from a potentially catastrophic bomb, and another for curing a paper-jammed printer.

Q Screen Savers
I'm trying to find a utility that clears the screen after a user-specified period of inactivity, thereby protecting the screen. To bring back the screen, all you would do is touch a key or move the mouse. I know of such programs for the IBM, do you know of any for the Macintosh?

Peter Basha
Fort Collins, Colorado

A You can always dim the screen when you plan to leave the Mac on and unattended. Use the brightness control (located under the front overhang of a Mac Plus, Mac 512K, or Mac 128K) to darken the screen and reduce the chance of screen image etching. This manual method works, but lacks the elegance and reliability of an automatic control such as you describe.

Many desk-accessory programs dim the screen automatically. Most are available from public domain and shareware sources, such as user groups, on-line information services, and local electronic bulletin boards. Here are a few:

- **Fade to Black**, as its name suggests, slowly dissolves to a black screen with the icon of the current application floating about on it. You set the time interval between the most recent user activity and the start of the fade-out.
- **Blank**, a desk accessory, black out the screen after a specified number of minutes and seconds. A small white square flashes at random locations while the screen is black. Blank optionally installs and activates itself when you start up. It does not work with the MiniFinder. Blank is part of the commercial product Top Desk from Cortland Computer, P.O. Box 9916, Berkeley, CA 94709.

Q BASIC Rounding
When using Microsoft BASIC, I would like to be able to round the result of a calculation from 6.432654321 to 6.4 or 6.43. I can't seem to do it with the FIX, INT, CDBL, CINT, or CSNG functions.

Maxwell J. Richards
Smithtown, New York

A Rounding is based on a simple formula. Using your numbers as examples, the formula INT(6.432654321*100 + 0.5)/100 equals 6.43, and the formula INT(6.432654321*10 + 0.5)/10 equals 6.4. You can concoct your own rounding function using the INT function in a DEF FN statement like this:

```
DEF FNROUND(value,places) = INT(value*10^places + 0.5)/10^places
```

You would use this user-defined function to round your number to one decimal place with the expression

```
INT(x*1000 + 0.5)/1000
```

(continues)

Macworld 177
**How To / Quick Tips**

**LaserWriter to Mac**

<table>
<thead>
<tr>
<th>Mac Plus</th>
<th>Mac 512K</th>
<th>Mac XL</th>
<th>LaserWriter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mini-Circular 8</td>
<td>DB-9</td>
<td>1</td>
<td>GND</td>
</tr>
<tr>
<td></td>
<td>DB-25</td>
<td>20</td>
<td>TXD+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TXD-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RXD+</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>RXD-</td>
</tr>
</tbody>
</table>

You can connect a Mac directly to a LaserWriter without using AppleTalk connectors. Construct a cable wired as shown here. Be sure to use fully shielded cable in order to avoid an FCC Class B violation. Data transfer occurs at a very high rate and is not attenuated by AppleTalk connection boxes.

FNROUND(6.432654321,1)

and to two decimal places with the expression

FNROUND(6.432654321,2)

**Macintosh ID**

I would like to know if there are any bytes in the Mac's ROM whose contents uniquely identify a logic board, like a serial number.

José Menchaca Benito Concepcion, Chile

According to Macintosh Technical Note #37 (published by Apple Computer), it is possible to determine whether your application is running on a Macintosh Plus or a Macintosh 128K/512K logic board. Check the low-memory global HWConfFlags at memory location $B22. Bit 15 is 1 only if the SCSI port is present. This is the method the 128K ROM uses to distinguish Mac Plus logic boards. Macintosh Technical Notes are available from the Apple Programmer's and Developer's Association (APDA), 290 S.W. 43rd St., Renton, WA 98055, 206/251-6548.

You can tell if the machine you’re using has the 128K Mac Plus-type ROM by inspecting ROM85 at memory location $28E. If the value at this location is $7FF, the 128K ROM is present; if it is $FFFF, you’re dealing with the 64K ROM. To determine the ROM version number, use the Environ procedure as described on page 236 of *Inside Macintosh, Volume IV*. Or check the word 8 bytes beyond the beginning of ROM, as specified by global variable ROM base at location $2AE. This word has the format $xxFF for the Macintosh XL and $00xx for the Macintosh Plus, 128K, 512K, and 512K Enhanced; xx is the ROM version number. The original 64K ROM number is $69 and the 128K ROM number in the Mac Plus is $75.

**LaserWriter sans AppleTalk**

Can a LaserWriter be cabled directly to a Mac Plus without using AppleTalk? If so, where can I get a wiring diagram? I have talked to people at several computer stores and at Apple. They all say "I don't know," or "It can't be done; you have to use AppleTalk." I simply can't believe it.

Ron Hamako
Cupertino, California

Apple Technical Communications says it can be done. Use the Macintosh Peripheral Cable, Apple part number M0185. Connect the cable's 9-pin end to the LaserWriter, and the mini-8 connector to the Macintosh Plus printer port. If you had a 512K Mac, you could use a Macintosh Plus Adapter Cable, Apple part number M0189, to adapt the Macintosh Peripheral Cable to the 9-pin printer connector on your computer. If you'd rather build your own cable, the necessary pin connections are shown in the table "LaserWriter to Mac."

Set the LaserWriter's mode switch for "AppleTalk." Select the AppleTalk Con-
Value Line’s new software: For the complete investor.

Value Line’s software lets you get the whole investment picture in clear focus.

Simply awesome —T.J.M.

Amazingly complete —B.A.L.

A quantum leap forward —J.A.H., Jr.

A valuable, easy-to-use, foolproof tool —C.R.R.

Well done and very useful —R.S.E.

Editor’s Choice—PC Magazine

$39 Trial If you act right now, we’ll send you the complete software—package—which regularly sells for $95—for only $39. And we’ll include 2 monthly data disks worth $29 each, absolutely free. There are no timesharing charges, since up-to-date data is mailed to you regularly on disk.

800-654-0508

□ I have an Apple Macintosh, 512K, and want to take the $39 two-month trial.
□ Please send information on the IBM
□ Apple version
□ My check for $39 is enclosed (NY residents, add sales tax)
□ Please bill my (circle one) Visa MasterCard American Express

Account# Exp. Date

Signature

Name

Address

City, State, Zip

Purchase is nonassignable.

Value Line Software
711 Third Avenue
NY NY 10017

Circle 591 on reader service card
How To/Quick Tips

Q Elephantine Desktop File
I have a 512K Mac with a non-Apple 1-megabyte upgrade and an Apple Hard Disk 20 (disk-port version). I recently installed System 3.2 and Finder 5.3 on the hard disk. Since then, the start-up time has increased considerably. It now takes 68 seconds to get to the desktop! What am I doing wrong?

Dennis Montecillo
New York, New York

A Sounds like the invisible Desktop file the Finder uses to keep track of your desktop organization has assumed pachyderm proportions. In fact, New York City may be in danger unless you act fast. A normal Desktop file on a 20-megabyte hard disk will easily take up 80K to 100K, but for reasons still shrouded in mystery, the file can suddenly become enormous. I was badly frightened two weeks ago by a 4-megabyte Desktop file on my hard disk. Alien!

You can rebuild the Desktop file by holding down the Option and # keys when you start up or when you quit an application. A dialog box asks whether you want the desktop rebuilt. Answer OK to put the Desktop file on a crash die t. One warning: you will lose any comments recorded with the Finder's Get Info command if you do rebuild the desktop.

Your hard disk may be inefficiently organized if it is nearly full and you have frequently added and removed files. In that case, an individual file cannot be written in one area of the disk. Instead, it must be scattered across the disk surface. You can reorganize your hard disk by backing it up, erasing it, and restoring it from the backup. This process rebuilds the desktop as well. You can save some time by using a disk reorganization program like Disk Express from AISoft, although you must still back up completely in case a power interruption or error wipes out your hard disk during reorganization.

Foil ImageWriter Feedback
Tip: Paper left in an ImageWriter for even a few minutes acquires a stubborn curl that tends to feed back into the printer when printing begins, jamming the paper

(continues)
Finally, disk drives that offer the advanced power and elegant design at the price you've been waiting for.

800K Disk Drive
- Extremely Quiet
- LED (so you know the silent drive is running!)

Comparison of 800K External Drives

<table>
<thead>
<tr>
<th>Relative Loudness*</th>
<th>Ehman</th>
<th>Data</th>
<th>Mirror</th>
<th>Huba</th>
</tr>
</thead>
<tbody>
<tr>
<td>50% LOUDER</td>
<td>50% LOUDER</td>
<td>50% LOUDER</td>
<td>50% LOUDER</td>
<td></td>
</tr>
</tbody>
</table>

20MB and 40MB SCSI Hard Disk Drives
- Smallest drives available — completely portable
- Head-locking safety feature, rated 60 Gs
- Mean failure time of 25000 hrs.
- SCSI port available for 512K Macs
- 12 month warranty


Ehman Engineering — The Dependable People
Like hundreds of companies have for years, you can depend on Ehman Engineering for the finest Macintosh peripherals at unbeatable prices. (Ask about our top-quality memory upgrades and 512K SCSI port for the Mac.) We take pride in our work, which is why all Ehman products are elegantly designed inside and out, and come with a 12-month warranty. And we take care of our customers, which is why you'll always find a friendly, knowledgeable person on the other end of our 800 number.

Call us today for details on the complete Ehman product line. We're looking forward to talking with you.

Ehman Engineering, Inc.
115 Apache Drive, Evanston, WY 82930

(800) 257-1666

Circle 600 on reader service card
GIVE YOUR SOFTWARE A GOOSE.

Now that software companies have discovered Mac's graphics interface, their products have become a lot more useful. Because now you can add pictures to your documents. And you know what they say about one picture.

That's where Thunder-Scan* really becomes valuable. Because ThunderScan can turn most printed images into high-resolution Macintosh graphics. Which means you can insert quality graphics into your files. Making your programs perform like never before.

Programs like PageMaker,* GraphicWorks™ and ReadySetGo™ for desktop publishing. With ThunderScan you don't have to rely on your own artistic abilities or someone else's clip art disk. Instead, you can illustrate your words with just the right graphics (even one-of-a-kind items like your logo or your own portrait). Improving both the professional appearance and readability of your publications.

Use ThunderScan with Business Filevision, dBASE* Mac or Filemaker* Plus to add pictures and photographs to your data, for more complete, more informative databases. It's perfect for research, real estate portfolios, personnel files — any time you're working with more than words or numbers.

For those who view Mac as a blank canvas, ThunderScan is an exciting new artistic tool. Not only can you create elegant works of art with ThunderScan's powerful image enhancement software, you can really get wild with SuperPaint and FullPaint™. And that's just the start. ThunderScan can boost the performance of MacDraw,* MacDraft,* MacPaint~ Mac Anything! Plus, Thunderware's new optional $29 connector makes ThunderScan Mac Plus compatible without a wall plug. So if you want to make the best of Mac software even better, take a gander at ThunderScan. At just $229 there's no better way to give your software a goose.

Filevision is a registered trademark of Telos Corporation. GraphicWorks is a trademark of Mindscape, Inc. MacDraft is a trademark of Innovative Data Design, Inc. Filemaker is a trademark of Nashoba Systems, Inc. dBASE is a registered trademark of Ashton-Tate Corporation. FullPaint is a registered trademark of Ann Arbor Softworks. Macintosh is a trademark licensed to Apple Computer, Inc. Mac, MacPaint and MacDraw are trademarks of Apple Computer, Inc. ThunderScan, Thunderware, and the Thunderware logos are registered trademarks of Thunderware, Inc.

© 1986 Thunderware, Inc.

Thunderware* Inc.
21 Orinda Way
Orinda, CA 94563
(415) 254-6581

ThunderScan

Circle 167 on reader service card
End Printer Jams
A Post-it note on the top spacer of an ImageWriter II, directly behind the platen, keeps paper from curling back into the printer and doesn't interfere with normal printer operation.

around the platen. You can prevent this mess with a Post-it note (see “End Printer Jams”). Because the Post-it is on the top spacer, it does not interfere with removing or installing the cover or with loading or removing paper. The paper coming out of the printer just glides across the bridge created by the Post-it, rather than curling back into the machine.

Stuart M. Kurtzer
Springfield, New Jersey

This Post-it note trick works with the ImageWriter II but not the ImageWriter I. You can eliminate paper curl altogether on either model by rolling the paper back just until the printer’s Paper Out light comes on. At that point, the paper is clear of the platen’s curling-iron influence. When you’re ready to print again, roll the paper forward to its standard starting position.

System Error Recovery Tip: When you get a system error, there’s always a Resume button, but it’s rarely activated. You can activate the Resume button by installing the CrashFix desk accessory and choosing it from the Apple menu each time you start an application. On a Mac Plus, you may be able to return to the Finder with any RAM disk or disk cache intact, even if you didn’t install CrashFix.

When the Mac Plus crashes, press the Interrupt switch (not the Reset switch). You’ll see a dialog box with nothing but the greater-than symbol, >.

Follow these steps:
1. Type SMFA700 A9F4 and press Return. A bunch of characters will appear in the dialog box, with the symbol > at the top.

(continues)
PC MacBridge weds Macintoshes and IBM PCs for a complete office network

For too long, Macintoshes and PCs have been feuding like the Hatfields and McCoys, unwilling to even acknowledge each other's existence. But now, with PC MacBridge as matchmaker, the two are brought together in a network where they can love, cherish, and share files and printers with each other.

All in the family
PC MacBridge Plus is a family of products that enable Macintoshes and IBM PCs to share information and peripherals within an AppleTalk network. PC MacBridge Plus includes a PC half-card with network software. Also included are LaserScript/Plus, LaserGraph and MailBox software. LaserScript/Plus and LaserGraph allow an IBM PC to use the LaserWriter or other PostScript printer while MailBox transfers files around an AppleTalk network.

Invite the relatives
The PC MacBridge family tree also includes PC MacServe, which permits hard disk sharing by both IBM PCs and Macs within a network. PC MacText allows you to transform PC files into Mac files and vice versa. And PC MacSpool frees computers for other tasks during any print job.

PCs and Macs—The perfect couple
PC MacBridge is all you need to let your IBM PCs and Macintoshes establish a lasting marriage. Use PC MacBridge with any AppleTalk product, including Hayes' InterBridge. Ask your local dealer for PC MacBridge, or call (404) 662-0366 today.
Interrupt Switch

You may be able to return to the Finder with your RAM disk, disk cache, and equanimity intact after a system error. Press the Interrupt switch and type the three commands SM FA700 A9F4, PC FA700, and G.

2. Type PC FA700 and press Return. The command will disappear but the dialog box should otherwise be unchanged.
3. Type G and press Return.

If you want to know how this works, step 1 puts the value A9F4, which is the code for the trap ExitToShell, at memory location FA700, the start of screen memory on the Mac Plus. Step 2 sets the program counter at memory location FA700. Step 3 executes the instruction at the current program counter location.

Bob Duys
Antwerp, Belgium

The Interrupt switch is the rearmost part of the optional two-part programmer's switch that can be installed on the left side of the Mac Plus, near the bottom rear corner (see "Interrupt Switch"). Be careful not to press the Reset switch, which is the frontmost part of the programmer's switch, or you'll restart the Mac. The CrashFix desk accessory is available from user groups and on-line information services. This tip and CrashFix both work about half the time. The other half of the time I get endless system errors and must restart—but half is better than none.

Send tips or questions to Quick Tips, Macworld, 501 Second St. #600, San Francisco, CA 94107. Send electronic mail to CompuServe 70370,702 or The Source BCW440. All published submissions become the property of Macworld.
Compu-Teach announces three new programs for the Macintosh, based on the success of our award-winning early learning programs. Word Pieces, ArithMATIC and ABsCenes are now available for children ages 3-7. Using early learning research, faculty members of Yale University developed these highly interactive programs full of graphics, sound and animation:

**ArithMATIC** introduces basic concepts essential to mathematical thinking.

**WORD PIECES** introduces simple three letter words and phonetics.

**ABsCenes** challenges children with animated pictures to join initial letters to their appropriate word endings.

Call for free $39.95 purchase coupon (800) 44-TEACH. In CT call 777-7738.

Circle 636 on reader service card
Getting Started with Telecommunications

What telecommunications is, what it offers, and what you need to go on line

by Jim Heid

You process your share of words, dabble in databases, and occasionally ask "what if?" of a spreadsheet. You're interested in desktop publishing (who isn't?) and graphics applications. But if you're like most Macintosh users, you haven't toyed with telecommunications—that strange world of modems, passwords, and protocols.

And why should you? What's at the other end of a phone line that could interest you and your Mac? You'll discover there's quite a bit actually, once you know how to get to it. This month, I'll introduce you to the world of telecommunications, spotlighting the most popular applications and explaining how to get on line. Next month, I'll look more closely at communications gear and at some of the technical details of telecommunicating.

One Computer to Another

Literally any phone conversation qualifies as telecommunications, since the term means "communicating at a distance." In computer parlance, however, telecommunications refers to telephone communications between computers. If you've ever had to wait in a store while a credit card validator reaches its verdict, you've experienced one of the less-enjoyable telecommunications applications.

Schools and corporations use telecommunications to enable students and employees to tap into large mainframe computers using terminals—keyboards and video monitors or printers with built-in communications hardware—attached to the big machines through phone lines or other wiring. Once, such terminals represented an individual's only access to computing power. But now personal computers have changed that; by using communications hardware and terminal emulation software, they've replaced terminals in many places.

The personal computer revolution caused a corresponding upwelling in the communications world, leading to the proliferation of new applications and communications companies, and prophecies of a day when you could learn, correspond, bank, shop, and swap by phone. That day hasn't arrived, partly because the refinement and widespread acceptance of a technology always take longer than its birth, but mostly because you can't endorse a check, go on a field trip, or try on clothes over the phone.

Information at Your Service

While it may be some time before we all, like the cartoon Jetson family, have terminals in our homes, telecommunications has much to offer us today. The key players that make it so appealing are information services like CompuServe, The Source, Dow Jones News/Retrieval Service, Delphi, (continues)
Doubles the Memory of Your Macintosh Plus™

Make the most of your Macintosh Plus now! Levco's One Plus One memory upgrade transforms your Macintosh Plus into a powerful, efficient workstation. With two megabytes of contiguous RAM, you can hold over 400 pages of text in memory, work out of a fast RAM Disk or use several memory-hungry programs simultaneously. More memory saves you more time!

Easy Installation
Just plug the One Plus One module into the SIMM sockets provided on your Macintosh Plus motherboard. No soldering or special equipment is required!

Compatibility Plus
The One Plus One makes the most of the current Macintosh system, standard applications and fast SCSI drives without the handicap of "boot" or "configuration" software.

Quiet Cooling Included
Levco's MacBreeze™ piezoelectric fan is included to keep your Macintosh Plus cool. This feather-weight fan is so quiet, you'll forget it's there!

One Plus One: Another high-performance product from Levco, makers of the MonsterMac™, Prodigy 4™ and OverDrive™.

Levco
6160 Lusk Blvd.
Suite C-203
San Diego, CA 92121
(619) 457-2011

Circle 493 on reader service card

How To/Getting Started

and GEnie. They're high-tech hybrids of a library, a shopping district, and a meeting hall; a subscription to one can keep you and your phone line busy for years.

Information services are built around rows of mainframe computers that divide their time among the subscribers who access them, giving each person the illusion of being the only one using the service. During peak usage periods, the system's response slows and the illusion fades somewhat, but generally you can get what you want when you want it.

Once you have the right equipment, you gain access to an information service by paying an initial fee, which buys you a user ID that identifies you, and a password that lets you into the service. Thereafter you're billed monthly for the time you spend on line. Membership fees range from $25 to more than $100 for specialized services, although most communications-related products come with discount offers that reduce or eliminate the initial fee and give you an hour or two of free connect time. Connect-time fees vary depending on the service and the time of day you call, but they usually range between $5 and $25 per hour.

In metropolitan areas, accessing an information service usually involves making a local call to a switching network such as GTE Telenet or Tymnet, which acts as a relay between you and the service. (From nonurban locations, you have to make a toll call to the closest city served by a switching network.) You call the network's local node, type a code for the information service you want, and the network connects you. You'll incur a small per-minute surcharge while you're communicating, but it's almost always less than a long-distance call to the service's headquarters.

What They Offer
Not surprisingly, an information service's primary commodity is information. Most provide access to up-to-the-minute news from the wire services: Associated Press or United Press International. Dow Jones News/Retrieval Service offers highlights from The Wall Street Journal. NewsNet sells access to hundreds of specialized business and government newsletters and journals. With most services, you locate items of interest by typing search phrases. Many services also let you create clipping folders: sets of search phrases the service uses to automatically set aside stories that interest you.

(continues)
LASER PERFECT VISION.

Imagine your PC being able to see photos, graphics, illustrations and precisely position them on your reports and proposals before they appear in print on your laser printer. Preview the graphic impact of charts and tables, modifying at will, before pressing the print button.

The Princeton LS-300 Scanner affords you the gift of foresight. It can scan a full page of text and images into your IBM PC/XT/AT or compatible at a laser-perfect 300 dots per inch.

The compact design of the LS-300 is ideal for desktop publishing applications, especially newsletters, reports, and proposals. Hardware dithering produces 32 levels of gray to make photos and illustrations pop off the page.

The LS-300 can be used with your PC system with CGA, EGA or monochrome displays, or teamed with the new Princeton LM-300 or LM-301 Print Preview Monitor, the LS-300 provides you full page visual effects before printing. And teamed further with an optional OCR software package, the LS-300 is trained to read and store typewritten pages.

Free PC Paintbrush Plus!
A $149 retail value, the amazing PC Paintbrush Plus is yours free with the purchase of the LS-300 Scanner. PC Paintbrush Plus lets you create image files which can be used with Ventura Publisher, PageMaker, etc. for professional quality drawings, diagrams, charts, graphs and headlines. Use your mouse, joystick or digitizer to manipulate images to create precisely the effect you want. Incorporate company logos too!

Cost Effective.
Put a spark into the methodical task of scanning with the quick, creative and productive LS-300. It's available with adapter board, PC Paintbrush Plus software, and all cables at a suggested retail price under $1,200. For an eye-opening demonstration — and an example of Princeton quality and reliability — visit or contact your Princeton dealer today.

Also available is an *SCSI* interface Mac Scan* for the Apple Macintosh. You can scan, edit and store a variety of Mac desktop publishing applications — MacPaint, MacWrite, PageMaker, ReadySetGo!, Ragtime and Just Text — and print on your Apple LaserWriter.

*New Image Technology, Inc.
10300 Greenbelt Road, Seabrook, Maryland 20706
Circle 656 on reader service card

PRINCETON GRAPHIC SYSTEMS
601 Ewing Street, Building A, Princeton, NJ 08540
800-221-1490, 609-683-1660 (NJ only) EXT. 94 Telex: 821402 PGS PRIN

We offer an integrated family of software products that allow you to search the Bible as never before.

With "THE WORD Processor" software (which includes the complete text of the KJV or NIV Bible) you may create indexes on key words, phrases, even concepts, as well as search, display or print, for just $199.95. Greek and Hebrew Transliterator products which include Strong's Concordance are also available. Or choose from a host of other exciting Biblical software products available in varying price ranges.

So if you're still searching, give us a call. We're anxious to show you how your PC can help you access your Bible as never before.

Include $3.00 for postage and handling. For Apple, BBS PC, Commodore 64, TI/RM, Macintosh, CPM 2.2, MS-DOS.

We guarantee 100% ERROR FREE

SONY 3.5" DISKETTES
Certified by Apple for Macintosh™

- High Performance DVIAX™ Magnetic Particle
- High Durability DQIT™ Particle Sticking System
- Safety Auto Shutter protects against fingerprints and dust
- Safety Auto Design is heat-resistant and guards against disk damage during handling
- Hard-Shell Design is heat-resistant and guards against disk damage during handling
- Slide-Type Write Protector prevents accidental erasure
- Convenient Pocket Size for carrying convenience

Price Per Diskette

<table>
<thead>
<tr>
<th></th>
<th>SS</th>
<th>DS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box</td>
<td>1.29</td>
<td>1.89</td>
</tr>
<tr>
<td>Bulk</td>
<td>1.17</td>
<td>1.49</td>
</tr>
</tbody>
</table>

GUARANTEED 100% ERROR FREE

Circle 578 on reader service card

How To/Getting Started

In addition to the daily news, many services offer specialized information like CompuServe's Disclosure II, which contains information on over nine thousand publicly held companies. Researchers and students can pore through on-line editions of encyclopedias, such as the ten-million-word Grolier's Academic American Encyclopedia, which is available on several services.

Another popular service is electronic mail (E-mail), which lets you correspond over phone lines. Companies with offices in different cities can use E-mail to relay reports faster and at lower cost than telegrams or express couriers. Of course, you must remember to sign on and check your electronic mailbox periodically; E-mail loses its timeliness when it sits unread. E-mail's major drawback is that you can only use it to correspond with other subscribers. However, one service, MCI Mail, lets you compose letters that are subsequently printed (on your letterhead, with a laser-printed replica of your signature, if you like) and delivered overnight.

Frequent travelers may appreciate access to the Official Airlines Guide (OAG), the same flight-listing service used by travel agents. Available on most information services, OAG lets you type your departure and arrival dates and cities, then view a list of flights, times, and prices. You can even find out if food is served on a given flight.

If you're still recovering from holiday shopping crowds, the discount shopping services that most information services offer might appeal to you. CompuServe carries the shopping metaphor to its suburban limits. Its Electronic Mall offers everything but acres of asphalt and socializing teenagers, counting among its merchants Waldenbooks, Bloomingdale's, and Sears. Find an item you want, and a command charges it to your credit card.

Perhaps the most lively branches of an information service are its special interest groups (SIGs). As sort of an on-line clubhouse, a SIG allows subscribers with common interests—ranging from computers to human sexuality to tropical fish—to exchange ideas and information. Computer SIGs such as the MicroNet Apple User's Group (MAUG) on CompuServe also offer megabytes of member-supplied software, MacPaint graphics, fonts, and more data that you can transfer to your own disks, or download. Many items are free; others are

(continues)
If you use a Macintosh or PC system to publish annual reports, newsletters, books, ads, brochures, or any other printed material, then you need Publish!, the How-to Magazine of Desktop Publishing.

**Act Now for Charter Subscriber Savings—40% OFF!**

 Publish! is written, edited, and produced on personal computer-based systems. Because we're on the cutting edge of this new technology, you can depend on us for the expert information you need to establish your own personal publishing operation.

**What You Will Find in Publish!**

- Hundreds of new product listings
- In-depth reviews of hardware and software
- Cost-saving ways to prepare pages
- Shortcuts to help you get the most from available products
- Tips on the fundamentals of graphic design and publishing basics

**All this and more, each month in Publish!**

**Fast Action Saves You Money!**

For a limited time, Charter Subscriptions are available—just $23.95 for a full year (12 monthly issues). That's nearly 40% OFF the basic subscription price.

Take advantage of this limited-time Charter Subscription offer now. Mail the attached postpaid card or the coupon below. For immediate service, call TOLL-FREE (800) 222-2990.

**Charter Subscription Savings**

**YES! Send me one year (12 monthly issues) of Publish! at the Charter Subscription rate of $23.95. That’s nearly 40% OFF the basic subscription rate.**

- □ Payment enclosed  □ Bill me later
- □ Visa □ MasterCard

Mail to: Publish!, Subscription Department, P.O. Box 51966, Boulder, Colorado 80322-1966.

Guarantee: If you're ever dissatisfied with Publish!, let us know. We'll promptly refund you for every issue remaining on your subscription. No questions. No problems.

Offer valid in the U.S. only. Please allow 6-8 weeks for delivery of your first issue.

HURDLE OVER THE BEST
WITH THE
LOWEST DISK PRICES FROM NCC
@TDK.

H NO-RISK’’DISK.

$450,000 DASH FOR CASH
SWEEPSTAKES

TDK is sponsoring the World Championship
Amateur Athletics in Rome. And, to celebrate
TDK has created a spectacular sweepstakes
event. Entry Coupon in each specially-marked
TDK Floppy Disk package. Chances to win
more than 20,000 prizes.

Sweepstakes event- February 1
thru
June 30, 1987

National Computer Consulting, Inc. CAL1 TODAY!
3375 Scott Boulevard Suite 422 800 245-3111
Santa Clara, CA 95054 408 496-1022 CA

Circle 668 on reader service card

MacSS

Macintosh STATISTICAL SYSTEM

COMPLETE STATISTICAL PACKAGE WITH DATA MANAGEMENT AND GRAPHICS

• Unlimited size of data files
• Double precision calculations, mainframe speed
• Complete statistical data-base management with spreadsheet
• Comprehensive selection of Descriptive, Basic, and Nonparametric statistics
• Crosstabulation/Frequency Tables
• General Multiple Regression with Forecasting (up to 50 predictors)
• General ANOVA/ANCOVA (up to 10 within/between factors)

Available from your dealer or from StatSoft ($245 plus $5 shipping/handling)

StatSoft 2832 East 10th Street, Suite 4.
Tulsa, OK 74104, (918) 962-4149

Circle 225 on reader service card

How To/Getting Started

distributed as shareware—you pay a modest fee for a product only after you decide
to keep it (see "Gems from the Public Domain," Macworld, August 1986, and "The
Problem with Shareware" in this issue). MAUG has evolved into one of the most ac-
tive and elaborate SIGs on CompuServe, with special forums for Macintosh de-
velopers and frequent, real-time conferences with Apple employees and industry
experts.

Other Ways to Communicate

Telecommunications doesn't have to
mean accessing big-time information ser-

(continues)
Here’s The Latest

- 400 and 800 MB WORM Optical Disks
- 300 Dots Per Inch Image Scanner with Gray Scaling
- 155 and 234 Megabyte SCSI Hard Disks to use with Apple® Share
- All this plus our Hard Disk, Tape Drives and Combos for the Macintosh™ and the newly announced Mac family

LoDOWN
10 Victor Square, Suite 600
Scotts Valley, CA 95066
(408) 438-7400
Telex 5106007873

In Europe Contact:
LoDOWN Europe Aps
Denmark
Telephone: 459-911619
FAX: 459144969
DEALER INQUIRIES WELCOME

Call your local dealer for a demonstration

Circle 466 on reader service card
Terminal Emulation available on the Macintosh features as well as the Desktop Communications Desktop Engineering Desktop Publishing CAD Workstation Color Graphics Color Output Publication Quality Output

**VersaTerm-PRO™**

Version 2.00  Price: $295.00

Special upgrade price for registered VersaTerm Owners.

All the features of standard VersaTerm AND...

The most complete Tektronix 4014 Graphics Terminal Emulation available on the Macintosh!

Enhanced Tektronix 4014 Graphics Emulation

Zoom and Pan Graphics Interactively from Memory!

- New! Cleared Graphic Screens (up to 32) may be instantly viewed from memory.
- Create MacDraw, MacPaint and MacWrite documents from memory.
- Very high quality graphics may be printed on the LaserWriter.
- Color graphics output supported with ImageWriter II.

Designed for the Professional who requires sophisticated GRAPHICS features as well as the powerful TEXT features of standard VersaTerm

Designed for a 512K Mac, Mac Plus or Mac- XL. Supports the ImageWriter II and LaserWriter printer.

---

**VersaTerm™**

Version 3.00  Price: $99.00

Terminal File Transfer:

- DEC VT100
- DEC VT52
- Tektronix 4014
- Tektronix 4010
- DG D200

- Multiple file uploads and downloads.
- Automatic Macro Definitions
- Multiple Command Sets
- "Word Mouse" feature

Not Copy-Protected.

Supports DEC VT100 132 column mode.

Very High character throughput.

Developed by: Abelback Software

Circle 304 on reader service card

---

**MAC DISK CATALOG II (50 call 203-966-6969)**

Published and Distributed by: PCS Inc.
2457 Perkomen Avenue
Mt. Penn, PA 19606
(215) 779-0522

MDCFinder's desk accessory lets you search your Macintosh Catalog anytime, from any terminal. Fully indexed database. Find, select files and volumes, create E-mail are supported. Fully indexed database. Find, select files and volumes, create E-mail are supported.

MacDiskCatalog II for the 512K Mac, Plus and XL, HFS Compatible: Catalog directories and hard disks. Fully indexed database. Find and Select files and folders. Includes 60 QuickLabels. Choose and edit names. Also prints directory.

**MacLabeler® 2.2**

- Labels disks fast
- Shows HFS or MFS
- Label shows date made and space available
- Shows files & folders
- Includes 60 QuickLabels
- Choose & edit names
- Also prints directory

**DiskQuick™**

- Fast and feature packed
- Catalogs 100s of floppy’s
- Creates hard disks
- Powerful file locator
- Shows into comments
- Marks files needing backup
- Marks superseded files

- Pack of 201 pin-fed removable QuickLabels™ $10
- MacLabeler $45.95 + DiskQuick $37.50 + US shipping $3 for 1st item, $1 for each additional item + Iowaans add 4% tax + IdealTerm Inc., P.O. Box 1549, Fairfield, IA 52556 + Visa/MasterCard accepted + (515) 472-7256

MacLabeler, DiskQuick, and QuickLabels are trademarks of IdealTerm Inc.

Circle 284 on reader service card

---

**MDC II T.M. MAC DISK CATALOG II**

MDC II for the 512K Mac, Plus and XL, HFS Compatible: Catalog directories and hard disks. Fully indexed database. Find and Select files and folders. Includes 60 QuickLabels. Choose & edit names. Also prints directory.

**NEW... MDCFinder™**

Our new MDCFinder desk accessory lets you search your MDC Catalog anytime, from anywhere. MDCFinder — $29.95.

Mac Disk Catalog II (128K) — $39.95

Finefeed MDCLabels — Choose from six colors or order the Rainbow Pack: $49.95. Special orders available: $59.95 — $19.95 — $59.95

SPECIAL

Order MDC II and MDCFinder together for just $74.95.

Shipping & Handling $3.00 ($5.00 Foreign) per order. Visa/MasterCard Accepted.

---

**How To/Getting Started**

How To/Getting Started

evolving Red Ryder to $149 for Hayes's easy-to-use Smartcom II. Packages that combine a modem and software are also available, such as Prometheus Products' Promodem (see "More than a Modem," Macware Reviews, Macworld, April 1986). Often the software half of such teams is weak, although Hayes's Smartmodem-and-Smartcom II package is an exception.

Next month's Getting Started will examine some factors to consider before buying a modem and communications program. For reviews of some communications programs, see "No Static at All," Macworld, December 1985, and "Grab that Microphone," Macware Reviews, Macworld, July 1986.

Not a Pretty Interface

For all its benefits, there is an ugly side to telecommunications—especially for Macintosh users, who are spoiled by the Mac's easy operating style and sharp, attractive screen displays. Signing on to an information service is like taking a trip back in time to the way computers used to work; forget pull-down menus, dialog boxes, and pointing and clicking. Because information services must be accessible from any brand of computer or terminal (which may have a typewriter instead of a video screen), they lack graphics and instead require typed commands, many of which seem to have been designed by cryptologists.

In fact, because information services can't tell whether you're using a video screen or a typewriter terminal, their text-editing facilities for creating E-mail are rather primitive—you must work on a line-by-line basis, which means no word wrap-around, no use of cursor keys, no selecting text with the mouse. For this reason, prolific silicon correspondents create their communiques with their favorite word processor, save them in text-only form, then simply upload the files when they're on line. This approach saves connect time, too.

You navigate through most information services by typing commands in response to menus that list services and options. Many services also have an expert mode that dispenses with menus and presents a simple prompt, such as "Command?" Memorizing the commands you need can be difficult, but the incentive is there: waiting for menus and their help screens to appear hinders the process, and in telecommunications, time is money.

(continues)
MacBottom SCSI Hard Disk Drive
The compact that takes you and your Macintosh for a ride in the fast lane.

Get more (and less). You've always heard that good things come in small packages—here's the proof. Available in 20 and 40 MB models, the MacBottom arrives completely formatted and ready to use; unpack it, plug it in, and turn it on. It comes with easy-to-use software including a print spooler for the ImageWriter and the LaserWriter; FloppyCopy, a floppy disk duplicator; and other MacBottom disk utilities. You also get PCPC's HFS Backup™, the popular archive and restore program, and Eureka, the desk accessory that locates misplaced files. And you don't have any surprise purchases in store when you buy a MacBottom. The cables, terminators, push-button SCSI address selection, and an additional SCSI port are built right into the compact case, as is the whisper-quiet fan that helps you keep your cool.

You CAN take it with you. The MacBottom is so lightweight and compact, you can take it anywhere. It weighs less than five pounds, and it's just two inches tall, so it fits under your Macintosh as perfectly as it fits into your attache case or your Macintosh Plus carrying case. More importantly, the MacBottom is designed to withstand the rigors of travel—it's not just small, it's sturdy.

All this and a modem, too! Reach out and explore the wealth of information available via telecommunications. You can buy a MacBottom SCSI with our optional Hayes™-compatible, 300/1200 baud modem built right in! Buy it now or add it later; the choice is yours.

Depend on it. As Macintosh hard disk pioneers, we have consistently set the industry standards. We provide unlimited technical support as well as a comprehensive upgrade policy that allows all MacBottom owners to take advantage of our latest developments. We're so confident in our drive that we give you a full one year limited warranty that includes all parts and labor.

Call your dealer today. Featuring the ultimate in speed, engineering excellence, outstanding software, long-term customer support, and portable reliability, the award-winning MacBottom SCSI hard disk is a combination you can't beat. It's only two inches tall, but no other hard disk stacks up.
Not just another pretty (type)face.

Century Software's LaserFonts collection is the largest library of PostScript typestyles in the world. With no copy-protection, and prices ranging from $35 to $45 per font family, it may also be the most useful. But don't just take our word for it...

- Awarded four mice (out of five) by MacUser.
- "A true five out of five rating." Alan Stevens, MacTimes.

For free information, call or write us at the address below. Or send $2 for a catalog with full-page print samples from each pack. Meanwhile, here's a taste of what's available:

- Caps & Fractions
- Weather & Nautical
- ITC Avant Garde
- Gothica
- Hell
- Heavy
- ITC Kabel
- Micron
- Minion
- Option
- Terra
- FRANKFURTER
- MILTON
- SUPERSTAR
- SHADOW
- applefont
- Colorado
- Congo
- Columbia
- Cumberland
- Devil's
- Hudson
- Manistee
- Neosho
- Potomac
- Rhine Seine
- Spokane
- SYX Thames
- Trent
- Willamette
- Yukon
- Rubicon
- Los Angeles
- Fat
- Helv.
- Thin Times
- PostScript Cairo & Taliesin
- Symbol
- Futura
- Helvetica
- Inline
- Bold Helvetica
- Burst Times
- Shadow Times
- Technical Fonts

What you see is what you get. This ad was printed on an Apple LaserWriter, and was not reduced or retouched in any way.

Century Software, Inc.
2483 Hearst Ave., #175
Berkeley, CA 94709
(415) 549-1901 (213) 829-4436

Circle 571 on reader service card

Communications
Two Ways

Compare CompuServe's main menu, typical of the all-text interfaces used by online services, with the main menu of AppleLink, Apple Computer's corporate network for employees and dealers. It may be a while before the average user can find software that allows point-and-click navigation of commercial on-line services, but that day is coming.

Pointing Ahead

Fortunately, the future of telecommunications looks a bit more attractive, and before long you'll be able to point-and-click your way through much of a communications session. Most major information services are developing ways to add graphic user interfaces to their systems while maintaining brand independence. One promising technology uses a system of pattern matching; your communications program recognizes certain screens as they're received, then creates a dialog box that lets you make selections, which your program translates into the text commands the service requires. Such an approach allows the information service—the host—to remain oblivious to the brand of computer with which it's communicating.

Another way of working graphics into the picture is to have the host send commands to transform your communications program into a more familiar format that uses, for example, a set of pull-down menus or a desktop-like display with icons representing the service's offerings. Apple's AppleLink dealer and employee communications service uses this approach now (see "The Telecom Link," Macworld, May 1986).

This route requires that both the host and the communications program know what they're talking to, so only users with a certain computer and communications package can use the service. Because an information service couldn't switch to this approach without alienating subscribers who lack the right equipment, compromise may be the answer: when you sign on, the service could quickly query your communications program to see if it understands graphics commands. If not, the service would use conventional text menus.

But until such graphic user interfaces become available, telecommunicators are stuck with old-fashioned prompts, ugly screen displays, and typed commands. Combine these drawbacks with the technicalities of communicating and it isn't surprising that most people still (and will continue to) rely on newspapers, express couriers, and local shopping centers.

See Where to Buy for product details.

See Where to Buy for product details.
Word Processing is Obsolete!

Presenting RAGTIME Page Processing

Page Processing: A New Breed
Word Processing has served you well for over two decades, and has now been replaced by a new, superior application—Page Processing. It's called Page Processing because it contains all the necessary tools for creating exciting pages and professional documents. Gone are the limitations of words without pictures and text without numbers.

Ragtime, the premier Page Processor for the Macintosh computer, is the first to combine the functions of word processing, spreadsheets, page layout (also known as desktop publishing), business forms generation and graphics management all in one complete package. Effective businessmen need these combined functions to create truly professional documents such as proposals, manuals, financial presentations, newsletters, and advertisements.

The Page Processing Advantage
If you are using separate software packages for word processing, spreadsheet and desktop publishing, you are not achieving your full potential. A new standard in top-quality business documents has been established with the integrated power of Ragtime Page Processing.

As an example, consider a typical business proposal, like that pictured above right. Only with the power of Ragtime Page Processing can you create the entire page layout (including columns, hairlines, headers, and the like) and simultaneously word process all your required text. Next, you can build in a persuasive spreadsheet with all the facts and figures (a requirement in any business proposal), all without leaving the application. Then bring in the graph that illustrates your data (a picture is worth a thousand words processed). Voilà, you and Ragtime have produced your most professional proposal ever. All this at a fraction of your previous efforts and costs. This is the Page Processing advantage.

Commitment to Innovation and Excellence
Orange Micro has spent over six years providing innovation to Apple users all over the world. To date, we have sold over 500,000 Apple enhancement products, and gained the support and respect of the industry.

Special Opportunity to Try Ragtime
We would like to give you an opportunity to experience the power of Ragtime Page Processing on your own Macintosh, at your convenience. Complete the coupon below and discover Page Processing for yourself.

FILL OUT AND MAIL TODAY!
Send a check or money order for $10 with this completed form and receive:
• Ragtime Evaluation Disk
• Sample Documentation
• $10 Manufacturer's Rebate coupon redeemable with Ragtime purchase
• Free Mouse pad ($10.00 retail value)

© Orange Micro, Inc., 1986
Trapeze™ is being called the next generation spreadsheet. Here's why:

No Row and Column Grid—Trapeze organizes your information into blocks. You refer to these blocks by name, rather than by cryptic row and column references. Blocks can be moved anywhere on the page and still retain their relationships. And they automatically adjust in size when you make additions or changes.

Unprecedented Flexibility—Trapeze lets you use all of the Macintosh fonts, styles, and sizes—**even color**—in any block. With Trapeze, you can mix calculations, text, pictures, and charts—all on the same worksheet. And you can link together up to 32 worksheets.

Unmatched Power—The real power of Trapeze is its more than 125 built-in functions. In addition to standard financial spreadsheet applications, Trapeze supplies a wide range of statistical, engineering, and scientific functions. You can solve simultaneous equations, perform matrix operations, utilize various regressions, even create amortization tables with a single function. Trapeze supports the Motorola 68881 floating point coprocessor chip, and takes full advantage of all available memory in your Macintosh.

Trapeze is available now for $295, and comes with a 30-day, unconditional, money-back guarantee. To order, contact the dealer nearest you or call 1-800-443-1022 today. Once you begin using Trapeze, there's no limit to what you can see.
Insights on Red Ryder
Inside information on the Mac's hottest communications program

by Charles Seiter and Daniel Ben-Horin

Throughout its rapid sequence of incarnations, Red Ryder has continuously maintained its position as the most popular piece of communications software for the Mac. Yet you'll never see it on the shelf at the local computer shop or appearing on best-seller lists, because the program reaches users through shareware channels. To appreciate this remarkable accomplishment, try to envision a universe in which the leading IBM PC business database, for example, is distributed on bulletin boards by an individual programmer. Red Ryder is currently managed by one person, Scott Watson, who continues to distribute the program with great enthusiasm and intensity. Often, it seems, the best software springs from one person's vision (the original design of Pascal is a good example).

Update and Be Straight
According to Watson, most operations in Red Ryder version 10.0 work nearly 100 percent faster than in version 9.4, which was in turn 80 percent faster than version 8.0. Nevertheless, many users still slog away on version 6.5, and occasional holdouts remain in the low 4s. Many Ryders limp along with only 3 percent of the program's functions because they were handed a copy without the documentation files.

Let me make a serious suggestion. On a few occasions in your life, you will have a chance to participate in a noble quest and do yourself some immediate, practical good. Whether out of altruism or self-interest, send Scott Watson $40 and become a registered user, enjoying solid and friendly documentation, the latest version of the program, and technical support from the man himself. Version 10.0 is simultaneously simpler and more powerful than its predecessors, and to keep advanced users from getting bored, the irrepressible Mr. Watson has included nearly one hundred undocumented procedures to explore in the new version.

If you have an old version of Red Ryder, you may not be able to tell from the information on disk how Watson distributes new upgrades. These days, each paid-for copy of Red Ryder provides the owner with a GEnie account, and Watson regularly posts new versions of the program in the Red Ryder Forum there.

Being a Good Host
The most frequently asked question at Red Ryder customer service is, "How do I get my system as host to recognize incoming calls?"

This question arises because the program is the most popular bulletin-board host system in current operation. For the original Mac 9-pin DIN serial port and 25-pin modem (of the Hayes type or earlier) the answer is to tie together the modem-input handshake and carrier-detect lines (these go to pin 2 on the Mac). For variant modem configurations, the best approach is to post your hardware question on the Red Ryder Host session of the Ryder forum on GEnie, and hope that the wizened pros who work this session have already seen a case like yours.

(continues)
How To/Insights

Program's Progress
The large progress indicator, which marks the progress of a file transfer, takes more time to be drawn on the Mac screen. Use the small indicator to speed up transfers.

Essential Knowledge
According to Watson, the only commands needed to start writing procedures are TYPE, PAUSE, PROMPT, COMM, and DIAL. Users often recommend using the option "Let RR write a procedure for me" and then inspecting the resulting file with a text editor. This method lets you examine the composition of a variety of procedures as a guide to composing your own.

Red on the Inside
- Archives Various modes are provided for recording an on-line session, and it is not necessarily clear from the Red Ryder documentation which mode is preferred.
- Archive Screens is intended only for use in downloading a file whose length is known beforehand.
- Progress Smaller Is Better The large progress indicator for transfers is undeniably nifty, but the Mac requires considerably more time to draw it on screen than the humble small progress indicator (see "Program's Progress").
- HFS Users of early versions of Red Ryder report frequent problems with file downloads under HFS. Versions 8.0 and higher work correctly with HFS, as long as you specify the right "path" for the download, through files and folders.

An Excellent Application
A prime business application of communications software is automatic downloading of financial data into a spreadsheet; many Ryders will want to load data into Microsoft Excel. Using Tempo along with the communications program and the spreadsheet, you can set up your Mac to hook up automatically to an on-line information service, download preselected data, and enter it into a spreadsheet. "Going On-Line with Excel," in the July 1986 Macworld, gives detailed instructions for using this technique to update an Excel stock-portfolio valuation spreadsheet while you sleep.

Successful Transfers
Sometimes you log on to a bulletin board and seem to be able to communicate with no problems (at least the screen isn't hash), but file transfers don't work properly. This may occur because the host machine is using a parity that differs from the N or E typical in the personal computer world. Many IBM mainframes require Mark as the parity designation, and there are plenty of IBM mainframe hosts out there.

(continues)

Coral Software introduces Object Logo
A programming language like none before it.

Object Logo is a new programming language developed specifically for the Macintosh. Object Logo incorporates the symbolic processing power of LISP, full object-oriented programming capabilities and the most advanced math package ever put on a microcomputer in a proven, easy to learn educational programming environment. Object Logo - it's a rare blend of simplicity and sophistication.

The Object Logo programming environment features an editor with multiple windows, a debugger, and a hidden native-code compiler, so you get the advantages of both a compiler and an interpreter, rolled into one. Object Logo also improves on the graphics capabilities that made Logo famous with multiple graphics windows and multiple turtles, each implemented as customizable Object Logo objects, and with access to more than 100 Quickdraw commands. Sounds overwhelming? The Object Logo manual is written by experienced educators whose examples and comments will guide you every step of the way.
How the pictures (and words) get into the Mac or PC

for desktop publishing

to create documents like this.

To get the most out of desktop publishing, you'll want to get images into your documents.

Datcopy is the leading supplier of scanning devices that feed pictures into your computer. (For the PC, you can even read in words, using our OCR or OCR Plus software.)

Shown: Datcopy's JetReader™ and Model 730, the only flatbed scanner available.

Both offer professional, laser quality resolution of up to 300 dots per inch. Once images are scanned in, you can manipulate them using your desktop publishing software (e.g. PageMaker,™ FrontPage,™ ReadySetGo,™ popular paint programs, and more).

These reliable, affordable tools help you get more out of desktop publishing, by helping you get more in. So why not make a toll-free call today, and get answers to your questions about software, hardware, ease-of-use, and how to order.

Questions? Call the Hotline now! 800-821-2898
In CA: 415-965-7900

Datcopy
The Eye of the Computer™

Circle 637 on reader service card
Instead of the communications settings (baud)-8-N-1, try either (baud)-8-K-1 or (baud)-7-K-2. K = Mark parity is simply statistically more frequent than S = Space parity, so it’s the first choice, but if K parity doesn’t work and there is no way to obtain further information on your host, try S.

The Kermit file-transfer protocol is very popular in university circles. It’s distributed in the public domain by a group at Columbia University, and well-maintained Kermit software resides on nearly every academic mainframe. If your host is a university computer, and for some reason your Xmodem file transfers aren’t working, you can improve your chances of success by trying a Kermit transfer instead.

*Caught in the Net* Many users complain about Red Ryder file transfers on Telnet; the problems typically happen in Xmodem download attempts. An evaluation of possible solutions concludes that no consistently successful scheme exists for getting around the timing considerations in packet switching. The only solution is to get version 10.0, which was completely redesigned expressly to accommodate packet-switching networks.

*Cache 22* With a 68020 processor, everything you run on a Mac will go faster except Xmodem transfers in Red Ryder, which will hang like a horse thief. You must turn off the instruction cache to make Xmodem work.

More New Improvements

The latest Red Ryder is so recent that its fans haven’t had much chance to exchange discoveries on line. So here are a few new features you might miss without road signs.

*The Big Picture* The screens in Red Ryder 10.0 are superficially similar to those in earlier versions, but with a little mouse experimentation you will find that they can be sized, dragged, and stacked. This feature was added to accommodate the capabilities of new large-screen Mac monitors (it’s been extensively tested with the Radius Full Page Display). On a large screen, a three-way split is a practical way to show windows with incoming, outgoing, and currently edited files all at once.

*Status* The Status Bar at the top of the 10.0 screen looks the same, but it now contains pull-down menus. Instead of toggling through a series of baud rates, for example, you can select the correct rate with a single click.

*More Time for the Puzzle!* In version 10.0 the desk accessories are enabled during file transfer. This means, for the resolutely businesslike, that you can begin editing a Notepad answer to your E-mail as you watch it scroll past in a separate window.

*If X, Why Not Y?* The Ymodem protocol now available for file transfers in 10.0 is basically a version of Xmodem that supports transfers of multiple files with a single command. Unlike Microphone, which supports Ymodem in receive-only, Red Ryder allows its use for both sending and receiving.

*Ultimate Mysteries* Version 10.0 contains a great many undocumented commands that can be used to change settings. These take the form PARMS address, in which address stands for a three-digit number corresponding to a setting value and address is where the setting variable is stored. For the moment, if you want to use these mystery commands, be prepared to experiment, since the documentation for them is not yet prepared.

See *Where to Buy* for product details.

---

**MacLinkPlus™ ... Connectivity to the IBM PC plus ...**

- It's a complete "kit" for exchanging files between the Macintosh and the IBM PC (and compatibles)
- Connects to the PC's serial port using modems or the included cable . . . or over AppleTalk when used with a Server or Network Product
- Contains an extensive library of translators to convert word processing formats, spreadsheets and data base information
- Full visibility into remote disks and directories
- TTY terminal emulator for general communications
- $195 includes Macintosh software, PC software, built-in translators, manual and cable
- Wang and NBI options available

DataViz Inc.
16 Winfield St. • Norwalk, CT 06855 • 203-866-4944

Circle 281 on reader service card
WE SEE SOMETHING NEW IN YOUR FUTURE

There is a lot of excitement in the Macintosh community these days. In the very near future there will be innovative new machines, open architecture, more powerful software and even greater memory capacities. Dove has been leading the way in developing quality memory solutions for the Macintosh and Macintosh Plus with 1 Megabit chip products, surface mount technology and large screen display compatibility. And that's true for the new machines in your future, too. Dove has been developing "state of the art" memory, communications and software utilities for Apple's "state of the art" machines. Soon you'll see and experience the best from both of us. An unbeatable combination! For more information about our current products or our new products, please circle the reader information number or call us toll free at: **1-800-622-7627**.
GET BACK TO BASICS
Peachtree's Back to Basics is the most popular accounting system on the market today. And it's no wonder why.
Back to Basics is simple to install, easy to use, and priced in line with what small businesses can afford.

But don't take our word for it. Software Digest, a leading consumer organization, rated Back to Basics number one in overall usability when compared to products costing as much as $995 and, for the past two years, Back to Basics has won the A+ Magazine Software of the Year Award for Macintosh business accounting systems thanks to the votes of over 20,000 Apple users.

NO EXPERIENCE REQUIRED
Back to Basics assumes you're an expert in only one business—your own.
- Installation of Back to Basics is painless — read only seven pages in the manual and spend 30 minutes using our screen menus.
- If you need to brush up on your accounting, use our accounting primer and tutorial, written by Harvard Business School Professor, Robert N. Anthony, plus our business section on how to handle everyday accounting dilemmas.

$199
Back to Basics Accounting System became a best seller priced at $525. Now, as a result of reduced expenses, we are able to offer all three modules — General Ledger, Accounts Receivable and Accounts Payable — in a complete set for just $199.

PROVEN POWER
Peachtree has long been the first name in accounting software and the powerful features we've included in Back to Basics prove we understand what you're looking for.
- Complete integration of General Ledger with Accounts Receivable and Accounts Payable.
- Single transaction entries up to $999,999.99 and year-to-date totals up to $21,000,000.
- Journals and reports updated as each transaction is recorded.
- Void transaction facility automatically creates reversing entry.
- More than 30 reports can be viewed on screen or printed.

MACINTOSH SPECIFIC
Back to Basics was written specifically for the Apple Macintosh, not simply converted from another computer version. It uses the Macintosh interface (mouse and visual icons) for system operation and groups functions into on-screen "file drawers" for organization and ease of use.

Back to Basics was a featured accounting system in Apple's initial ads for the Macintosh and is backed by Peachtree's outstanding support, labeled by InfoWorld as "the finest in the industry". Support is available as you need it, at a nominal charge directly from Peachtree or through our network of local authorized support centers.

MONEY BACK GUARANTEE
When you purchase Back to Basics directly from Peachtree Software you're protected with a 30-day, money back guarantee (an option even the most expensive accounting products don't offer).
If you're not satisfied, simply return the complete product in saleable condition within 30 days and your purchase price will be promptly refunded. For full details, call the toll-free telephone number below.

Invoicing Coming Soon
Back to Basics Invoicing will soon be available for the Apple Macintosh at an introductory price of $95.

HARDWARE SPECIFICATIONS
- IBM Personal Computer, PC/XT, PC/AT with two floppy disk drives or one floppy disk drive and a hard disk.
- Apple IIe, IIIc, IIGS with 128K and two disk drives or a hard disk.
- Apple Macintosh 512K or Plus with two disk drives or hard disk.

Features That Made Back to Basics A Best Seller
- GENERAL LEDGER
  - On-line help displays Chart of Accounts.
  - MTD and VTD show on income statements.
  - Allows automatic entry for income statements.
  - Check processing and printing capability through Cash Disbursements.
  - Optional cost of sales ranges.
  - User modifiable Chart of Accounts included.
  - Allows up to 3 checking accounts.
  - Up to 10 departments with separate income statements.

- ACCOUNTS RECEIVABLE
  - Calculates receivables on balance forward basis.
  - Print statements and mailing labels.
  - Allows automatic posting to General Ledger.
  - Accepts partial payments.
  - Calculates finance charges.

- ACCOUNTS PAYABLE
  - Up-to-date customer information can be scrolled for review at any time.
  - Customer IDs can be alpha or numeric.
  - Verifies customer credit.
  - Calculates up to 3 sales taxes per entry.

- VENDOR MTTCH
  - Automatically matches up vendor checks or processes hand-written checks.
  - Verifies automatically or manually selected for payment.

Apple is a registered trademark of Apple Computer, Inc. Peachtree is a trade-mark of Macintosh Software Laboratory, Inc., licensed to Apple Computer, Inc. and used with the express permission of its owner.
Mac Desktop Tools
More goes on behind your desktop than meets the eye

by Tom Saxton

When you work on your Mac’s desktop—moving files around, opening applications, and throwing away old files—you are actually running the Finder, a collection of programs and routines fundamental to the machine’s operation. (For introductory material on the Finder, see “The Compleat Disk Juggler” and “Clean Up Your Electronic Desktop,” Macworld, May/June 1984, and “Getting Started with the Mac System,” November 1986.) Although the Finder is as typical a Mac program as any, many tricks for using it efficiently are easily overlooked. Some, in fact, are rather well hidden.

As with most Mac programs, the Finder has evolved since its introduction. Features have been added that make it faster and easier to use. The newer Finders take advantage of the improved Macintosh hardware; they also include new features such as the Shut Down command and the Hierarchical File System (HFS), which simplifies working with a hard disk. To make a long story short, if you are using an original Mac, you should have Finder version 4.1 (and System 2.0). If you are using a Mac with more than 128K of RAM or with the 128K ROM, you should use Finder version 5.3 (or higher) and System version 3.2 (or higher).

To determine which Finder you have, select About the Finder from the Apple menu. A window appears that contains the version number of the Finder that is running. If the version you are using is relatively recent, it also shows how much RAM your machine has. With Finder version 5.0 or later, if the Mac has the 128K ROM, a period follows the RAM size; if that period does not appear, the Mac has the old 64K ROM. Also, the Trash Can icon tells you something about the Finder: in version 5.0 or later, the dots at the top and bottom of the can’s vertical ribs point to the left; in earlier versions they point to the right.

You may update to the correct version of the Finder and System files by copying them from a disk that has them (for Finder 4.1) or by running the Installer program on the System Installation disk available from Apple dealers, bulletin boards, and user groups.

Maximizing Window Use
Once your files have been placed on disks and in folders, you may organize things within the disk and folder windows. This can be nearly as important as how you shuffle things into the folder structure. As the number of icons in a given folder increases, resist the impulse to enlarge the window so that all of the icons are visible. Large windows quickly lead to conflict, as

(continues)
You've put your finger on 3 key reasons to subscribe...

1. SAVE SUBSTANTIALLY! Your subscription means a handsome savings for you—check it out.

2. GET THE MOST FROM YOUR MAC! Your money-saving subscription also insures a steady flow of the practical information you want—reviews of software and hardware you can rely on, new applications, techniques, and practical “how-to” tutorials.

3. GET THE MACWORLD GUARANTEE! We’re so certain you’ll get what you need—and more—from MACWORLD, we guarantee it! If for any reason you’re not satisfied with MACWORLD, just let us know, and we’ll promptly refund the cost of your subscription for every unmailed issue.
SUBSCRIBE
NOW

YES! Please send me one year (12 monthly issues) of *Macworld* for only $24. I’ll save $23.40 off the annual cover price of $47.40, a savings of almost 50%. (That’s $6 off the regular subscription rate of $30.)

SAVE EVEN MORE!

☐ $37.90 for 2 years (24 monthly issues)
☐ Payment enclosed ☐ Bill me later

Name
(Please print your full name)

Company

Address

City, State, Zip

Please allow 6 to 8 weeks for delivery of your first issue. Offer good in the U.S. only. Offer expires September 30, 1987.

MACWORLD
*The Macintosh Magazine*

SUBSCRIBE
NOW

Order Now to Take Advantage of These Special Savings.

Call TOLL FREE: 800/524-3200

Visa and MasterCard Accepted!

(New Orders Only)
How To/Mac Tools

Root-Level Windows

Establishing a system for window placement avoids confusion on the desktop. The author's arrangement: a small window at the upper left for application disks, data-disk windows underneath; folders from the data disk open on the right half, with icons uncovered at the far right.

Two more HFS shortcuts: holding down the Option key when you click on the close box of a window causes all windows to close. Holding down the Option key when you double-click on a disk or folder icon makes the window open as usual. But note that the Finder will forget that the window was open next time you use the disk.

If you have installed the MiniFinder and want to return to the Finder, hold down the Option key when you quit your application.

More Tips

We all develop habits when we work with the Mac, and some of them take more time than they need to. Here are a few shortcuts that save time during routine tasks.

- Changing Finders To change start-up disks without restarting the Mac, open the System Folder on the new disk, hold down the Option and Option keys, and double-click on the Finder. When you return to the Finder, throw the former start-up disk into the Trash. If you hold down the Option key when opening an application, the disk containing the application becomes the start-up disk.

- RAM Caching To speed up returning to the Finder, set the RAM cache to at least 64K.

- Finder of Lost Icons Occasionally, one icon seems to have disappeared, a Clean Up will uncover it.

- Shutting Down When you want to turn off the Mac, or you need to restart, use the Shut Down command from the Special menu. It's faster than ejecting your floppies and turning off the Mac's power, and it cleans up the floppies before ejecting them, which makes the Mac start up more quickly the next time you use those disks.

- Tab to Find Disk In the Standard File dialog box, if the Drive button is dimmed so you can't switch disks, press the Tab key to prompt the Mac to recognize the other disk.

- Naming Files In the Standard File dialog box, files show up alphabetically. If you want a particular file to appear on the list ahead of other files, put a period or a numeral at the beginning of the file name. This is a handy trick when there are many files in the same folder, or when using an MFS disk.

(continues)
How To/Mac Tools

For the Bold and Daring
Macintosh programs are stored as a series of resources. Many language-dependent and cosmetic features of a program are easily accessible through a resource editor such as ResEdit. In the case of the Finder, you can change the contents of dialog boxes, adjust the appearance of certain icons, and customize many other details. The Layout resource of Finder version 5.0 and later, for example, is easy to modify and can actually make the Finder faster and easier to use.

To make changes such as those I suggest below, obtain a copy of ResEdit (version 1.0.1 or later) and prepare an expendable copy of the Finder for experimentation. After opening ResEdit, find the window for the Finder’s disk. The window lists every file that has resources. Select the Finder item and open it. A new window will open, listing all the resources in the Finder. Now you can begin changing the look of your desktop.

Open the Finder’s LAYO resource. Another window will open, showing all of the resources of type LAYO. In this case there is only one, with ID = 128. Open it, and you’ll see a scrollable list of the 38 items in the LAYO resource. “Finder Layout” shows a few of the items.

Font ID and Font Size determine the type used to display file and folder names. (Valid values for Font ID can be found in the FOND resource in the System file.)

Finder Layout
Normally the Mac offsets icons by 64 pixels when cleaning up the desktop. You can add to that number to increase the space between icons on the grid. Here, the vertical phase has been changed to allow long file and folder names to appear legibly on the desktop.

Available Courses:
Learn Word Series
1 Beginner
2 Intermediate
3 Advanced

Excellerate Series
1 Fundamentals of Excel
2 Creating Business Graphs
3 Adding power to your Spreadsheet
4 Building & Using Databases
5 Building & Using Macros
6 Linking and Consolidating Spreadsheets

Personal Training Systems
Dealer Inquiries Welcome

I don’t want to spend 30 hours learning WORD
Then get LEARN WORD
What’s that?
Self-paced courses on Word that you can complete in about an hour
How do they work?
Instructors on the LEARN WORD audio tape guide you through the lessons while you use Word with the LEARN WORD practice disk
You mean I can be using Word in an hour?
Sure can!
Without reading the manual?
Yes—Just call
408-559-8635
for more information

Circle 560 on reader service card
INTRODUCING 101 MACROS™ FOR EXCEL™

Instead of This...

MAKE EXCEL EASIER — AND MORE POWERFUL
Now you can have your own on-disk library of shortcuts, utilities, keystroke savers and mousestroke savers that will work with ANY Excel worksheet. No more dull, repetitive operations, no more pulling down and clicking through multiple menus, no more hours wasted with manual input that could be automated.

Introducing the ultimate collection of 101 pre-typed, ready-to-use, all purpose macros on disk. Imagine being able to:

- Automatically double space and print a worksheet
- Set up and maintain data bases with a single command
- Create slide show presentations
- Add menu-driven financial functions
- Automatically overlay and clean up all the worksheets on the screen with a single keystroke

Plus 96 more features to save time and multiply the power and ease-of-use of Excel.

With 101 MACROS FOR EXCEL you can save keystrokes & mousestrokes, save menu steps, save time and automate your worksheet. Whip through complicated menus and worksheet setups with a single keystroke. Eliminate repetitive operations with macros that will move down columns or across cells, changing each cell to your specifications. Operations that previously required several mousestrokes, like swapping columns or inserting rows, can now be done with single keystrokes.

You Can Do This...

FREE! HANDY REFERENCE GUIDE
Act now. For a limited time you get not only a complete collection of 101 macros with User's Manual, you will also receive a handy reference guide listing all 101 macros and their call-up keystrokes.

"Outstanding... the ultimate macro library."
— P. Aminullah, President, Solar Systems Software

“A must-have for Excel users.”
— R. Sharp, President, Clarify Glass Inc.

“A great idea... what a time-saver!”
— A.Stan, President, Studio Silicon

ORDER 101 MACROS FOR EXCEL today!

NOT COPY PROTECTED
60-DAY MONEY BACK GUARANTEE
Excel is a registered trademark of Microsoft Corp.

With This. $69.95

ELIMINATE FRUSTRATION
How many times have you had to go back to the manual to learn how to do some simple function that seems overly complicated in Excel? How often have you waded through charting, database operations and building tables? How often have you wished that you didn't have to wear out your arm reaching for the mouse to perform just about every operation? The macros in 101 MACROS FOR EXCEL help you out with everything from simple mousestroke and keystroke savers, to sophisticated, interactive macros which "walk you through" more complicated Excel operations.

EASY TO USE
These macros are extremely easy to use. Just load the macro sheet called 101 into Excel and you’ll have all 101 macros available for instant use at any time.

By pressing the option key, the command key and a single letter, you can insert new rows that copy data automatically. Or enter long phrases instantly. You can even toggle the gridlines and headings on and off with a single keystroke combination.

EASY TO LEARN
101 MACROS FOR EXCEL comes complete with a comprehensive, step-by-step manual that includes a tutorial chapter and explains each of the macros and how to use them. The macros are fully documented, so they’re easy to review, change and learn from — which gives you an excellent starting point for writing your own custom macros.

Yes! I want 101 shortcuts, utilities and keystroke savers!
Send me ___ copies @ $69.95 plus $2.50 shipping ($12.50 outside U.S.A.). CA residents add $4.90 sales tax.

I enclose ___

Please charge my □ VISA or □ MasterCard
Credit Card Exp. Date ______ 
Card # ______ 

Name ______ 
Phone ______ 
Company ______ 
Address ______ 
City ______ State ______ ZIP ______ 

MACROPAC INTERNATIONAL
19855 Stevens Creek Blvd., Suite 166 • Cupertino, CA 95014
or Call with your VISA or MASTER CARD 1-800-227-2400, x945
If you need a hard drive or tape back-up system, you must take advantage of our high quality, low prices, and incredible service. All prices and features are fully guaranteed. Check the competition, then order today. If you’re not 100% satisfied, we’ll gladly refund your money!

1-800-345-0685
1-800-345-1742
(Nationwide)
(Inside Calif.)

30 DAY 100% MONEY-BACK GUARANTEE
1 YEAR WARRANTY ON PARTS AND LABOR
SAME DAY SHIPING (Overnight Available)

HOW TO/MAC TOOLS

Window Rect specifies the size and position of newly created windows. Type in the coordinates (in pixels) or click on Set and use the mouse to drag a new rectangle.

Icon Horz Spacing and Icon Vert Spacing determine the spacing (in pixels) between icons when you choose Clean Up from the Special menu.

Icon Vert Phase tells how many pixels go between adjacent icons when you clean up the desktop. If the amount is greater than 0, file and folder icons are staggered when they are cleaned up. This eliminates the annoying tendency of long file names to overlap and become unreadable (see “Finder Layout”). To avoid damaging the Finder, do not set the vertical phase bigger than the Icon Vert Spacing; nor should you set it equal to half of that value.

Sm Icon Horz and Sm Icon Vert position the small icons. Add to the value for Sm Icon Horz to accommodate long file names.

Text View Date is a hexadecimal word (four digits preceded by a dollar sign). The second digit is the one that counts. Setting it to 0 displays dates in the short form (that is, 12/14/86); setting it to 1 displays dates in long form (Sunday, December 14, 1986). Making it a 2 produces the date in this form: Mon. Dec. 14, 1986.

Default View specifies the view format for newly created windows, with a value from 0 to 5 corresponding to the menu items in the View menu. 0 means by Icon, 1 means by Icon, and so on down the menu. If you prefer to display your files by something other than icons, changing the default saves you the trouble of converting every window.

Setting Use Zoom Rects to 0 turns off some of the Finder’s cosmetic animation. At first the desktop looks out of range without the zooming rectangles, but the change noticeably speeds up launching applications and opening disk and folder windows.

If you never throw away the wrong file and you find those “Are you sure you want to throw away…” queries annoying, change Skip Trash Warnings to 1.

Changing Always Grid Drags to 1, so icons always pop to the nearest grid point on the desktop, reduces Clean Up time. Doing this with a vertical phase keeps your files organized and visible without manual adjustment.

On my Finder, I opened the ICTN# resource, found the Trash Can, and altered it
Drive Over the Speed Limit with MegaDrive! Hard Disk

30 Megabytes of high-speed SCSI storage
MegaDrive! 30S is a high-performance, high-capacity external hard disk for your Macintosh™ Plus. With a data transfer rate much faster than conventional hard drives, MegaDrive!s SCSI technology lets you access files and run programs with increased speed.

Wait less and accomplish more
MegaDrive!s storage capacity is nearly 40 times greater than an 800K disk drive. You can store application programs, large documents, numerous fonts and graphics all in one fast and easy-to-use device. That means you won't have to endure endless disk-swapping every time you use your computer. The drive is also compatible with Mac 512, Apple IIGS™ and Ile computers using a SCSI card.

Reliable, expandable, easy to use
This good-looking drive was designed and manufactured for reliability, speed and easy use. And MegaDrive! makes your system simple to expand. You can connect up to seven SCSI-compatible memory devices and printers without taking up your Mac's serial ports.

FEATURES: 30S model
- 30 Megabyte formatted capacity
- SCSI technology for high-speed performance
- Pre-formatted and easy-to-use—plug in and power up!
- Expandable—connect up to seven SCSI peripherals
- Runs quiet and cool, low power use
- Small footprint
- Utility software for testing and data back-up
- Portable—automatic head-lock secures your data
- Complete cabling and manual included
- Reliable—one year limited warranty
MegaDrive! 30S includes software, termination cable, user's manual and warranty registration card. Ask your computer dealer for more MegaDrive! information or call toll free: 800/225-6442. In California call 800/843-0426. For technical support call 714/586-7700. Logic Array, 2 Faraday, Irvine, CA 92718

Specifications and availability subject to change without notice.
Apple II series and Macintosh are trademarks of Apple Computer, Inc.
© 1987 Logic Array, Inc.

Dealer Inquiries Invited

Circle 654 on reader service card
MacCalc is the clear value leader in the Macintosh spreadsheet market. — Infoworld

MacCalc
Speed, Style, Simplicity

To be fast is not enough — the speed must be easy to use. We set out to make MacCalc fastest in this fullest sense ... and succeeded. MacCalc is blindingly fast — and that speed is available to the novice as well as the power user. And not only is MacCalc easy, we also included the most important "wish list" features, like cell notes, database search/sort commands, complete formatting with variable fonts/styles/sizes for any cell, variable row height and variable column width, and more. With full desk accessory support, MacCalc is the clear value leader in the Macintosh spreadsheet market.

- Infoworld

Speed, Style, Simplicity

- Supports Desktop Publishing print publication-quality output or paste formatted tables directly into your page
- Full Undo for all operations
- Notes for any cell: create an audit trail or remember key assumptions
- Not copy-protected
- Reads/writes Lotus 1-2-3 files and SYLK data

- "[MacCalc] actually runs faster than Excel; and it clearly surpasses Multiplan in both speed and features. MacCalc is the clear value leader in the Macintosh spreadsheet market... it is difficult to rate [MacCalc] anything but excellent." — Infoworld software review, 3 November 1986

- "MacCalc's one of the best programs I've ever bought... It has an excellent manual... [Bravo] did a terrific job." — A Financial Analyst in New York

- "MacCalc is a well-designed and powerful product for those who require a full-featured spreadsheet... It is easy to learn, fast and efficient, and is a very good buy." — MacWorld, December 1986

$139

Call to order, 8AM to 5PM PST.
800 345-2888
(800) 345-2888

(BRAVO Technologies, Inc.)

Deal er & Corporate Inquiries: (415) 841-8552

See Where to Buy for product details.

How To/Mac Tools

so that I can immediately tell when I am using a modified Finder.

While you have the Finder's resources at hand, you might want to change the File Type to APPL, for application—the Finder is, in fact, an application.

Labeling it APPL allows you to change start-up disks by double-clicking on the Finder's generic application icon instead of using the Option technique. Also, once it's defined as an application, the Finder appears as a choice in Finder-substitute programs. To make the change, close the LAYO window and the Finder window. Tell the ensuing dialog box to save changes. Select Finder in the window remaining in the foreground of the screen, if Finder isn't already highlighted. Select Get Info from the File menu, tab once, and change FNDR to APPL. Close the window; answer "Yes" when the dialog box asks if you want to save changes, and you are ready to quit ResEdit.

More Drastic Measures

Even with these shortcuts, the Finder can still bog things down. A radical way to make the best use of the Finder is to bypass it when its full capabilities are not needed. For a description of Finder-substitute programs (the MiniFinder being the most common), see "Mac Desktop Tools," Macworld, January 1987. In addition to the alternatives outlined in that article, there is another public domain program, Jan Eugenides's Oasis. This program works much like Waystation, except that it handles both applications and documents, allowing you to move, copy, or delete files, and to create folders. Additionally, by the time this is printed, Andy Hertzfeld's Servant should be out. Judging by the prerelease versions, Servant should be several evolutionary steps beyond the Finder, with Switcher and a facsimile of ResEdit thrown in for good measure.

Paradise Found

After you learn a few of the hidden secrets of the Finder, you can make it perform advanced tricks or allow it to skip some mundane interruptions. By modifying the Finder's resources, you can make it work faster and tailor the program to suit your needs and preferences. Sidestep the Finder altogether when you don't actually need it, and you will avoid much frustrating slowness...
Do NOT ATTEMPT WITHOUT CompuServe.

Get all the facts as fast as the experts do before you try to tame the market.

Without accurate, up-to-the-minute data you can easily get taken for a ride on Wall Street. That's why it's important to get your hands on CompuServe. The fastest, most reliable source of comprehensive financial data available.

Now, just like Wall Street's most prestigious firms, you can check out a tip or find a hot, money-making lead in a matter of seconds. Investigate any area of interest.

Or scan CompuServe's financial news highlights to find new areas to investigate. Including:

- **Continuously updated quotes** on over 10,000 issues.
- **MicroQuote II**—12 years of daily historical prices, along with dividends, splits, distributions and interest payments on more than 90,000 stocks, bonds, mutual funds, options, foreign exchange rates and hundreds of market indexes.

Graph trends quickly online. Review your portfolio performance, investigate returns in bull and bear markets. Screen for stocks to buy, or transfer prices and dividends to your microcomputer for detailed analysis.

- **Standard & Poor's** descriptive information on over 3,000 companies.
- **Value Line Data Base II**—extensive, fundamental data for analyzing the performances of over 1,800 major corporations.
- **Disclosure II**—descriptive and financial information from the SEC filings and annual reports of over 8,500 companies.
- **Institutional Broker's Estimate System (I/B/E/S)**—earnings projections from top research analysts on over 3,000 widely followed companies.

You can also research technical market trends, review economic projections and high-powered market analyses. Get expert advice on retirement, financial planning, managed accounts, taxes and insurance. Evaluate your own portfolio, even connect to a variety of at-home banking and brokerage services.

And all this comes with CompuServe's base of news, weather, telecommunications, special interest and entertainment services.

Compare CompuServe's rates to the cost of expensive floppy-based sources. Compare our up-to-the-minute delivery to time-consuming publication research. Compare the depth and breadth of our virtually infinite databases to any other source of investment information.

Then see your nearest computer dealer for a CompuServe Subscription Kit. Suggested retail price is only $39.95 and includes $25 of online time.

For more information or to order direct, call or write:

CompuServe®

Information Services
P.O. Box 20212
5000 Arlington Centre Blvd.
Columbus, OH 43220
800-848-8199

In Ohio, call 614-457-0802

Circle 330 on reader service card
Parameter Manager™ from SMS

Instant Data Analysis Without Macros!

Better Analysis, Better Decisions. All Made Easier Because of Parameter Manager & Your Macintosh™.

Collected, store, analyze, and report all your data — whether time, date, or sample-based. At your desk.

Without worrying about writing macros or using templates!

Whether you’re working in science, engineering, manufacturing, finance, or business, you need to analyze, graph, and chart data. And PM is the one tool you don’t want to be without. With power and versatility unmatched anywhere, it sets a new standard for easy-to-use analysis.

With PM, you avoid wasting valuable time setting up the database. Simply use PM’s built-in forms to enter data. Or use its Text Import feature.

You can input an unlimited number of “items” (like machines, experiments, or sales regions) into the PM database. And each item can have up to 64 parameters, with thousands of measurements for each parameter.

Spot significant trends in your data by setting Condition Limits for each parameter. And each parameter can have its own graph template, allowing you to plot results exactly as you want. You can even include ASCII text and graphics for each item in your database.

Analyze your data in ways you’ve never imagined before. In addition to the nine built-in functions, PM’s incredible “Calculated Parameters” feature enables you to sort and analyze data in ways that best serve your needs.

All in all, you’ll find Parameter Manager to be one of the most productive tools you’ve ever used on your Macintosh. And you’ll be assured of performance and service because it’s backed by SMS, a leader in technical analysis software programs for over seven years.

Best of all, PM is only $99.95. Put PM to work on your data and let SMS take all the risk with its 30-day money-back guarantee. Or try our complete demo disc for only $10.

651 River Oaks Parkway
San Jose, California 95134
408-263-2200 TELEX: 4999067

Circle 576 on reader service card
Mac Troubleshooting Tools
A beginner's guide to staying alive

by Cynthia W. Harriman and Benction Calica

So you think you've got problems? You flip the switch of your Mac and nothing happens, or more spectacularly, psychedelic patterns dance across the screen, accompanied by the eerie moan of distressed electrical components. Maybe the file you carefully saved before lunch now refuses to load into your machine, or your favorite program tells you, "This disk is unreadable. Want to initialize?" when you put it in the drive.

Although the Macintosh is a reliable machine overall, no computer is trouble-free. The trick is being able to recover from the little problems your Mac throws at you, and to guard against their return. Most manuals and books either take the Pollyanna approach—"Don't worry, everything will be fine"—or delve into the arcane of rewriting disk sectors. It's rarely mentioned that most common Mac difficulties can be resolved by following a few simple and logical procedures.

**Rum RAM**
Most problems can be traced to one of the three basic elements of a Mac system: the user memory, or RAM; the hardware (rarely responsible); or the software.

The easiest of these to check is the Mac's RAM. Virtually everything that happens in your Mac involves binary digits, or bits, which are nothing more than on/off signals. Whenever you touch a key on the keyboard, a pattern of on/off signals travels through the memory of your machine. Stray electrical signals can get into this cycle and stir up trouble. Even though the Mac has built-in safeguards, our environment is full of electrical charges from storms, static, and other sources. What's surprising is not that occasional problems arise, but that computers have as few problems as they do.

One obvious way to start troubleshooting is simply to retry the procedure that produced the error message or abnormal behavior. Often the same procedure will work the second time around. If it doesn't, or if the problem has locked up your machine, turn off the Mac and restart it. This clears out RAM. (It also means, of course, that any data you haven't saved to disk will be lost.) When you start up again, a "clean" copy of the system software and your application are loaded into memory.

**Hardware Hassles**
If the problem persists, your next step should be to determine whether the culprit is your hardware or software. Try running some applications other than the one you've been using, always remembering to use a copy of your program rather than the original disk. If the same hitch occurs, all signs point to a hardware problem.

Even though hardware is seldom at fault, it's a good idea to check it early in the troubleshooting process. The procedure doesn't take long, and if you do have a hardware problem you could easily damage your disks or further damage your equipment by continuing to use it. Also, remember to take notes as you go. If you end up having to take the Mac to a dealer, your test findings may save time and money.

If you think your hardware is flawed, your next step is to try to locate the fault by process of elimination. Take all the peripherals off your Mac and see how the machine works on its own. Then, one by one, reconnect the peripherals. If you suspect a particular peripheral, try to borrow another unit of the same equipment and test it. If the borrowed unit works, then take yours to the dealer for a checkup.

Sometimes peripherals simply refuse to function. You're using your ImageWriter, for example, and no matter what you try to print, the machine gives you the message "Can't print that document." You borrow a friend's printer and get the same message—even though the printer worked fine on your friend's machine. If any peripheral, especially one attached to the printer or modem port, behaves like this, the problem may be in your Mac's battery-powered memory, known as its parameter RAM, or PRAM.

The PRAM holds the settings for your control panel—clock speed, date, time, and the like. It also keeps the settings for your ports, usually set from the Chooser. As with information in any other type of
Quick Fixes

Here’s a guide to some of the common problems beginning Mac users may encounter.

You’ve tried to start the Mac using a disk with no System and Finder on it. Find a start-up disk and try again.

The Mac won’t start up properly. If the second digit below the icon is a number from 1 to 5, you’ve got a hardware problem. If it’s an F, the problem is in software. Turn off the computer and try again with a start-up disk you know is good. See your dealer if the screen keeps displaying the digits.

Something happened, probably with the operating system. The codes that appear with this icon and its error message provide no real help for diagnosing or solving a bomb scare. Restart your Mac and try again. If the bomb returns, copy a new set of Finder and System files onto your start-up disk, and try again.

Make sure you’re using the most recent versions of the System and Finder (at this writing, Finder 5.3 and System 3.2). If you’re not sure about your versions, select the System and Finder icons on the desktop and choose Get Info. You should see “Finder… created June 4, 1986” and “System… created June 2, 1986.”

If you still get frequent bombs, there may be a problem with your application software; this should not happen with established commercial software.

Make sure your external drive is placed to the right of the Mac. Components in the computer's left side can cause electrical interference if your drive is placed on that side or on top of the machine.

Check all connectors on the network. Make sure every Mac on the network is using the most recent versions of the System and Finder. Pull down the Chooser desk accessory to make sure that the LaserWriter's name appears and that it's selected (appears black). If you're using an ImageWriter on AppleTalk, the same procedures apply.

memory, PRAM settings can get garbled, making it impossible for the Mac to send data out the door. The only sure cure is a Mac lobotomy: turn off the computer and remove the battery from its case, located above the machine's power cord. The Mac will forget everything stored in PRAM. After about five minutes, put the battery back in and turn on the Macintosh. Reset the time, date, and other settings. Now try your peripheral again.

Once you've tested all your peripherals, substituted a friend's equipment, and reinitialized your PRAM, you've gone as far as you can. By now you should at least know whether the problem lies in your machine, the external drive, or another peripheral. If the machine still malfunctions, take it to your dealer.

Software Solutions

Any problem not in RAM or hardware must be in software. By now your main interest is probably not so much figuring out what's wrong as cutting your losses and getting back in business as soon as possible. Just make sure you don't make matters worse by continuing to work with corrupt data and suspect software.

(continues)
Our New MacEnhancer™ lets you consider all the possibilities
Open your Mac up to the world. Break your Mac's two port barrier and connect more things to your Mac. MacEnhancer instantly turns one port into four very smart ports, all controlled with the mouse. And, you can connect non-Apple printers like daisywheels, ink jets, lasers, even color plotters. Snap, zap, you’re in business, without changing the way you use your Mac.
Get the most out of your Macintosh marriage. Use a modem, scanner, plotter, and laser, dot matrix, or daisywheel printers. Talk to IBM PCs or other computers, AppleTalk or more.
MacEnhancer plugs into your Printer or Modem port and takes them on, four at a time.

Now Mac Plus compatible. A port for any brainstorm: a standard Mac RS-422 serial port; two RS-232C serial ports; and a serial-to-parallel Centronics port for most IBM PC-compatible printers.

Comes with a dowry of software
MacEnhancer knows what turns on more than 30 printers. The new Driver Disk has most of SoftStyle’s proven ‘Start family of printer drivers, including Laserstart™ and Plotstart™ for HP laser printers and desktop plotters. Install your drivers for good with a click on your application or hard disks. And improve your communications

with the powerful, comprehensive communications software package included at no extra cost—hook up to data bases, tie into other computers, transfer files and emulate a main-frame terminal.

Family ties
Hardware developed by Microsoft, software by SoftStyle. The new MacEnhancer is attractive, compact and completely mouse controlled. All you need to use a variety of Apple and non-Apple peripheral devices.
Changing devices is quick as a click because you have no switches to set or spaghetti to untangle.
Now Apple's Chooser desk accessory controls it all. Want to expand later? Add another to get eight ports in all. With MacEnhancer, you and your Mac are open to all the possibilities.
Works with: Macintosh 512K, 512K Enhanced or Plus; Finder 5.3 or equivalent and Chooser; virtually all application software; AppleTalk plug compatible; Apple modem and Hayes Smartmodem or compatible; Apple ImageWriter and LaserWriter; selected daisywheel, ink jet and dot matrix printers from Brother, Diablo, Epson, Hewlett Packard, IBM, NEC, Star Micronics, Texas Instruments, and Toshiba; HP ColorPro, HP7475A, HP7550A plotters; HP Laserjet laser printer family; as well as numerous other devices. Upgrades available to registered owners of original MacEnhancer. Not copy protected. $245 complete.

Essential Software™
When you marry into SoftStyle's family of utilities, you inherit ease of use, power, speed, color and expandability. Discover how much better your applications can work. Our software is so basic and critical to performance, your computer will feel sluggish and incomplete without it. We call it Essential Software. You'll call it indispensable.

Jointly developed by SoftStyle® and Microsoft®

Get hitched quick
Call 1-800-367-5600 to order.
30-day money back guarantee on direct orders.
If within 30 days you find that the product does not perform in accordance with our claims, call us and we will gladly arrange a refund.
SoftStyle, Inc. 7192 Kalanianaole Hwy., Suite 205, Honolulu, Hawaii 96825.
Phone: (808) 396-6368.
Buy SoftStyle products at quality dealers who carry Essential Software.

Trademark Acknowledgements: SoftStyle is a registered trademark and Essential Software is trademarks of SoftStyle Inc., MacEnhancer is a trademark licensed to SoftStyle by Microsoft. Microsoft is a registered trademark of Microsoft Corporation. HP, Hewlett-Packard, LaserJet and ColorPro are trademarks of Hewlett-Packard Company. Apple is a registered trademark, ImageWriter, LaserWriter and AppleTalk are trademarks of, and Macintosh is a trademark licensed to Apple Computer, Inc. Diabolic is a registered trademark of Sera Corporation. Hayes, Smartmodem are trademarks of Hayes Microcomputer Products, Inc. Brother, Epson, IBM, NEC, Star Micronics, Texas Instruments and Toshiba are registered trademarks of their respective companies.

Circle 640 on reader service card
Set aside both the program and data disks you were using when the trouble arose, and make copies of your original program disk and your most recent data backup. Use a copy/archive program such as Copy II Mac or MacBackup if necessary. Never use your original application disks or your only data backup for anything except making working copies; keep two working copies of everything, one of which you never use. After all, whatever caused your problem could happen again, damaging your disks when it does.

If you know how to reinitialize your RAM and PRAM, and you keep backups of all your programs and data, you may never need to know anything further about Macintosh troubleshooting. All of us, though, at one time or another, have "just this once" skipped making a backup. If you find yourself with no backup, or a badly outdated one, there are a few things to try before major disk surgery is necessary.

Often programs will give the message "This disk is damaged [or unreadable]. Do you want to initialize?" Be sure to decline this generous offer; you could be getting this message for one of several reasons:

- You're using a double-sided (800K) disk in a single-sided (400K) drive. Double-sided disks can only be used in double-sided drives, although any drive should read a single-sided disk.
- You're using a disk that's been left out in the cold, in the sun, or near a radiator. Disks shrink and expand in temperature extremes. Let the disk stabilize to room temperature, then try again.
- You're using a disk formatted on another drive. Sometimes slight differences in drive speed or alignment can make a disk from one drive unreadable on another. Try your other drive, or another machine.

If these simple fixes don't do the trick, it's time to look to the disk's contents. Three kinds of information can be on non-program disks: System information (such as the System, the Finder, or printer files), housekeeping information (information the Mac uses to catalog the files on a disk), and your own data.

If the disk that begs to be initialized is a System (start-up) disk, try copying new System, Finder, and ImageWriter or LaserWriter files onto the disk. Make sure they're all the newest versions.

If the disk still won't appear on the desktop, try rebuilding its Desktop file. This is an invisible file on every disk where the bulk of the disk's housekeeping data is kept. Rebuild the file by holding down the Option and ⌘ keys while inserting the disk. You'll have to rename all your folders, as this process gives them catchy names like "unnamed 1" and "unnamed 2", but your data should be accessible.

Sometimes even when a disk appears on the desktop, double-clicking on an individual file fails to open it. This may mean that the housekeeping information linking a file to a specific application has been damaged. To reestablish the link, try opening the application first, then opening the file from within the application. Once you get into the file, use Save As to make a copy of it on another disk. The link is reestablished when you save a copy.

The most popular dBASE language is available on your Macintosh. Now!!

Call your Mac dealer to order your copy of dBMAN-MAC.

V E R S A S O F T  C O R P O R A T I O N
4340 ALMADEX EXPRESSWAY, SUITE 250
SAN JOSE, CA 95118
TEL (408) 723-9044
TELEX 6502635806(VIA WUI) Answer Back MCI

VERASOFT CORPORATION
4340 ALMADEX EXPRESSWAY, SUITE 250
SAN JOSE, CA 95118
TEL (408) 723-9044
TELEX 6502635806(VIA WUI) Answer Back MCI

Circle 670 on reader service card
File First Aid

The definitive product for troubleshooting on the Macintosh is the 1st Aid Kit from 1st Aid Software. 1st Aid consists of a comprehensive manual, a disk of recovery tools, and a few disks of sample files. The great thing about this product is that it takes the "techie" aura away from Mac troubleshooting, making the subject accessible.

The 1st Aid manual starts off with a quick discussion of Macintosh problems, followed by a thorough explanation of how Mac disks are made up—a behind-the-scenes look at file structure. If you're yawning from boredom or cringing with fear at the thought of digesting such a topic, don't. The authors have made a potentially complex subject clear, and in the long run, you'll better understand why something has gone wrong if you first understand how it "goes right." A section on problem prevention wraps up 1st Aid's background material.

If you're already facing a disaster, you'll most likely skip right to the heart of your 1st Aid Kit—three chapters of troubleshooting techniques. In Chapter 4 of the manual you'll find 16 pages of the most comprehensive error-message list ever assembled, including messages generated by the System, the Finder, MacPaint, and MacWrite. Self-explanatory messages are merely listed, while those that are less obvious refer you to the relevant problem category in Chapter 5.

Chapter 5 covers 35 problem areas. For each area, 1st Aid presents a list of "try this, try that" procedures, giving the easiest and most likely ones first. Finally, Chapter 6 supplies step-by-step directions for carrying out your chosen repair procedure. If you're nervous about trying out disk surgery on your own, 1st Aid Kit includes a damaged disk for practice operations.

The 1st Aid software includes all the features the average Mac user could want for routine problem solving. You start with a bit-copy routine that makes a work copy of your damaged disk, then proceed to the Diagnose menu to figure out what's wrong. Here you can verify that there are no bad disk sectors, or check the volume directory, file directory, or sector tags. Once you get an idea of what's wrong, the Repair menu offers a chance to fix the volume directory, the file directory, the sector tags, or the boot blocks. You can also undelete files or fix a file's creator and type.

All of these features are available in other products, such as MacTools and Fedit, but 1st Aid makes the procedures more accessible by putting them all in one place, arranged in logical menus with comprehensive explanations. The 1st Aid software throws in a few extra capabilities, too: it can erase deleted files (a security measure) and extract text from a damaged file.

1st Aid's only drawback is that much of it does not apply to HFS disks. At press time the company was working on a new version, which will be available as an upgrade. In the meantime, the background information, preventive tips, and at least part of the disk-recovery information in 1st Aid still serve as valuable resources for troubleshooting.

For most of us, disk and file recovery fall within the realm of things we know we should pay attention to but we avoid, like flossing our teeth and eating leafy green vegetables daily. When you're finally ready to admit that you should understand more about how your disks work—and why they sometimes fail to work—take a look at 1st Aid.

cover your data. The 1st Aid Kit (see "File First Aid") is an excellent tool for helping nontechnical users learn about and practice disk recovery. See "Recovering a Damaged Disk," Macworld, November 1985, for details on using other popular tools.

Most hard disks and disks formatted under the Hierarchical File System (HFS) need different file-recovery tools than MFS disks. The change in file structure from MFS to HFS was so vast that HFS recovery tools are still unavailable at this writing, more than a year after Apple introduced HFS. Two software companies, MacMaster and Central Point, have promised HFS versions of their recovery packages—Fedit and MacTools, respectively. These upgrades may be available by the time you read this.

Take Two Aspirin . . .

Running for a disk-recovery expert whenever you get an error message is like calling the doctor every time you get a mosquito bite or catch a cold. With just a little bit of information and a good dose of confidence, anyone who can use the Mac can solve the majority of the machine's most common problems.

The next time Murphy's Law catches up with you, give some of these tips and tools a try. ☐
If you've ever outgrown your accounting software, it wasn't ours.

Because ours can't be outgrown.
That's right. The SBT Database Accounting Library is the first business software package that works just as well whether your business is small or big. Here's why.
One.
It's modular. You can start with the modules you need today. Then add more as your needs grow. And all the modules work together.
Two.
It runs with McMax database management software (a high-performance dBASE III work-alike for the Apple Macintosh).* So you get all the power and flexibility of the most advanced and best selling Database Accounting Software.
Three.
You can customize our software in just hours to fit your business. No matter what size or shape your business is. Because we give you the source code (the key to changing our software) absolutely free.
The SBT Database Accounting Library. Try to outgrow it. We dare you.
Call today for our demo disk and brochure. (415) 331-9900.

<table>
<thead>
<tr>
<th>Module</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>dProfessional</td>
<td>Time &amp; Billing</td>
<td>$395</td>
</tr>
<tr>
<td>dOrder</td>
<td>Sales Order Processing</td>
<td>$295</td>
</tr>
<tr>
<td>dInvoice</td>
<td>Billing/Inventory Control</td>
<td>$295</td>
</tr>
<tr>
<td>dStatement</td>
<td>Accounts Receivable</td>
<td>$100</td>
</tr>
<tr>
<td>dPurchase</td>
<td>Purchase Order</td>
<td>$295</td>
</tr>
<tr>
<td>dPayable</td>
<td>Accounts Payable</td>
<td>$395</td>
</tr>
<tr>
<td>dPayroll</td>
<td>Payroll/Labor</td>
<td>$395</td>
</tr>
<tr>
<td>dLedger</td>
<td>General Ledger/Finance</td>
<td>$395</td>
</tr>
<tr>
<td>dAssets</td>
<td>Asset/Depreciation</td>
<td>$295</td>
</tr>
<tr>
<td>dProject</td>
<td>Project/Job Accounting</td>
<td>$395</td>
</tr>
<tr>
<td>dBackup</td>
<td>Menu/Backup</td>
<td>$65</td>
</tr>
</tbody>
</table>

Three Harbor Drive
Sausalito, CA 94965 (415) 331-9900

*The Macintosh is a registered trademark of Apple Computer, Inc.
Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade price for registered owners; the last price is the current list price.

**GraphicWorks** version 1.1 includes on-screen rulers and rotation, perspective, and distortion tools. It allows color printing and supports high-resolution scanners and versions 1.2 and 2.0 of *PageMaker*. Mindscape, 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667. $19.95; $99.95 new.

**Laser Author** version 1.0 does away with copy protection. RL I., 71 N. Franklin Turnpike, Waldwick, NJ 07463, 201/444-5700. $199.95 new.

**MapMaker** version 2.0 allows some multiple selections when creating a map from boundaries, supports PICT format output for text and supports LaserWriter fonts, adds rulers in the Map Scale dialog box for easier page positioning, and improves operation on large-screen displays. The new version also offers more data options and an expanded manual. Select Microsystems, 2717 Crescent Dr., Yorktown Heights, NY 10598, 914/245-4670. Free; $295 new.

**measureUp** version 1.2 lifts copy protection, allows separate instructions for different sections of a test, and has a lower list price. Logic Extension Resources, 9651 Business Center Dr., Rancho Cucamonga, CA 91730, 714/980-0046. Free; $149 new.

**PC MacBridge/Plus** version 3.0 adds printing and formatting options; supports binary, block, and ASCII transmission; and improves PostScript conversion. It supports printing on Houston Instrument DMIL plotters and works with Microsoft Windows, *PageMaker* for the PC, and other applications on the PC. Upgrade offer good until June 1, 1987. PC MacBridge 3.0 Upgrade Offer, Tangent Technologies, 5720 Peachtree Pkwy, Norcross, GA 30092, 404/662-0366. $100 from version 1.99 or earlier; $75 from versions 2.0 to 2.16; $50 from version 2.16 if purchased after August 1, 1986, $650 new.

**Smart Alarms** version 2.3 (packaged with Appointment Diary version 2.7) adds keyboard shortcuts and a snooze feature for the alarm, allows automatic setting of weekly appointments, and improves compatibility with *Tempo*. Imagine Software, 19 Bolinas Rd., Fairfax, CA 94930, 415/453-3944. $8; free to registered *Tempo* users; $49.95 new.

**Turbo Maccountant** version 2.0 adds advanced payroll functions and flexible budgeting and improves operation speed. Digital, Etc., 1750 14th St., Santa Monica, CA 90404, 213/452-5696. $15 if previous version was purchased after September 1, 1986; $95 if purchased before then; $495 new.
Dear Colleague:

Where will you be in 3 years?

Estimates are that the desktop publishing industry will be a $5 billion business by 1989. Will you profit from this windfall? Your work is safe in our hands.

You and other manufacturers, marketers, dealers, developers, and designers will be making the most of desktop publishing. PCW's expert in-house writers need specialized information from insiders. PCW's expert analysts—Tom Bove and Cheryl Rhodes—now bring you a monthly newsletter-DESKTOP PUBLISHING. The Bove and Rhodes Inside Report. It covers the industry completely, giving you:

- Quick alerts to trends and trends in development and marketing
- Cogent analyses of profitable niche markets
- Candid, authoritative assessments of market strategies and events
- Subscription details and a special offer are attached. I invite you to take advantage of the expertise Bove and Rhodes bring to your marketplace. It will make a great difference to you.

Sincerely,

David Bunnell
Chairman
Macworld Directory

The Macworld Directory is a comprehensive listing, by category, of products and services available for the Apple Macintosh. It provides advertisers with a low-cost advertising alternative and our readers with an easy reference guide.

FORMAT: The standard format includes a product ID, a 300-character descriptive ad, and a company name, address, and telephone number.

Advertisers may choose among categories already in use, or they may create their own. Display advertisers can cross-reference their current ad to the Macworld Directory for increased exposure.

RATES: Listings are accepted for a three-time consecutive insertion at a rate of $775. We offer a six-time insertion at $1,200 for each issue that reflects a 15% frequency discount. Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, Visa, and MasterCard are accepted.

DEADLINE: For copy deadlines and further information, please contact Niki Stranz, your Macworld Directory Account Manager, at 415/546-7722 or 800/435-7766 (800/435-7760 in California). Please send copy and prepayment to the Macworld Directory, 501 Second St. #600, San Francisco, CA 94107.

Accessories

Cables

Mac Lock/Mac Cables
Mac Lock, finest security kit for Mac +, secures Mac, keyboard, mouse, 2nd drive, modem, and printer. Attractive red vinyl-covered steel 5/4" cables. Lock included. No tools req. 1-year back guarantee. Also, IBM, Apple, etc. $40. Mac Cables provide any length custom cables for Mac + (inc. keyboard) or almost any computer need. $20 & up. Mac Products, 20231 San Gabriel Valley Dr., Walnut, CA 91789, 714/555-4838

Supplies

Laser Cartridge Recharge
$4 1/4 a lot of money recharging laser-printer toner cartridges for Hewlett-Packard LaserJet II, Canon, Apple LaserWriter, Corona, QMS. Recharged cartridges are reconditioned to work like new but last 20% longer. Money-back guarantee. Send $40 per cartridge plus $5 s/h. Monthly discounts.

Letterhead Stationery
Enhance your professional mail image with Continuous Form Stationery. PerFORMS's use of new printing technology makes it easy for you to purchase only the amount of fine-quality letterhead & envelopes you need at low discount prices. Select a format or design your own. Call for info & FREE catalog.

Laser Toner Cartridges
Factory-new toner cartridges for HP LaserJet, Apple LaserWriter, QMS, Canon, and Corona laser printers. Three colors. Black...$82.95 Brown...$96.95 Blue...$134.95 Visa, MC, COD, and company POs accepted. $2 s/h.

Hardware

Bar Code

Bar Code/MagCard Readers
The PC-580 Bar Code & PC-580 Magnetic Stripe (credit card) Readers have been designed to interface with the Apple Macintosh, are easily connected between the keyboard & the CPU, & require neither additional software nor an RS-232 port. A powerful but simple program for printing Code 39 bar codes is also available for both ImageWriter & LaserWriter.

Memory Upgrade

Memory Enhancements
Upgrade your Mac to 512K, 1024K, or 2048K of contiguous memory. SCSI port & fans available. Factory flow-solder techniques used for high reliability. 120-day warranty. Local 20-minute installation or mail order. Dealer inquiries welcome. Call for pricing and information.

Networking

PhoneNET Connecting AppleTalk compatible network connector can use existing telephone components and wire to create permanent, reliable 300-foot AppleTalk networks. Also available: 12-port packet repeater StarController™, Repeater adapters for Apple, IBM, & DIGB wiring, & TrafficControl™ network management software.

Sunol Systems Hard Drives
SUN*DISK offers 21-245MB of storage for the IBM, Apple II and IIGS, Mac, Epson, Wang, Victor, etc. Sunol's SUN*TALK is a disk server for Mac products. SUN*MUPS is a file server for the Mac. SUN*STREAK is a SCSI drive for the Mac Plus. Prices range from $1095 up.

Video

MacMonitors/Projectors

- 17- & 23-inch hi-res monochrome monitors w/ antiglare, white phosphor, vari scan. Whether your Mac or Mac Plus can be seen in the classroom, trade show, office, etc. Only $1095 & $1295.

- Projectors for the ultimate in Mac viewing pleasure from $3995.

- Rental MacMonitors & Projectors for all events.

- Dealer inquiries welcome.

National Data Systems, 2419 Rutland Dr., Austin, TX 78758, 512/837-1760, 800/531-5143, 800/252-8286 in Texas

Mentauris Corp.

Specialists in Macintosh video interfacing for over two years. Mentauris offers a wide range of products to satisfy any Mac or Mac Plus video interfacing need: our original, high-res Composite Video Adapter; our new "no-drill" OVA; monochrome and color NTSC scan converters. Call for price quotes and information.

Mentauris Corp., P.O. Box 1467, San Marcos, TX 78666, 512/396-1565

Insurance

Safeware

Insure your computer. Safeware offers full replacement of hardware, media, and purchased software. As little as $50 a year provides comprehensive coverage. With our blanket coverage, no lists of equipment are needed. One phone call does it all! Call 8 a.m. to 10 p.m. EST (Sat. 9 a.m. to 5 p.m.).

Safeware, The Insurance Agency Inc., 2929 N. High St., P.O. Box 02211, Columbus, Ohio 43202, 800/848-3699 (national), 614/262-0559 in Ohio

Data Security Insurance

The "all risk" Personal Computer Policy from DSI includes essential coverage not available with other pol-
cies: protection against loss of data (even from accidental erasure), loss of custom programs, and fraud. Especially protected for business computers. Coverage can be bound by telephone, 9 a.m. to 4 p.m. mountain time.

Data Security Insurance, 4800 Riverbend Rd., P.O. Box 9003, Boulder, CO 80301, 303/442-0900, 800/822-0901

**Services**

**Data Conversion**

Electronic Data Conversion

Conveniently translate data files from mainframes, minis, dedicated word processors, typesetters, & PCs (word processing embedded codes, database structures & spreadsheet reports & formulas) to Mac or almost any system. Ultimate technology. Nation’s leading firms use our invaluable services.

CompuData Translators, Inc., 6565 Sunset Blvd. #301, Hollywood, CA 90311, 213/462-6222

**Tape/Disk Conversions**

Conversion services for your Macintosh, to or from over 800 computer systems:

- Mag tapes
- Microcomputers
- Word Processors
- Typefaces
- Software packages

Our conversion capabilities include

- from or to 3½-inch, 5¼-inch, and 8-inch disks & mag tapes.
- P/N Computing Services, Inc., 165 Arlington Heights Rd., Dept MC, Buffalo Grove, IL 60089, 312/849-6010

**Desktop Publishing**

MacTypeNet™


MacTypeNet™, P.O. Box 52188, Livonia, MI 48152-0188, 313/477-2733

**Photoplotters**

PC Photoplotters


Design Express, Inc., 80 S. Lake Ave. #820, Pasadena, CA 91101, 213/681-0304

**Publishing/Communication**

**Office Link™**

Mac/IBM compatible Linotronic typesetting via disk or modem. Tech support for Apple, Aldus, Microsoft, etc. Text/graphics capabilities & error-free transmission (local access #

available). Provides newsletter design, electronic mail, graphics library, custom data bases, & more. Office Link™ delivers a total solution to meet your company’s publishing & communication needs. Easiest to use communication software or $ back.

Office Link, 345 Montgomery Ave., Bala Cynwyd, PA 19004, 800/345-0133

**Apple Emulator**

II in a Mac™ Version 2.0

BELIEVE IT … a complete working Apple II computer inside a Mac.

- Run Apple II +/e software without modification!
- Convert Apple II data into Macintosh data & vice versa.
- Develop Apple II software using integer/AppleBasic or M.I.

Switcher™ & UniDisk. Available NOW! Only $89.95.

**Typesetting**

**Command Typhographer®**

MAC TYPEGRAPHER. Macintosh Quality Typesetting. Command Typhographer® features were on minis & mainframes. Sophisticated multipass H/S provides kerning, formats, tabs, line justification, micro justification, automatic leader, letterspacing, $495. Save $, copy disk/main, high-res/typesetting/24 hrs. Typesetting available.

Regional Typographers/The Software Shop, 229 Bedford Ave., Burlington, New York 17110, 516/785-4422

**Software**

**BPI General Accounting**

A complete accounting system that includes automatic double-entry accounting & check writing, three subsidiary ledgers, six specialized journals, financial reports, default transactions, a "select" menu, the ability to export accounting data to productivity tools using the BPI Productivity Connection.

BPI Systems, Inc., 3001 Bee Cave Rd., Austin, TX 78746, 800/531-5252

**Payroll-General Ledger**

CheckMark PAYROLL and AMS GENERAL LEDGER are full-featured accounting programs for $195 each. PAYROLL calculates all employer and employee taxes. Prints checks and W-2s. User-modifiable tax tables. GENERAL LEDGER has extensive reporting capabilities. Profit centers, budgeting, previous-year balances. CheckMark Software, Inc., P.O. Box 860, Fort Collins, CO 80522, 800/426-2456 ext. 338

**Perspective Drawing**

Gridblazer™: perspective grid construction set. Create a variety of three-dimensional grids that can be used within MacDraw or MacDraft as a guide for perspective drawing. Grid shape, dimensions, line density, rotation, and perspective are independently controlled. Switcher compatible $49. Visa/MC.

Folkstone Design Inc., P.O. Box 80982, N. Vancouver, B.C., Canada V7L 4P6, 604/935-8060

**MacArchitex™**

Helps architects and draftspersons in all steps of the design process. Fill the interactive functions may be classified into 3 fields:

- 3-D CAD volume (perspective, axonometry, cross-sections),
Macworld Directory

- 2-D (front views, plans), and instant calculation of areas and columns. All files are saved in MacDraft's or Archirion's 2-D format. Digiscal Informatique, 425 Des-Matsonneve W. #303, Montreal, P.Q., Canada H2A 3G5, 514/288-9167

- Backup/Restore
  - HFS Backup™
  - Back up (archive) data from your hard disk. Back up/restore the entire disk, select files, or changes only. Includes/excludes files based on name, extension, or date modified. Creates backup templates, saves/print files list (hierarchically by folder or alphabetically by file). $49.95, MCVISA or MC/Visa or your dealer.
  - Personal Computer Peripherals Corp., 6204 Benjamin Rd., Tampa, Fl. 33624, 813/884-3092, 800/622-2898

- BRUtility™
  - The Millennium Backup and Restore Utility
  - Easy to use, like the Finder
  - Neat graphics!
  - Copy, backup, or restore
  - Bulk erase & copy
  - Graceful shutdown
  - Files not scrambled or archived
  - Runs faster than the rest
  - Req. Mac Plus or 512K. All files, selected or modified. Intro. offer $59.95. Incl. 10 double-sided disks!
  - Millennium Computer Corp., PO Box 20010, Rochester, NY 14602-0010, 716/436-2952

- Billing

- Invoicing/Job Costing
  - Office Productivity System (OPS). For professionals that bill based on time-use. Includes invoicing, time-keeping/production reports, job budget/cost tracking, client database with mail merge and accounts receivable. Multiluser capable. 512K Mac with hard or external drive. Avail now for $475.
  - Applied Micronetics, 3 Burnt Oak Circle, Lafayette, CA 94549, 415/285-1498

- Communications

- Tekalike
  - Mesa Graphics, PO Box 600, Los Alamos, NM 87544, 505/672-3998

- Mac2642A: HP Terminal Emulator
  - Lets your Mac emulate the HP2642A, HP2392A, and HP2394D. Easily running all HP3000 software. Implements all HP modes, parameters, keyboard features, and display characteristics within the Mac's mouse/menu/key environment. Ultrafast transfer (with text and graphics conversion options) included.
  - Tymlabs Corp., 211 E. Seventh St., Austin, TX 78701, 512/478-0611, Tel: 755820

- pellINK™
  - The first fully functional communications solution for MVS/UNIX/XT, Stratus, and UNIX systems: terminal emulation (VT220, VT241, VT590, 1622), file transfer (ASCII, binary, MacBinary); virtual disk; both host & Mac print services. Companion version for IBM PCs.
  - Pacer Software, Inc., 7911 Herschel Ave., #402, La Jolla, CA 92037, 619/454-0555

- Desktop Publishing

- DrawArt™
  - A library of "publishing quality" graphics in MacDraw files. More than 150 images in the categories of Publishing, Clip Art, 2-D CAD, Drafting, Cartoons, & Drawings. DrawArt is "SmartArt." Customize sizes, scales, patterns, borders & still retain image quality using ImageWriter or LaserWriter. Req. MacDraw & 512K.
  - Order from us. List: $49.95. VISA/MC.

- Set & Send
  - Mac-to-Computgraphics MDS provides substantial savings in time & money to the desktop publisher. Features: text & headline kerning, word & letter spacing, automatic hyphenation, point size options from 4 - 12 pt. in 1-pt. increments, leading in 1/4-pt. Over 1300 fonts avail. Set & Send automatically generates codes & provides resolution output at 2600 pixels per inch.
  - Bree Communications Inc., 661 D Market Hill Rd. Vancouver, B.C., Canada V5B 4B5, 604/875-1622

- E-Z Newsletter Kit
  - First of its kind. Includes:
    - E-Z Fill-in Forms: Get all the information! Get it right the first time.
    - Writer's Word Menu: Find the exact word in seconds!
    - Good Writing Guides: Be Vivid! Be Clear!
    - Step-by-Step Proofreading Guides. Specify Disk (3.5" Mac/FiigeMaker) or 5¼" x 11" Portfolio: $29.95 + $5 s/h (6.5% tax in CA).
    - Rules & Associates/Fill To Print, 17746 W Sierra Hwy, Canyon Lake, CA 92583, 805/298-7251

- Educational

- Gradebook/Test Generator
  - MICROGRAF - flexible course & grading. 400 students and 100 assignments per class, prints class & various reports. Ideal for any grade level. MICROTEST - II - create, update, generate, & store exam materials. Easy question entry, large database, multiple test versions. Free brochures - $5.
  - Clear Software Group, 3659 Indiana St., #10, San Diego, CA 92103

- MacANATOMY
  - A complete electronic atlas of human anatomy in MacPaint document form. The drawings may be modified and merged into MacWrite documents using the Clipboard. Comprised of four volumes, available singly or as a collection.
  - MacMedic Publications, Inc., 5805 Westheimer, Houston, TX 77057, 713/977-2655

- measureUP™ Testing
  - measureUP is a new test generator that has the features you need & the ease of use you expect! Combines graphics, word processing, database management, measureUP enables you to produce test easier & better than ever - "we guarantee it! See why measureUP has been called the "Best Mac program."
  - Logic eXtension Resources, 9651 Business Center Dr., Ste. C, Rancho Cucamonga, CA 91730, 714/980-0046

- Brainchild Gradebook™

Need help studying?

- Learning Tool™ is designed to help you study. Learning Tool uses the principles of cognitive psychology to help you learn any subject, from philosophy to engineering. Learning Tool is an electronic notebook that helps you organize class notes, study for exams, write term papers, and more. $129, $50, MCVISA.
  - Arborworks, Inc., 2540 Pittsfield Blvd., Ann Arbor, MI 48104, 313/973-0612

- Electronic FLASH CARD™
  - Learn facts quickly. Increase your motivation. Learn course or job information more rapidly: save time and learn more. Best-based flashcard metaphorical program. Ask familiar facts more frequently. Handles 2000+ facts. 128K, 3.5" drive. $35 + $3 s/h. Check or MO. Write for free information.
  - Artificial Mind Software, PO Box 17590, Pittsburgh, PA 15235-0590

- Engineering

- Digital Logic Design Aid
  - LogiWorks is an interactive digital logic drawing and simulation package for the Macintosh. Features:
    - built-in library of common gates, flip-flops, etc.
    - user-defined devices, PROMs and PLAs
    - adjustable device delays
    - 3-state and open-collector devices
    - produces timing diagram of selected signals
    - $199.95 (U.S.)
    - Package including 7400, analog libraries, and net list utility $199.95
  - Capilano Computing, 300-1120 Hamilton St., Vancouver, B.C., Canada
  - VSB 252 604/669-6343

- Structural

- Powerful, easy-to-use analysis programs with design aids for beams, 2-D frames, trusses: BEAM MAG, BEAM MAC II, FRAME MAC. Structure, loading, internal force, deflection diagrams, input & output text. Section table. more. From $145 to $595. Money-back guarantee, free support. Demo available.
  - Erez Anzel Software, 115 McCabe Crescent, Thornhill, Ontario, Canada L4J 2S6, 416/738-4601

April 1987
“Nothing less than awesome.” “I love it!” A myriad of technical tools as easy to use as your Macintosh. $250 + $45 postage. CA residents add 6% tax. Call or write for free info.

Button-down Software, P.O. Box 19493, San Diego, CA 92119, 619/463-7474

Loan Amortization
AnPak is a straightforward loan-amortization software package designed by a CPA & tax attorney. AnPak supports variable rates, graduated, skipped, & principal-only payments. Also includes balloons, negative amortizations, customized schedules, loan analysis, & more. $49.95 + $5 s/h. MC/Visa.

Softfile, Inc., 2100 W. 53rd St., Minneapolis, MN 55419, 612/924-3404

Family Heritage File
The most powerful genealogy program on the Mac. Licensed version of Personal Ancestral File™ produced by the LDS Church.

• Mac user interface
• Supports all Macs & hard disk ex
excluding Macintosh 128K
• Reports: Pedigree, Family Group,
Individuals, Marriages, Surnames,
Documentation, etc., $49.95 + $3 s/h
(Utah res. +6%). Demo $7.

Star+Com Software Systems, Win
dor Park East, 25 West 1480 North,
Orem, UT 84057, 801/225-1480

MacART LIBRARY
Illustrate your ideas with MacART LIBRARY! 12 disks of professional MacPaint images:

• Animals
• Farm Life
• Geography
• Kitchen
• Sports
• Tools
• Buildings

Flowers/Trees/Plants
Greeting Cards
People
Transportation
Signs/Symbols/Borders

FONTgenix & LASERgenix
FONTEX™: Four volumes of dot-
matrix display fonts $29.50 each vol-
ume (all four $99.50). FOREIGN
FONTEX™: A22 foreign-
language fonts on disk, only $49.50.
LASERgenix™: Downloadable Laser
Printer fonts only $32.50 each (add
$3 s/h, CA res. add 6%). Write for
samples or order at:
Devotion International Software,
P.O. Box 2351, Montclair, CA 91763,
714/621-0973

COMPART LIBRARY
Includes Micro CAD/CAM, Inc., a highpowered, easy-to-use CAD program for
the Mac, similar in performance to AutoCAD for the IBM PC.

MGStation: boasts over 140 powerful
functions, including CAD, drafting,
modelling, math, geometry, solids,
digitizer, and edrawings. MGStation
is compatible with and supports
AutoCAD, Microstation, Pro/Engineer,
and many other formats. MGStation
is available on 5.25" floppy disk or
CD-ROM.

Macsrix, P.O. Box 7175, Los Angeles, CA 90052, 213/274-1260

Lisp Development System
Macsri™ GNU™ lets you program the Mac interactively in Lisp; complete access to Toolbox traps, multithreading, high-level window
& menu managers, interrupt-driven event handlers (no more polling). Includes MacScheme™ Lisp

Interesting Graphics
Our skilled illustrator has produced 5 collections for your Mac: Horrori
Fantasy #1: Bytes of Fright, Dino
saur Eyes (natural history), Sky
Globes (aerospace), and Classic Sci Fi.
The collections contain a variety of images, each of which is carefully
crafted. Each collection is $29.95
($32.05 in CA).

AHL Computer Graphics Products,
Box 4508, Santa Clara, CA
95054, 408/980-7363

Languages
Mach2™, a multitasking FORTH3D de
velopment system, is a natural
language for interactive Mac programming:
COMPLETE toolbox access, inte
grated assembler (MDS-format)/
debugger/disassembler/text editor,
FAST execution, creates stand-alone
applications, 500-pg. manual. Booth
#940 at the Expo. $99.95 (+CA tax)

Visa/MC.

The Palo Alto Shipping Co., P.O. Box
7430, Menlo Park, CA 94026,
415/854-7594

MacPlot & MacCAD
MacPlot by Microspot is a powerful
plotter driver that will plot any ob ject
oriented graphics produced on the
Mac in up to 30 colors/ pens.
Supports over 45 plotters. MacCAD is a
series of 12 separate architectural &
engineering template libraries for use
with either MacDraw or MacDraft
(specify which).

Compatibility w/ MacWrite, Microsoft
File, etc. $145

Applied Ideas, Inc., P.O. Box 3225,
Manhattan Beach, CA 90266, 213-
546-6451

Image Measurements
Caliber™ is the high-powered pro
gram you need to accurately mea
sure area, length, angle, slope, ve
locity, form, center of gravity, etc.
Fast entry with tablet or mouse. 20
data channels each with statistics
and graphics windows. Caliber™ counts,
rescales, sorts, and merges. Imports
and exports graphics and data. Intro
offer $295 MC/Visa. Demo avail. $10.

Caliber Systems, 60 Manor St.
Handen, CT 06517, 203/261-7621

MiniCAD 2D/3D
The only CAD system developed ex
clusively for the Mac. Works like a
Mac CAD system should. Don't be
satisfied by a PC port. Nine decimal
place precision, 40 color layers, sym
bolic library, MacDraw & Clipboard
compatibility; 8 line types; & lots
more! Even if you never use 2-D,
MiniCAD is still your best buy for the
Mac. Satisfaction or your money
back $395. Demo avail.

DiebI Graphics, Inc., 3246-K Nor
mandy Woods Dr., Ellicott City, MD
21043, 301/341-9488

Multitasking for the Mac
MACH™, a multitasking FORTH3D de
velopment system, is a natural
language for interactive Mac program-
ning: COMPLETE toolbox access, inte
grated assembler (MDS-format)/
debugger/disassembler/text editor,
FAST execution, creates stand-alone
applications, 500-pg. manual. Booth
#940 at the Expo. $99.95 (+CA tax)

Visa/MC.

The Palo Alto Shipping Co., P.O. Box
7430, Menlo Park, CA 94026,
415/854-7594

Evalison, Inc., 74 Revenue Dr.,
Menlo Park, CA 94025, 415/259-0212

Profit Stalker II
Are you a Macintosh investor? Then
you need to track the market. Here's
what others say about this program.
 "Well worth the wait... I would not
delay purchasing this program."
Macworld Directory

system. 1M RAM recommended. Introductory price $250.
Semantic Microsystems; 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539

Mathematics
PowerMath
Solves problems from simple algebra to complicated calculus expressions. You can differentiate, integrate, plot polynomial expressions, manipulate matrices, solve simultaneous equations, and create custom functions. If you are a student, engineer, or work with math, you'll love the easy-to-use versatility. Retail $100.
Central Products Corp., 221 Norfolk St., Houston, TX 77098, 713/529-1080

Medical
Medical & Dental Mgmt.
Solo or multi-practitioner office includes patient (non-personal party) billing, recall, paper/elec tronic claims, aging, collections, Superbill, labels, druggists, history, Word/MacWrite, audit & productivity reports. 24-hr. support. 312K+ hard disk or XL Mac Office. Demo from $100. AMEX/Visa/MC, 2,400+ dealers.
CMA Micro Computer, 55888 Yucca Trail, P.O. Box 2080, Yucca Valley, CA 92286-2080, 619/365-9718

Networking
DCENet™ for the MAC
TSNet™ allows your Mac to become a true networking partner in a DEC network. Supports low-cost asynchronous communications and allows task-to-task communications, file transfer that retain all Mac characteristics, and VAX electronic mail.
$529 includes 30-day money-back guarantee and 6 months support.
Thurby Software Systems, 4301 Oak Branch Ct., Arlington, TX 76016, 817/572-2352

Payroll
Time Saver Payroll V3.0™
COMPLETE FULL-FEATURED Payroll System
- Calculates • Accumulates
- Prints reports • Salaried, hourly, & comm. wages • 10 deductions, incl. fed. & state taxes • Tax tables easily edited by user • Monthly & quarterly reports, incl. 941, FUTA, 940 • Prints checks and W-2 forms • Flexible – easy to use! Req. PC

Communication Extender™
Compiled libraries provide high-level access to communications. Capable of serial-port initialization & modem, error-free transfer protocols, reporting of time data, generic & DEC terminal emulation, & more. Retail $995.
Invention Software Corp., P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

Public Domain
Mac software from $2.50
The best, most complete public domain & shareware collection available, with over 220 disks. Everything from business programs to games and DAs. We offer the best after-the-sale service, with toll-free order lines, overnight & second-day delivery, technical support hot line. Send $1 for 80-pg. catalog.
EducComp, 2431 Oxford St., Cardiff, CA 92027, 619/942-3383

2000+PGMs • Tips • News
No club has more programs or a better newsletter. Members in 31 countries. One-time $20 subscription gets you our intro disk w/10 terrific programs + a description of our huge library of over 2000 programs, PLUS our quarterly newsletter filled w/PGMs and new programs. Members pay $9 for any disk (plus $1 s/h).
PD Mac, Dept. 14, P.O. Box 5626, Sherman Oaks, CA 91423

200+ Mac Disks
Don’t get ripped off 400k or 800k disks for a $3 copying charge per disk! One-day turnaround. Free shipping and every disk free. For catalog with full program descriptions, send $1.75 or formatted disk with return postage to: CHA Services Inc., Dept. 3, P.O. Box 622, Lincoln, MA 01773, 617/891-1981

Programmers’ Tools Extender™
Invention Software Corp., P.O. Box 3168, Ann Arbor, MI 48106, 313/996-8108

PD Software Club
We have the best in proven updated PD software. We scour all the national and local sources for you. Our disks contain only current versions of over 1000 items. $2 gets you our catalog & a $2 coupon. $20 annual membership fee gets you monthly newsletters and 2 FREE disks of fonts and DAs. Monthly disks $5, library disks $8.95. Visa/MC.
Translum International, 1730 E. Oilor St. #127, Austin, TX 78741, 512/442-0266

The Mac Group
ROLL-YOUR-OWN public domain disks (choose from over 1000s of titles), bargain desktop publishing CLIP-ART, special THEME DISKS, and user services. Send $1 for our TM Catalog or become a TMG member and receive a sampler disk, newsletter subscription. TMG Catalog and discounts all for only $15/y. MO/Visa.
The Mac Group, P.O. Box 95152, San Diego, CA 92138

Real Estate
Property Management
Comprehensive program for managing residential and commercial properties. Many management reports, including operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses.

Investment Analysis
From RealData, the leader in real estate software. Lastest tax rules included in this powerful analysis for income property.Ten year pro forma of cash flows, financing, resale, tax consequences, IRR/FMRR, and more. Flexible and easy to use. Requires Multiplan™, Jazz™, or Excel™. $95.
RealData, Inc., 78 N Main St., South Norwalk, CT 06854, 203/255-2732

The Appraisal Office
State-of-the-art program developed by professional appraisers, just for the Mac. Completes the FNMA 1004 Residential Form quickly and accurately. Menu-driven, on-screen form, performs all calculations. Stores, searches, retrieves, and pastes comps to/from database. Office management function. FREE URA upgrade. Requires Excel. $395.
RealData, Inc., 78 N Main St., South Norwalk, CT 06854, 203/255-2732

Property Management
Complete manager’s tool for residential & commercial properties. Features include full accounting & budgeting, operating statements, & easy starting balances; Rental, Repair, & Tenant Managers; auto. rent increase & late fees; over 40 reports per IREM
testing, multiple and stepwise regression, and n-way ANOVA with repeated measures. The Professional version adds cluster, canonical correlation, and factor analysis along with complex matrix calculations.

**Scientific Tools for Scientists**
Two low-priced products that enhance the usefulness of your Mac. Our **Scientific Symbol Fonts disk** contains all the characters in IBM's Selectric™ symbols ball and an $80. The **Spectral Analysis** package provides four basic functions: forward and inverse transform, power spectrum, and autocorrelation for $75.

**Renaissance Software Systems, P.O. Box 27276, Austin, TX 78755-1276, 512/338-1250**

**Stock Market Portfolio/Market Link**
- **Stock Portfolio System**, a complete portfolio manager, includes 9 reports, ties to Dow Jones and manual update. Handles diversified investments.
- **Market Link**, auto fetch up to 120 quotes up to 8 times in untended mode. Tie to DJ or Source. Bridge quotes to Excel.
- Free brochure + 100% rebate offer. Smith Micro Software, Inc., P.O. Box 7137, Huntington Beach, CA 92645, 714/564-0412

**Utilities**
**Copy II Mac**
Backs up nearly all protected software quickly and easily! Includes Copy II Hard Disk, which copies many protected programs directly to your hard disk so you can run them without a key disk. Great disk utilities (Mac Tools) also included. For Mac/Plus, 1 or 2 drives. All 3 for $99.95 + $3 s/h. Visa/MC/Chk.

**Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5782**

**Circle 450 on reader service card**

---

**Macworld**
**Macworld**

---

**Utility**
**Copy II Mac**
Backs up nearly all protected software quickly and easily! Includes Copy II Hard Disk, which copies many protected programs directly to your hard disk so you can run them without a key disk. Great disk utilities (Mac Tools) also included. For Mac/Plus, 1 or 2 drives. All 3 for $99.95 + $3 s/h. Visa/MC/Chk.

**Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5782**

**ThinkTank—Report Time**
Converts ThinkTank files to word processor files and adds some of MORE's labeling features. Automatically labels each level with any one of six options (capital & lowercase roman numerals, capital & lowercase roman alphabet, bullets, numbers). Write or call for free brochure. A true must for only $49.95.

**Oceanside Software, P.O. Box 2028, Walnut Creek, CA 94595-2028, 415/957-1000**

**Word Processing**
**Japanese Word Processor**
- **E/G Word** allows the user to input alphabets, which turn into kanji syllabaries on screen that can be converted to Kanji (3500) characters. $399. Req. 512K.
- **E/G Bridge** ($249) and JAM ($149) allow the user to input Japanese in major Mac application software.

**Qualitas Trading Co., 323 Monte Vista Ave., #307, Oakland, CA 94611, 415/547-1520**

---

**Circle 450 on reader service card**

---

**We RENT Mac Software!! MacStore**
**MacStore**

---

**Ask about our frequent renter program!**

---

**Circle 16 on reader service card**

---

**We'll match any software rental price in this issue.**
The library contains the most current public domain software. It is updated daily and we are constantly expanding our selection. A free catalog is available upon request. We invite authors to submit new programs. For technical support, feel free to call our librarian-Lupe Cambero.

Minimum order quantity on PD - 5 program disks


511-104 Encinitas Boulevard. Encinitas, California 92024

Hours: Mon.-Sat. 6:00 am - 4:30 pm

Lifetime warranty on Disks. Satisfaction guaranteed or your money refunded within 30 days. Disk packaged in 10's-Min. 30 disks. Checks (allow 10 days to clear), money orders, MC, Visa, AX, C.O.D. (add $1.90). P.O.'s accepted from qualified public institutions, gov't agencies and well-rated companies, net 30. Ca. residents add 6%. For Information and free catalog call (519) 942-9998.
Where to Buy

This section contains information about products featured editorially in this issue. Programs are not copy protected unless otherwise indicated. All prices are list prices. An asterisk indicates that a product review appears in this issue.

Public domain software and shareware are available through on-line information services, through user groups such as Berkeley Macintosh Users Group (415/849-2684) or the Boston Computer Society's Mac special-interest group (617/367-8080), or through mail-order clearinghouses such as Educomp, 2429 Oxford St., Cardiff-by-the-Sea, CA 92007, 619/942-3838, or the Public Domain Exchange, 673 Hermitage Ln., San Jose, CA 95134, 408-942-0309.

Aquarium
Public domain software. 128K minimum memory.

Arazok's Tomb
Version 1.0. Aegis Development, 2210 Wilshire Blvd. #277, Santa Monica, CA 90403, 213/392-9972. 512K minimum memory. $49.95.*

AxeTo C68K
Version 1.06 H. Maxx Software Systems, P.O. Box 55, Shrewsbury, NJ 07705, 201/542-2121, 800/221-0440. 128K minimum memory for Level-R, 512K minimum memory for Level-D and Level-C. Personal package (Level-R) $99, Developer (Level-D) $299, Commercial (Level-C) $499.*

Bar-code Labels
Data Composition, 1099 Essex, Richmond, CA 94801-2185, 415/232-6200, 800/227-2127. Also available from Seton Name Plate Corp., 20 Thompson Rd., Branford, CT 06405, 203/488-8059. Call for quotes on custom orders.

Beep Init
Public domain software by Fractal Software. 512K minimum memory; speaker recommended.

Bounce
Public domain software. 128K minimum memory.

BPI Entry Series General Accounting
Version 1.00. BPI Systems, Inc., 3001 Bee Cave Rd., Austin, TX 78746, 512/328-5400, 800/551-5252. 512K minimum memory; external drive recommended. $249.*

The Bug
Public domain software. 128K minimum memory.

Cap'n Magneto
Shareware, also available from PowerTools, 1206 Karen Ave., Austin, TX 78757. 128K minimum memory; 512K or Mac Plus recommended. Send $20 and a blank disk, or $30 without disk.*

Clock
Public domain software by Mark Wall.

CompuServe
CompuServe, Inc., 5000 Arlington Center Blvd., P.O. Box 20212, Columbus, OH 43220, 614/457-0802, 800/848-8199. Modern required. Subscription kit $99.95; rates for prime time (8 a.m. to 6 p.m. M-F): 300 baud $12.50 per hour; 1200 to 2400 baud $15 per hour; standard time (6 p.m. to 8 a.m. M-F): weekends): 300 baud $30 per hour; 1200 to 2400 baud $37.50 per hour; plus 25-cents-per-hour surcharge when dialing a local CompuServe phone number; if there is no local number the prime-time surcharge is $10 per hour, standard time $2 per hour.

Copy II Mac
Version 6.0. Central Point Software, 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5782. 512K minimum memory: $39.95; includes MacTools and Copy II Hard Disk.

Crabs
Public domain software. 512K minimum memory.

DataFrame 40-XP
SuperMac Technology, 950 N. Rengstorff Ave., Mountain View, CA 94043, 415/961-8884. 512K minimum memory; requires SCSI port. $1999.*

Delphi
General Videotex Corp., 3 Blackstone St., Cambridge, MA 02139, 617/491-3393, 800/544-4005. Requires modem. $49.95 one-time fee; rates through TimeNet or TeleNet: 7 a.m. to 6 p.m. (M-F): 29 cents per minute, 6 p.m. to 7 a.m. (M-F, weekends): 12 cents per minute. Direct-dial rates: 7 a.m. to 6 p.m. 16 cents per minute, (6 p.m. to 7 a.m. M-F, weekends, and holidays) 11 cents per minute.

DeskScene
Version 1.0. PBI Software, Inc., 1111 Trion Dr., Foster City, CA 94404, 415/497-8765, 800/843-5722. 128K minimum memory. $29.95.

Dial-a-Disk

Disc Organizer
Bede Tech, Inc., 8227 Clinton Rd., Cleveland, OH 44144, 216/631-1441, 800/772-4536. $7.95.

The Disk Directory, The Easel, The Library

Disk Easel

Disk File, Disk Jacket

Disk Jackets, Disk Pockets
International Datawares, Inc., 2278 Trade Zone Blvd., San Jose, CA 95131, 408/262-6660, 800/222-6032. Disk Jackets $5 for two packs of ten, Disk Pockets $2 per package of ten.

Disk Book Series
MicroStore, P.O. Box 27, St. Peter, MN 56082, 304/292-8124, 800/562-8885. DiskBook-10 $14.95, DiskBook-32 $29.95, DiskBook-Plus $29.95.

Disk Pockets
See Disk Jackets.

DiskWallet
CompuCover, P.O. Box 310, Mary Esther, FL 32569, 904/243-5793, 800/874-6391 (orders only). Holds twenty 3½-inch disks. $16.95.

Dow Jones News/Retrieval Service
Dow Jones & Company, Inc., P.O. Box 300, Princeton, NJ, 08543-0300, 609/452-2000, 800/257-5114. Requires modem. One-time subscription fee:
Where to Buy

personal $29.95, corporate $49.95. Additional rates differ, depending on the database and baud rate; there are 40 different databases on the service.

EarthPlot
Version 2.0. Public domain software. 128K minimum memory.

The Easel
See The Disk Directory.

Fedit Plus

1st Aid Kit
Version 1.0. 1st Aid Software, 42 Radnor Rd., Boston, MA 02135, 617/783-7118, 800/843-3497. 128K minimum memory. $9.95.

Floppy Wallet
American Covers Inc., P.O. Box 1796, Sandy, UT 84091, 801/566-3100, 800/228-8987. $9.95.

FModem
Shareware, also available from Christian Doucet, P.O. Box 721 Branch Rd., Montreal, Quebec, Canada H2G 1M4. 512K minimum memory; requires System 3.2 and modem. $20.*

GEnie
General Electric Information Services Co., 401 N. Washington St., Rockville, MD 20850, 301/340-4000, 800/658-9636 ext. 21. Requires modem. $18 one-time fee; rates for prime time (8 a.m. to 6 p.m. M-F): 300 to 1200 baud $35 per hour, 2400 baud $45; nonprime time (6 p.m. to 8 a.m. M-F, weekends, and holidays): 300 to 1200 baud $5 per hour, 2400 baud $15 per hour.

Gone Fishin'
Public domain software by Wade Blomgren. Buggy; can cause disk crashes.

Great Plains Accounting Series

Hardball
Accolade, Inc., 20833 Stevens Creek Blvd., Cupertino, CA 95014, 408/446-5757. Not copyable. 128K minimum memory. $44.95.*

Icon Switcher
Version 1.2. PBI Software, Inc., 1111 Triton Dr., Foster City, CA 94404, 415/349-8765, 800/843-5722. 128K minimum memory. $19.95.

The Library
See The Disk Directory.

LogicWorks

Maccossories Disk Case
Kensington Microwave, 251 Park Ave., New York, NY 10010, 212/475-5200, 800/555-4242. $29.95.

MacInTalk
Public domain software.

MacLink Plus

MacServe

MacWait
Public domain software by Bob Finch. 512K minimum memory. Buggy; can cause disk crashes.

(continues)
For those who didn't place first in the Spelling Bee...

and even for those who did:

You bought Microsoft® Works to save time and unnecessary effort. So, let WorksPlus Spell track words for your Works! WorksPlus Spell is the fastest spelling checker on the market—10 times faster than any other. Spell checks a two-page memo in 1 second; a 60-page proposal in less than 30 seconds!

Ever have trouble remembering the spelling exceptions? "I before e..."? Spell doesn't. It knows all those endless rules as well as verb tenses, plurals, adjectives, and adverbs.

Can't remember a word's spelling? Spell can look it up for you. Simply type a command key and the first few letters and Spell will insert the correct word right into your document.

Spell can also check each word as you type without slowing your speed. A gentle beep warns you of a misspelling or typo. Just choose the correct alternative and continue typing!

Its main directory contains 70,000 words. If you need more, you can add words to either the main dictionary or a document's personal dictionary. Or, you can delete words.

But Spell is more than a spelling checker. Its Glossary feature saves you typing the same phrases over and over. Just abbreviate those frequently-used phrases. Spell will automatically insert the complete phrase for you. You can also use its automatic hyphenation feature to give your documents a compact, professional appearance.

WorksPlus Spell is the spelling checker to use with your Macintosh™ and Microsoft Works program. Spell is so well integrated that even the Works Help file is updated to include it. Now you can write, check, and print a document without ever leaving the Works program.

We're so sure that you'll win every time you use Spell that we'll include a blue ribbon with your purchase! In addition, Spell comes with a 30-day money-back guarantee so you can't lose.

WorksPlus Spell

Send me ___ copies of WorksPlus Spell at $59.95 each

In the USA & Canada, add $3.00 per copy for shipping and handling
Outside the USA/Canada, add $10.00 per copy for shipping and handling
CA residents add sales tax

Amount enclosed $_____

To order by phone, call (800) 233-6851 in CA, (800) 922-PLUS

WorksPlus is a trademark of Lundeen & Associates © 1986.
Macintosh is a trademark licensed to Apple Computer, Inc. Microsoft® is a registered trademark of Microsoft Corporation.
Take the Bite Out of High-Priced Software

All on one disk — 12 top-sellers from MacWorld!

Art
- 96 Space Images: ANDROMEDA, etc. $9
- 19 Red Ryder latest version version $9
Desk Accessories
- 66 Teleport, MINIDOS, icon maker $9
- 19 Minixwalk text editor video $9
Fonts
- 90 Boston II, limerick on imager $9
- 94 New Fonts and icons $9
- 96 Laserwriter times + American Sign Language Font $9
Games
- 62 Dungeon of Doom, Social Climber, etc. $9
- 67 Billiards, Volleyball Juggling $9
- 75 Cap'n Magneto, Spacebubbles $9
- 88 Design own text adventure $9
- 99 Crystal Reader, Stuntpacker $9
Home/Business
- 33 Multiplicity templates: bus, nut/noun $9
Nudes
- 49 Girl!; Adult only pictures $9
- 60 More Girls $9
- 68 MacNudes: Digitized Photos $9
Programming
- 44 XLSIP: All language $9
- 51/52/53/54 Mod 2 language w/ ced $27
Sound
- 91,101 Install and play digitized sounds on your keyboard (2 disks) $18
Utilities
- 5 Code cracking video: FEDAI
- 69 Receipts, add fonts & icons, docs $18

SPECIAL OFFER! Any 3 Disks + Book PLUS 1 Year Membership ONLY $39.95 (+ $4 S/H)

Add $4 ($5 foreign) for shipping & handling or $2 ($5 lift) if ordering book only. CA orders add sales tax.
Enclosed $ by check. VISA MC
Card No Expiration
Name
Address
City State Zip

Where to Buy

Math Blaster
Davidson & Associates, Inc., 3135 Kashiba St., Torrance, CA 90105, 213/531-6070, 800/556-6141. Key-disk copy protection. 128K minimum memory. $49.85.*

MCI Mail

Meltdown
Version 1.0. Public domain software. 128K minimum memory;

Micro Data File, Micro Disk Minder, Micro Flip Pak

MindWrite
Version 1.0. MindWork Software, P.O. Box 222280, Carmel, CA 93922, 408/625-2720, 800/367-4334. 128K minimum memory; external drive recommended. $99.95.*

MockTerminal
Version 4.3. Shareware, CE Software, 801 73rd St., Des Moines, IA 50312, 515/224-1995. 128K minimum memory; requires modem; 512K or Mac Plus recommended. Bundled in MockPackage Plus.$35.*

Moose Fraser
Version 1.0. Public domain software by Jan Eugenides. 512K minimum memory; requires MacinTalk on the same disk.

Moose Phrases
See Talking Moose.

NewsNet
NewsNet, 945 Haverford Rd., Bryn Mawr, PA 19010, 215/527-8030, 800/345-1301. Requires modem. Subscription fees are $15 per month, $75 for 6 months, $120 per year; rates vary, depending on publication being accessed, time of day, and baud rate.

Oasis
Public domain software by Jan Eugenides, also available from P.O. Box 151, Maynard, MA 01754.

Office Productivity System (OPS)

Pak Ups
Computer Cover Co., P.O. Box 3080, Laguna Hills, CA 92654, 714/380-0085, 800/235-5330. Holds up to eight 3½-inch disks. $9.95; two for $16.95.*

PC-380 Bar Code Reader
TPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833. 128K minimum memory. $795.*

Pocket Pack
Computer Cover, P.O. Box 310, Mary Esther, FL 32569, 504/243-5793, 800/874-6591 (orders only). $9.95.

Pocket Pak
Innovative Technologies/Communications, 5649 La Jolla Blvd., La Jolla, CA 92037, 619/456-0722, 800/525-2226. $13.95.

The Print Shop
Version 1.0. Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903, 415/479-1185. Key-disk copy protection. 512K minimum memory; requires printer. $79.95.*

Project Billing

PromoMod

(continues)
For Apple Macintosh* Personal Computers.
Connects directly to SCSI port.
Macintosh Plus will boot directly from Datastack on power-up.
Same size as Mac; Sits directly under unit.

StateWide
Your Nationwide Professional Distributor
87 South Eisenhower Lane, Lombard, IL 60148 • Telephone: (312) 932-5650
Toll Free: (800) 882-8311

*Macintosh is a registered trademark of Apple Computers Inc.
Where to Buy

Red Ryder
Shareware; also available from FreeSoft Co., 10828 Lackl Kling, St. Louis, MO 63114, 314/523-2190. 512K minimum memory: $40.

ResEdit
Version 1.01. APDA, 290 S.W. 43rd St., Benton, WA 98025; 206/251-6548. 128K minimum memory. Bundled with Macintosh Development Utilities (MacD.U.). For members only: $25.

ScreenMaker
Version 1.0. Public domain software by Bill Atkinson. 128K minimum memory.

Smartcom II
Version 2.2. Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617. 128K minimum memory; 512K to use interactive graphics feature; requires modem. $49.

Smartmodem
Hayes Microcomputer Products, Inc., P.O. Box 105203, Atlanta, GA 30348, 404/441-1617. 128K minimum memory; 512K recommended; requires Hayes compatible modem. $99.

Sound Init
Public domain software by Fractal Software. 512K minimum memory; speaker recommended.

The Source
Source Telecomputing Corp., 1616 Anderson Rd., McLean, VA 22102, 703/754-7500, 800/336-3330. Requires modem. $49.95 one-time fee; rates for prime time (7 a.m. to 6 p.m.) and off-peak time (6 p.m. to 7 a.m., M-F); 300 baud 60 cents per minute, 1200 baud 43 cents per minute, 2400 baud 66 cents per minute. Requires Hayes compatible modem; requires modem. $99.

Turbo Pascal

Typewriter
Public domain software by Fractal Software.

Now, Cut That Out!

Cut out the tedium. One keystroke, and Tempo reaps a myriad of commands.

Cut out the waiting. Turn on the Mac and Tempo performs your daily startup routine automatically.

Cut out the mistakes. Record any series of commands or keystrokes once, and Tempo replays them perfectly, every time.

Cut out this ad. Send it to Affinity Microsystems, Ltd., 1050 Walnut Street, Suite 425, Boulder, CO 80302, and we’ll send you complete details on Tempo, the most powerful macro ever made for man or mouse!

Call 1-800-367-6771 or write for info today!

TermWorks
Version 1.29. Shareware by James Rhodes; available from James Rhodes, 401 Eastwood, Luikin, TN 37501. 128K minimum memory; requires Hayes-compatible modem; 512K or Mac Plus recommended. $20.

Thunder
Version 1.0. Batteries Included, 30 Mural St., Richmond Hill, Ontario, Canada L1B 1B5, 416/881-9941, 800/387-5707. 512K minimum memory; Mac Plus recommended. $49.95.

TimeWand Barcode System
Vidx, Inc., 1105 N.E. Circle Blvd., Coralville, IA 52230, 403/598-0521, 512K minimum memory; requires at least an 800K drive. Prices range from $646 to $886, depending upon software and size of TimeWand.

TOPS
Version September 11. Centrum Systems West, Inc., 2560 Ninth St. #220, Berkeley, CA 94710, 415/549-5900. 512K minimum memory; requires AppleTalk network; at least one hard drive recommended. $499 per Macintosh, $389 per PC.

Traveller Series
MicroStore, P.O. Box 37, St. Peter, MN 56081, 304/292-8414, 800/962-8885. Traveller-4 $79.95, Traveller-8 $119.95, Traveller-12 $139.95.

Turbo Pascal
512K minimum memory; hard disk recommended. $99.95.

Typewriter
Public domain software by Fractal Software.

Call 1-800-367-6771 or write for info today!
1-800-MAC-DISK

**Hardware**

- SCSI Hard Drives
  - Magic20: $399.00
  - Magic30: $599.00
  - Magic65: $1399.00
  - Magic235: $3399.00
- Dataframe Hard Disks
  - 20MB: $75.00
  - 40MB: $1300.00
- The Keeper
  - The Brain: $1295.00
  - 20MB: $1695.00
- 19" Stretch Screen: $1695.00
- DisplaySpace 800K Drive: $229.00
- Elman 800K Drive: $219.00
- Magic800K Drive: $199.00
- Avatel 1200 Baud Modem: $119.00
- MagicModem (1200 Baud): $149.00
- Numeric Turbo: $119.00
- Turbo Touch (Kensington): $119.00
- MacFan: $95.00
- Thunderstorm: $175.00
- Casvine Software Reader: $175.00
- PC-Mac Keyboard: $119.00

<table>
<thead>
<tr>
<th>Ribbons</th>
<th>15</th>
<th>25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>2.95</td>
<td>2.75</td>
</tr>
<tr>
<td>Colored</td>
<td>4.50</td>
<td>3.75</td>
</tr>
<tr>
<td>Multicolored</td>
<td>13.00</td>
<td>12.00</td>
</tr>
</tbody>
</table>

**Software**

- Upgrade Rates:
  - 128K to 512K: $129.00
  - 512K to 1024K: $179.00
  - 1024K to 2048K: $289.00
- SOLD OUT:
  - SC3 Port: $89.00
  - MacDock: $695.00

**Accessories**

- PocketPack: $9.00
- Surge Protector: $10.00
- Magic Pad: $10.95
- Disk File30: $21.00
- Internal Feet: $3.95
- Disc Directory: $19.00

**Ordering Information**

- Call: 1-800-MAC-DISK
- Hours: 8am-6pm CST
- Minimum: $3 additional
- Visa, MasterCard, C.O.D., PO's, Checks
- Texas residents add 7 1/4% sales tax.

**Vision Technologies**

- 2200 Guadalupe St.
- Austin, Texas 78705

---

**Mailing Lists & Merge**

With "IF-THEN-ELSE"

2 Billion Records!

1stBASE 3.2
1stBASE Systems, Inc.
800-522-2286
7 Industrial Park Rd
617-533-2203
Medway, MA 02053
Fax 617-533-5691

**Mac OEM's!**

Complete the Connection with an Anco Cable

Connect your peripheral to the Mac or MacPlus with a custom molded cable.
Anco has a wide range of experience building cables and accessories—custom and standard for the Macintosh family.

Anco has cables for every application including:

- Printers
- Networking
- Plotters
- Digitizers
- Modems
- Disk Drives
- Keyboards
- SCSI Drives
- Mouse
- Other PC's

Anco's cables meet Apple's standards and incorporate our own Mini-din connector, the new platinum color, are shielded to FCC Class B specifications and meet UL2464 requirements.

OEM's, VAR's and Distributors, call us for a list of our standard Mac and SCSI products.

Anco Electronics, Inc.
279 E. Imperial Hwy. Suite 720
Fullerton, CA 92835
415-976-0293 • 714-879-3770

---

Circle 459 on reader service card

Circle 665 on reader service card
The Only True CADD system developed exclusively for the Macintosh!

**MiniCad 3.0** Computer Aided Design

**MiniCad Standard Features**
- 9 digit precision (1.000000000)
- Center Lines, Dashed Lines, & more
- Draw By Tools or Data Entry Boxes
- Unlimited User-Defined Scales
- Display & Type Coordinates,
- Unlimited Zooming
- Total 2D/3D Integration

**New Features on 3.0**
- Advanced automatic alignment
- Multiple window / Multiple document
- Symbol editor with search / replace.
- Partial Architectural Scales
- Text rotates at 90° increments
- Dimension text rotates at any angle
- Advanced Auto-Orienting with
  witness lines
- 165 Fill & Pen Patterns, 32 editable
- Auto Zoom
- User-Defined Snap & Visual Grid
- Centers Lines, Dashed lines, & more
- 10 decimal precision (1.000000000)
- Unlimited User-Defined Scales
- COlOR & Acelate Layers

**Supplementary Features**
- 2D CAD tools only
- Auto Scroll
- Auto Dimensioning
- Color & Acelate Layers
- Preset Architectural Scales
- Dimension text rotates at any angle
- Advanced Auto-Orienting with
  witness lines
- 165 Fill & Pen Patterns, 32 editable
- Auto Zoom
- User-Defined Snap & Visual Grid
- Centers Lines, Dashed lines, & more
- 10 digit precision (1.000000000)
- Unlimited User-Defined Scales
- COlOR & Acelate Layers

**GDT SOFTWARE INC.**

Diehl Graphsoft Inc.  
3246-K Normandy Woods Dr.  
Ellicott City, MD 21043  
301-461-9488

Circle 634 on reader service card

---

**THE PRINT-LINK™**

Gives your Macintosh™ printer choice

A true printer driver software package (disk with optional cable) that allows a variety of popular ink jet, dot matrix and daisywheel printers to be used with all Macintosh™ computers. Prints directly from Macintosh applications. Drivers may be installed on the HD 20 hard disk. No need to learn any new printing procedures.

**DAISYWHEEL**

Supports all normal features including two-color ribbon. The Print-Link™ is smart enough to recognize which font and point size you have selected, and will automatically space in accordance with your screen selection. Where it appears on your screen is where it will appear on your page, both horizontally and vertically.

**DOT MATRIX**

All normal dot matrix capabilities are fully supported. This includes the special feature of near letter quality. Coming very soon — 24 Pin and laser support.

**EASY INSTALLATION**

As easy as a drag and click routine using the user-friendly Macintosh™ window and menu system. “Choose printer” or “Chooser” for final installation.

**$62.00** (driver only)

Mac SE or Mac Plus high quality cable is available.

For inquiries: (604) 291-9121
To order, call: 800-603-6222
Dealer inquiries are welcome.

**Where to Buy**

**Products for New Macs**

For more information about the products mentioned in "Filling the Slots," contact the companies directly.

- Abaton Technology Corp. 415/463-8822
- Apple Computer 408/996-1010
- AST Research, Inc. 714/863-1333
- Autodesk, Inc. 415/332-2344, 800/445-5415
- Avatar Technology, Inc. 617/435-8722
- Corvus Systems, Inc. 408/284-8700
- Cricket Software 215/387-7555, 800/345-8112
- Datalopy Corp. 415/965-7200, 800/821-2898
- Datadesk International, Inc. 818/700-1673, 800/826-3998, 800/592-0012 in California
- Dayna Communications, Inc. 800/531-0600, 800/531-0600
- DCC Systems 714/632-3902
- Dest Corp. 408/946-7100
- Dope Computer Corp. 919/763-7918
- Dreams of the Phoenix, Inc. 904/396-6952
- Eicon Technology Corp. 514/333-8543
- E-Machines, Inc. 503/692-6556
- Eurosoft International, Inc. 408/741-0739
- General Computer Corp. 617/492-5500, 800/634-9737, 800/854-9737 in Illinois
- Hayes Microcomputer Products, Inc. 404/445-8791
- Icegate Corp. 801/778-1000
- Kinetics Inc. 415/947-0998
- Liveco 619/457-2011

**Living Videotext, Inc.** 415/964-6300, 800/443-4310 in California, 800/822-3700

**LoDown** 408/348-7400

**MacMemory, Inc.** 408/922-0140, 800/862-2666

**Matrix Instruments, Inc.** 914/365-0190, 800/431-4466

**MCIDEAS, INC.** 415/573-0580

**Micro CAD/CAM, Inc.** 818/376-6851

**Micrographic Images Corp.** 818/407-0571

**Microtek** 213/321-2121, 800/654-4160

**Mirror Technologies, Inc.** 612/426-3276

**Opcode Systems** 415/321-8977

**Peachtveme Software** 404/564-5800

**Radius, Inc.** 408/732-1010

**Reach Technologies, Inc.** 512/280-1977, 800/523-8392

**Rodime, Inc.** 216/765-8414

**Steve Jask** 415/522-1386

**Southworth Music Systems, Inc.** 617/772-9471

**SuperMac Technology** 415/964-8884

**Tecmar, Inc.** 216/349-0600

**Think Technologies, Inc.** 617/863-5590

**3Com Corp.** 415/961-9602

**Touch Communications, Inc.** 408/438-4800

**Tri-Data** 415/969-3700

**Univision, Inc.** 408/263-1200, 800/221-5842

**Visual Information, Inc.** 818/938-8854

**Western Computer, Inc.** 714/553-1611

**Whisper Microcomputer Products, Inc.** 512/329-0303

**WordPerfect Corp.** 801/227-4420, 800/321-5906

**Xebec Corp.** 702/883-4000

---

Circle 634 on reader service card

---

Circle 603 on reader service card
It's easy to get more information on products advertised in Macworld.

Here's how:

- Print or type your name and address and circle the appropriate answer to each question.
- Circle the numbers that correspond to the reader service numbers for the products that interest you. These numbers appear in the ads and in the Advertiser Index.
- Apply first-class postage before mailing.

1. Your primary job function:
   a. Corporate or general manager
   b. Department manager
   c. MIS or micro manager
   d. Engineering or scientific
   e. Professional
   f. Reseller/VAR
   g. Other
   h. Other

2. Number of employees in your company:
   a. 25 or fewer
   b. 26-99
   c. 100-499
   d. 500-999
   e. 1,000 or more

3. Plan to buy:
   a. Now
   b. In 6-12 months
   c. In 12-24 months
   d. For reference only

4. How many personal computers do you buy products for? (Include both company and personal units, please.)
   a. 1
   b. 2-4
   c. 5-9
   d. 10 or more

5. How many of the above are Macintoshes?
   a. 1
   b. 2-4
   c. 5-9
   d. 10 or more

Please print or type all information.

Name:

Title:

Company:

Address:

City, State, Zip:

Phone: Area code/Number:

Circle number 999 to subscribe to Macworld. We will bill you $24 for a one-year (12-issue) subscription (U.S. only).

Circle number 999 to subscribe to Macworld. We will bill you $24 for a one-year (12-issue) subscription (U.S. only).
**Product Index**

**Software**

- **Business**
  - 1st Aid Software, 180
  - Aldus Corp., 28
  - Borland Int'l., IFC-1
  - Bravo Technologies, Inc., 212
  - ClearView Software, 64
  - Cognion Technology, 107
  - Computer Shoppe, 239
  - Cricket Software, 42-43
  - Dow Jones Software, 50
  - Forethought, 175
  - Infoshirpe, iBC
  - LaserWire, Inc., 72
  - Layered, Inc., 52-53
  - Living Videocon, 16-17
  - Macrolop Int'l., 209
  - Micro Planning Software, 116
  - Microsoft, 90-97
  - Microsoft, 104-105
  - Microsoft, 50
  - Microtech Software, 204
  - Motorola Training Systems, 208
  - SBT, 221
  - Satori Software, 110
  - Solutions, Inc., 84
  - StorSoft, 192
  - Value Line Software, 179
  - VersaSoft, 219
- **Data Management**
  - 1st Desk Systems, 237
  - 1st Desk Systems, 237
  - Bull Int'l., IFC-1
  - Data Tailor, 198
  - Forethought, 176
  - Macrolop Int'l., 209
  - PVI Development Corp., 38
  - SMS, 214
  - VersaSoft, 219
- **Word Processing**
  - Ann Arbor, 179
  - Greven Johnson, 60
  - Lundeen, 233
  - Microsoft, 92-93
  - Microsoft, 95
  - Mindwork, 44-45
  - Tinker Co., 118
  - 1st Desk Systems, 237
  - 1st Desk Systems, 237
  - Bull Int'l., IFC-1
  - Data Tailor, 198
  - Forethought, 176
  - Macrolop Int'l., 209
  - PVI Development Corp., 38
  - SMS, 214
  - VersaSoft, 219
- **Vertical**
  - Micro Planning Software, 116
- **Communications**
  - Bull Int'l., IFC-1
  - Data Tailor, 198
  - Forethought, 176
  - Macrolop Int'l., 209
  - PVI Development Corp., 38
  - SMS, 214
  - VersaSoft, 219
- **Product Shoppe**

**MACPLOTS II™**

*Business Version-$195  Drafting Version-$295*

MacPlots II™ is a software package that turns your Macintosh® or MacPlus into CAD system with color plotting from a full range of plotters up to "E" size. Can plot files saved in PICT format. Not just a plotter utility, but alot more! See your dealer today for a demonstration.

**Features include:**
- Easy to use
- Fast loading of files
- Faster Bit Image Support
- Supports full range of plotters
- Plot position can be controlled
- Supports variable line thicknesses
- Supports draftig packages
- Optimization of file for faster plotting
- Dashed line support for MacDraft
- Bold, Italic, & Underline text supported in all sizes.

**In addition, the Drafting Version also features:**
- Clipping (hidden line removal)
- Quick Plot (one pass overview)
- Design your own fill patterns
- Faster speed for the MacPlus
- Allows you to use plotter text and bit image text in the same document
- Supports "E" size plotters

**Computer Shoppe**

P. O. Box 18344
Greensboro, NC 27419

**Circle 548 on reader service card**

240 April 1987

**Digitizers/Scanners**

663 AST Research, 8-9
615 DBS, 85
637 Datacopy, 201
466 Down, 193
566 Macintosh Graphics, 189
167 Thunderware, 182

**Display**

271 Computer Friends, 48
600 E-Machines, 108
235 Micrographic Images, 103
577 Radius, 15

**Modems**

271 Computer Friends, 48
450 Panamex, 229

**Hard Disks/Storage**

663 AST Research, 8-9
627 Bering, 48
657 CMS Enhancements, Inc., 35
584 DCC Systems, 210
602 Ehrman Engineering, 181
143 General Computer, 40-41
570 Jasmine Computer Systems, 100-101
591 Levco, 148
466 LeoDow, 193
564 Logic Array, 211
498 MacDraft, 25, 26-27, 29
223 Personal Computer Peripherals Corp., 195
666 StateWare, 235
749 SuperMac Technology, 49, 51
439 Warp Nine Engineering, 36-37

**Miscellaneous**

665 Anco, 237
607 Central Point Software, 74-75
271 Computer Friends, 48
498 Dove, 205
605 GDT Softworks, 239
395 MacDoctor Electronics, 78
11 Performance Electronics, 234
568 ScanCover, 106
618 Sun Remarketing, 240

**Hardware**

Boards 1
- Apple Computer, Inc., 22-23
- Apple Computer, Inc., 22-23

**Computer Systems**

Boards 1
- Apple Computer, Inc., 22-23

**Mail Order**

272 Icon Review, 86-89
125 MacConnection, 122-125
368 MacIntells, 55
90 MacStore, 229
668 MacSoft Consulting, Inc., 192
48 PC Network, 58-59
194 Programs Plus, 76-77
641 Sequoia mb, 236
91 Software Library, 90
618 Sun Remarketing, 240
483 Tussey, 82
234 U.S. Disk, 230
134 USA Flex, 54
459 Vision Technologies, 237

**Circle 548 on reader service card**
Macworld Expo is an open door... in Rotterdam

For those who think the States have cornered the Macintosh market... a European premiere! Macworld Expo on April 22, 23 & 24 in Rotterdam, at Holland's state-of-the-art Ahoy Exhibition Centre... Europe's first full-scale Apple Macintosh trade fair, featuring:

* three full days of hands-on experience with the newest and best in Macintosh software, hardware and peripherals.
* scores of market-leading exhibitors, including Addison-Wesley, Adobe, Apple Computer, Blyth, Letraset, Microsoft and Symbiotic...
* hundreds of international dealers, distributors, professionals and user groups.
* market information and business tips for the Macintosh community...
* a New Product Show, company sessions and seminars on compatibility, the Mac as executive tool, CAD applications and Desktop Publishing and a special program for DP professionals on the Mac in the mainframe environment...
* and all this at your fingertips in lively Rotterdam, with six major European capitals (Brussels, Paris, London, Bonn, Luxemburg and Amsterdam) within a 250-mile radius.

April 22, 23 & 24, 1987 Rotterdam, Holland

For more information about Macworld Expo, accommodation, the scores of participants and special events, fill in the coupon and send it to the address listed.

Macworld Expo
sponsored by Apple Computer/B.V. (Dutch Subsidiary) and Y-Tech Innovation Centre
Kerkstraat 299, 1017 GZ Amsterdam-C, The Netherlands
Telephone: 31.20.264454/Fax: 31.20-254296

I DON'T WANT TO MISS IT!

Yes, I want to know more about Macworld Expo, April 22-24, 1987. Send me your special brochure. I'm especially interested in: (check one or more boxes)

☐ meeting exhibitors
☐ attending seminars and company sessions

Name
Title
Company
Mailing Address
City Country
Postcode Phone

Send this coupon in a sealed envelope (stamp required) to Macworld Expo, Kerkstraat 299, 1017 GZ Amsterdam-C, The Netherlands.
# Macworld Best-Sellers

## Business Software

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>6*</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>1</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

- **Microsoft Works** Microsoft
- **Microsoft Word** Microsoft
- **Microsoft Excel** Microsoft
- **PageMaker** Aldus
- **FullPaint** Ann Arbor Softworks
- **MacWrite** Apple Computer
- **MacDraw** Apple Computer
- **MacPaint** Apple Computer
- **SuperPaint** Silicon Beach Software
- **MacLightning** Target Software

## Education Software

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Kids' Time** Great Wave Software
- **Math Blaster** Davidson and Associates
- **KidTalk** First Byte
- **MacEdge II** Think Educational Software
- **Typing Tutor III** Simon and Schuster Computer Software

## Entertainment Software

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Flight Simulator** Microsoft
- **MacGolf** Practical Computer Applications
- **Dark Castle** Silicon Beach
- **The Ancient Art of War** Broderbund Software
- **Gato** Specturm Holobyte

## Networking/Data Communications

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

- **AppleTalk** Apple Computer
- **MacServe** Infosphere
- **Apple Personal Modem** Apple Computer
- **TOPS 3Com**
- **MacTerminal** Apple Computer

## Hard Disk Drives

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

- **Apple Hard Disk 20** Apple Computer
- **Apple HD-20SC** Apple Computer
- **DataFrame 20** SuperMac Technology
- **MacBottom 20** Personal Computer Peripherals Corporation
- **FX-20** General Computer

## Books

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td>5</td>
</tr>
</tbody>
</table>

- **Excel in Business** Douglas Cobb, Microsoft Press
- **The Apple Macintosh Book** Gary Lu, Microsoft Press
- **Inside Macintosh** Addison-Wesley
- **The Printed Word** David A. Kater and Richard L. Kater, Microsoft Press
- **Microsoft Excel with Macros** Douglas Hergert, Microsoft Press

## Product Watch

Editors' choice:
Other recent products of particular interest.

- **The Brain** Reach Technology diskless file server
- **PowerPoint** Forethought business presentation software
- **XPress** Quark page-layout software

Source: Exclusive InfoCorp survey of more than one hundred Macintosh retailers and selected mail-order suppliers. Covers sales during December 1986.

*Formerly bundled with the Mac.
CLONE YOUR MODEM

ComServe™

The Modem Sharing Solution for AppleTalk

Now, for less than the cost of one extra modem, everyone can have a modem right at their desk. ComServe eliminates the need for dedicated modems for each Macintosh – and all the accompanying wiring complexities, line charges, connections.

ComServe works transparently in the background of your Macintosh, without any special hardware. And it’s made by Infosphere, the people who brought you MacServe™ and LaserServe™ – so you know it’s elegantly crafted and reliable.

Infosphere®

4730 SW Macadam Avenue
Portland, Oregon 97201
503 226-3620

Circle 249 on reader service card