Whether you run a small business or your knowledge about computers happens to be less than monumental, Microsoft® Works 2.0 has you covered.

Microsoft Works 2.0 is actually five tools in one: word processing, spreadsheet, database, drawing and communications. But as far as you’re concerned, it’s one integrated program—so it’s easy to move between the different productivity tools and use them together.

In fact, from the moment you take it out of the box, Microsoft Works 2.0 is easy to use. It comes with an animated training program written in HyperCard® format. As well as on-line help and unlimited phone support to help answer any questions you may have about Works’ features.

No matter how varied your projects are, Microsoft Works 2.0 can handle the job. Its newest feature, the drawing module (with page layout), can take an otherwise dull, fact-filled document and turn it into one full of compelling graphics.

The word processor can create everything from a simple memo to a detailed report—and it even includes a spell-checker aimed at eliminating typos.

Of course, if your document needs to be supported with numbers, you can always jump over to the spreadsheet to compute and analyze data. And then transform it all into easy-to-read, easy-to-understand charts.

As for information that keeps your business going, the database is indispensable for keeping track of clients and orders. And you can count on the communications module to bring information to your desktop through a modem.

If you’d like to learn more about Microsoft Works 2.0, just call (800) 541-1261, Dept. 176 for the name of your nearest dealer.

No wonder Microsoft Works 2.0 is the best selling application in its class. Aside from being a great value, Microsoft Works 2.0 is one program that can handle a myriad of business needs.

It’s that simple.
Just shopping for ideas, we recommend this year's Alpine Woods Development. You can park at the Denny Shopping Center and take a tour bus from there between 9:00 a.m. and 6:00 p.m. daily.

HOME OF THE MONTH
Lakefront Country House: Designed for Entertaining!

This lovely brick and cedar country house can be found just fifteen minutes from downtown Aspen. Nestled in guns fire, it represents true Colorado style! The master bedroom suite features a panoramic view of Lake Diamond. The master suite also has his-and-hers walk-in closets, a separate vanity, and a spacious shower area made of glass blocks. The living room, study, family room, and bedrooms (2+) feature hand-polished redwood paneling and skylights. The three-car garage has special wall-mounted ski racks and an extra-sized third stall to accommodate up to a 24-foot boat. Two additional baths, a stone fireplace, 800 square feet of decking, three wooded acres, and a private dock complete this rural dream home.

Sincerely,

Peter Cohen
Residential Agent
Afraid of prying eyes and sinister viruses? Worried that your Mac and hard disk might not make it through the night? Or maybe you're tired of coming back from lunch to find your desktop mysteriously rearranged? Whatever your security questions, you'll find the answers on page 142.

(Photo by David Bishop.)

Far details on how this illustration for our cover story was created, see page 43.

DEPARTMENTS

How to Contact Macworld ........................................... 12
Reprints, subscriptions, Macworld in microform, editorial contacts.

Commentary/Jerry Borrell ........................................ 23
Multimedia? Bah, humbug!

Letters ........................................................................... 31

Art Beat .......................................................................... 43
By Deborah Branscum/The artists and techniques behind selected illustrations.

The Iconoclast ................................................................ 47
By Steven Levy/Our reporter computes his net worth.

Conspicuous Consumer .................................................. 91
By Deborah Branscum / Effective complaining.

State of the Mac .............................................................. 99
By Thom Hogan / Toward a 24-bit color-display standard.

News

Mac Bulletin ................................................................. 17
Late-breaking news.

Macworld News ........................................................... 119
- Radius Unveils CAD Accelerator Up to 30 times faster. - Life in the Studio Line Lettraset's new strategy. - When the Earth Shook, the Mac was There Keeping the presses running. - Miramar Speeds Up MacLAN Connect AppleShare server on a PC. - The Polyglot HyperCard MitemView makes mainframes friendly. - Third Parties Line Up behind the Portable With hardware galore. - The Future of Music VALIS, the high-tech opera. - Lights, Camera, MediaTracks When the Mac is a movie. - Apple Bobs Back after Great Quake Some damage surfaces. - Automating Connectivity How Clear Access lets Full Impact churn out reports. - Data Analysis, Xerox Style The ultimate integrated package. - TI Printer Can Upgrade to PostScript And boasts a small footprint. - Survey: Multimedia Who uses it, and why.
Features

Special Report: Data Safety .................................. 142
By Cheryl England Spencer / How to protect sensitive data from prying eyes and destructive viruses.

Warning: Computing Can Be Hazardous to Your Health ..................................................... 150
By Diana Hembree / Is the Mac jeopardizing your health? Here's a survey of computer hazards—and how to avoid them—from the pain of repetitive strain injury to the perils of radiation.

Math without Tears .................................................... 158
By Charles Seiter / You no longer have to be a math wizard to do complex calculations. Powerful yet easy-to-use numeric and symbolic math programs have finally come to the Mac.

Middled-Aged Crazy ..................................................... 166
By Steven Levy / A look back at 1989, when the Mac hit midlife.

Object-Oriented Programming .................................. 174
By Brita Meng / Object-oriented programming will help Mac programmers build better applications. But its simplicity can open up the world of programming to users too.

Reviews

Microsoft Mail 2.0 ................................................... 184
Electronic mail package.

SuperMac Spectrum/24 Video Interface Board, Radius DirectColor/24 Video Interface Board, and Radius QuickColor Graphics Accelerator Board .............................................. 185
Two 32-bit graphics boards and a QuickDraw accelerator board.

AntiToxin 1.0, Anti-Virus Kit 1.0, Symantec Antivirus for Macintosh 1.0, Virex 2.1 ..................................................... 188
Antiviral software.

LightningScan, ScanMan ............................................. 192
Two hand-held scanners.

Publish It 1.1 ............................................................... 197
Page-makeup program.

MathCAD 2.0, TK Solver Plus 1.1 ..................................... 201
Numerical mathematics software.

Works Plus Command 2.0, Works Plus Spell 2.0 ................................................................. 203
Spelling and macro programming add-ons for Microsoft Works.

MacEnvelope Plus 1.0, MacInvoice 1.0, MacPhonebook 2.0 .................................................. 204
Envelope, invoice-printing, and phone book utilities.

MacSprint II ............................................................... 208
Cache board for the Mac II.

Quicken 1.5 ................................................................. 210
Home finance/checkbook program.

MacInteriors 1.0 .......................................................... 215
3-D room-layout program.

SuperGlue II 2.01, CanOpener 1.0 .................................. 217
Print-to-disk and document-browsing utilities.

Mobius MultiScreen 2.0 ................................................. 219
Multiscreen video board for the Mac SE.

Window Shopping ...................................................... 221
Mum's the Word 1.1, MacStickers 1.0, AmPack 4.2 and AmPack Plus 4.2, Handwriting Analyst 3.1.
HOW TO SHIFT YOUR DISK OPTIMIZER FROM MANUAL TO FULLY AUTOMATIC

Only ALSoft will let you upgrade your old disk optimization package to DiskOptimatic™. DiskExpress II features ALSoft’s revolutionary new Disk Optimatic technology designed to automatically optimize your hard drive’s performance forever. Whatever optimization software you currently own, DiskExpress II is the newest, fastest and safest way to optimize. DiskExpress II is fully automatic and runs transparently in the background mode. That means DiskExpress II works intuitively around your busy schedule without ever tying you up and causing computer gridlock. Don’t expect that kind of awesome power and intelligent performance from any other disk optimizer. You’ll need much more than SUM™ Tuneup utilities to get you in the fast lane. Shift into Disk Optimatic with DiskExpress II.

Simply send or FAX us a photocopy of your manual cover (any disk optimizer or ALSoft product will do) along with just $45 plus shipping and handling. We’ll speed you your brand new DiskExpress II to keep you optimized FOREVER. Suggested retail $89.95. Network licenses available.

ALSoft, Inc.
P. O. Box 927 • Spring TX 77383-0927
713/353-0490 SALES • 713/353-9868 FAX
Now Your Network Can Go Wherever You Can Go.

No matter where in the world you go, now you can take your office network with you. Because Dial-In Network Access™ from Shiva lets you access your office PhoneNet® or AppleTalk® network from anywhere you happen to be. Dial in from home, a customer's office, a motel room or the middle of nowhere. Use Microsoft Mail™, TOPS™, AppleShare®, a LaserWriter®, or any other network resource just as if you were right there in front of your office Mac. All you need is a phone line, a Macintosh® or IBM-compatible PC and a modem. If you have an IBM-compatible laptop, you don't even need a power outlet! Your office network will need a NetModem™ or a TeleBridge™ with an ordinary modem. Dialing in is easy — just click on a control panel icon and select the remote network you want. It's just as simple on a PC. And you can list different names and communication settings for each network. Wherever you go, now you can take your network along — with Dial-In Network Access. Call 1-800-458-3550, or write Shiva, 155 Second Street, Cambridge, MA 02141.

Shiva
We're Putting Networks To Work.

To some it was just a game. An intricate game composed of subtle moves, sublime suggestions, and intricate defenses. To him, it was a paradigm of life. An ever shifting pattern. Of Victory and Defeat. Each game unique. Each game a bitter-sweet experience. He studied Sun Tzu. He read Clausewitz. He explored Napoleon. He marvelled at the Masters. He never stopped learning. He played his opponent as closely as some would hold a lover. He played the clock as if his life depended on hitting the button five seconds under the allotted time.

They called him the King of Strategy. He called himself a Student of Life.
When we introduced the Radius Full Page Display, it was the first time anyone had seen a full page view of a Macintosh.

But we didn't stop there.

We created the Radius Two Page Display. So you could see a full two-page view of your work. Then we developed the Radius Gray Scale Display with 256 shades of gray. So you could work with two full pages of photographic-quality gray scale images.

Today, you can choose from our Full Page, Two Page or Gray Scale Displays. Or, you can work in color with our eight, sixteen or twenty-four bit Color Displays.

And regardless of which Radius Display you select, you're always assured of an unflinching, crisp, paper-like image. Consistently rated the best in the industry.

In addition, you get all the benefits of the classic RadiusWare features. Including Tear-off Menus in every application. The ability to capture any portion of your image in a PICT file. Small or large menu bars. And direct control panel access.

So, if you're looking for a display for your Macintosh, the first thing to do is visit a Radius Authorized Dealer. You can find one near you by calling 1-800-227-2795.

It's clearly the best move you can make.
The Original AnthroCart. Mobile. Compact. Incredibly strong. So many ways to solve your space and equipment problems!

Start with our smallest cart. Customize it. Choose from 30 options...

or maybe you need a bit more room. We have carts 25" wide to 48" wide...

or connect any of our carts into complete workstations...

Call us for a complete catalog or to place an order:
800-325-3841
6:30 a.m. to 5:00 p.m., PST

• Prices start at $299 for the smallest AnthroCart
• All AnthroCarts easily hold up to 150 lbs. (all steel frame construction)
• Available for OEM applications
• Made in U.S.A.

Anthro®
Technology Furniture®
3221 N.W. Yeon St.
Portland, Oregon 97210
(503) 241-7113

Anthro and Technology Furniture are registered trademarks of Anthro.
FASTER
FASTER
FASTER
FASTER
FASTER
FASTER

PERHAPS THIS WILL EXPLAIN WHY 100,000 PROFESSIONALS LOVE MORE.

MORE II is the fastest way to create everything you see here. Nothing else even comes close.

Why? Because MORE II was designed for professionals like you: professionals who organize, plan, manage, and report. For example, MORE II knows that most business communications follow a concise, condensed format. So its powerful outline structure indents, spaces, and numbers your line items and paragraphs for you. In essence, it automates the basics, organizes the details, and shows off your results.

In fact, all six documents above were created instantly from a single To-Do list outline using software templates available from Symantec. * The templates supply professional-looking typestyles, spacing, centering and sizing. ** You just type in the text.

With output this fast, you'll have extra time for input. And that, in a nutshell, is why 100,000 professionals love MORE.

FREE DEMO DISK
(800) 228-4122 Ext. 763G

Symantec Corporation, 10201 Torre Avenue, Cupertino, CA 95014. 408/253-9600.

*Graphs imported from Microsoft Excel. **Templates shown will be available free to users registering after December 1, 1989. While supplies last. MORE and MORE II are trademarks of Symantec Corporation. © 1989 Symantec Corporation

Circle 215 on reader service card
Usually, the technology available to computer users just plods along—with competing products repeating one another's so-called improvements.

But once in a blue moon there's a great leap of innovation. Something new appears that's so well thought out, so smart, that the way you work may never be the same again.

WIZ™ by CalComp, for example.

WIZ is an exciting new productivity tool. Combining the easy-to-use features of a mouse with the power of an "intelligent" graphics pad to enhance every pointing, tracing and drawing function you do.

WIZ meets the needs of virtually every Macintosh and PC user—from novice to advanced. Because WIZ gives you the convenience and flexibility of six programmable buttons, a cross-hair pointer and 1000 dpi for pinpoint accuracy, along with

Prehistoric.
a user-definable mouse area. What's more, WIZ unleashes the full power and speed of your software. Optional templates for most major programs eliminate tedious pull-down or bar menus. Because WIZ templates put the commands you use most at your fingertips for instant access. And for the artist in you, WIZ offers an optional pen for drawing. There's no rolling ball or moving parts. Nothing to clean. And WIZ has a five year warranty backed by CalComp, a world leader in computer graphics for over 30 years. But the most amazing thing about WIZ is that you get it all for an introductory price under $200. See WIZ at your local dealer or call 800-CALCOM. WIZ by CalComp. Everything else is just a mouse.

Historic.
LightningScan, Thunderware’s hand scanner for the Mac. Now with new and improved software.

Our hand scanner is worth a little arm waving. That’s because LightningScan lets you scan images up to four inches wide from books, mounted artwork, or anywhere else. You get switchable resolution up to 400 DPI. And built-in memory for the fastest scanning anywhere.

LightningScan has more software power than any other hand scanner. Features like gray scale conversion. Image re-sizing. Scanner calibration. Plus the choice of over 100 halftone patterns. And line art. No wonder that Publish! magazine calls our hand scanner “the best value on the Mac.”

To end this ad on an upbeat note, LightningScan can be yours for just $495 suggested retail. So get rolling to your dealer and pick one up today.

LightningScan
Hand Scanner for Macintosh®
21 Orinda Way, Orinda, CA 94565 415/254-6581 FAX: 415/254-3047

© Copyright 1990 Thunderware, Inc. All rights reserved.

MACWORLD
HOW TO CONTACT MACWORLD

Subscription Services
For subscription service questions, call 800/234-1058, 800/525-0643, or 303/447-9350, or write Subscriber Services, P.O. Box 54529, Boulder, CO 80322-4529. To place new orders, call 800/288-6848.

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

Back Issues of Macworld
Write to: Back Issues of Macworld, 144 Townsend St., San Francisco, CA 94107; $6 per issue ($20 overseas). Prepayment in U.S. funds necessary.

Macworld Editorial
Mail or Courier Macworld Communications, Editorial Dept., 5th floor, 501 Second St., San Francisco, CA 94107; 415/243-0505.

AppleLink: Macworld Connect: Macworld
Compuserve: 70370, 702了 415/442-0766

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

Questions and Quick Tips
Direct questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to: Quick Tips, Lon Poole.

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

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

Editorial Calendars
For a copy of Macworld’s editorial calendar, direct requests (by mail) to: General Information, Editorial Dept.

Reprints and Permissions
For written permission to quote or reproduce material from Macworld, direct requests (by mail) to: Reprints and Permissions, Editorial Dept.

Writing for Macworld
Please do not send us unsolicited manuscripts. If you’re interested in writing for Macworld, send a stamped, self-addressed envelope along with a request for our writer’s guidelines. Direct (by mail) to: Writer’s Guidelines, Editorial Dept.
The Story Of Apple® & Eve.

In the beginning, there was an Apple. & a lot of software. Great stuff to use. Great stuff for pirates to copy free.

Then came a bigger, more powerful Apple called the Mac. The temptation for free software rose once more. & piracy again had its way.

Then Eve arrived. To quickly end the free-loaders' rule. & the rest is history.

Introducing EVE for the Apple—the software developer's key to a secure return on development investment.

EVE protects Macintosh software from piracy—with a simple but virtually foolproof concept: The software won't run unless the EVE hardware key is plugged in. And only those who purchased the software have a key that works with the program.

To developers, EVE's implementation is simple. Key codes are imbedded in the software which require a correct response from EVE any time the program is accessed. Without EVE, the software doesn't run.

And to users, EVE is totally transparent. The software runs as if EVE wasn't even there. It's that simple.

KEY FEATURES:
- For the Macintosh SE and II
- Developer implemented
- Completely transparent to the user
- Permits unlimited backup copies
- Seven programmable security locks
- Up to seven programs per key
- Multi-level password-based access
- Installs via any Mac ADB connector
- Compact and easy to install

EVE. The perfect companion to Mac software. For additional information, call Rainbow Technologies. European inquiries can be conveniently made to Rainbow Technologies Ltd, United Kingdom.

Rainbow Technologies also provides the SentinelPro and Sentinel-C hardware keys to protect software developed for IBM PCs, PS/2s and compatibles, and the Atari ST. And the DataSentry for PC users who want to protect data files.
Multimedia defined.
Now with MacroMind.

Mul-ti-me-di-a (mul-ti-me-de-e) noun. Involving the use of several media of communication, expression or entertainment. 1. From the Latin word meaning more than one medium; to combine text, graphics, animation, sound and video for improved communication. 2. The integration of several media when presenting, instructing or simulating concepts and ideas. 3. Extremely effective when attempting to keep an audience “awake.” 4. Dangerous when used by competi- tors. 5. The complete solution is available now—only from MacroMind—developers of the world’s most flexible multimedia presentation and animation software tools.

There’s more to this definition than meets the eye. MacroMind Director really delivers on the promise of communicating important ideas and concepts—going beyond words and pictures to engage all of the senses with exciting sound, animation, even video.

For anyone who uses a Macintosh® to present, instruct, simulate—or in some instances stimulate—MacroMind Director can help you to set your most sound ideas in motion, adding a whole new dimension to your most essential work. It’s the one software application that allows you to go beyond conventional media—unleashing a powerful new way to comprehend and share ideas.

When presenting a case.
MacroMind Director can do amazing things for you when it comes to making business presentations—especially when share of mind, ear, body and soul is the main objective. Create exciting images effortlessly with MacroMind Director’s built-in tools. Or, import all of your sound and graphics from one of the standard Macintosh software applications.

Take advantage of the MacroMind CD-ROM”, which offers a wide selection of ready made sounds and animations, to dazzle your audience with a truly caffeinated presenta- tion. One that is sure to be memorable over time.

To move a case forward.
Add graphically exciting animation to all of your video work. Make your logo “jump” right off the screen—and orchestrate it to whatever tune you choose. Use graphics to add excitement to all of your video productions and important presentations. MacroMind Director can play an important role—whatever the script.

Add an extra dimension to all of your important business presentations.

Take advantage of MacroMind Director’s powerful paint tool to add “life” to any animation.
When doing a case study.

MacroMind Director really stands out when it comes to developing exciting instructional or training programs. Take the most complex subject—and make it easily understood. There is no content too challenging, or too simple, given MacroMind Director's powerful multimedia capabilities.

From the most fundamental corporate training programs, to a simulated moon landing—or moonwalking if you choose—it's the one product that really excels in and out of the training room.

In case you need to simulate DNA... ASAP.

MacroMind Director's powerful capability to simulate complex scientific or medical concepts provides yet another powerful application. Import three-dimensional or flat images created using other Macintosh graphics-based software applications. Exciting models can be created—allowing you to visualize just about anything—from a DNA molecule to an assembly line at a manufacturing facility.

Let MacroMind Director clearly define how multimedia can work for you, whatever the endeavor or application. This is the one product that can do it all. See for yourself why the most creative minds are turning to MacroMind.

MacroMind Director allows you to import images and sounds from most Macintosh software applications.

The ultimate video experience.

Conventional print media has serious limitations—that's why we created a video with some exciting examples of how MacroMind Director can make a difference for you. Learn from those who know best—our customers. To order the video, simply call, or write! Call: (415) 442-0200. Write: MacroMind, Inc., 410 Townsend, Suite 408, San Francisco, CA 94107. Important: Be sure to include $9.95 to cover the cost of shipping and handling. Make checks payable to MacroMind, Inc.
High Performance
MS-DOS® for Macintosh®

MAXIMUM PERFORMANCE FOR THE MAC II SERIES
Orange Micro's Mac286™ 2.1 brings the power of an IBM® AT to your Macintosh II™. Multi-tasking of MS-DOS and Macintosh applications is now possible, with the help of on-board processing and RAM. The Mac286 rates an 8.2 on the Norton Computing Index. That's 6 times faster than any software based solution. Only Mac286 matches the best DOS performance with the best Mac performance.

PRICE PERFORMANCE FOR THE MAC SE
Mac86™ 2.1 brings many of the advantages of Mac286 to the Macintosh SE*. With the power and speed of a PC XT, Mac86 creates a second computer within your SE, capable of independent tasks even while you work in Macintosh applications.

Priced to compete with software-only solutions, Mac86 is the clear choice when performance is important.

*Not compatible with MacSE/30

APPLICATION COMPATIBILITY
Mac286 and Mac86 open new windows of opportunity by ensuring compatibility with major MS-DOS applications. You can use MS-Windows™, Lotus 1-2-3™ or MS-Word® simultaneously with your favorite Mac programs. Fortran, Pascal, and compilers run with Mac286/86 as well, turning your Mac into a full development system.

SHARING HIGH PERFORMANCE
Mac286 and Mac86 don't just add DOS to your Mac, they blend the two environments to maximize your productivity. Mac286 and Mac86 are fully compatible with the TOPS™ network. With an optional utility, you have full use of Apple's SuperDrive™ for DOS files and applications. Copy and Paste graphics and text from MS-DOS programs right into MacWrite™, PageMaker™, or other popular Mac software. Transport files between Mac and MS-DOS formats in two quick steps with Mac286. Whatever your MS-DOS application, Mac86 or Mac286 provide the performance and compatibility you need.

Orange Micro, Inc.
1400 N. Lakeview Ave., Anaheim, CA 92807
(800) 223-8029, In CA (714) 779-2772

©Orange Micro, Inc., 1989
MAC BULLETIN

INDUSTRY NOTES
Symmetry Merges with Teknon
Symmetry, publisher of Acta, HyperDA, and PictureBase, is merging with Teknon, the company that wrote Layered's atOnce. The new firm is keeping Symmetry's name but moving to Teknon's headquarters in Scottsdale, Arizona, and will continue to market Symmetry's line while developing and marketing new products. For more information, call 602/998-9106 or 602/844-2199.

Mass Microsystems Going Public
On September 22, Mass Microsystems filed with the Securities and Exchange Commission to make a public offering of 1.4 million shares of common stock, which the company expects to sell for between $4.25 and $5 a share. Mass Microsystems develops and markets a line of Macintosh hard disks and boards for video manipulation.

Apple Shuns DRAM Consortium
Apple has declined membership in U.S. Memories, an industry consortium formed to manufacture dynamic random access memory (DRAM) chips. Apple's reasons for not joining were twofold: it wants to spend its money on what it considers more important areas, and it does not see that consortium membership would benefit customers. Current members of U.S. Memories include IBM, Digital Equipment Corporation, and Hewlett-Packard.

Apple Japan and Canon Investigated for Unfair Trade
Apple Computer Japan and its largest Japanese distributor, Canon Sales, are being investigated by Japan's Fair Trade Commission (FTC) for violating Japanese antimonopoly laws. The FTC is looking into claims that Apple Japan and Canon Sales pressured four Japanese computer magazines to reject advertisements placed by Step, an unauthorized, or gray-market, Mac importer. Apple Japan is also being investigated on charges that it asked two service firms not to maintain Macs bought from Step. Both Apple Japan president Shigechika Takeuchi and a Canon official denied the allegations.

MacWrite II and Open Architecture Software
Version 1.1 of MacWrite II supports drop-in modules for adding features. Claris plans to implement the new technology, called XTNDs, in all of its applications. The first batch of XTNDs for MacWrite includes about 30 translators for reading and saving in AppleWorks and in Mac and MS-DOS versions of Microsoft Word and WordPerfect, as well as in Acta and other file formats. DataViz, which developed the translators Claris is using, has additional translators for WordStar, XyWrite, the VAX word processor WPS Plus, and others, and is developing a translator to import records from DOS dBASE into MacWrite mail-merge documents. Claris is making the extension format available to developers at no charge. MacWrite II version 1.1 also adds substantially increased speed on the Mac Plus and SE, built-in virus protection, and an improved online help system. Version 1.1 lists for $249 and is available free on request to registered owners of version 1.0. For more information, contact Claris in Santa Clara, California, at 408/987-7000.

Sybase Offers Mac API
Sybase has introduced its first Mac product, a Mac-based application programming interface (API) for the company's Sybase SQL Server relational database-management system. The API, called Open Client, comes in two versions and works over networks running TCP/IP and DECnet protocols. DB-Library supports Macintosh Programmer's Workshop (MPW) C, Hyper/DB-library provides SQL command capabilities within HyperCard. Apple's Strategic Investment Group made a minority investment in Sybase in August 1987.

Quick Look at a New Panorama
Panorama, described by its publisher ProVue as "the database that thinks it's a spreadsheet," is being revised to version 1.2. The upgrade features the ability to trigger a macro by entering data in a field; matrices, which will simplify the use of line items; the ability to select records using multiple criteria at once; and a summary capability for Flash Art that will, for example, make it possible to overlay data on a map or a calendar. The new version will also concatenate fields when printing. Panorama's list price remains unchanged at $395, but upgrade pricing had not been decided at press time. ProVue is also publishing a 40-page how-to book for $6.95. For more information, call ProVue at 714/892-8199.

OCR Goes Preppie
Blue Solutions (until recently Orange Solutions) is working on a product, tentatively called OCR Prep, to clean up TIFF images of scanned text and prepare them for optical character recognition packages. OCR Prep is designed to isolate letters from extraneous bits in gray-scale or black-and-white scans of dirty originals such as newspapers. It will also correct for skewing and misalignment of the original scan, one of the primary reasons optical character recognition packages misidentify (continues)
INDUSTRY NOTES

AppleShare file server capabilities to UNIX and computers on networks, respectively. Mt. Xinu will continue to develop and market the three programs.

Good News for NuPaint

NuPaint has turned over distribution of its black-and-white paint package, NuPoint, to Good Software. The list price is unchanged at $129.95. For more information, contact Good Software at 214/239-6085.

Mediagenic Drops Most Mac Products

Mediagenic is stopping development on its TenPoint0-labeled Mac products and plans to sell the division. Affected products include Focal Point II, Reports for HyperCard, Business Class, City to City, and OpenPill. The Manhole and Cosmic Osmo are not affected by the change. For more information, contact Mediagenic at 415/329-0800.

Plus Changes Hands

Olduvai has given up distributing Format Software's HyperCard work-alike, Plus, and Spinnaker Software is planning to take over Plus. For more information, contact Spinnaker at 617/494-1200.

Japan Market Forum

Macworld is hosting a forum for companies interested in the Japanese Macintosh market. The Japanese Market Forum is cosponsored by Apple Pacific and IOC Japan and is scheduled for January 12 at the Hotel Nikko in San Francisco. Speakers from Apple Japan, Apple Pacific, and other companies will cover the current market, future opportunities, establishing business in Japan, and localization issues. For more information, contact David Ushiiima by phone at 415/978-3239 or by fax at 415/442-0766.

The Empty Table

Table Tools publisher Mansfield Systems has closed its doors. Mansfield Systems president James Duke said it is unlikely another publisher will take over TableTools to provide support or to market version 2.0, which was about to ship. However, TableTools owners can buy the competing Tycho for $99.95, a $50 discount. For information about Tycho, contact MacCreations at 415/359-7649.

letters. OCR Prep is scanner-independent and should work with any standard TIFF file. At press time, no release date or pricing had been set. For more information, contact Blue Solutions at 805/371-4521.

Virus Prevention Built In to New Applications

Virus-prevention recommendations made by the Software Virus Task Force, a committee of the 1500-member Software Development Council, have already been implemented in at least three Macintosh products: Advanced Software's DocuComp, a utility for comparing versions of word processor files; AppleLink 5.0, the software for Apple's proprietary online system; and version 1.1 of Claris's MacWrite II. According to SDC president Michael Odawa, the recommendations provide a generic description of how to incorporate virus-detection code into an application so that it "performs a self-integrity check similar to counting your fingers and toes when you wake up in the morning." For more information, contact the Software Development Council at 415/854-7219, or write Odawa at Simple Software, 220 Redwood Hwy., #42, Mill Valley, CA 94941.

MacMoney Invests for the Future

The home-finance package MacMoney is expanding in several directions. Version 3.5, which should be available now, has hooks for add-in modules, and the first module planned is Invoiqt, which uses MacMoney's categories and figures to generate invoices and prepare reports for sales, cash received, and aging. Version 3.5 also adds the ability to change the opening balance, edit categories after using them, perform quarterly and semiannual loan planning, and create bar and line graphs comparing specific income and expense categories. MacMoney version 3.5 lists for $119.95, and Invoiqt lists for $99.95. For more information, contact Survivor Software at 213/410-9527.

Online Service Comes Home

Macintosh users can now access Prodigy, the family-oriented online system developed by Sears and IBM. The Prodigy system features a simple interface and offers online shopping, clubs, magazines, movie reviews, horoscopes, news, group games, and even a summary of the day's soap operas, as well as electronic mail and conferencing. Each Prodigy account covers up to six members and costs $10 a month for unlimited use; so far only electronic banking carries surcharges. Prodigy takes over the entire Mac screen with attractive but definitely IBM-looking graphics. It does not run under Multifinder or in a window, preventing users from cutting off the strip of advertising along the bottom of the screen. Prodigy's Macintosh software requires at least a Plus and is available for $49.95 with three months of free time. For more information, in the United States contact Prodigy at 800/822-6922, ext. 205.

Mac II Gone but Not Forgotten

Apple has admitted that it took the Mac II out of production in March, after introducing the Mac IIcx. The Mac II was the first open-architecture Macintosh, featuring six NuBus add-in slots, and the first Mac with a 32-bit architecture. But the IIx, IIcx, and IICi outshine the Mac II. The newer machines are built around the 68030 processor, which is slightly faster than the Mac II's 68020 processor and features the memory management that will be necessary to take advantage of System 7.0's virtual memory capability. But don't scrap those 68020-based II's; they can easily be fitted with an inexpensive memory management chip for users who do require virtual memory. For $275, Connectix supplies the 68851 PMMU with version 2.0 of Virtual, software that creates up to 14MB of virtual memory under the current System 6.0. For more information, contact Connectix at 415/324-0727.

Claris Public Folder Offers File Exchange

Looking for a way to exchange files on an AppleTalk network—without a file server? Claris programmer Michael Peirce has written a Chooser document called Public Folder that lets you do just that. Using it, networked users copy files to and from a specific folder on another user's Mac drive. Public Folder is free to any licensed user of Claris software, and is available on bulletin boards such as CompuServe.
According to a recent article in *MacWorld* Magazine, "There is very little to distinguish one hard drive from another, other than speed, software, and price." We agree.

Only a very few milliseconds of access speed separate the Jasmine and the Ehman hard disk drives, and both include utility software programs free. Both come with two year warranties and a 30-day money back guarantee. And both companies enjoy a reputation for manufacturing high-quality products. That brings us to price.

As you can see, the Ehman 45 MB hard drive is $200 less than the Jasmine 40 MB. That's a difference users may not notice, but buyers certainly will. Ehman's low Rocky Mountain overhead always means lower prices.

With all Ehman products, you get a 30-day money back guarantee, a lengthy warranty, and our optional 24-hour express service replacement service policy.

The Ehman drive is a better buy. But don't take our word for it. *MacWorld* Magazine called the Ehman drive "a real bargain." Call us today and see the difference for yourself. Visa, MasterCard, American Express welcome.

### Hard Drive Prices

<table>
<thead>
<tr>
<th>Size (MB)</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>$329</td>
<td>$629</td>
</tr>
<tr>
<td>30+</td>
<td>$379</td>
<td>$649</td>
</tr>
<tr>
<td>40</td>
<td>$449</td>
<td>$749</td>
</tr>
<tr>
<td>60+</td>
<td>$499*</td>
<td>$799</td>
</tr>
<tr>
<td>80+</td>
<td>$579*</td>
<td>$879</td>
</tr>
<tr>
<td>105</td>
<td>$799</td>
<td>$999</td>
</tr>
<tr>
<td>155</td>
<td>$899</td>
<td>$999</td>
</tr>
<tr>
<td>450+</td>
<td>$1,099</td>
<td>$1,899</td>
</tr>
<tr>
<td>Removable</td>
<td>$799</td>
<td>$799</td>
</tr>
</tbody>
</table>

*Good only on Macintosh II models. SE drives also available. Utility software not available on 70 MB. All product names mentioned are trademarks of their respective holders. Prices subject to change without notice and may not reflect limited-time pricing. 3% Surcharge on American Express.
1 The NeXT™ Computer System is the first computer in the world (and so far the only) to use read/write/erasable optical storage. While PCs today are typically equipped with Winchester drives that store 20 to 40 MB, a single optical disk can store 256 MB. Plus, it is removable, for portability and added security. This dramatically new technology provides storage that is simultaneously vast, reliable and cost-effective—a combination unmatched by computers of any size.

2 NeXT has made the power of UNIX® usable by mere mortals. UNIX is the high-performance operating system used by workstations to achieve true multitasking and superior networking. Unfortunately, it has always been the antithesis of user-friendly. NeXT has given UNIX a revolutionary new interface—one that is both visual and intuitive. Now computer users of every level can instantly wield this tremendous power, with no technical knowledge whatsoever.

3 To achieve the power needed for the 90s, NeXT bypassed traditional workstation architecture and went directly to that of a mainframe. This eliminates bottlenecks and attains an extraordinary level of system “throughput”—the true measure of computer performance. Only through the use of VLSI (Very Large Scale Integration) technology could this architecture be reduced in size so that it could fit inside a desktop computer. It’s a mainframe on two chips.

4 While PostScript® has long been the industry standard for printing, NeXT has made it fast enough to also be used on the display. This “unified imaging model” ensures that what you see on the display is precisely what you will get on paper. All your work, in any size type and any degree of rotation or magnification, appears with perfect 92-dots-per-inch clarity on the NeXT MegaPixel Display. And with laser precision at 400 dpi on the NeXT Laser Printer.
The NeXT Computer System is the first to be capable of producing CD-quality sound. Without requiring any additional equipment. This feat is made possible by a chip that has been specifically designed for the task of manipulating sound—the Digital Signal Processor (DSP). Because this processor is standard in every NeXT machine, software developers will be able to call upon its power to enrich programs we use every day. Now computers will not just be seen, but heard.

NeXT Mail takes electronic communications beyond anything you've seen on a personal computer before. Now you can send and receive multimedia mail—including text (with varied type fonts, styles and sizes), graphics and voice messages. And despite its high level of sophistication, NeXT Mail is so intuitive, you may not ever need to open the manual. NeXT Mail is built into the system, along with Ethernet and TCP/IP, so the NeXT machine can quickly become a part of existing networks.

Programmers can create software on the NeXT Computer up to ten times faster than on any other computer—the result of a breakthrough called NextStep. It gives software developers the power to create the graphical user interface portion of their applications (often the most time-consuming and difficult part) without any programming at all.

This revolutionary environment means we will see more programs, and better ones, in less time than ever possible before.

These seven breakthroughs will change the way we use computers in the 90s. Which is why Businessland, the leading supplier of computers to corporate America, chose the NeXT Computer System as the workstation they will offer. Call us at 800-848-NeXT, and we'll send you a 28-page brochure describing the NeXT Computer. We'll also give you the address of your nearest Businessland Center. There, you can experience for yourself the first seven breakthroughs of the 90s. And get a good idea where the next three will come from.

Circle 485 on reader service card
Macintosh Data Storage
Fast as 5.4 ms Access
Using MicroNet's Overlapping Seek Algorithms and Spliced Imprimis MacWren Full-Height Hard Disk Drives
642, 1174 and 2011 MB
Especially Suited For Use With The SE/30, II, IIx, IICx and IICi

Micro/Spliced Rapid Access Storage Systems are excellent for disk intensive applications, such as, sound, desktop presentation, file servers, CAD and computer-aided-publishing systems. These subsystems seek half as far, half as often and increase transfers up to 60%.

Micro/Spliced systems use two identical MacWren hard disk drives that are daisy chained with their SCSI ID's set in sequential order. Two hard disk drives are spliced into one logical volume by use of a device driver developed by MicroNet. An Overlapping seek system appears as one volume on the desktop or it can be partitioned with up to 36 partitions with password protection. The system occupies two SCSI ID positions and are compatible with Mac/OS only. Each system is fully tested and includes a one year warranty and is rated at 40,000 hours MTBF. Our SCSI software is maintained by our own engineers to be fully compatible with the latest system releases from Apple Computer. Other features include verify, bad block spare, SCSI bus status, disk cache enable and are developed around reliable MacWren hard drives.

"QUALITY YOU CAN COUNT ON"
Call for data sheets and the name of your nearest dealer. Dealer inquiries invited.

MicroNet Technology, Inc.
20 Mason • Irvine, California 92718 • Telephone: (714) 837-6033
FAX: (714) 837-1164 • Connect: Micronet • AppleLink: D1656 • CompuServe: 76004,1611

Circle 116 on reader service card
There I was, working away in PowerPoint, hammering out a last-minute presentation when suddenly the multimedia urge struck me. I realized in that instant that my presentation should be more than just good type—it should have pictures, maybe some animation. After all, as the editor of *Macworld*, my presentation should be state of the art.

So I opened a new slide and began tinkering with PowerPoint's drawing tools. After significant effort, I recognized that I was not going to impress anyone with my artistic abilities. I thought of those glowing advertisements I had seen on television—I should be able to do that on the Mac, right? Inspiration hit. I might not be able to amaze with PowerPoint's graphics, but what about using MacDraw?

I wanted to add an organization chart to my presentation, so I opened a copy of our org chart in MacDraw, did a Select All function, copied, closed MacDraw, and reactivated my PowerPoint window. I positioned my cursor on the slide window and hit Paste. Wham. No problem. Except that I needed to resize the drawing, and I needed to add some color. So I started in, only to realize that I could not edit my original drawing! In fact I couldn't even change the type.

DON'T YOU HATE IT WHEN . . .
The Mac lives down to the expectations of, say, a DOS machine? Here I am with a presentation that has 48-point type for text slides in yellow on a blue background, and then I have an unreadable org chart. Someone explain to me why Apple and Microsoft can't get together and exchange information so that I get an editable document. Jeez. Even spreadsheets, word processors, and databases have common formats for the import and export of data. (Well, some do.) So what about graphics? It was jarring, this image of the little helicopter from the Apple ads on television compared with my dippy org chart.

Then more inspiration struck. It occurred to me to borrow some good work. I thought of the illustration by Arne Hurty that explains how laser printers work (it appeared in our October 1989 issue). Arne put a few days into that drawing—that should look great! The illustration was done in FreeHand and took up 314K of storage. I found the file and opened it.

Or tried to. Actually, FreeHand wouldn't open, and a dialog box told me I didn't have sufficient memory. I knew that was incorrect; only two applications and the Finder appeared on the Apple menu. I have 5MB of memory. It occurred to me that since I don't use FreeHand frequently, I probably didn't have sufficient memory allocated to the program. I doubled the memory allocation and tried again. It worked.

Don't you hate it when that happens? Don't you wonder why applications can't figure out for themselves if there's enough memory in the computer? Why doesn't the system software or the application take care of that for me?

TIME FOR A COFFEE BREAK
I wait for the slow (get-a-cup-of-coffee-type slow) screen-drawing process. Finally, the image appears. I do a Select All function on it. I cut the image and close FreeHand. I activate PowerPoint, select an insertion point, select Paste, and voila—nothing.

Twenty minutes go by. I try copying the image and pasting. Nothing. Each time I try anything in FreeHand, of course, I have to wait for the screen to redraw the image. I try the venerable Scrapbook. No luck. I try asking others. "Try saving it as an EPS file in FreeHand," I'm told. Okay, I do that. I open FreeHand again. I select the drawing and copy. I save in an EPS format. I close FreeHand. I reactivate PowerPoint, which I've kept open in a window. I reopen the document and do the copy-close-paste jig. I note to myself that it's a good thing I have a 19-inch monitor, 5MB of RAM, and a Mac IIx, or this would be a slow process. It works. The drawing appears in my presentation.

Now we're talking multimedia, right? Well, the picture's too small. PowerPoint (continues)
To be chosen the best from a large crop of drives requires more than good looks. We've worked hard to make our drives the best, inside and out, because we know that your reasons for choosing a drive run more than skin deep.

You should know that many other drive manufacturers' concern with quality stops with the case. At La Cie we don't think that's what value is all about. That's why we only use the best drive mechanisms and components — and we can prove it. We offer the fastest, quietest and smallest drives with the only true five year manufacturer's warranty in the industry backed by Quantum, Maxtor and Hewlett Packard.

Our attention to details makes us better. Silverlining™ is one more example of that. We wrote it, we own it, MacWorld recommends it: "La Cie drives include the best software we tested." What does it do? Silverlining performs formatting, interleave setting, programmable SCSI addressing, true partitioning, resizing of partitions without initializing, diagnostics, password protection, defragmentation and much much more. We're proud to point out that Silverlining was the first partitioning software available for the Macintosh.

Next time you purchase a drive be sure you experience the difference... experience the cream of the crop — La Cie. That's your right.

### Cirrus Drives

<table>
<thead>
<tr>
<th>CAPACITY</th>
<th>INTERNAL</th>
<th>EXTERNAL</th>
<th>MECHANISM</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 mb</td>
<td>$599</td>
<td>$659</td>
<td>Quantum</td>
</tr>
<tr>
<td>84 mb</td>
<td>$599</td>
<td>$659</td>
<td>Quantum</td>
</tr>
<tr>
<td>105 mb</td>
<td>$999</td>
<td>$1059</td>
<td>Quantum</td>
</tr>
<tr>
<td>201 mb</td>
<td>$1599</td>
<td>$1599</td>
<td>Maxtor</td>
</tr>
<tr>
<td>613 mb</td>
<td>$3099</td>
<td>$3099</td>
<td>Hewlett Packard</td>
</tr>
</tbody>
</table>

Includes Silverlining™, Silverserver™, WingZ Test Flight™, 5 mb of public domain software, Cordura carrying case, 30 day money back guarantee and 5 year warranty.

### Holiday Specials*

70mb—$599 ★ 180mb—$1299
## Mass storage and productivity solutions for the Mac office.

**19” La Cie Lamonz Color Systems:** 72dpi, 1024 x 768 resolution, anti-glare screen and tilt/swivel base. 8 or 32 bit for display of 256 or millions of colors.
- 8 bit card with monitor — $4399.95
- 32 bit card with monitor — $6199.95

**Cirrus 600MO Magneto-Optical Drive:** 600 megabytes of erasable, removable data storage. Includes superior Sony drive mechanism, plus our own Silverlining and Silverserver software.

**La Cie Modems:**
- 2400 baud Internal data and fax modem for the portable Mac — $249.95
- 2400 baud Internal modem for Mac II — $299.95
- 2400 baud External modem — $169.95
- 9600 baud External modem — $819.95

Introductory offer! All modems include MacKnowledge™, La Cie’s Silverplatter™ software and cables.

**Phone Line Manager:** Automatically routes and sends voice, FAX and modem calls over a single line. Answers incoming calls and connects to the correct device automatically or by caller-entered access codes.

**Cirrus Removable Cartridge Drive:** 45mb cartridges offer limitless storage with floppy convenience and hard disk speed. Includes La Cie’s Silverlining and Silverserver software.

**Panther SEA PostScript Printer:** 5ppm, 300dpi, 35 PostScript™ fonts, 2 auto feed bins for all business letters and envelopes.

---

### Call Us Now! 1-800-999-0143

Prices shown are cash prices and do not include shipping. Add 3% for VISA, Mastercard, 5% for American Express. Add 10% for rush handling. Cirrus, La Cie, Silverlining, Silverserver and Silverplatter are trademarks of La Cie Ltd. Macintosh is a trademark of Apple Computer. Prices and specifications shown are subject to change without notice. Comparisons drawn from MacWorld reviews and company and manufacturers’ specifications for 80 mb drives; call for further details. Product and company names are trademarks of their respective companies. *Holiday specials are limited quantity, one year warranty and don’t include carrying case or JOdayM.B.G.*

Circle 145 on reader service card
Mathematics Made Easy!

Milo is the first math processor that combines mathematical calculations with graphing and word-processing capabilities. Milo effortlessly describes a problem, solves it, and graphs your solution. Our WYSIWYG interface allows you to easily manipulate expressions with a click of the mouse. No programming language required! Easily move your results to any word processor or desktop publishing application. Milo is the essential tool for all users of mathematics.

Introduction Retail Price $249.

P A R A C O M P

123 Townsend Street, Suite 310
San Francisco, CA 94107 (415) 543-3848

Milo™
The Math Processor for the Macintosh®

has a resize function. I select the drawing and create a box. By dragging on one of the handlebars I make the box bigger. And my drawing looks like hell. It breaks apart when scaled, just like the MacDraw document. Yo—what's happening here? After all this, I can't make the drawing big enough to be visible to a small group of viewers who will see this on my 19-inch screen. The internal file format of the FreeHand document can't be manipulated by PowerPoint. Don't you hate it... well, you get the idea.

I'm drumming my fingers by now, more than a little impatient. I stare at my screen, subconsciously noting the size of my file. I note that the window I keep open for my documents in the View by Size mode has not changed since I started. I am reminded that I must close the window and reopen it to see how the size of the file has changed. I am reminded that this is a pain in the ass. I am reminded of long-winded speeches about the elegance of the interface.

Still, I'm doing good stuff. Okay, marginally acceptable stuff. But I'm encouraged enough to try some more. I grapple with how to get something really impressive into my presentation. What about ImageStudio? I look at the sample images included. There are some really dramatic 8-bit gray-scale files. I select a big one, 897K. I open it and it is converted to a RIFF file format. Why, I wonder, does the program inform me of this? Never mind. I select and cut the document, close the file, and create a box. (Why do I see them? Why do I have to wait for them to do something when I start up my Mac?) And what about those silly dialog boxes that tell me to open a document from within an application when again, the system software or application should take care of all of that for me?

But I digress. My point here has to do with the reality, or lack thereof, of multimedia. We do have exciting products that, together with a lot of experience and time, can produce remarkable results. The whole multimedia blitz, however, feels like desktop publishing around the time of the introduction of the LaserWriter in 1985.

THE BIG DAY

So the big day arrived. I had my Mac in the room, with the Kodak slide-show device hooked up so that I could run the presentation away from the computer. When called I rolled the machine forward and started in. (Actually, the batteries of the Datashow were in backwards so it didn't work on the first try.) I had enlarged the type size to 96 points so that from 10 feet away you could read the screen. I grimaced my way through the MacDraw and EPS files. They were too small to be seen. Then I went on to the big finale, my ImageStudio file, which refused to open. But perhaps I should insist that what we've got works before we go charging off into the future of multimedia.
Power Defined.

Power Realized.

Master the power of your software quickly as your own private tutor talks you through the software, step by step. With your hands on the keyboard, trying each new skill as it's explained, you'll learn quickly and thoroughly. Our interactive, hands-on tutorials are available for:

- Macintosh Basics
- Excel 1.5 or 2.2
- FileMaker II
- FreeHand 2.0
- HyperCard
- Illustrator 88
- PageMaker 3.0
- Persuasion 1.0 or 2.0
- Word 3.0 or 4.0
- Works 1.1 or 2.0

We offer beginning, intermediate and advanced tutorials for each of these software programs, so there's sure to be one that meets your needs.

Use the training that Apple uses for its own employees, and sells under its own name in Australia, Canada, New Zealand, and the United Kingdom.

If you're looking for a fast, convenient, affordable way to unleash the power of your software, call us at 1-800-TEACH-99 or 408-559-8635 and we'll send you a complete catalog — at no charge.

Circle 42 on reader service card

© 1989 Personal Training Systems. All Rights Reserved.

First with 2nd Generation Erasable Optical!

2nd generation means greater speed and full industry compatibility

**COMPARE!**
Opticals offer a low cost per MB, but Mirror delivers the lowest cost per MB!

<table>
<thead>
<tr>
<th>Mirror</th>
<th>Pinnacle</th>
<th>SuperMac</th>
<th>DataFrame</th>
<th>PLI</th>
<th>InfinityOptical</th>
</tr>
</thead>
<tbody>
<tr>
<td>RM600</td>
<td>RED-550</td>
<td>DataFrame</td>
<td>RIS</td>
<td>PLI</td>
<td>InfinityOptical</td>
</tr>
<tr>
<td>Formatted capacity/side</td>
<td>309</td>
<td>309</td>
<td>309</td>
<td>309</td>
<td>309</td>
</tr>
<tr>
<td>ANSI Compliant</td>
<td>Yes!</td>
<td>Yes!</td>
<td>Yes!</td>
<td>Yes!</td>
<td>Yes!</td>
</tr>
<tr>
<td>ISO Compliant</td>
<td>Yes!</td>
<td>Yes!</td>
<td>Yes!</td>
<td>Yes!</td>
<td>Yes!</td>
</tr>
<tr>
<td>Price</td>
<td>$3,497</td>
<td>$4,995</td>
<td>$6,995</td>
<td>$5,695</td>
<td>$5,695</td>
</tr>
<tr>
<td>Cost/Megabyte</td>
<td>11.32</td>
<td>15.17</td>
<td>22.64</td>
<td>18.43</td>
<td>18.43</td>
</tr>
</tbody>
</table>

*As of 10/31/89

The Right Optical

Others may sell Optical, but our RM600 Optical delivers the lowest cost per megabyte without deviating from essential ISO/ANSI compatibility standards. Using second generation technology we deliver top access speeds.

Buy from Mirror and you're buying from the company offering more removable solution than anyone! Our experts can objectively guide you through SIX separate removable technologies!

The RM600 rewriteable optical drive stores 600Mb on removable 5.25 inch cartridges. Our optical technology is perfect for backing up networks, containing large scale projects, or for memory intensive applications (graphics, sound, etc.)

Ge Direct to the Source!

How do we deliver the highest quality products and still keep the price so low? Frankly, we've left something out... the dealer. By going direct to the source, you can save up to 40% without cutting corners on quality or features.

"Mirror Technologies has proven again that high performance doesn't have to be priced higher than a kite... Factory direct sales keep the price low."

—MacGuide

Besides, what dealer do you know that offers a 30 day Love-It-or-Return-It policy, has a 24 hour toll-free sales hotline, or technical answers direct from the source (after all, for product information, who better to ask than its maker?). And unlike dealers, we build and warehouse product, so they'll be no "special order" delays. We ship 94% of our orders within 24 hours! Call us—we'll show you a better way to buy peripherals.

Circle 424 on reader service card
## M Series Externals
**starting at**: $447

Sleek, fast, quiet. Our drives feature an international power supply, SCSI switching, cables, and a ultra quiet fan. Backed by Mirror Technologies and our two year warranty. Drives ship formatted, tested and loaded with 20MB of utilities & software.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>20MB</td>
<td>$447</td>
</tr>
<tr>
<td>30MB</td>
<td>$497</td>
</tr>
<tr>
<td>40MB</td>
<td>$597</td>
</tr>
<tr>
<td>60MB</td>
<td>$897</td>
</tr>
</tbody>
</table>

**All other prices/specifications subject to change without notice. Call for current pricing, warranty and promotional details. Mirror and Mirrorimage are trademarks of Mirror Technologies, Inc. All other brand and product names are trademarks or registered trade names of their respective holders.**

## M Plus Externals
**starting at**: $647

These are the drives that reviewers rave about. Similar to the M series, except our Plus drives contain the fastest mechanisms in the industry.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>40MB</td>
<td>$647</td>
</tr>
<tr>
<td>60MB</td>
<td>$997</td>
</tr>
<tr>
<td>100MB</td>
<td>$580</td>
</tr>
<tr>
<td>200MB</td>
<td>$3297</td>
</tr>
</tbody>
</table>

**I could choose from all three manufacturer's complete line. I'd prefer the Mirror (M550)!** —MacUser

## MI Internal Drives
**starting at**: $377

Save space and money. We've got drives for all SE and Mac II computers. Custom mounting for the SE allows you to keep both original drives!

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>20MB</td>
<td>$377</td>
</tr>
<tr>
<td>30MB</td>
<td>$427</td>
</tr>
<tr>
<td>40MB</td>
<td>$527</td>
</tr>
</tbody>
</table>

**I would keep both the original drives if I were my money. I'd buy the Mirror... its price/performance ratio is unequaled.** —Byte

## Combination Drives
**starting at**: $1447

C series drives combine our finest drives (Quantum & Imprimis, the slowest being 19ms) and a choice of removable or tape backup.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual 42MB Removables</td>
<td>$1647</td>
</tr>
<tr>
<td>Dual 80MB Removables</td>
<td>$1447</td>
</tr>
<tr>
<td>Dual 100MB Removables</td>
<td>$1247</td>
</tr>
<tr>
<td>80MB Floppy Drive</td>
<td>$147</td>
</tr>
</tbody>
</table>

**So quiet it would be unobtrusive anywhere except a library on Friday night.** —MacWorld

## 42MB Removable
**starting at**: $847

Utilizing Eddy award winning Syquest technology, our RM42 is faster than many hard drives.

**...among the fastest backup solutions I tested.** —MacWorld

**For convenience, flexibility and speed, the 45MB removable is the clear winner.** —MacWorld

## 20MB Removable
**starting at**: $877

Our RM20 is as fast as many hard drives but with the integrity of a floppy. Utilizing Kodak technology, the shock resistant media is guaranteed for life, making it perfect for archiving and backups.

**...faster (and #120 less) than the Jasmine drive.** —MacUser

## 80MB Removable
**starting at**: $1247

The slide-out modules in our RD series contain our fastest components: from 30-100MB and as fast as 19ms! The obvious choice for high security applications and file servers.

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>30MB</td>
<td>$747</td>
</tr>
<tr>
<td>40MB</td>
<td>$867</td>
</tr>
<tr>
<td>60MB</td>
<td>$1000</td>
</tr>
</tbody>
</table>

**So quiet it would be unobtrusive anywhere except a library on Friday night.** —MacWorld

## Flatted Scanner
**starting at**: $587

Crisp line art, and dithered halftones at a fraction of the cost of most scanners. Complete with full function scanning software, DeskPaint and, for a limited time, we're including FREE optical character recognition (OCR) software from Olduvai ($495 Value).

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS200 (200dpi)</td>
<td>$597</td>
</tr>
<tr>
<td>VS300 (300dpi)</td>
<td>$797</td>
</tr>
</tbody>
</table>

**If it were my money, I'd buy the Mirror... its price/performance ratio is unequaled.** —Byte

## 150MB Tape Backup
**starting at**: $1087

Backup over 150MB of your precious data at 3 times the speed of the Apple tape solution — and at a lower price! Custom software for automated (unattended) backups, mirror image, file-by-file, incremental or macro driven backups.

## Dead Jasmine or Apple Drive?

Our experts repair SuperMac, GCC, W3, and MacBottom drives too. And we usually do it faster and cheaper! Data recovery too. Give that expired drive a new life. (i.e. 40Mb starts at $277). Call our Technical Support Hotline for details: (612) 633-2105.

---

**TO ORDER CALL TOLL FREE**

**1 800 654-5294**

**TECHNICAL SUPPORT HOTLINE:** (612) 633-2105 Hours: Mon-Fri 8am-5pm CST

2644 Patton Road, Roseville, Minnesota 55113 (612) 633-4450 FAX: (612) 633-3136

At prices/specifications subject to change without notice. Call for current pricing, warranty, and promotional details. Mirror and Mirrorimage are trademarks of Mirror Technologies, Inc. All other brand and product names are trademarks or registered trade names of their respective holders.
DataPak – voted by you and industry experts as the hands down winner for the best new storage system for the Macintosh. With today’s large applications and massive data files you need a system that grows with you, and megabyte for megabyte DataPak is your best value.

- **Low-Cost Expandability**
  45 Megabytes on a removable cartridge. Just pop in another cartridge whenever you need more storage.

- **High Performance**
  The DataPak is actually faster than many fixed drives with its 2.5ms access time and 1:1 interleave.

- **Portability and Security**
  Padlok software provides password protection and volume partitioning. And because DataPak cartridges are removable you can take them with you, or lock them up for ultimate security.

- **Easy Backups**
  Our KopyKat software makes the DataPak ideal for backing up all your files.

- **Selection**
  Choose a DataPak, DataPak II or the new DataPak IIcx to match your system. Available in single drive, dual drive, or combined with a fixed hard drive.

- **Award-Winning Quality**
  With all these features it’s no wonder that DataPak is the only product of its kind to win three awards for outstanding quality and performance. "Best New Storage System" - MacUser "Best Alternative Storage System" - MacWorld "Best New Hardware Peripheral" - MacUser Europe

The DataPak family – all the convenience of a floppy, all the performance of a hard drive. Call 1-800-522-7979 for the dealer nearest you.
Practice Makes Perfect

Thomas Hogan’s “The Show Must Go On” [August 1989] touches on the most basic blind spot in the world of Mac mania—the idea that owning a Mac and the right software can make you an instant pro at anything. The 128K Mac was simple and intuitive, but in the world of 8-megabyte color machines, too many Mac users won’t face the reality that more serious training and skills—or at least some practice—are critical to making the best use of the Mac’s prowess. This is definitely the case with desktop presentations. We regularly see clients trying to do in a week what artists on our staff have taken years to learn. It’s not the fault of desktop presentation software that Hogan is not a skilled graphic artist. But he’s not entirely to blame either. Software developers and Apple Computer itself are plenty guilty of promoting the idea that you too can be an instant professional in the discipline of your choice.

Hogan does us all a disservice by scolding developers for producing “inadequate” products when he hasn’t taken the time to learn them properly. With a bit more effort he would have found, for instance, that Cricket Presents offers a snap-to guideline that lets you align anything anywhere you want and that Aldus Persuasion’s master background tools are quite powerful.

Desktop presentation software is a new and evolving application. In this first-generation lineup are some very good programs, albeit with room to mature. However, users shouldn’t expect to produce successful graphics until they’ve taken the time to learn how to be graphic artists.

Gary Karp
Chartmasters
San Francisco, California

Hogan has been using most of these products regularly since their introduction. One of his gripes is that Cricket Presents is the only presentation program that has an alignment tool—but it’s not intuitive and is poorly described. The only program he finds intuitive and easy to use—PowerPoint—lacks most of the features necessary to satisfy a presentation professional, while the feature-laden Persuasion has a clumsy interface and design. If PowerPoint were to acquire Persuasion’s feature set or Persuasion PowerPoint’s ease-of-use, he swears he would stop complaining.—Ed.

In Praise of FullWrite

I enjoyed reading the Macintosh Bible until I came upon advice that at best is ill informed and at worst a vicious hatchet job: Naiman’s offhand dismissal of FullWrite Professional.

I have written books on five different computer systems using five different word processors since 1979. My last two books were done on a Mac II using FullWrite, which I’ve been using exclusively since I first tested the demo disks being given away at the 1988 Macworld Expo.

The working folder for the last book contained nearly 6.3 megabytes. The finished formatted book is 2.4MB, spread over 320 full-size pages and containing 1500 discrete entries in 24 chapters with dozens of sidebars, pictures, and notes. The headers are different on nearly every page and are

Macworld • January 1990
Fast Statistics.

Because you don't have time to waste.

You don't have time to read a 1000 page manual, to play games, to wade through a pile of confusing menus.

You have lots of data. You need graphs, tables, financial projections, surveys. The report is due tomorrow and the stat package you thought had everything can't do the job.

Now you can do it. The company that brought professionals "the best statistics package on the Macintosh" introduces the easiest: FASTAT. Designed just for the Macintosh, FASTAT makes high-powered, accurate statistics easy.

You can do dependent and independent t-tests, time series analyses, factor analysis, two-way and n-way tables, correlations, nonparametric tests, regressions, analysis of variance and covariance, exploratory data analysis — even if you've never done them before.

You can also create full-featured graphics such as X-Y plots, bubble plots, line plots, histograms, box-plots, stem-and-leaf diagrams, autocorrelation and time series plots, as well as state-of-the-art displays, like scatterplot matrices.

Some of the graphs are only a click away. Click on a variable name, and you get a histogram or a box plot of the variable. Click on a regression output or a cell in a correlation matrix, and you get a scatterplot of the variables.

Need to customize a graph? With FASTAT's MacDraw-like tools you can color, draw, add text, and move things.

Need help understanding a statistic? FASTAT's "pop-up tutor" tells you what the numbers mean.

Need reports? FASTAT's built-in text editor lets you scroll through results, cut and paste, change fonts, add explanatory notes, and save your work.

Some of the graphs are only a click away.

Need to customize a graph? With FASTAT's MacDraw-like tools you can color, draw, add text, and move things.

Need help understanding a statistic? FASTAT's "pop-up tutor" tells you what the numbers mean.

Need reports? FASTAT's built-in text editor lets you scroll through results, cut and paste, change fonts, add explanatory notes, and save your work.

System requirements: 1 megabyte of memory and hard drive. Mac II version available. Unlimited free technical support.

FASTAT

For $195,** you can stop wasting time.

Systat. Intelligent software.

Call or write for further information:
SYSTAT, Inc.
1800 Sherman Avenue, Evanston, IL 60201
312 864.5670 FAX 312 492.3567

*MacWeek September 13, 1988
**Suggested Retail Price
Say Goodbye to Financial Hassle!

Why waste time doing your finances? Quicken slashes time and effort every month...perfectly organizes your finances...and provides instant insight into your money matters.

Breeze Through Financial Chores
Quicken takes the drudgery out of routine finances. It automates everything from bill paying to bookkeeping...reconciliation to reporting. Quicken does in minutes what used to take hours. Quicken actually learns your regular bills. Just confirm payment amounts, and in seconds, Quicken performs 14 bookkeeping steps, categorizes expenses, and hands you printed checks addressed for mailing. And Quicken keeps perfect records of all your handwritten checks.

A Bigger Picture with Smaller Effort
Quicken automatically organizes your finances. Imagine always knowing how much money you have...and exactly where it's going. At the click of a button, Quicken generates insightful reports such as Income and Expense, Cash Flow, Budget vs. Actual, Job Costing, and more.

Relax at Tax Time
Stop dreading tax time. Quicken keeps important tax data at your fingertips automatically. In seconds, you can print an itemized list supporting your deductions. Plus, Quicken links directly to top selling tax software like MacInTax.

NEW VERSION 1.5
FAR MORE THAN A CHECKWRITER
• Far more flexible reports
• Multi-column reports show spending and profit trends over time
• A/R aging and customer history reports
• A/P reports by supplier
• "Modelless" reports recalculate automatically on screen
• Improved payroll handling
• More ways to split transactions
• New wallet-size and laser voucher checks
• New Canadian dates and tax categories

The World's #1 Best Seller
Quicken is the best selling business and personal finance software in the world. Ken Landis of MacUser gives Quicken the highest rating of five mice and says, "Quicken is a great program...the industry standard." Broadway playwright "(Mame)" Robert E. Lee remarks, "This astonishingly simple program...is truly true to its name. Indeed, it does quicken the time required for routine bookkeeping."

No Computerese or Accounting Mumbo Jumbo
Quicken is so easy, you're up and running in minutes. That's because the whole program looks and works just like the paper checkbook and register you've always used. Quicken doesn't change how you do your finances, only how fast you finish them.

Powerful Business Features
Over half of Quicken's customers use it for small business bookkeeping. Quicken produces financial statements such as P&L, Tax Summary, and other useful management reports. It forecasts your cash flow, and tracks A/R, A/P, payroll, jobs, clients, properties, and more.

SPECIFICATIONS
• Software Compatibility: Exports to SYLK, Text, Excel, HyperCard™ and MacII.
• Hardware Compatibility: All Macintoshes with at least 512K RAM. Works with your printer and monitor; we guarantee it. Capacity: Unlimited number of bank accounts and transactions (subject to available disk space). Maximum amounts to $9,999,999.99.

Yes, I want to say goodbye to financial hassle and try Quicken. If I'm not completely satisfied, I may return it within 30 days for a full refund. Quicken Version 1.5 for Macintosh, U.S. $59.95, includes free shipping by air. California residents, please add sales tax. For coupon orders, allow 10 days for delivery (longer to Canada).

Try Quicken FREE for 30 Days
Order from the coupon below, and if you're not completely satisfied for any reason, simply return it for a full, no-questions-asked refund. So, why wait? Say good riddance to financial hassle, and order Quicken today.

Send in the coupon, or call 1-800-624-8742 U.S. and Canada.

$59.95

Call toll-free: 1-800-624-8742
Mail to:
Intuit
66 Willow Place
Menlo Park, CA 94025-3687

© 1987 Intuit Inc.
oriented left and right. FullWrite pictures, tag lines, signatures, and sidebars were stored in MultiClip and integrated perfectly when needed. FullWrite's most impressive feat was the 18-page, 3100-entry, multilevel index it allowed me to create. It was set in a mix of bold, italic, and plain type. I seriously doubt whether any other word processor (with the possible exception of the outrageously expensive Interleaf) could create an index of this size and sophistication.

Both books were printed on the first model of the Apple LaserWriter without hitch or hesitation, yet Naiman says not to buy it until it "works better" with a LaserWriter. How much better could it work?

FullWrite isn't perfect. I'd like to see a line-count indicator directly on screen. And while setting columns is duck soup, making them all different widths is difficult. There are a few other minor things I'd change, but in this full-time user's opinion, there is no other word processor on the market as versatile or as simple.

Tony Hyman
Claremont, California

In Defense of Snap

As a senior designer who has beta-tested Snap, Intergraph Microstation, MacCad, and CADMover, I feel qualified to respond to your review of Snap [Reviews, September 1989]. Snap does not look like a Macintosh draw program because it is a CAD program that is much more accurate and flexible than any draw program. Snap gives you the ability to build your own on-screen button menu or a custom digitizer menu. Snap allows you to create your own menus with the graphics that you choose, not some canned menu setup such as the other programs provide.

You stated that you could not launch Snap with the 256-color setting on a Mac II with 5MB RAM. If you're using MultiFinder, you must allocate 2MB of memory to Snap (rather than the default setting of 1MB). On my 2MB Mac II, with 256 colors and the virtual screens turned on, I have a maximum design file size of 248K. With 4MB, the maximum design file size would be about 2.2MB. With the virtual screen feature turned off, you'd have a maximum design file size of about 920K using only 2MB RAM. Note that this is without using MultiFinder.

It's strange that you found the color control hard to use, because Snap has one of the most flexible color setups of any CAD program. You can select an active color by using the color table or the key-in CO=. You can also modify the 256-color table by double-clicking on a color and using the Apple color picker to change the color's number.

CAD programs should not be judged by how Mac-like they appear but on their productivity level. Having all your commands in front of you on a digitizing tablet beats anything you can do with a mouse.

Robert Newhall
GulfCoast CAD, Inc.
Largo, Florida

While Snap does allow you to use MultiFinder, it's not easy to figure out how. Though reasonable as set up, the color controls would be easier to use if they were displayed in the palette.

(continues)
HOW TO MAKE YOURSELF LOOK BETTER.

Compare Write Impact™ from GCC Technologies with the Apple® ImageWriter®, and you realize there simply is no comparison. The difference isn’t hard to pin down. The ImageWriter is a 9-pin printer. WriteImpact is a 24-pin.

You can choose push or pull tractor-feed. For letters, you can print on single sheets and envelopes without removing your tractor feed paper. There’s also automatic paper loading and parking, plus a paper tear feature with automatic repositioning.

At GCC Technologies, we guarantee satisfaction. Order your WriteImpact directly from us, and if after 30 days you’re not completely satisfied, return it to us and we’ll cheerfully refund your money.

Remember, too, that WriteImpact carries a one-year warranty on both parts and labor. And we offer repair service here at GCC and at hundreds of GCC dealers.

WriteImpact Printer $599.

For the name of the authorized GCC Technologies dealer nearest you, or

To Order, Call 800-422-7777.

We gladly accept MasterCard, Visa, American Express, or your company’s corporate purchase order.

GEC TECHNOLOGIES
Peripherals With Vision.

Ordering WriteImpact is pretty automatic, too. Just call the number below or visit your nearest GCC dealer.

Direct or Dealer: The Choice Is Yours.

To order WriteImpact direct, just call 800-422-7777 from 9 AM to 9 PM (EST) on weekdays, or 10 AM to 4 PM (EST) on Saturdays. Our trained staff will answer all your questions and offer advice on any of our products. (Be sure to ask for our free catalog.) Orders received by 8 PM (EST) for in-stock items will be shipped the same day via overnight delivery for only $9.

Or, you can order WriteImpact from one of our dealers. Every GCC dealer is a Macintosh professional, and if you call, we can give you the name of the one nearest you.

Risk-Free, Hassle-Free.

In Canada, (800) 263-1405 © 1989 GCC Technologies, Inc.
GCC dealers may differ in regard to policies, procedures and prices.

Circle 119 on reader service card
Intuitive Mathematics and Equations Made Easy

Although Snap's flexibility can be an advantage, one of the Mac's key attractions as a CAD platform is its standardized interface. Powerful programs that adhere to the standard simply are more useful to more people, even CAD professionals.—Ed.

La Cie Product Updates

We would like to note some changes and clarifications to information published about two of our products: the Cirrus 613MB drive ("High-Capacity Hard Disks") and the Cirrus 600MO Mageto Optical Drive (Reviews) both in the November 1989 issue.

The Cirrus 613MB drive's booting problem has since been corrected and all shipped drives now have the updated drive mechanism.

The 600MO optical drive promotion was incorrectly stated. The customer must purchase the drive from La Cie and then La Cie purchases a Mac Plus from Businessland for the customer.

All optical drives come with preformatted cartridges. In addition, La Cie now offers both Ricoh and Sony drive mechanisms for its magneto-optical line.

Toni Abrahamson
La Cie
Tigard, Oregon

Insights on Insight

We were excited to see Macworld devote a feature article in the November issue, "A Full Accounting," to Macintosh accounting. Although we feel the subject was covered very thoroughly, there are a couple of points we'd like to clarify.

We sell only a single-user version of our Insight Expert Accounting series, which lists for $695 per module. Each module is fully networkable and can run concurrently with any other Insight Expert module, though the modules themselves are not multiuser. In the second quarter of 1988 we took Insight Multiuser off the market, but we continue to support the product. At that time, we began to concentrate on making Insight the first Macintosh accounting product with flexible data import and export.

Volle J. Kolde
Layered
Boston, Massachusetts

Mastering Master Tracks Pro

Christopher Yavelow's article on MIDI sequencers in your September 1989 issue ("MIDI Sequencers: Greatest Hits") not only contained some factual errors, but also totally disregarded the fact that Passport is releasing Pro 4 (a significantly enhanced MIDI sequencer based on its predecessor, Master Tracks Pro) this month, instead featuring Portrait. Not only is Portrait still unavailable, it's been announced on the Pan network that Resonate will not release it. The feature-comparison chart is riddled with inaccuracies about Master Tracks Pro. In his conclusion the author steers "anyone who isn't a serious musician, toward Master Tracks Pro." I would consider the likes of such Master Tracks Pro users as The Grateful Dead, Prince, Billy Cobham, and Stevie Wonder's band, among many others, fairly serious musicians. As Yavelow acknowledges, Master Tracks Pro is known for its highly intuitive user interface and ease of use; however, it's misleading to imply that this is at the expense of (continues)
**THE HARD DISKS THAT SURVIVED HARD DISK HELL.**

Practically all hard disks perform well under ideal conditions. UltraDrive** hard disks are designed to perform well in a far less hospitable environment. A world we've duplicated at the industry's most grueling proving ground for hard disks. The GCC School Of Hard Knocks.

In the design stage, we shock components and assembled hard disks in both operating and non-operating states. Next, vibration tests mimic the jostling of car, truck and air transport.

Then, we drop our disks over 20 times from varying heights in varying operating and non-operating states on every face and edge. They're exposed to a wide range of humidity and temperatures—from 122° to −40°F. And finally, every hard disk is burned-in for 14 hours before shipment.

All of these proven hard disks come with a generous software library which normally retails for several hundred dollars. Including Symantec's® SUM II, a utilities package featuring data recovery, deleted file recovery, DES security, and backup.

You also get UltraWare,** including a disk management program featuring true SCSI partitioning (DiskManager**), a rapid print spooler (QuickSpool™), and over 3 MB of selected shareware software.

But UltraDrive hard disks don't just work longer and smarter than others, they also cost less. In fact, the UltraDrive series is priced up to 50% less than Apple's®

**Toll-Free, Hassle-Free, Risk-Free.**

To order your internal or external UltraDrive, call 800-422-7777 from 9 to 9 on weekdays, or 10 to 4 on Saturdays. Our expertly trained staff is glad to answer questions, provide technical support, and offer advice on choosing any of our products. Ask for our free catalog.

When your order is received by 8 PM (EST), it will be shipped the same day via overnight delivery for only $9.

UltraDrive comes with a 30 day money-back guarantee. Just return your hard disk for a full refund, no questions asked.

Finally, UltraDrive carries a full two year warranty on parts and labor (ask for details). We also offer repair service at any one of hundreds of GCC dealers.

**The UltraDrive Family.**

**MODEL** | **EXTERNAL** | **INTERNAL**
---|---|---
UltraDrive 20 | $549 | NA
UltraDrive 30 | $629 | $529
UltraDrive 45 | $699 | $599
UltraDrive 80 | $949 | $849
UltraDrive 155 | $1499 | $1399

For the name of the authorized GCC Technologies dealer nearest you, or

**To Order, Call 800-422-7777.**

We are glad to accept MasterCard, Visa, American Express, or your company's corporate purchase order.
Anastasia Lanier
Passport Designs
Half Moon Bay, California

Passport provided us with version 3.3 of Master Tracks Pro (the reviewed version) and promised to keep us up-to-date on future releases. Pro 4 did not ship until several weeks after the article was published. (We did print one inaccuracy about version 3.3: that Master Tracks Pro requires a Mac Plus, when actually it will run on a 512K.) Pro 4 does indeed have many of the features missing from 3.3.

Finally, rather than steer serious musicians away from Master Tracks Pro, we merely wanted to emphasize that its intuitive interface, ease and speed of use, and learning curve made it suitable for nonprofessionals as well. —Ed.

Stand by Your Product

I find the letters column to be a good source of information about companies and programs that I may or may not want to deal with, based on other users' experiences. Thus, I would like to commend Fox Software for its customer support.

The last time I called, the tech rep told me of a future update to FoxBase+/Mac that would solve the problem I was having. I waited for the update but never heard anything until I read an ad for version 2.0.

So I zipped off a letter asking why I wasn't informed of the update and how I could obtain it. The following week I received a package containing new manuals and the version 2.0 disk—all at no charge.

Even the best companies sometimes let things slip through the cracks, but when the problem is rectified in such a generous and efficient manner it restores all my confidence in the company. I love FoxBase+/Mac, and it's nice to know that such a good program has an equally good company standing behind it.

Christyne Imhoff
Winnetka, California

The Invisible Folder

One of the days when System Folder meant a folder with the System, Finder, and four or five small additional files. At the moment, my System Folder holds 92 files and folders, all of which have to be there. I always try to keep no more than 10 items in a folder, but there is nothing I can do about this huge System Folder.

Could someone please invent a transparent (not HFS) folder type that would let me place my INITs in one folder, my CDEV files in another, and so on, while making the Mac think that all those files are squatting in one flat System Folder? It should be easy to assign a different folder icon to this new folder type.

Ingemar Öhberg
Skövde, Sweden

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe (70370,702) or MCI Mail (addressed to Macworld). Include a return address. We regret that, due to the high volume of mail received, we're unable to respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of Macworld.
Two or three years from now, the typical laser printer will be a lot like the Business LaserPrinter®: small, light, with a SCSI connector for a hard disk, and inexpensive. That's how Publish! described our Business LaserPrinter (BLP), a true Adobe® PostScript® printer for Macintosh®, IBM® and IBM compatibles. We'd only add that the future has arrived ahead of schedule.

Simply stated, the BLP is a better way to translate the language called PostScript into the graphics, words and numbers people use to communicate in the workplace.

Better because the BLP lets you—or anyone else on your AppleTalk® network—produce high-quality text using 39 fonts (4 more than our nearest competitor).

Better because the BLP comes with expandable RAM (2 MB expandable to 4), which lets you increase print speed. Because it has a straight paper path that easily accommodates envelopes. And because it has a SCSI port, which lets desktop publishers extend the font storage capacity of the BLP via a hard disk.

Best of all, the BLP even takes better care of your bottom line. In fact, you can buy a BLP for 34% less than a LaserWriter® II NT.

Someday, if Publish! magazine is right, other printers will offer all this. But if you prefer not to wait, use the toll-free number below to order the BLP today. Here's how.

Ordering your BLP from GCC Technologies is simplicity itself. Just call 800-422-7777 between the hours of 9 AM and 9 PM on weekdays, or 10 AM and 4 PM on Saturdays. Our expertly trained staff will be glad to answer questions, provide technical support, and offer advice on choosing and getting the most out of any of our products. We'll also send you our free catalog.

When your order is received by 8:00 PM (EST), it will be shipped the same day via overnight delivery for only $9.

What's more, we guarantee satisfaction. If after trying the BLP for up to 30 days you aren't completely satisfied, just return the printer and we'll cheerfully refund your money, no questions asked.

A Better Return On Investment. The BLP carries a full one year warranty on parts and labor (ask for details). We also offer repair service at any Xerox® carry-in service center, or at any one of hundreds of GCC Technologies dealers.

Business LaserPrinter $3299.

One Year Warranty.

For the name of the authorized GCC Technologies dealer nearest you, or To Order, Call 800-422-7777.

We gladly accept MasterCard, Visa, American Express or your company's corporate purchase order.

Circle 422 on reader service card

In Canada, (800) 263-1405 © 1989 GCC Technologies, Inc.
The fact that you own or are considering a Macintosh II, IIx, IIcx or SE/30 shows you’re serious about computers. That you want to reach as far as a great system will let you. So you can reach your potential.

Well, now there’s a way to go even further. By giving your system a MacSync™ color monitor from NEC.

Or, if you prefer, the MultiSync® GS2A monitor, its gray-scale sibling.

Designed for the Macintosh II Video Card and compatibles, they are the direct result of some meaningful conversations with Mac users. So they have all the features you’ve always wanted in a monitor.

Like easier-to-use up-front controls. A 14” non-glare screen to reduce
the Macs.

fatigue. Plus a smaller footprint and a tilt-swivel base, for more comfortable viewing. What’s more, we give you a cabinet that looks as good from the back as it does from the front. As well as a HyperCard stack on-screen user reference guide called Valet™.

All at no extra cost. And if you don’t mind us saying so, that’s the least you and your Macintosh deserve.

Designed and optimized just for the Macintosh II Video Card and compatibles.

GS2A monitors. We’ve taken everything we’ve ever learned about making great monitors. And applied it to the Macs.

For literature, call 1-800-826-2255. For technical details, call NEC Home Electronics (USA) Inc. 1-800-FONE-NEC.
Introducing software that thinks. There has never been personal computer design and drafting software this powerful, this fast or this intuitive. Vellum thinks. Its radical new technology automatically pinpoints and aligns geometry as you draw. Built-in intelligence allows you to draw virtually freehand, yet set precise dimensions at any time. Finally, the days of complex commands and weeks of training are gone. Vellum has made industrial-strength design click on the Macintosh. For a demonstration see your Ashlar dealer or call (408) 746-3900.

Circle 472 on reader service card
ART BEAT

by Deborah Branscum

This column examines the tools and the talent behind Macworld's graphics and the techniques that make them possible.

Artist: Canadian John Hersey moved to San Francisco in 1983 to concentrate on his art and has succeeded wildly, as awards and assignments for Esquire, GQ, LA Style, and the Washington Post testify.

Tools: Mac II with 5MB of RAM; Aldus FreeHand 2.0.

How It Was Done: The topic of our cover story suggested skullduggery and dark colors. "Because of the subject matter, I thought the image would have to be fairly monochromatic," says Hersey, explaining the palette of black and blues.

The artist made a preliminary sketch by hand, then created an outline drawing in FreeHand based on the sketch. Once the shapes were finished, Hersey created a library of line widths, which he assigned to different shapes. He also assigned color values and gradations to each shape.

The illustration has the look of an engraving, thanks to a half-tone screening effect. Adding values shape by shape was a time-consuming process for Hersey, who needed 24 hours to create the illustration. Still, "the great thing about FreeHand is that you can go through at the end and change the lines. If you're using a predetermined line width and you've made 20 different shapes with that line width, you can change it automatically under the Line menu. That's a big advantage over Adobe Illustrator."

Although he's a big fan of FreeHand, Hersey also uses Adobe Illustrator, ImageStudio, PixelPaint, Easy3D, and Swivel 3D. "I really love combining programs because it's like mixed media," he says.

Hersey still does some "analog illustration" but says, "I really don't think that computer illustration should be distinguished from other illustration. I want my illustrations to be judged with watercolor or any other medium."

---

Diamond quality in SINGLE IN-LINE MEMORY MODULES for Mac Plus, SE, SE/30, II, llx, 2sx, 2cx

- 256K, 1M, 4M
- Low Profile SMD CMOS
- Manufactured in USA
- Nationwide Distribution

Expand your Mac memory by 1 to 32 megabytes with Diamond-Pac SIM modules, the Mac's "best friend". The many facets of Diamond-Pac include state-of-the-art CMOS DRAM surface mount technology, 100% testing, "fail safe" installation instructions, and a lifetime guarantee. All combined to ensure your Diamond-Pac's are forever. Get the best quality SIM modules, at competitive prices. Government & University PO's welcomed. Call Today.

AMERICAN MICRO DISTRIBUTORS, INC.
16897-D Algonquin, Huntington Beach, CA 92649
714/840-5560 • 800-243-6654 • FAX: 714-846-0570
MacPlus, SE, SE/30, II, llx, 2sx, 2cx are trademarks of Apple Computer Corp.

Circle 403 on reader service card.

MathType 2.0

Equations for Word Processing

Create publication-quality results like this by using MathType 2.0 with your word processor or desktop publishing program:

$$\left\{ \frac{1}{p} \left( \sum_{i=1}^{m} \lambda_i(x)^p \right)^\frac{1}{p} \right\} \leq \sum_{i=1}^{m} \left( \int_a^b \lambda_i(x)^p \right)^\frac{1}{p}$$

Unlike most other equation editors, MathType 2.0 automatically applies the spacing and formatting rules used by professional math typesetters as you build an equation using simple point-and-click editing. When used with LaserWriters and imagesetters, equations are output directly into PostScript, giving unprecedented quality and typographic control. MathType 2.0 features a new, customizable user interface and keyboard access to all functions. MathType 2.0 also includes a PostScript font containing characters used frequently in math and science but unavailable in standard fonts.

Let us show you how MathType 2.0 has set a new standard in equation editing. Ask for our brochure and free demonstration disk including mini-tutorial. MathType's suggested retail price is still only $149.

Design Science
Call or write for your FREE demo disk
6475-B E. Pacific Coast Hwy., Suite 392, Long Beach, CA 90803 • (213) 433-0685

Circle 165 on reader service card.

Three years ago Jasmine set the standard for value by bringing the first affordable external hard drive to the Macintosh market. Today we're pleased to celebrate our third anniversary with a spectacular savings event — Jasmania!! Buy direct from Jasmine before December 31, 1989 and save.

The Award Winning DirectDrive Series.

Jasmine continues to set the quality standard with the hard drives that swept the 1989 Macworld World Class Awards. Macworld readers selected Jasmine #1 in the “80MB or less” category, and in every single ranking (that's all 5) in the “above 80MB” category!

Jasmine DirectDrives are also the value standard. Every drive is bundled with DriveWare, Jasmine's exclusive formatting and partitioning software which insures your data by performing drive diagnostics and error corrections on the fly; SUM II by Symantec which lets you recover data from a mistakenly-initialized hard disk; DemoWare, a collection of demonstration versions of some of the most popular programs available; plus 5MB of public domain and shareware software.

All Jasmine DirectDrives Feature

- 2 Switched, Surge Protected, AC Outlets
- Precision Ball Bearing Fans
- Removable Air Filters
- External Push Button SCSI Switch
- Dual Power On and Data Access LED Indicator
- Hard Drive Encyclopedia
- All Cables and Connectors
- Easy Access Termination Panel

World Class Award Winner 3 Years In A Row!

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Regular direct price</th>
<th>Jasmania direct price (thru 12/31/89)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20MB</td>
<td>$549</td>
<td>$399</td>
</tr>
<tr>
<td>40MB</td>
<td>$699</td>
<td>$599</td>
</tr>
<tr>
<td>80MB</td>
<td>$999</td>
<td>$849</td>
</tr>
<tr>
<td>100MB</td>
<td>$1199</td>
<td>$1099</td>
</tr>
<tr>
<td>130MB</td>
<td>$1349</td>
<td>$1199</td>
</tr>
<tr>
<td>180MB</td>
<td>$1599</td>
<td>$1499</td>
</tr>
</tbody>
</table>
**DirectServe File Server.**

Now you can liberate your Macintosh from the mundane task of network file serving.

DirectServe is a combination of hardware and software that's designed specifically to be a high-performance, low-cost file server. DirectServe can support up to 255 workstations with Mac IIcx speed, for less than the cost of a Mac Plus and AppleShare software!

DirectServe plugs right into your LocalTalk™ or twisted-pair network, is 100% AppleShare/AFP 2.0 compatible, and comes complete with Installer and Administrator software. Now you can purchase DirectServe bundled with our highly-reliable (70,000-hour MTBF) DirectDrive 130 or 180 at special Jasmania direct pricing.

---

### The DirectPrint Page Printer.

Now everyone can afford the printer MacUser called the “Best New Output Device” in their 1989 Editors' Choice Awards. DirectPrint's crystal shutter technology is PostScript®-compatible and provides deep velvet blacks with super sharp 300 dpi output. Thanks to a 4 MIPS RISC processor and 3MB of RAM, DirectPrint is up to 5 times faster than the competition and comes complete with 39 resident fonts.

<table>
<thead>
<tr>
<th></th>
<th>Regular direct price</th>
<th>Jasmania direct price (thru 12/31/89)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stand-alone DirectServe</td>
<td>$3495</td>
<td>$2995</td>
</tr>
<tr>
<td>DirectServe and DirectDrive 130</td>
<td>$2499</td>
<td></td>
</tr>
<tr>
<td>DirectServe and DirectDrive 180</td>
<td>$2799</td>
<td></td>
</tr>
</tbody>
</table>

---

**Worry-Free Ordering**

- 72 Hour Shipping Guarantee
- 30 day Money Back Guarantee* 
- 2 year Parts and Labor Warranty (1 year for DirectPrint)
- FREE Telephone Support
- Call 7:30 a.m. to 5 p.m. (PST).
- Visa, MasterCard and American Express accepted.

---

©Jasmine Technologies, Inc., 1740 Army Street, San Francisco, CA 94124. Jasmania promotion valid only in the U.S. For international inquiries call (415) 282-5053 or FAX (415) 285-7953. Prices and specifications subject to change without notice. DirectDrive, DirectPrint, DirectServe, DriveWare and DemoWare are trademarks, and Jasmine is a registered trademark of Jasmine Technologies, Inc. All other product names are trademarks or registered trademarks of their respective manufacturers. *Money back guarantee does not apply to DirectPrint toner and drum.

Circle 102 on reader service card
When we offered MacDraw II® users the chance to trade up to Canvas®, we had no idea what we were letting ourselves in for. We've been buried in an avalanche of MacDraw II disks. Swamped. Inundated. Overwhelmed. The fact is, we've received thousands of disks, with more arriving daily.

If you've read the reviews, you shouldn't be at all surprised.

In awarding us 5 mice (versus 3½ for MacDraw II), MacUser (April, 1989) called attention to many of Canvas' unique features, including much higher precision, a 16.7 million-color wheel (vs. only the basic 8 for MacDraw), full Bezier curves and auto-tracing of bit maps.

MacWeek (January, 1989) was no less enthusiastic. "Canvas 2.0 is loaded with drawing tools and tool enhancers that go beyond those of its more expensive object-oriented rival, MacDraw II ... Canvas is superior in color handling, the comprehensiveness of its drawing environment, support for a variety of file formats and its neat object library feature."

MacWeek went on: "Canvas can position objects extremely accurately - down to one sixty-four-thousandth of an inch ... a boon to technical illustrators and others with low-range drafting needs."

And all this was before we introduced such additional enhancements as 4-color separation capability, dashed lines and even a spelling checker.

Need we say more?
Money is at the heart of everything. Besides giving you the wherewithal to buy printer paper, candy bars, and Volvos, money is a discipline in itself, a topic too hot even for Geraldo. Ultimately, money is the measurement we use to keep score in this country. And keeping score is no problem with a program called Andrew Tobias's Managing Your Money. There's an entire menu item called Net Worth; by selecting it you can immediately grasp whether you are a winner or a loser in late-twentieth-century America.

The ability to know what you are worth, net, in less than a second of computational time, is a sobering experience. It is only one of the shocks that comes with Managing Your Money. But it was something I was compelled to try the minute I booted the program.

Before I get into my new Net Worth obsession, let me explain why I was trying out this program. I had been wondering if the state of technology had yet reached the lofty point where it would be practical to use a personal computer to do one's finances. Previously it was better to stick to pencil and paper, or even cuneiform. The only people who actually used personal computers to do their finances were anal-retentive wireheads who wrote their own programs in BASIC, and hapless chumps who'd paid good cash for the available commercial packages and were too proud to admit they'd wasted their money. All this supposedly changed a few years ago when the writer Andrew Tobias, well known for his scribblings about economic matters, lent his knowledge to the MECA software company, which produced Managing Your Money.

Some people raved about it—Whole Earth Catalog founder Stewart Brand called it reason enough to buy a PC.

But not a Mac—Managing Your Money ran on IBM computers and Apple IIs, but not Macintoshes. I once ran into Tobias at a party and asked him why not. He told me he didn't like the Mac and that he didn't think Mac users were a good market for his program. I guess the appearance last year of Managing Your Money on the Mac means he changed his mind. Anyway, I thought I would submit my own increasingly complicated finances to the program and see if it was worth sticking to the Tobias regimen.

**TOBIAS'S BIASES**

It didn't take long to realize that whatever bias Andrew Tobias had against the Macintosh is subtly reflected in Managing Your Money. All too often things happen that are not Mac-like. The root of the problem, I discovered, is the mind-set underlying the program. It wants you to submit, totally, with no reservations. The enforcement is embedded in the lack of freedom concerning file creation. You don't simply open a file called New when you want to start over; a complicated rigmarole is invoked that, after over an hour of figuring, I still can't comprehend. Eventually you get the idea, perhaps in some misguided paranoia about piracy, that you aren't supposed to have "new" finances. It's as if an auditor is looking over your shoulder, making sure you're not keeping a double set of books.

This quasi-tyranny is distressingly evident at all levels of Managing Your Money. Tobias, whose charming prose helps the manual considerably, explains this in a section called Managing Your Money's Way of Doing It. The program, the author says, "intuitively knows all the signs and rules. The pluses, minuses, debits, credits, and parentheses are all taken care of in the bowels of the program the same way steam gets supplied to the..."
City of New York. I don’t know where it comes from or how it works—no one knows where it comes from or how it works. It just works.”

Let it be noted that during the week I am writing this column, New York City steam lines have exploded in three separate incidents, sending deadly asbestos into the streets. I assume that the bowels of Managing Your Money are sturdier. Still, I wish it had an Undo function.

**LET'S GO TO THE CHARTS**

That said, Managing Your Money is loaded with fascinating tools for analyzing one's financial situation. Chief among them is the aforementioned Net Worth. It takes a while to input all the components of one's empire, but the experience is enlightening—not only will you list all your stocks, bonds, IRAs, and bank accounts, but you must go through your house room by room, gauging what all your furniture is worth. Then you have to enumerate your various debts, including the mortgage, and voilà! Here’s your bottom line. As months pass, and your finances go through various ebbs and flows, you can call up the net worth at any old time. See if it's up or down. Using a program like Tempo, you can even get your Net Worth automatically, every time you turn on the computer.

Granted, this can become a sickness. It gives your finances an almost pornographic appeal. But not everything is as fascinating with Managing Your Money. Once you have entered its portals, you have to leave a certain kind of thinking behind—for instance, the kind of thinking where you can spend $3 for a magazine without recording it on the ledger. That kind of behavior is now banned. The least intrusive thing you can do with the $3 purchase is lose it in the Spending Money category. Or—here comes a decision—include it in the Newspapers and Magazines category. Did you make that one deductible? Yes. Well, then definitely in that category. Aah.

Some might call this world a little too demanding. But it has its virtues. The amazing thing about Managing Your Money is the various things you can do once you get all the details of your finances on the machine. In an instant, you’re calling up pie charts and bar graphs, detailing how your cash flow is running or how accurate your budget projections have been.

My favorite little component is the quickie tax spreadsheet. By giving off-the-cuff estimates of the various line items on the 1040 forms (and supplemental forms like schedule A or C), the program, using current tax schedules, quickly calculates how much you owe. By switching numbers around, you can get instant feedback on the impact of various tax strategies. For instance, what are the benefits of filing jointly or separately? Of socking $5000 in a Keough account? It's all there.

**THE DARK SIDE OF MYM**

Other features are downright depressing. Like the little chart that calculates how many years you have left to live, and how (continues)
You have a right to be mad if you pay too much for a big screen display. Here's what Rival owners have to say:

"It's crisp and clear and easy on the eyes—that's important when you end up working at it for 10 to 12 hours straight. I really don't know how I got along without it."

Carol Stieglitz, Graphic Designer

"Our Rival is great. The price nabbed us. We shopped around, and it was far and away the best value."

Shannon de Herrera, Publisher

Rival is the latest version of the MegaScreen display rated Number One by Macworld, May '89. Its 1024 x 826 resolution at 75 dpi is flicker-free, thanks to 75Hz performance. And the image is bright and clear on the high-quality Zenith monitor. Rival comes complete with a built-in tilt-and-swivel base, cable and controller.

There are versions for the SE, SE/30 and Mac II family—at hundreds of dollars below our competitors.

"It was all too much for Gordon Lewis of Dishman, Washington. When, after paying nearly $2,100 for a large screen display for his new Macintosh computer, he read in an ad that he could have bought a better system for about $400 less, he flew into a rage, drove straight to Bob 'n' Brian's Computers 'n' Stuff, grabbed the nearest weapon, a 5-1/4" Flight Simulator floppy disk and proceeded to pummel his salesman into senselessness. Police were called to break up the scuffle, but Brian Girvins, Manager, declined to press charges: "We didn't know about the Rival ourselves, or we wouldn't have been pushing these expensive brands." He muttered.

"We owe Gordon a debt of thanks for bringing the Rival to our attention. Although we wish he'd just called and told us on the phone," said Chief Aldo Malmstein. "We've had a few of these cases lately, all stemming from customers overpaying for computer equipment and finding out later how much they could have saved."

You owe it to yourself, to your budget, and to your computer salesperson.

We can keep your name out of the papers.
Definitions on disk

Language Master gives you instant access to more than 80,000 dictionary definitions plus 470,000 synonyms from Merriam-Webster—the English language authority.

The dictionary contains definitions, usage notes and hyphenation points. The thesaurus contains synonyms, meanings for each synonym group and properly inflects all responses.

Language Master, formerly Choice Words for the IBM PC, works with most popular MS-DOS word processors and is now available for the Apple Macintosh.

Whether you're writing, reading, or simply want to explore the English language in a new and exciting way, Language Master is for you.

See your local software dealer. Or order directly by calling 1-800-323-0023, (305 566-3511 in FL) or write: Franklin Software, 3511 N.E. 22nd Avenue, Fort Lauderdale, FL 33308

Language Master™

New! Macintosh Version

Franklin Software

$99

Circle 272 on reader service card.

Case No. 05734

AMERICA'S MOST WANTED MOUSE

Wanted for over 200 counts per inch and operating without a cord. Also wanted for being the smoothest, fastest mouse available for any Macintosh. Armed with features and dangerous to all other mice, it has eluded capture for even a mug shot. In the event that you come in contact with this mouse, be sure to purchase it immediately.

For further information, our agents are standing by.

Practical Solutions®
(602) 322-6100

The Cordless Mouse™

©1989 Practical Solutions, Inc. All rights reserved.
The Cordless Mouse is a trademark of Practical Solutions, Inc.
Macintosh is a registered trademark of Apple Computer, Inc.

Circle 488 on reader service card.
You’ve been practicing for years.
Now it's time to play.

Introducing the HP DeskWriter printer for the Macintosh. $1195.
The new HP DeskWriter printer for the Macintosh puts laser quality on your desktop. With its advanced inkjet technology you can print text and graphics, even scalable outline fonts, at 300 DPI. Just like a laser printer.

But unlike a laser printer, the DeskWriter is priced so you can have your own. No more waiting in line for output. Or having your work scrutinized by the office busybodies.

And at a compact 15" x 17" x 8", the DeskWriter fits neatly next to your Macintosh. So call 1-800-752-0900, Ext. 688E for your nearest authorized HP dealer and see a demonstration. And keep the laser quality all to yourself.

There is a better way.
VIRUS DETECTION & TREATMENT

Great Product. Great Service.

It's not surprising that Virex® is the premier anti-virus solution for the Macintosh. Virex was the first commercial anti-virus software and the first to repair infected files. And now the Virex INIT included with Virex provides continuous system protection. But HJC Software offers more than just a great product.

Incredible Turn-Around on Product Updates. Anti-virus software must be updated when new viruses occur to repair files infected by the new virus. Virex was first to combat the INIT29, Hpat, ANTI, and MEV# viruses. Product updates have been available within days of new reports. Well ahead of the competition!

"How quickly (and cheaply) these updates are developed and provided is critical... The standard to match is HJC's Virex."
—MacUser Magazine, October 1989

Toll-Free Virex Help Hotline—HJC offers a responsive, toll-free technical support hotline so registered users can get help fast.

Annual Subscription Service. Registered users may purchase individual updates or subscribe to an inexpensive annual update service.

Virex—more than just a great product.

HJC Software, Inc.
P.O. Box 51816
Durham, NC 27717
(919) 490-1277

© 1989 HJC Software, Inc.
Virex is a registered trademark of HJC Software, Inc.
Macintosh is a trademark of Apple Computer, Inc.

Steve Levy is a Macworld columnist and the author of The Unicorn's Secret: Murder in the Age of Aquarius, recently released in paperback by NAL.
Never underestimate the importance of a great backup system.

Just how risky is running a hard disk system without backup, anyway? Would you believe almost a half-million dollars? Studies indicate that’s how much it could cost to restore a typical 90 megabyte hard disk of business or engineering data. Of course, that doesn’t include loss of income while you find another job.

You can avoid the sinking feeling that accompanies data loss by using MaxStream™, the convenient, affordable Macintosh® tape backup system from Archive.

MaxStream’s built-in error correction and data verification guarantees that even if your hard disk takes a dive, your data will have a soft landing.

A sizzling 6 megabyte-per-minute transfer rate leaves other tape systems in the dust. And easy-to-use backup and restore features include scripting for automatic, unattended operation, storing up to 150 megabytes—a network full of data—without intervention.

MaxStream’s Universal Tape Format™ even lets you use cartridges to transfer data between your Macs and IBM PCs®. Call 1-800-237-4929, or write: Archive Corporation, Data Storage Division, 1650 Sunflower Ave., Costa Mesa, CA 92626 for the name of your nearest MaxStream dealer.

And make the jump to better backup.

MaxStream™
by Archive Corporation

Why trust your data to anyone else?™

Archive is a registered trademark, and MaxStream, Universal Tape Format, and Why trust your data to anyone else? are trademarks of Archive Corporation. Macintosh is a registered trademark of Apple Computer, Inc. IBM PC is a registered trademark of International Business Machines.
Need it tomorrow?

Two years ago, they laughed when we said we were going to ship all orders overnight for just $3. Well, actually, they didn't laugh—they just sort of stared at us in disbelief. Now that we've proven it can be done, overnight shipping has become an industry standard in Mac mail order. And our overnight shipping policy remains the standard-bearer. Because, at MacConnection, any credit card order going to any state (in the lower 48) is shipped for next-day delivery. We don't care how many products you order or how heavy they are. Your total shipping charge is still only $3. And if, by any chance, we have to place part of your order on back-order, it will ship overnight as soon as we get it. Absolutely freight free.

ORDER BY

8PM.

Any order we receive by 8 PM goes out that day. Just call 800/334-4444, or fax your order, complete with credit card info, to 603/446-7791. By the way, through the holiday season, we'll be here taking orders until 1 AM. So shop 'til you drop!
Airborne delivers.

Other overnight freight companies may have flashier logos, but no one beats Airborne Express when it comes to reliability. In fact, over 99% of all Airborne orders arrive the next day, 95% of them by noon. That’s why they’ve led the industry in percentage growth of shipments for the last five years.

Not only does Airborne have a phenomenal overnight delivery rate, but, thanks to our direct Electronic Data Interchange with their computers, we can instantly transfer all the vital statistics about your order into Airborne’s computers. That helps us maximize accuracy and monitor your order’s progress every step of the way. In the rare case that it isn’t at your door the very next day, we’ll be able to figure out exactly where it is within minutes.

USUALLY BY NOON!

Toll-free support.

Back in 1984 when we started, people said you could never get technical support from a mail order company. Well, we never take “never” for an answer. So ever since our very first order, we’ve had a policy of unlimited toll-free technical support for every customer.

By doing so, we’ve created yet another industry standard. Now, even some of our own vendors call us to consult on technical questions. All our Mac sales and support personnel are Mac specialists—they only sell and service Mac products. So, we can give you the facts to make informed software purchases, and answer all those critical compatibility and upgrade questions (whether you have an original Mac 128K or a new IIci). If there’s something you want to do on your Mac, we’ll tell you whether you have enough memory, storage, and/or output capacity to pull it off. And, if you don’t, we’ll explain all your upgrade options. Whenever you’re in doubt, call us toll-free.

800/344-4444

MacConnection

MacConnection, 14 Mill Street, Marlow, NH 03456  1-800/334-4444  603/446-7711  FAX 603/446-7791
All business.

With atOnce!, "finally the Macintosh has powerful yet simple accounting software" (New Accountant Magazine 2/89). It gives small and medium-sized business G/L, A/R, A/P, and Payroll modules, seamlessly integrated so that all of them (and up to 26 periods) can be open simultaneously. You can use the built-in financial reports or customize your own. For larger businesses, layered's Insight Expert Series offers six modules (listed below) which can be fully integrated or used alone. It gives you the answers, analysis, and advice you need to manage a business effectively, all in an intuitive Mac environment. And, it now includes data import capabilities. This is the accounting series that won Macworld's World Class Award the last three years in a row.

Now. And forever.

Find your vital statistics fast (real estate, insurance, taxes, medical, income sources, etc.) by keeping them in For the Record. And, now that you know exactly what you own, WillMaker can help you create and update your own valid will, making all the correct legal adjustments for your state. Don't put it off any longer! It's as easy as answering a series of questions on screen.

Nolo Press ... 60 day MBG
4228 For the Record 1.03 ............ $28.
2981 WillMaker 3.0 ............... $32.

Painless Paydays.

Process payroll fast with Payroll PLUS. It tracks up to 10 different income sources or hourly rates per employee, accumulates sick and vacation hours, and more. To automate all your check printing and maintain updated ledgers for all accounts, use Checkwriter. It actually reminds you when recurring checks are due, facilitates the balancing act, and can generate extensive reports on your finances, including graphs. Use it as a DA or standalone program.

Aatrix Software ... 30 day MBG
5872 Checkwriter 2.0 .... special $33.
3958 Payroll PLUS 3.1 .... special 149.

Small Business Expert.

ACCPAC Bedford Simply Accounting is a complete Mac accounting program with fully integrated G/L, A/R, A/P, Payroll, Inventory, and Job Costing modules. It can handle up to 1000 ledger accounts, vendors, customers, employees, and projects (that's 1000 each), and 2000 inventory items. InfoWorld gave it a 7.9 rating and said that it "doesn't require a CPA designation to understand it. It's accounting for the rest of us."

$65

Kinder, Gentler Taxes.

Get that intimidating 1040 off your desk and onto your Mac where it belongs. With MacInTax you simply put your numbers on screen instead of on paper. The program links them, and does all the calculations automatically. Then it prints all the data in IRS approved format. It includes over 50 forms, schedules, and worksheets, totally up-to-date for 1989 taxes. Plus, it's a great year-round way to analyze the tax consequences of various actions in advance.

SoftView
3470 MacInTax ............... $65.

Latest Versions Only.
Solid investment.

Market Manager Plus "makes very good use of the Mac interface and is easy to use" (MacUser 4/89). It combines an easy link to Dow Jones News/Retrieval with the ability to handle up to 256 portfolios. Use it to track stocks, options, mutual funds, bonds, Treasury issues, cash, and to produce graphic analyses of your portfolio. It also includes a tickler system to remind you when dividends and interest are due.

Dow Jones ... 30 day MBG
1786 Market Manager PLUS 2.0 $189.

ACCOUNTING & PAYROLL COMBINED.

MultiLedger combines G/L, A/R, A/P, and Inventory in a single program developed specifically for the Mac. It generates invoices, statements, checks, and a wide range of other financial reports. The companion program Payroll can handle check writing and all required reporting for 1 to 1,000 employees. It can be used as a standalone program, or it can be integrated with MultiLedger.

CheckMark Software ... 60 day MBG
5862 Payroll 4.02 ............... $179.
5863 MultiLedger 1.3 ............ 239.

FINANCIAL WIZARD.

First, take the program that won two 1988 Macworld World Class awards and has been called "the most Mac-like and...most fun accounting package on the market" (Macazine 11/87). Now, factor in a new invoicing module that's just as easy, intuitive, and versatile. The bottom line is MacMoney 3.5 (and InvoicIt), a powerful financial management solution for home or small business.

Survivor Software ... 30 day MBG
3289 MacMoney 3.5 .... special $55.
6097 InvoicIt (Req. MacMoney 3.5) 50.

Call 1-800/334-4444 to order.
Overcome the language barrier!

$319

Forget complex syntax. New Double Helix Version 3.0 lets you build any database application fast, because there's no programming to slow you down. It's all done visually. This new version lets you use buttons, macros, and even scanned images to develop applications that combine a friendly HyperCard-like interface with the power of a relational database. Plus, it's Mac/VAX multi-user compatible. Special price through 1/31/90!

Odessa ... 30 day MBG
5621 Double Helix 3.0. special $319.

A brief history of Timeslips.

In the beginning, all was darkness. Then time started ticking and, before long, people started tracking what they were doing and how long it took them to do it. Well, things just kept on getting more complicated until Timeslips III was created. This highly-efficient time and billing program helps people turn time into money by making it easy to keep accurate track of every hour. You can use the DA from within any program to track time and expenses on up to 250 activities for up to 250 people, working on 128 projects per client, with a maximum of 2,000 clients. Then use the application to generate in-depth reports, including Billing History Report, Client Billing Worksheet, Client Fund Report, and custom work-in-progress or timesheet reports. You can customize bills by detailing services by activity, expense, or project, and incorporating flat fees and previous balances. And then print your bills in any font with imported graphics. MacUser gave Timeslips an Eddy award in 1989, and Macworld said it's "flexible enough to work well with many different organizations and methods of billing." As an added incentive, you'll receive a free upgrade to Version 2.0 (due early 1990) and a free Tempo macro disk for Timeslips. Offer good through 1/31/90.

North Edge Software
30 day MBG
2986 Timeslips III 1.1 ........ $169.

ENTER A NEW DIMENSION.

In May '88, 4th Dimension (V. 1.04) was given the highest rating for Mac databases by Software Digest. Now, Acius has introduced 4th Dimension 2.0. It's up to 100 times faster, is even easier to use, and has 300 new features including scripts, automatic buttons and links, and enhanced multi-file relational capabilities. Sophisticated relational operations are handled automatically, reducing or even eliminating the need for you to write your own procedures.

$469

Acius ... 30 day MBG
5618 4th Dimension 2.0 .......... $469.
4024 4th Dimension Runtime (4-user pack) ............... 229.

The Fox enhances its base.

The original FoxBASE +/Mac was named InfoWorld Product of the Year, MacUser Editor's Choice, and was a MacWEEK Top 10 product. Version 2.0 is faster than ever, and packed with new features. FoxReport creates custom reports and labels in seconds. Place objects representing fields, lines, boxes, text objects, and graphics where you want them—FoxReport does the rest. Enhanced XCMD/XFCN Support gives you access to up to 16 XCMDs and XFCNs written in a variety of programming languages. Most HyperCard XCMDs and XFCNs can be used without changes. Plus, you get an automatic application generator, complete dBASE compatibility, integrated graphics, and much, much more. The Network version is compatible with AppleShare, Novell, 3Com, and FoxBASE+/LAN. Multi-User and Runtime versions provide unlimited distribution of single- and multi-user applications.

Fox Software ... 30 day MBG
5572 FoxBASE II/Mac 2.0 .... $295.
4580 FoxBASE +/Mac Runtime 2.0 179.
4844 FoxBASE +/Multi-User 2.0 . . . 399.
5579 FoxBASE +/Multi-User Runtime ............... 295.

No Credit Card Charge Til We Ship.
The new way to Excel.

The singular solution for any business.

Wait! We take it back! Don't buy Excel! Buy The Microsoft Office. It's the budget-balancing way to buy all the Microsoft programs your office needs. It includes Excel, Word, PowerPoint, and Mail in a bundle that's priced significantly lower than all four combined. You'll be working with four full-powered and totally integrated applications, thereby transforming your very own office into a lean mean productivity machine. Look out!

Microsoft ... 30 day MBG
5454 The Microsoft Office (includes Excel, Word, PowerPoint, and Mail) ............ special $499.

$249

Version 2.2 of Microsoft Excel gives you full access to the 8 megabytes in high-powered Macs. That's room enough for remarkably large spreadsheets (and their graphics), documenting your company's financial condition for the past two centuries, and projecting into the next one (which is just around the corner). And, thanks to advanced intelligent recalculating, your calculations will be 40% faster. This new Excel is also a visual delight: it lets you select up to 256 fonts per sheet, including up to six styles and eight colors, change row height, add shading, insert notes, and otherwise turn some rather ordinary numbers into some rather extraordinarily compelling visuals. And remember, all these features have been added to what was already the best selling spreadsheet for the Mac. Which could put a smile on the face of the most taciturn number cruncher.

Microsoft ... 30 day MBG
2865 Excel 2.2 ............. $249.

$185

Okay, so you're sitting there thinking that all this power is impressive, but what you really need is one straightforward way to crunch some numbers, manage some lists, write some presentable proposals, and get on-line once in a while. Sounds like you need Microsoft Works—it gives you all the tools you need to run a small business or even a rather complex personal life, by combining word processing, spreadsheet, database, drawing, and communications into one powerfully integrated program. So you can keep track of your clients, create newsletters, do your projections, and log on to on-line services, all by learning just one program. Plus, the new drawing module (with page layout) lets you add pizzazz to all of the above. Works also comes with an animated training program written in familiar HyperCard format, and if you ever get confused, you can take advantage of on-line help and unlimited phone support.

Microsoft ... 30 day MBG
2884 Works 2.0 ............. $185.

Call 1-800/334-4444 to order.
**Fast C.A.T.**

C.A.T. is the lightning-fast relational database that's perfect for managing all your contacts, facts, figures, events, and projects. Plus, it gives you letter writing and mail merge capabilities you need to stay current with all these Contacts and Activities in a Time-ly manner. Enter and look for information based on a contact person, activity (meeting, letter, phone call, etc.), and/or when it happened. It will constantly update your files, and generate reminders, schedules, memos, etc.

$229

Chang Labs .... 60 day MBG
1611 C.A.T. 2.0 ........... $229.

**$95**

**Hot dates.**

Throw away those calendars with their crossed-out plans and multiple layers of stick-em notes. Endeavour Planner lets you plan and track projects via a very clean, simple, and fully graphical interface. You work directly with a Gantt chart to enter data, set dependencies between tasks, milestones, and task durations. Every time there's a change, the program automatically updates your new schedules and displays them right on screen.

Softstream Int'l. .... 60 day MBG
5439 Endeavour Planner 1.0 .... $95.

**$145**

**Top of the charts.**

This Mac power tool lets you import data, analyze it, and generate scientific and business graphics. KaleidaGraph is extremely fast, and features built-in graphing tools, curve-fitting functions, and user-defined macros. It has 14 types of graphical structures, lets you transform data mathematically, and create high resolution output. Pull-down and pop-up menus make selections and modifications fast and straightforward.

Synergy .... 30 day MBG
3129 KaleidaGraph 2.0 ........ $145.

**$349**

**Database omnibus.**

Omnis 5 is a comprehensive program for developing business data management applications. This multi-user, multi-platform database for the Mac also features SQL connectivity to a VAX or mainframe. It supports full color graphics for ‘Mac-like’ applications, and its HyperCard access allows stacks to read and write to Omnis 5 data files in both single-user and multi-user installations.

Blyth Software
5492 Omnis 5 ................. $349.
5855 Omnis 5 ... (each additional user) .... 75.

**$439**

**MODEL WINNERS.**

From the developers of award-winning StatView statistical software comes SuperANOVA, a revolutionary new full-featured general linear modelling program designed specifically for the Macintosh. Ideal for researchers and engineers, SuperANOVA lets you easily perform ANOVA, ANCOVA, MANOVA, MANCOVA, and regression on your data.

Abacus Concepts .... 60 day MBG
5840 SuperANOVA 1.0 ... special $439.
5904 SuperANOVA 1.0 ... (for Mac II) ...... special 439.
5907 StatView II/SuperANOVA bundle ............... 695.
POWER
IN THE FLATS.

Just because all you need is a flat-file database doesn't mean that all you can do is manage and sort lists. Panorama gives you extensive spreadsheet-like, semi-relational analysis features for finding what that data's trying to tell you. Fast? Its Clairvoyance feature will complete common entries for you, and you can easily record your own macros. It also features extensive mail merge, outline capabilities, and a full palette of form design tools.

Silicon Beach ... 60 day MBG
3506 SuperPaint 2.0 .......... $125.
5100 SuperCard 1.0 .......... 125.

ENTER THE 3RD DIMENSION.

Add another dimension to your product designs, scientific modelling, animation, and illustrations. Swivel 3D lets you bring in existing graphics in virtually any format (Encapsulated PostScript, PICT, PICT2, MacPaint, etc.) and change the lighting, add shadows, or create a 3D background. Or you can start from scratch to build models with parts that twist, turn, swivel, and move in other realistic ways. For animation, put your images into VideoWorks or HyperCard stacks and watch them come alive.

IDD, creator of MacDraft, now also offers a powerful precision drawing program for professional scaled drawings, illustrations, presentations, and graphics. Dreams features zoom, rotation, layers, dimensioning, symbol libraries, an array of drawing tools, and many advanced illustration tools. You can merge shapes together, cut edges of objects using other objects as templates...even glue lines and curves together to form unique shapes to be filled with colors or patterns. If you can dream it, you can draw it.

Innovative Data Design
4707 Dreams 1.0 .......... special $249.

PRECISION DRAWING.

Enter the world of precision drawing and drafting with the two-time Macworld World Class award-winning program, MacDraft. Its precise, fast, and easy-to-use drawing tools are ideal for creating custom graphics, business charts, forms, illustrations, technical drawings, and schematic designs. You can draw both geometric and freehand shapes, and then rotate, zoom, scale, fill with custom patterns, dimension, or even calculate their area.

Innovative Data Design
2417 MacDraft 1.2B .. special $135.
Fountain of fonts.

**$89 EACH**

You can answer all your typeface needs with MacFontware Typeface Packages, no matter what Mac output device you use, including: Apple LaserWriter II/INT and II/PostScript, the LaserWriter IIISC, and any Image Writer. The fonts in each package are scalable to any size (within application or device limitations) by PostScript PDL devices. They also provide bitmap fonts for QuickDraw printers, and true WYSIWYG fonts in 20 sizes from 9 to 96 point on your screen. So it's easy to proof type accurately in bitmap format before outputting to a laser printer or typesetter. The two Headline font packages include four typefaces each, and the text faces come complete with roman, italic, bold, and bold italic. MacFontware fonts are compatible with virtually all Mac applications.

**Bitstream**
- 5968 Baskerville ................. $89.
- 5969 Bitstream Charter .......... 89.
- 5970 Futura Medium .............. 89.
- 5973 ITC Galliard ............... 89.
- 5974 ITC Garamond .............. 89.
- 5975 ITC Souvenir ............... 89.
- 5976 Letter Gothic .............. 89.
- 5977 News Gothic ............... 89.
- 5971 Headlines I (Bitstream Cooper Block, Broadway, Cloister Block, University Roman) ........ 89.
- 5972 Headlines II (Brush Script, Blippo Black, Hobo, Windsor) ........ 89.

**INFINITE PAINT POSSIBILITIES.**

NuPaint is an innovative paint program that provides over 100 defined patterns plus 32 x 32 fill-pattern capability. Edit and print up to 300 dpi. It features many unique tools. You can use masking tape to protect areas from drips and splatters, restore small edited areas back to the original, create shadows from any direction, repeat images with precision, free rotate, adjust frame height and width up to 16 x 16 dots, halftone, smooth, stir, fade, mix, and more.

**$99**

**GRAPHIC CHARTING SOLUTION.**

Now there's a charting package with the flexibility and power to create captivating charts and dramatic graphics, all in one program. DeltaGraph lets you choose from 22 3D and 2D chart types with full color support, Postscript output, and complete formatting control over each element in the charting window. Drawing Tools include Bezier curves, lines, arcs, arrows, and special fills. You can also import data from all popular file formats and establish direct links to Excel 2.2 files.

**DeltaGraph**
- 6095 DeltaGraph .................. $99.

**MULTILINGUAL FONTS.**

STAFF: 10.0C

**$79**

**SIMPLY BRILLIANT.**

With Pantone Color Selection, a built-in color separator, complete range of paint tools, and sophisticated blending of any 256 colors (out of 16.8 million), PixelPaint delivers the most sophisticated paint effects possible in an 8-bit program. PixelPaint Professional adds support for 8, 16, 24, or 32-bit color depths (including Apple’s QuickDraw 32), 0-100% transparency control, and image processing effects. Both are simply brilliant.

**PixelPaint Professional**
- 3380 PixelPaint 2.0 ............... $225.
- 5625 PixelPaint Professional 1.0 .. 395.

**No Freight on Backorders.**
Very decent exposure.

Give yourself total creative screen control with Exposure, the System 6.0- and MultiFinder-compatible CDEV screen graphics utility with screen capture, painting tools and fonts, and the ability to format color and gray scale images. To keep track of all those graphics (and text) try Database, the full-featured desk-accessory database that MacWEEK called “one of those rare products we can recommend to all regular Mac users.”

Preferred Publishers ... 30 day MBG
5751 Exposure 1.1. ............... $54.
4780 Database 1.12 ............... 69.

You can be very persuasive.

For flip charts, overhead transparencies, slides, and audience handouts PowerPoint gives you the power to be your most persuasive. It makes it easy to develop coherent presentation formats (fonts, borders, titles, etc.) filled with text and graphics imported from a wide range of programs. You can visually

$229

Are your applications long on power but short on personality? Give them their very own talking on-screen character (agent) with interFACE. This sophisticated animation toolkit lets you develop full-color talking agents of various sizes and proportions (each with up to 120 total images). These agents are an excellent interface for business presentations, training programs, informational kiosks, and more. And, interFACE allows for the importation of color into HyperCard.

Bright Star Technology
6093 interFACE 1.0 ... special $229.

CLIP-ART MAPS.

Add a new dimension to your proposals, periodicals, and presentations with MacAtlas. You get detailed clip-art maps of the entire world, world regions by country, USA by state, and all 50 states by county. MacAtlas maps are ready to customize with fill patterns, drop shadows, text, and more. Available in Paint, Draw (PICT), and Illustrator/ freehand (EPSF) format. Macworld gives it five stars.

MicroMaps ... 30 day MBG
5516 MacAtlas (MacPaint) 2.0 ... $45.
5514 MacAtlas EPSF
(PostScript) 1.0 .............. 105.
5513 MacAtlas Professional
(PICT) 1.0 .................... 105.

$65


DeskPaint (with DeskDraw) gives you full graphic editing power from within any application. It can create, load, edit, or save any TIFF, MacPaint, or PICT image up to 4000 dots per inch. You get a complete set of bitmap graphic tools including AutoTrace, air brush, smoothing, scaling, halftone control, and special effects. Plus there's support for full LaserWriter resolution and huge poster-size printing on an ImageWriter.

Zedcor ... 60 day MBG
3986 DeskPaint & DeskDraw 2.01 $65.

$249

rearrange slides, and create hard copy reproductions for memorable handouts. You also get word processing functions, on-screen slide show rehearsal, support for all 16.8 million colors on the Mac II, and support for many B&W and color printers and 35mm recorders. Plus, PowerPoint offers an easy interface to slide-production service centers—you can even send color presentations to Genigraphics via disk or modem, using the new Genigraphics Driver and GraphicsLink.

Microsoft ... 30 day MBG
2878 PowerPoint 2.01 ........... $249.

Call 1-800/334-4444 to order.
Give yourself a FreeHand to develop high-impact illustrations and typography.

Combine Aldus' super powerful drawing program with their best-selling desktop publisher. And in one fell swoop you'll transform your Mac into a fully equipped design studio, ready to create sophisticated newsletters, brochures, ads, flyers, package designs, and anything else you can envision. Aldus FreeHand gives you the illustration power. You see your changes on the monitor while you work, so it's easy to refine a shape or apply Pantone colors while keeping the big picture in focus. It also gives you total typographic control for curving text on a path, rotating or stretching type, mixing sizes, fonts, and colors, and, in general, getting words exactly the way you want them before outputting to an expensive typesetter.

Aldus ... 30 day MBG
1330 FreeHand 2.02 .... $345.

Then Make your Pages come alive.

Once you've developed your graphics and display type, just place them into PageMaker to put your piece together. The two programs are completely integrated, so you can immediately start fine tuning the letter kerning and word wraps, add rules and spot color, and experiment with a multitude of ways of combining your text and graphics. You'll soon discover why this program has single-handedly enabled thousands of designers to make the transition from drawing board to Mac as natural as the one from waterbed to futon. When you give PageMaker a FreeHand you get a potent combination of advanced illustration, design, typography, and page layout capabilities that will give you a definite creative edge.

Aldus ... 30 day MBG
1331 PageMaker 3.02 .... $385.
6149 PageMaker Color Extension 149.

$385

30/60 Day Money-Back Guarantee.
And pour on the persuasion.

Whether you have weeks or just minutes to create your next presentation, Aldus Persuasion will make it easy to assemble the materials, including totally professional black and white overheads, 35mm slides (either with a desktop film recorder, or via a slide bureau), and audience handouts. Thanks to Persuasion's AutoTemplate technology, it's as simple as selecting a design, and typing into the text outliner—your ideas are transformed into a professional-quality presentation automatically. And, for customizing your work further, just use the built-in word processing, drawing, and charting tools. When you're done, you can preview, or even show your entire presentation on screen. The new Version 2.0 can import PowerPoint and other files saved in Scrapbook format, and features 12 additional AutoTemplate designs (for a total of 36), automatic resizing, context-sensitive Help, and compatibility with Apple's new 32-bit color standard. Plus, you can now type notes directly on your outline and have them appear on your speaker notes next to a thumbnail image of the slide. InfoWorld said, "This may be the product that does for desktop presentations what PageMaker did for desktop publishing."

Aldus ... 30 day MBG
4751 Persuasion 2.0 .......... $339.

Call 1-800/334-4444 to order.
Smooth those rough edges.

Adobe outline fonts. It installs in a couple of clicks and then works in any application. Adobe Type Manager comes with 13 popular fonts including Times, Helvetica, Courier, and Symbol. And, for even more variety, there's the Adobe Plus Pack, giving you the same 22 outline fonts that come with Apple's I1N and I1NTX LaserWriters. Only now you can enjoy them on your ImageWriter. By the way, for a limited time, Adobe Illustrator 88 comes bundled with a free copy of Adobe Type Manager.

$109
Adobe Systems
5750 Adobe Type Manager . . . . $56.
6156 Adobe ATM/Plus Pack Bundle .162.
1137 Illustrator 88 1.9 w/ATM . . 279.

$56
Adobe outline fonts. It installs in a couple of clicks and then works in any application. Adobe Type Manager comes with 13 popular fonts including Times, Helvetica, Courier, and Symbol. And, for even more variety, there's the Adobe Plus Pack, giving you the same 22 outline fonts that come with Apple's I1N and I1NTX LaserWriters. Only now you can enjoy them on your ImageWriter. By the way, for a limited time, Adobe Illustrator 88 comes bundled with a free copy of Adobe Type Manager.

$279
Adobe Systems
5750 Adobe Type Manager . . . . $56.
6156 Adobe ATM/Plus Pack Bundle .162.
1137 Illustrator 88 1.9 w/ATM . . 279.

$49
SCRIPT
IMPROVEMENTS.
Enhance your HyperCard scripting with the ScriptEdit DA. It lets you edit multiple scripts on screen simultaneously, even from different stacks. It also features global search and replace functions, a script compare feature, separate undo commands for each editing window, and pop-up HyperTalk command menus. You can access most HyperCard menus while editing, and customize the way you use the editor with the included XCMD.

$95
Beyond HyperCard.
Develop powerful, full-color, HyperCard applications with PLUS. You work in a familiar HyperCard-like environment with direct access to existing stacks. There you can create cards up to 32,000 x 32,000 pixels, with buttons of any shape, a multitude of colors (you can even import color graphics), database fields where you can pre-format data, word processing fields, and more. Buy at a special price through 1/31/90, and get a free upgrade to the next version.

$225
Publish-It! is the fully-integrated, completely self-contained Mac desktop publishing system that gives you the text, graphic, and page-layout power you need to create high-impact documents even if you have no previous graphic experience. Special features include text rotation and patterned text, and the ability to edit scanned images after they are placed into your documents. It comes with 70 professional sample layouts so you can get started immediately.

Order by Fax 1-603/446-7791.
HYPER IMPROVEMENTS.

Enhance your HyperCard productivity with these two collections: HyperTools #1 (16 tools for stack design) and HyperTools #2 (16 tools for stack enhancements). They let you perform many new functions, from modifying buttons to adding field validation, and they create their own scripts automatically. Also, try StackCleaner—a collection of stack management utilities for HyperCard.

Trendware
5202 HyperTools #1 1.02 special $47.
5199 HyperTools #2 1.04 special $47.
5203 Stack Cleaner .......................... 29.

$129

Develop yourself!

Use HyperHIT's 40XFCN's you can finally create your own "keyed" database from within HyperCard. A serious database engine, HyperHIT lets you design simple and sophisticated databases (multiple indexes) while cutting search time to as little as half a second. And you still get the freedom of HyperCard (SuperCard or PLUS) on the front-end. It supports the creation of text, PICT, and sound records, and can run on any Mac that runs HyperCard.

Softstream Int'l. ... 60 day MBG
5440 HyperHIT 1.0 .................. $125.

$125

DATABASE POWER. HYPERCARD EASE.

Using HyperHIT's 40XFCN's you can finally create your own "keyed" database from within HyperCard. A serious database engine, HyperHIT lets you design simple and sophisticated databases (multiple indexes) while cutting search time to as little as half a second. And you still get the freedom of HyperCard (SuperCard or PLUS) on the front-end. It supports the creation of text, PICT, and sound records, and can run on any Mac that runs HyperCard.

Softstream Int'l. ... 60 day MBG
5440 HyperHIT 1.0 .................. $125.

$125

Get with the program.

Here's the fast direct route to your own programs. With Microsoft QuickBASIC you can write as super serious (or super-silly-ous) a program as you like, complete with music and graphics. The compiler and interpreter are all in one program so you can compile and execute at any time with a simple double click.

Microsoft ... 30 day MBG
4471 QuickBASIC 1.0 ........ $65.

$65

DEBUGGING MADE SIMPLE.

Reduce debugging time and increase productivity with these two debuggers. TMON is a multi-window monitor debugger that will set breakpoints, display labels, intercept system errors, and more. Perfect for the novice as well as the experienced programmer, it was given five mice by MacUser. Exclusively for HyperCard, HyperTMON brings interactive debugging to HyperTalk. It can help anyone write more advanced scripts and solve the mysteries of existing scripts.

ICOM Simulations
5681 HyperTMON 1.0 ........ $59.
4085 TMON 2.8.2 ............... 89.

Symmetry ... 30 day MBG
3318 HyperDA 1.2 ........ special $47.

FOR HYPERCARD HYPERNEED.

HyperDA is the DA that gives you access to HyperCard stacks anytime (complete with buttons and fields) from within any application or the Finder. It lets you print and phone dial, search stacks, and copy to the clipboard. Plus you can change your stack screen to an expandable, scrollable window for easy access to your background application. New Version 1.2 lets you add or modify text in existing text fields, and save to the original stacks independently of HyperCard. It works on any Mac from the 512K up.

Call 1-800/334-4444 to order.
The ultimate prototyper, simulator, and code generator.

With Prototyper you can program your interface as fast as you can draw it. As Dan Shafer, author of HyperTalk Programming, put it, this completely integrated interface builder and code generator "makes the process of building a Mac application as easy as it's likely to get." Just click and drag items from a palette to give your program all the buttons, icons, pictures, text areas, check boxes, lists, rectangles, pop-menus, bells and whistles you want. You can run simulations anytime during the process. Then, once you're satisfied, Prototyper will generate all the C or Pascal source code and resources automatically. Your interface is complete. It literally couldn't be easier.

$169

SmathersBarnes ... 30 day MBG
1478 Prototyper 2.1... special $169.

THINKING SPEED? THINK C.

Why is THINK C used to create heavy-duty programs like FoxBASE+/Mac, PageMaker, and Illustrator? Speed. And more speed. This ultra-fast development system includes a multi-window text editor, compiler, linker, Mac-style source level debugger, and more. It's a programming powerhouse designed for the pros.

$149

Symantec ... 30 day MBG
3420 THINK C 4.0. . . . . . . . $149.

It figures.

Prepare for exams with learning programs from the inventors of True BASIC. Let Mac do the calculations and graphing while you master the concepts. Algebra, Pre-Calculus, and Calculus are each available with a valuable workbook. Algebraic Proposer handles word problems in math, the sciences, economics, even real life!

True BASIC, Inc.
3571 Algebra plus workbook... $39.
3580 Pre-Calculus plus workbook... 39.
3575 Calculus plus workbook... 39.
6110 Algebraic Proposer ........ 45.

$65

Beacon Technology ... 30 day MBG
4967 HyperBible (King James) 1.1 $145.
4968 HyperBible (New Intl.) 1.1... 175.

No Credit Card Charge Til We Ship.
MEGABYTES. NOT MEGABUCKS.

Blast through the eight megabyte barrier with Virtual 2.0 from Connectix. Now you can afford more memory than you thought your Mac could have. This simple software package turns your hard disk into as much as 14 megabytes of internal memory. The Mac II version includes a PMMU chip—to make your Mac II System-7-ready today.

Connectix
6123 Virtual 2.0 (for SE/30, IICx, IIX, and IIci) ................. $125.
6122 Virtual 2.0 (for Mac II, includes PMMU) ..................... 195.

To your Mac’s health.

SUM II is your hard drive magician: it recovers files and crashed hard disks, and even improves disk performance. Its Volume and File Recovery programs use three superior algorithms for triple file recovery power. SUM’s friend SAM protects your system from viruses, even monitoring peculiar activities that may indicate a virus, and scanning floppies to prevent a virus from infecting your system.

Symantec ... 30 day MBG
5176 Symantec AntiVirus for Mac 1.1 (SAM) .................... $63.
5724 Symantec Utilities for Mac II (SUM II) ..................... 95.

Look ma, no program!

Want to check a file but don’t have the application? Need to get some info out of a partially damaged file? Then get CanOpener! This clever utility will let you search for and open virtually any file (on a disk, hard drive or network) to check out its text, pictures, even sounds. Without the application that created it. Plus, it lets you copy material into your current application, or archive it for future use.

Abbott Systems ... 30 day MBG
5236 CanOpener 1.1 .............. $65.

HOLISTIC MEDICINE FOR MAC.

The new version of Virex goes beyond the mere file repair that earned it 4½ mice from MacUser. Now, it actually monitors your system continuously and repairs infected files before they have the chance to spread their evil corruption through your helpless bits and bytes. There’s also a new diagnostic tool for detecting previously unknown viruses. And the annual update service lets registered users get protection for new viruses within days of the first reports.

HJC Software ... 30 day MBG
4803 Virex 2.1 .................. $55.
5885 Virex 2.1 (10 Pak) ........... 349.

WHAT’S APP, DOC?

HandOff eliminates the dreaded “Application Not Found!” message. No more searching for applications to open the documents that you borrow from your friends and co-workers. HandOff will let you assign their documents to your applications so you can open their files directly from the Finder. HandOff also lets you redirect files to any application based on the filename extension. Jean-Louis Gassee calls it “a nice, unobtrusive and very much needed extension to Macintosh.”

Software Innovations ... 30 day MBG
5869 HandOff .......... special $29.

Make it big. Play it safe.

Get big screen vision on a small screen with Stepping Out II. It lets you scroll across pages in a mouse click, zooming in to work on details, or zooming out for the big picture, via 16 levels of magnification and three levels of reduction. And to prevent screen burn-out, use After Dark. Choose from 12 wild images, including flashing lightning bolts, streaking meteors, and crawling worms, or create your own.

Berkeley Systems ... 30 day MBG
5737 After Dark 1.0 ........ special $22.
1541 Stepping Out II 2.01 special 45.

Call 1-800/334-4444 to order.
POWER TWINS.

MacCalc is the easy-to-learn, easy-to-use, super-fast spreadsheet that's earned a MacUser Editor's Choice Award, and been called a "must have" by MACazine. It features extensive formatting, and support for .WKs files, for compatibility with 1-2-3 and Excel. And, through 1/31/90, we're bundling it at a special price with Bravo's SPAMM, the automatic INIT utility that can double the speed of calculations for your graphics, CAD/CAM, statistics, database work, and virtually all arithmetic operations on your Mac Plus or SE.

Bravo ... 30 day MBG
5404 SPAMM 1.1 ............... $48.
1539 MacCalc 1.2D .......... 79.
6084 MacCalc/SPAMM, special 115.

BACKUP AND SPOOL.

DiskFit automates your backup chores intelligently, backing up just those files that have changed. There's a network version available, and it's MultiFinder compatible, so you can keep on working while backing up. With SuperSpool you can even print while you work. The original is just for ImageWriters. The laser version works with all Apple printers and is also available in an economical 5-Pack.

SuperMac Software ... 60 day MBG
3377 DiskFit 1.5 ............... $58.
3379 Network DiskFit 1.5 .... 225.
3383 SuperSpool 5.0 ........... 58.
3382 SuperlaserSpool 2.0 ...... 88.
3378 SuperlaserSpool 5-Pack 2.0 295.

MANAGE YOUR ENVIRONMENT.

XTreeMac integrates disk management with file undelete and security protection. Its unique interface gives you a clear Directory Tree on the left and a DeskPad working environment on the right. There you can gather, rearrange, or delete files and folders from multiple disks, launch applications, lock files, and even recover accidentally deleted files. All on one screen, not multiple layers of windows.

Xtree ... 30 day MBG
5177 Xtree Mac 1.02 .......... $52.

HOLY MACRO! FREE TEMPLATE!

Tempo II makes simply powerful macros, either from existing text and graphics or by recording unlimited keystrokes and clicks. An amazing time-saver, it can automate any routine, with pauses, conditional branch and repeats, "smart" features like window- or screen-relative recording, and "play-by-name" simplicity. Plus, through 1/31/90, you'll receive a free keyboard template ($9.95 retail) to keep track of your macros.

Affinity Microsystems ... 60 day MBG
1016 Tempo II 1.02 .......... $75.

TRUE ARCHIVING.

With Retrospect, you can put inactive but still useful files where they belong: in an archive. Free valuable hard disk space by moving files into the archive— you can access them later via a catalog on your hard disk. Or copy files into the archive for backup. It supports disks, tapes, optical cartridges, file server volumes, etc.—if it can hold data, Retrospect can archive or backup to it. And it includes file compression and a calendar for unattended operation.

Dantz Development ... 30 day MBG
5255 Retrospect 1.1 ........... $152.

With Smart Alarms, you can be notified at any appointed time, remind you what to do, and even generate printed schedules. Appointment Diary is a daily calendar that can send reminders directly to Smart Alarms. The multi-user versions lets everyone on AppleShare or TOPS have identical or individual diaries.

JAM Software ... 30 day MBG
6089 Smart Alarms w/Single-User Appointment Diary .......... $49.
6088 Multi-User Appointment Diaries with Smart Alarms (1-4 users) ... 99.
6087 Appointment Diaries (5-8) ... 149.
6086 Appointment Diaries (9-15) .... 199.
6085 Appointment Diaries (16-25) ... 299.

No Surcharge on Credit Card.
$79

LABEL TEMPLATES. AT LAST.

Formatting a document for label printing can make anyone yearn for a nice old-fashioned typewriter—unless, of course, you have StickyBusiness, the program that gives you preformatted templates for labels, cards, and tags from Avery, MOORE, Rolodex, I nmac, NEBS, UPS, Dennison, and Williams & Macias. It includes tools for creating your own imaginative designs, and you can import graphics from other files. Plus, it's compatible with text files from all leading applications.

Williams & Macias ... 30 day MBG
4976 StickyBusiness 1.0.7 special $79.

$107

MacSafe II lets you secure your documents and applications inside password-protected folder-like safes on a hard disk, diskette, or network. The latest version features exclusive LightningCrypt encryption, Control Panel access, and the ability to put multiple files into a safe at once. For nighttime protection put The NightWatch on duty. Your hard disk will be locked up until you turn it back on with the correct password. And only you have access to the override function (in case of forgotten passwords). When you leave your desk and want to keep anyone else from seeing your work or accessing your network connections, QuickLock darkens your screen, displaying only a moving image that protects your screen from burn-in, while allowing background processing. To regain access to your screen, simply type in the access password. Three simple, elegant, and secure solutions.

KentMarsh Ltd. ... 30 day MBG
5457 QuickLock 1.0 ............... $57.
2591 The NightWatch 1.03 ...... 87.
6134 MacSafe II ................. 107.

$57

CLIPPING SERVICE.

PictureBook is a powerful Finder-like DA that organizes your clippings into multiple scrapbooks. You can name and annotate each clipping, track creator name and date, move clippings between multiple windows by simply clicking and dragging, and print scrapbook catalogs. Plus, the integrated editor lets you precisely crop or re-size. PictureBook can directly read PICT, MacPaint, and EPS files, converting all EPS to PICT. Routed five mice by MacUser.

Call 1-800/334-4444 to order.
How much time do you spend tracking down references you've used before? How about retyping the same bibliographic entries? EndNote lets you create and update a personal database of up to 32,000 references which you can access anytime, searching by author, year, or any word in the text. (Full logic searches are also supported.) The data from those references can be pasted directly into your word processing document as citations, just the way you need them. Then, the program will generate your bibliography automatically, formatted in any style. EndNote works either as a DA or as an application and is compatible with Word, MacWrite, WriteNow, and WordPerfect. Its companion program EndLink lets you import references directly from on-line services into your EndNote database. It works with MEDLINE, BIOSIS, Chem Abstracts, and other databases available on DIALOG and BRS Colleague. MacUser (2/89)

Niles & Associates ... 30 day MBG 5048 EndLink 1.0 .......... $58. 4602 EndNote 1.2.1 .......... 75.

Nisus has enough word processing power for even the most serious textpert. It boasts ten clipboard, extensive editing features like unlimited undo; and a lightning-fast search and replace facility that's font- and style- (including color) sensitive, can search by matching patterns, and can even look through unopened files. You also get a spell checker and thesaurus, integrated graphics, versatile formatting, an editable page preview, 50 useful macros (or write your own), and much more.

Paragon Concepts ... 30 day MBG 5683 Nisus 2.0 ....... special $225.

DocuComp is the fast and accurate way to show differences between two versions of anything from a contract to a book to source code. Even documents from different word processors can be displayed simultaneously, revealing insertions, deletions, replacements, and moves. The comparisons can be saved or printed as needed. A great time saver for technical writers, editors, lawyers, programmers, educators, and others.

Advanced Software ... 30 day MBG 5608 DocuComp 1.11 .......... $89.

Though 1/31/90, you'll get a free copy of ClickArt Personal Graphics ($49.95 retail value) when you buy the word processor that's been called "Best New Word Processor" (MacUser 5/89) and "Readers' Choice" (MACazine 1/89). WriteNow is an elegant combination of simplicity and power, featuring WYSIWYG editing, 100,000 word spell checker, multiple columns, mail merge, and many other claims to fame.

T/Maker ... 30 day MBG 3639 WriteNow 2.0 (with ClickArt Personal Graphics) special $99.
One Word says it all.

Whether you're a salesperson, scientist, secretary, or just writer of the occasional love letter, Microsoft Word has all the formatting, editing, and printing power you need. Integrated outlining lets you get your thoughts in order before writing a single word and reorganize whole documents with a few clicks. Store and summon your favorite formats with Style Sheets. Avoid nasty gaffes and faux pas with the 80,000-word spell checker. The QuickSwitch feature lets you go to other programs in a single keystroke and bring back graphics just as fast. The new and powerful Table feature lets you create columns, charts, lists, and forms without tabs. And simple to use? The menus are flexible and customizable to meet the needs of everyone from novice to expert.

Microsoft ... 30 day MBG
4969 Microsoft Word 4.0 .... $249.

Complete outline tool.

Acta Advantage combines the convenience of a DA outline for putting down rough notes anytime, with the full features of an application for developing polished outlines. The latest version of the DA lets you mix faces, styles, and sizes at will, and specify page breaks for printing. The application adds a full menu bar plus your choice of Harvard, Roman, or bullet outline labels, page preview, printing options, and more.

$64

LISTEN AND LEARN.

Become a power user at your own pace on your own Mac by listening to an expert talk you through the program step by step while you try each new skill. Each 90-minute tutorial includes an audio cassette, example files on disk, and quick reference card.

$39

GRAMMAR & BIBLIO FILES.

Catch grammatical errors in any text file before your colleagues or clients do. Sensible Grammar flags awkward writing, jargon, inappropriate contractions, etc., and suggests corrections. To manage references for your newly improved writing, try Bookends, a sophisticated HyperCard database that stores all your reference data and then generates bibliographies in whatever format you need.

Sensible Software ... 30 day MBG
3375 Grammar 1.5.4 ... special $51.
4692 Bookends 1.1.7 ... special $51.

$249

INcredible quickies.

QuickLetter makes writing letters and printing envelopes a snap. You don't even have to use pre-printed stationery—QuickLetter lets you print your own picture letterhead. Just write your letter, view it in Page Preview, and let QuickLetter address your envelopes automatically, even while you're working in another program. This DA word processor also has full font and style control, and a built-in address book. MacUser 10/89 gave it 4½ Mice and said that it's "quickly earned a place on my most-used DAs list."

Working Software ... 30 day MBG
4699 QuickLetter 1.01 .... $73.

$73

Call 1-800/334-4444 to order.
PARLEZ POWER.

Now you can use your Mac along with the top-selling audio language program to master a foreign tongue. Vocabulearn/ce interactive HyperCard Stacks are available in two levels for French, German, Italian, Spanish, and Japanese. Each program includes two 90-minute audio cassettes, a complete word list, and a free copy of HyperCard V.1.2.

Penton Overseas ... 30 day MBG
Level 1 Level 2
5864 5887 French . . . . ea.$30.
5865 5889 Italian . . . . ea. 30.
5867 5891 Spanish . . . . ea. 30.
5868 5888 German . . . . ea. 30.
5866 5890 Japanese . . ea. 36.

Who dun nit?

Who put the fun into math equations, word problems, and logical thinking? No, the butler didn’t do it, Davidson did. With Math Blaster Mystery. For ages 10 and up, Math Blaster Mystery is the exciting and entertaining way for children to master a variety of math and problem solving skills. It runs on a Mac Plus, SE, SE/30, IIX, or II, and can be installed on your hard disk.

Davidson & Associates
1734 Math Blaster! 1.0 (CP). . . . $27.
6128 Math Blaster Mystery (CP) . . . 27.

COMPOSE YOURSELF.

Your Mac can make music magic with Super Studio Session. You can compose using many instruments, tempos, and key signatures, and play it all back on your Mac or home audio system. No synthesizer is needed. Write and play back on eight tracks using over 90 instruments. The complete library offers over 320 different instruments and sound effects. Supports Apple Talk links.

Bogas Productions ... 60 day MBG
4255 Super Studio Session 2.0 . . . $65.

HYPER-ANIMATED LEARNING.

Learning letters and their sounds is far more enjoyable thanks to Hyper Animation, which combines real speech sounds, synchronized with correct facial motions. Children can improve their letter recognition by following the Talking Elf in Alphabet Blocks. To transform learning phonics into play use Talking Tiles whose on-screen tutor spells and pronounces words. Get both of Bright Star’s two learning programs together at a special price through 1/31/90.

Bright Star Technology
6096 Talking Tiles 1.0 & Alphabet Blocks 1.0 special, both for $45.
Guess what? It's 2004 and San Francisco is ruled by aliens. Your job is to work undercover with the aliens in order to penetrate the hideout of a band of renegade Ninjas and defy the Pig-Monkey mutants to win freedom for all humankind. But it's hard when creatures out of your worst nightmares stalk the familiar streets and sights of the City by the Bay.

Sierra On-Line
5694 Manhunter: San Francisco . $29.

ARE YOU GAME?
The TaskMaker takes you through ten challenging tasks in which you fight off some truly nasty creatures in order to restore prosperity to the depressed, devastated world. NFL Challenge can make any Sunday super by pitting all 28 NFL teams against each other at varying levels of difficulty, taking into account different players' special talents. Or head for the links with MacGolf Classic. You get to use all 14 clubs on 108 different holes complete with awesome graphics and sound effects.

ENTERTAINMENT GROUPWARE.
These two games transform your computer network into an action-packed battle field. Strategic Conquest is the realistic war game that dares you to explore and conquer an unknown, enemy-infested world. And, for adventures of another class, launch NetTrek and attempt galactic colonization in this real-time space battle simulator. Both allow you to challenge your Mac or other network users for hours of full color, networkable entertainment.

GET JET. QUICK.
Take the controls of a carrier-based F-18 or a land-combat F-16 and pit yourself against your friends or your Mac. You can even fly with others (like in Top Gun). Jet lets you choose from a breathtaking array of Scenery Disks. And, to help you take off faster, we're bundling Jet with the Kraft QuickStick at a special price. The QuickStick plugs right into your mouse port, and features both auto-centering or free-floating operating modes. Offer good through 1/31/90.

Software Toolworks ...
6111 Cribbage King-Gin King . $39.

Premier Technology
5773 Strategic Conquest Plus 2.0 $35.
5774 NetTrek-The Real Version . . 35.

CALL 1-800/334-4444 TO ORDER.
Alexey Pajitnov’s Tetris could challenge parts of your brain you didn’t even know you had. Well, his sequel, Welltris will send you into another dimension altogether, where you’ll spend many challenging hours staring deep into a four-sided well with grid-like walls while you try to position falling pieces quickly and accurately on the bottom grid.

Spectrum HoloByte ... 30 day MBG 6112 Welltris ............... $19.

Bomber is an intensely realistic action/adventure game recreating the sights, sounds, and split-second decisions of the young B-17 crews in the skies over Nazi Germany. You get digitized sound, animation, and a ten-man crew to talk you through the tough ones. It runs on everything from a Mac Plus to a IIci. HyperCard required.

InLine Design ... 30 day MBG 5870 Bomber (incl. headphones) $26.

Bombs away! $26

Have your Mac and PC it, too. $245

Are you still doing part of your computing on a DOS machine and part on a Mac? Well, now you can put an end to such silicon schizophrenia. Because SoftPC gives your Mac II, IIX, IICX, SE/30 or 68020-accelerated SE true MS-DOS compatibility. So you can run any PC application, from best sellers to in-house programs, right on your Mac. Plus you can run PC and Mac programs at the same time, and even cut and paste between Mac and PC applications via MultiFinder. There’s no hardware. No hassle. Just install SoftPC on your Mac, double click, and get the best of both worlds.

Insignia Solutions 4089 SoftPC 1.3 ............... $245.

MAC CRUISE CONTROL. $249

Reduce your CompuServe on-line time and costs with CompuServe Navigator. It can automatically log on, take care of your Forum business, check stock quotes and pending electronic mail, download files, and then log back off. And it can do all this unattended, or in background. Winner of the 1989 SPA Telecommunications Award, it’s available at a special price through 1/31/90 and you’ll receive an upgrade to Version 3.0 directly from CompuServe.

CompuServe ... 60 day MBG 1673 Navigator 2.1 ... special $39.

Special delivery. $39

Your workgroup’s productivity will soar when you start sending messages, files, even graphics created with other Microsoft programs via Microsoft Mail. This electronic mail system lets everyone on your AppleTalk network communicate easily with each other (even PC and VAX users), and provides a gateway to AppleLink and MCI Mail.

Microsoft ... 30 day MBG 5856 Microsoft Mail 2.0 Server ... $249. 5858 Microsoft Mail 2.0 Workstation ............... 84. 5857 Microsoft Mail 2.0 (20 Pack) 969.

No Sales Tax.
Dial the Dow.
The Dow Jones News/Retrieval Membership Package brings current business and investment facts, figures, and full-text articles from over 50 Dow Jones Services directly to your Mac. It comes with the E-Z Online communications disk for easy access to those services and a User's Guide for finding the facts you want fast. Plus, you get five hours of usage time and your first year's annual service fee free!

Dow Jones ... 30 day MBG
5295 News/Retrieval Membership Package .... $24.

GO OVER THE TOPS.
TOPS transforms any Mac into a TOPS network station, able to share files, printers, and multi-user applications. As you add workstations, maintain your network performance by virtually tripling network capacity with the TOPS FlashBox. It installs in minutes. And, for communications software there's TOPS InBox. Use it to send messages and memos just by pressing a few buttons, and to receive your messages whether your Mac is on or off.

TOPS ... 30 day MBG
4598 TOPS FlashBox ........ $123.
3723 TOPS Mac 2.1. .................. 137.
4714 InBox Starter Kit 2.2 ............ 149.
4715 InBox Connection Mac 2.2 . . . 45.

THE INCREDIBLE EXPANDING NETWORK.
The new version of best-selling telecom software MicroPhone II lets you build front ends to information services and corporate mainframes. It also supports ZMODEM, XCMDs and XFCNs, European languages, icons, color, and sound. Using built-in modem drives, it works with any modem to transfer documents for you anywhere in the world... with super reliability at a super low price.

MicroPhone II
Software Ventures ... 30 day MBG
3455 MicroPhone II 3.0 ......... $219.

Call 1-800/334-4444 to order.
Transfer data. Codes and all.

With MacLink Plus, you don't just transfer data between Macs and PCs (at up to 57,600 bps), you retain all the correct styles and formats. And now it lets you do the same with Sun and NeXT systems too. The MacLink Plus/Translator library now includes over 100 translators. So, for example, you can send a MacWrite or Word document to your PC to appear correctly in WordPerfect, WordStar, MultiMate, XYWrite, etc. Or, you can send your PC's dBASE, 1-2-3, Multiplan, Symphony, or DIF file, with all formulas and formats intact, to your Excel, Multiplan, or other Mac application. All it takes is a couple of points and clicks between two familiar Mac file windows. MacLink Plus comes complete with a direct connect cable to your PC's serial port (or you can use a Hayes-compatible modem) and software for both the Mac and the PC. If your Macs and PCs already share a network or server, then you can buy the Translators separately. Welcome to the world of real file exchange.

DataViz ... 60 day MBG
1823 MacLink Plus/PC 4.1
(includes Translators) ... $125.
4842 MacLink Plus/Translators 4.1 ... 99.

THIS PACK SAYS IT ALL.

$199

Get on line quickly, easily, and cost-effectively with the Mac Communications Pack. It includes the external PM 2400SA modem (platinum color to match your Mac), installation cable, and Microphone 1.5, the popular communications software. This superior, standalone, USA-made modem is Hayes compatible, accepts pulse or touch-tone dialing, full- or half-duplex operation, and features automatic adaptive equalization for error-free operation.

Practical Peripherals
30 day MBG
3089 Mac Communications Pack 1.5 ... special $199.

COMMUNICATION ART.

White Knight 11 takes over where its popular predecessor Red Ryder left off. It supports four XMODEMs, three YMODEMs, three Kermit, ZMODEM, and Flash protocols, emulates TTY, VT52, VT100, and VT102 terminals, and supports Color QuickDraw and large monitors. The interface can be customized and its improved Host Mode and 200+ command Procedure language let you fully automate any session. And, for a limited time, it comes bundled with a free copy of Okyto 1.0—the revolutionary Mac-to-Mac file transfer program, and a free subscription to GENie.

White Knight Version 1.1
Okyto Version 1

White Knight

FreeSoft 60 day MBG
6115 White Knight 11 ... 89.

SIMPILIFY YOUR PRINT LIFE.

LabelWriter is the first printer designed just for labels. It's whisper quiet, maintenance free, and produces letter-quality 1" x 1½" labels (even machine-scannable bar codes) on 130-label rolls. Bundled software lets you use existing lists, create new ones, and format in any style. The Organizer from CoStar raises your LaserWriter II to desktop height and has storage for extra paper, paper trays, toner cartridge, and even a Hard Disk 20. And it comes on casters so it's easy to roll over to a colleague's desk.

CoStar 30 day MBG
6090 LabelWriter ....... $189.
6067 LabelWriter labels ... 11.
6091 The Organizer ....... 239.

Overnight Shipping $3.
Now one quick pass of your hand brings images and text up to 4.2" wide into your Mac. LightningScan is the hand scanner that saves and edits in true gray scale. The built-in memory makes it extraordinarily fast, and its new DA software can resize, calibrate, rotate, and flip in a flash. In fact, it was rated the top Macintosh hand scanner by both Publish! and MacWEEK.

$369

**SCAN BY HAND.**

Now one quick pass of your hand brings images and text up to 4.2" wide into your Mac. LightningScan is the hand scanner that saves and edits in true gray scale. The built-in memory makes it extraordinarily fast, and its new DA software can resize, calibrate, rotate, and flip in a flash. In fact, it was rated the top Macintosh hand scanner by both Publish! and MacWEEK.

**THE BIG PICTURE.**

The full-page (15") and two-page (19") B&W Nutmeg Monitors deliver ultra-high resolution, flicker-free viewing for hours of desktop publishing, CAD/CAM, etc. Both feature 72 dpi resolution and come with a built-in tilt and swivel stand. And, through 1/31/90, we’re offering special prices on the entire 19" line.

Nutmeg Systems **... 30 day MBG**

- 2993 15" for Mac II ......... $799.
- 2992 15" for Mac Plus ........ 1299.
- 2994 15" for Mac SE .......... 1195.
- 4002 19" for Mac Plus ... special 1195.
- 4096 19" for Mac SE ... special 1195.
- 5680 19" for Mac SE/30 special 1195.
- 4097 19" for Mac II .... special 1195.

$79

**GET ON A ROLL.**

The Kraft ADB Trackball doesn’t use up valuable real estate on your desk, because it stays put while your cursor takes off. Three switchable cursor speeds let you choose the response range that’s most comfortable for your applications. It plugs right into the mouse port, runs all mouse software, and delivers ultra-sensitive and accurate response. Plus, Kraft’s opto-mechanical design and quality construction is backed by a five year warranty. Complete with foot pedal!

**SCAN WORDS AS WORDS.**

It’s no fun trying to edit text with drawing tools. OmniPage text recognition software can read virtually any font in sizes from 8 pt. to 72 pt. as scanned by any popular scanner, into any popular word processing format. Besides regular text, it can read spreadsheets and other financial documents, 11 of your favorite Indo-European languages, and even decipher pages with both text and graphics.

Call 1-800/334-4444 to order.
Speed demons.

The awesome productivity benefits of Mac software can be lost while you're waiting for that spreadsheet to calculate, database to sort, or CAD image to arrange itself. An accelerator card from Dove can improve your performance by 55%. The Marathon 020 series gives you 1 or 4 Megs of additional memory to your SE, along with a 32-bit microprocessor operating at 16 MHz (faster than a Mac II). And you can double the speed of calculations with the optional math co-processor. The Marathon 030 series enhances your Mac SE/30, II, or IIx's performance with a 256K internal data cache, 256K instruction cache, and full 32-bit microprocessor operating at 32 MHz. And, new from Dove, is the Marathon Racer, the cost-effective way to take advantage of Dove's cache technology to make your Mac II perform an average of 20% faster.

Dove Computer ... 60 day MBG
1793 Marathon 020 MSE1 ... $429.
1794 Marathon 020 MSE2
(1 Meg) ... $699.
1795 Marathon 020 MSE3
(math chip) ... $589.
1796 Marathon 020 MSE4
(1 Meg/chip) ... $879.
5192 Marathon 020 MSES
(4 Meg) ... $879.
5193 Marathon 020 MSES2
(4 Meg/chip) ... $1099.

Note: Each Marathon 020 is also available in a FastNet LAN version which adds Ethernet connectivity to other Macs or networks.

4663 Marathon 030 Accelerator
32 MHz ... $969.
5878 Marathon 030x Accelerator
32 MHz ... $969.
5880 Marathon 030 SE/30 Accelerator ... $969.
5623 Marathon Racer ... $149.

We also carry the complete line of Dove MacSnap memory enhancements and FastNet networking products. Call for details.

The cutting edge of storage.

Cutting Edge Hard Drives arrive at your door pre-formatted and ready to boot automatically. They feature automatic head parking and dual SCSI ports for daisy chaining. You get access times as low as 23 milliseconds, and a mean-time-between-failure rate of up to 100,000 hours. All at a great price.

Now, if your storage needs are unlimited but your budget isn't, you'll want to check out the new 45MB Removable Hard Drive. You get all the benefits of the popular SyQuest mechanism without the high price. And whenever you need more storage, all you have to do is buy extra cartridges. It features automatic head parking, super fast 25 millisecond access time, and it can transfer data at up to 1.2 meg per second. Cutting Edge also solves your disk swapping dilemmas with this 800K External Disk Drive. It formats at 400K or 800K HFS, and is light enough to take home or across the hall. Plus, it's so quiet you need to check the LED indicator to see if it's working.

Cutting Edge ... 30 day MBG
3989 800K External Disk Drive (platinum) ... $149.
5133 20 Meg Hard Drive ... $439.
3990 30 + Meg Hard Drive ... $499.
3991 45 + Meg Hard Drive ... $549.
5275 65 + Meg Hard Drive ... $629.
5276 80 + Meg Hard Drive ... $739.
5456 45 Meg Removable Cartridge ... $889.
5736 44 Meg Removable Cartridge ... $115.

BITS O’POWER!

Crank your system memory to the max with MacConnection’s own, very reliable 80ns SIMMs. These surface-mount 1 Meg SIMMs plug in easily, and are completely compatible with your Mac. Add 2 Meg at a time to your Plus or SE to a maximum of 4 Meg. For your SE/30 on up, add 4 Meg at a time to a max of 8 Meg. Every MacConnection SIMM carries a two-year warranty.

MacConnection ... 60 day MBG
1107 1 Meg, 80ns SIMM ... $99.
From the folks who introduced the first SCSI hard drives for the Mac come four superior external drives, pre-formatted and ready to boot your Mac and store multiple Megs of data. All support the full SCSI command set including Apple's UNIX system and LaserWriter NTX printer. There's even a built-in second SCSI connector for daisy-chaining.

SuperMac Tech. ... 30 day MBG
5452 Dataframe 20 ........ $589.
5447 Dataframe XP 30 .... 699.
5448 Dataframe XP 60 .... 959.
5449 Dataframe XP 100 .... 1279.

The world has been beating a path to Moustrak's door since the early days of the Mac. Their smooth, high-tech mouse pads provide sensitive mice with a surface suitable for slipping and sliding across your screen with the utmost precision. This elegant accessory suits the most discriminating Mac palate (or palate) and makes a wonderful gift for anyone who's been bitten by the Mac.

Moustrak ... 60 day MBG
Available in blue or gray.
2694 Moustrak Pad
(standard 7" x 9") .......... $8.
2692 Moustrak Pad (large 9" x 11") . 9.
2693 Moustrak Pad UF (9" x 11") ... 10.

One of the first things that many of our customers say to themselves after placing an order is, "Oh my gosh, I forgot to order disks again. Well there's always next time." Sure, but what if you run out before next time? Hey, don't get caught short. We've got the Sony 3 1/2" Disks you need—and they could be in your hands tomorrow.

Sony ... 60 day MBG
3297 3 1/2" DS/DD Disks (10) .... $14.
6148 3 1/2" DS/DD Disks-3 Pak (30) . 35.
3298 3 1/2" HD Disks-1.44 Meg (10) 25.

Always keep your SE safely under wraps with the Protection Pak. On the road, use the High Trek Travel Case, featuring 3/4" high-density closed-cell foam, lined pockets, and a durable waterproof Cordura plus nylon skin. Keep up to 20 disks safely in the Gallery Disk Easel—designed to fold flat and fit into a pocket in the travel case. And, back home, cover your SE and keyboard with MacAttire Dust Covers, made from attractive, water-resistant, anti-static, washable rip-stop nylon.

Sopris Softworks ... 60 day MBG
4862 SE Protection Pak
(ext. keyboard) ... special $75.
The Ultimate SE Carrying Case boasts two sturdy outside pockets for books, umbrellas, disks, pens, even 8 1/2" x 11" notebooks. Inside there's a padded compartment for your extended keyboard and a 9" x 9" padded pocket for mouse, cords, etc. The super-sturdy construction features a water-resistant Cordura shell, nickel-plated chromium steel hardware, and ultra high-density foam.

I/O Design ... 30 day MBG
6129 Ultimate SE Case ... special $79.
2379 MacLuggage Imageware II ... 49.
2376 MacLuggage Macinware Plus 64.
2381 MacLuggage Macinware SE ... 75.

Avery Labels deliver guaranteed performance in Apple laserWriter Plus and ImageWriter printers. They feed automatically from the paper tray and are available in address, shipping, file folder, and round sizes. New Laser Diskette Labels for 3 1/2" diskettes feature a special adhesive designed to stay on your disk and not peel off in your disk drive. Avery List&Mail Labels feature a special adhesive to prevent them from peeling off in your ImageWriter. They are available in individual use and bulk pack sizes.

Avery ... 60 day MBG
4865 Address (3 1/2"x2 1/4", Qty. 3750) $15.
4807 Laser (1" x 2 1/4", Qty. 3000) ... 24.
5392 Disk—Laser (3 1/2", Qty. 630) ... 29.
Call for other sizes.

Targus Carry Cases feature closed-cell foam and a special static-proof, water-resistant material that's strong as Cordura but softer so it won't wear out clothes. You also get 100 lb. tensile-strength shoulder straps and a sturdy padded bottom to cushion crash landings.

Targus ... 60 day MBG
3618 ImageWriter II Carry Case ... $45.
3617 Mac Plus/SE Carry Case ... 55.
4015 Mac SE & Extended Keyboard Carry Case ... 69.
6116 Mac llcx Carry Case ... 85.

Don't let spikes, sags, and surges smash your productivity. The 110SE UPS maintains continuous power for any Mac, including file-server units, protecting your data from both undervoltage and overvoltage. In an extended power outage, it can signal PowerChute, APC's software monitoring program, to automatically shut down your AppleShare (2.0 and up) networks. PowerChute comes free with the 110SE through 1/31/90.

American Power ... 30 day MBG
5895 110SE UPS 90 watts, 8 lbs., with free PowerChute ... special $269.
6102 PowerChute (free with 110SE UPS through 1/31/90) ... 65.

Part of our Mac mail order business is located in the old mill in Marlow, NH (pop. 561). So, it's not really any surprise that some of the old-timers around these parts still think that chips come from trees. In fact, to prove it, they've designed and hand-made the MacConnection Solid Oak Disk Case. It sports some solid New England craftsmanship and just-as-solid oak, and will hold 90 disks safely, securely, and in high style. Accept no substitutes.

MacConnection ... 60 day MBG
4623 Solid Oak Disk Case ... $29.

FannyMac QT can greatly extend your Mac's life. Its ultra-quiet fan reduces operating temperature, and it has a built-in surge protector to foil those spiteful spikes. Plus, it sits in your Mac's handle, so your Mac can still sit in its carrying case. The Mobius Mouse delivers super-fast and precise cordless cursor control. It's 100% compatible with all Mac hardware and software and doesn't require a special pad.

Mobius Technologies ... 60 day MBG
4470 Fanny Mac QT ... special $55.
6126 Cordless Mouse ... special $95.

No Sales Tax.
CALL MACWORLD 1-800-334-4444 TO ORDER.
Call MacConnection 1-800/334-4444 to order.
<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACCESSORIES</strong></td>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>1113</td>
<td>Black ImageWriter Ribbon</td>
<td>$10</td>
</tr>
<tr>
<td>1114</td>
<td>LaserWriter Plus Toner Cartridge</td>
<td>$11</td>
</tr>
<tr>
<td>1115</td>
<td>LaserWriter II Toner Cartridge</td>
<td>$115</td>
</tr>
<tr>
<td><strong>Avery ... 60 day MBG</strong></td>
<td>Disk Labels 3 1/2&quot; (Qnty. 250)</td>
<td>$10.32</td>
</tr>
<tr>
<td>1116</td>
<td>Disk Labels—Laser 3 1/2&quot; (Qnty. 629)</td>
<td>$10.50</td>
</tr>
<tr>
<td>4903</td>
<td>Address Labels 200 1/2&quot; x 80</td>
<td>$4.10</td>
</tr>
<tr>
<td>4865</td>
<td>Address Labels 3/4&quot; x 13 1/4&quot; (Qnty. 750)</td>
<td>$2.80</td>
</tr>
<tr>
<td>4811</td>
<td>Transparencies 8 1/2&quot; x 11&quot; (Qnty. 50)</td>
<td>$2.00</td>
</tr>
<tr>
<td>4812</td>
<td>Round Labels 3&quot; x 3/4&quot; (Qnty. 150)</td>
<td>$1.00</td>
</tr>
<tr>
<td>4813</td>
<td>Laser Labels 1 1/4&quot; x 1 1/4&quot; (Qnty. 2000)</td>
<td>$1.00</td>
</tr>
<tr>
<td>4807</td>
<td>Laser Labels 1 1/4&quot; x 2 1/4&quot; (Qnty. 3000)</td>
<td>$1.00</td>
</tr>
<tr>
<td>4808</td>
<td>Laser Labels 1 1/2&quot; x 1 1/2&quot; (Qnty. 1400)</td>
<td>$1.00</td>
</tr>
<tr>
<td>4809</td>
<td>Laser Labels 1 1/2&quot; x 2 1/4&quot; (Qnty. 1000)</td>
<td>$1.00</td>
</tr>
<tr>
<td>4810</td>
<td>Laser Labels 1 1/2&quot; x 2 1/4&quot; (Qnty. 1400)</td>
<td>$1.00</td>
</tr>
<tr>
<td><strong>Basic Needs ... 60 day MBG</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5635</td>
<td>Keyboard Flip</td>
<td>$6.00</td>
</tr>
<tr>
<td>5633</td>
<td>LaserWriter Printer Stand</td>
<td>$28.00</td>
</tr>
<tr>
<td>5634</td>
<td>Large Screen Monitor Stand</td>
<td>$38.00</td>
</tr>
<tr>
<td><strong>Computer Coverup ... 60 day MBG</strong></td>
<td>ImageWriter LQ Cover</td>
<td>$8.00</td>
</tr>
<tr>
<td>1722</td>
<td>ImageWriter Imageware III</td>
<td>$6.00</td>
</tr>
<tr>
<td>1723</td>
<td>ImageWriter Imageware III</td>
<td>$6.00</td>
</tr>
<tr>
<td>1720</td>
<td>Mac Plus Cover</td>
<td>$10.00</td>
</tr>
<tr>
<td>1724</td>
<td>Mac SE Cover</td>
<td>$10.00</td>
</tr>
<tr>
<td>1725</td>
<td>Mac SE Ext. Keyboard Cover</td>
<td>$10.00</td>
</tr>
<tr>
<td>4657</td>
<td>LaserWriter II Cover</td>
<td>$10.00</td>
</tr>
<tr>
<td><strong>Goldenstein &amp; Blair ... 30 day MBG</strong></td>
<td>2267</td>
<td>The Macintosh Bible (2nd Edition)</td>
</tr>
<tr>
<td>2267</td>
<td>The Macintosh Bible (2nd Edition)</td>
<td>$19.95</td>
</tr>
<tr>
<td><strong>Kensington ... 60 day MBG</strong></td>
<td>MacConnection carries the entire line of Kensington's accessories.</td>
<td></td>
</tr>
<tr>
<td><strong>MacConnection ... 60 day MBG</strong></td>
<td>PowerBacker 800</td>
<td>$749.00</td>
</tr>
<tr>
<td>5230</td>
<td>PowerBacker 1200</td>
<td>$949.00</td>
</tr>
<tr>
<td>5228</td>
<td>PowerBacker 1200</td>
<td>$949.00</td>
</tr>
<tr>
<td><strong>Mappiness Technologies ... 60 day MBG</strong></td>
<td>Solid Oak Disk Case, made by New England craftsmen (holds 60 disks)</td>
<td>$29.00</td>
</tr>
<tr>
<td>4623</td>
<td>Solid Oak Disk Case, made by New England craftsmen (holds 60 disks)</td>
<td>$29.00</td>
</tr>
<tr>
<td><strong>Moustrak ... 60 day MBG</strong></td>
<td>MacSnap Plus SE (standard 7&quot; x 9&quot;)</td>
<td>$8.00</td>
</tr>
<tr>
<td>2654</td>
<td>MacSnap Plus SE (standard 7&quot; x 9&quot;)</td>
<td>$8.00</td>
</tr>
<tr>
<td>2652</td>
<td>MacSnap Plus SE (standard 7&quot; x 9&quot;)</td>
<td>$8.00</td>
</tr>
<tr>
<td>2653</td>
<td>MacSnap Plus SE (standard 7&quot; x 9&quot;)</td>
<td>$8.00</td>
</tr>
<tr>
<td><strong>NoRad ... 30 day MBG</strong></td>
<td>5620</td>
<td>Shield for Mac Plus or SE (25249)</td>
</tr>
<tr>
<td>5622</td>
<td>Shield for Mac II (2523F)</td>
<td>$29.00</td>
</tr>
<tr>
<td><strong>Ribbons</strong></td>
<td>Available in black, blue, brown, yellow, green, orange, purple, red, silver &amp; gold.</td>
<td></td>
</tr>
<tr>
<td>3255</td>
<td>ImageWriter II Color Ribbon</td>
<td>$8.00</td>
</tr>
<tr>
<td>3261</td>
<td>ImageWriter II Color Ribbon</td>
<td>$8.00</td>
</tr>
<tr>
<td>3270</td>
<td>ImageWriter II Color Ribbon</td>
<td>$8.00</td>
</tr>
<tr>
<td>3260</td>
<td>ImageWriter II Color Ribbon</td>
<td>$8.00</td>
</tr>
<tr>
<td>4011</td>
<td>ImageWriter II Color Ribbon</td>
<td>$8.00</td>
</tr>
<tr>
<td><strong>Soris Softworks ... 60 day MBG</strong></td>
<td>Mac SE Std. Keyboard Cover (navy)</td>
<td>$15.00</td>
</tr>
<tr>
<td>4171</td>
<td>Mac SE Std. Keyboard Cover (navy)</td>
<td>$15.00</td>
</tr>
<tr>
<td>4173</td>
<td>Mac SE Std. Keyboard Cover (navy)</td>
<td>$15.00</td>
</tr>
<tr>
<td>4168</td>
<td>Mac SE Std. Keyboard Cover (navy)</td>
<td>$15.00</td>
</tr>
<tr>
<td><strong>SuperMac Tech. ... 30 day MBG</strong></td>
<td>5631</td>
<td>Tilt/Swivel Kybd. Carry Case</td>
</tr>
<tr>
<td>5631</td>
<td>Tilt/Swivel Kybd. Carry Case</td>
<td>$22.00</td>
</tr>
<tr>
<td>5632</td>
<td>Drive 2.4</td>
<td>$32.00</td>
</tr>
<tr>
<td><strong>SuperMac Tech. ... 30 day MBG</strong></td>
<td>SuperMac drives include SuperSpool, SuperLaserSPOOL, DiskFit and Manager</td>
<td></td>
</tr>
<tr>
<td>5452</td>
<td>Dataframe 20</td>
<td>$58.99</td>
</tr>
<tr>
<td>5447</td>
<td>Dataframe XP 30</td>
<td>$69.99</td>
</tr>
<tr>
<td>5448</td>
<td>Dataframe XP 60</td>
<td>$95.99</td>
</tr>
<tr>
<td>5449</td>
<td>Dataframe XP 100</td>
<td>$127.99</td>
</tr>
<tr>
<td><strong>STORAGE MEDIA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Verbatim ... 60 day MBG</strong></td>
<td>3772</td>
<td>3 1/2&quot; DS/DD Disks (10)</td>
</tr>
<tr>
<td>3773</td>
<td>3 1/2&quot; HD Disks 1.44 Meg (10)</td>
<td>$29.00</td>
</tr>
<tr>
<td><strong>Sony ... 60 day MBG</strong></td>
<td>3941</td>
<td>DC2000 Tape Cartridge</td>
</tr>
<tr>
<td>3295</td>
<td>3 1/2&quot; DS/DD Disks (10)</td>
<td>$15.00</td>
</tr>
<tr>
<td>3296</td>
<td>3 1/2&quot; HD Disks 1.44 Meg (10)</td>
<td>$29.00</td>
</tr>
<tr>
<td><strong>MAXELL ... 60 day MBG</strong></td>
<td>3943</td>
<td>DC2000 Tape Cartridge</td>
</tr>
<tr>
<td>3297</td>
<td>3 1/2&quot; DS/DD Disks (10)</td>
<td>$15.00</td>
</tr>
<tr>
<td>3298</td>
<td>3 1/2&quot; HD Disks 1.44 Meg (10)</td>
<td>$29.00</td>
</tr>
<tr>
<td><strong>3M ... 60 day MBG</strong></td>
<td>3944</td>
<td>DC2000 Tape Cartridge</td>
</tr>
</tbody>
</table>

**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 shipped first Class Mail.
- International orders U.S. $25 minimum.
- Upon receipt and approval, personal and company checks now clear the same day for immediate shipment of your order.
- Corporate P.O.'s accepted subject to credit approval.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- To order; call us anytime Monday through Friday 9:00 AM to 1:00 AM EST, or Saturday 9:00 AM to 5:30 PM EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 AM to 5:30 PM EST.

**SHIPPING**
- Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all credit card orders phoned into MacConnection weekdays by 8 PM EST will ship same day. Provincial exception: For those within UPS Ground Zone 1 (which is also an overnight service). Saturday delivery available to many areas upon request. The total freight charge on any order placed with MacConnection is now $3. Backorders will also ship same day to overnight order placed with MacConnection is now $3. Backorders will ship same day to overnight order placed with MacConnection is now $3.
- Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.

Call MacConnection 1-800/334-4444 to order.
Letraset Software. Graphic Design First.

Letraset knows that it takes a company that understands graphic design and software to develop software that lets your creativity run wild. Software that keeps pace with your imagination. Tools with the power and flexibility you need to turn a good idea into a great one. Letraset Graphic Design Software helps you create incredible layouts. Develop type solutions you thought you could only get by hand. Create custom halftones and effects without ever calling the lab. Letraset Graphic Design Software — what you would expect from a company with 30 years experience in graphic design and the expertise to create software tools that understand the way you work. Software that puts graphic design first.

Come see Letraset for graphic design software from the graphic design specialists. In the U.S., call 1-800-343-TYPE for information. Elsewhere, contact any Letraset international subsidiary.

Images Created using Letraset Software:
DesignStudio™, ColorStudio™, ImageStudio™, LetraStudio™, FontStudio™, and LetraFont™ Type Library.
When you're having problems with a company, you need to know how to complain and whom to complain to. "A Phone Guide to Customer Service" lists 48 companies drawn from our Best-Sellers section over the past two years. It includes a main telephone number, customer service and tech support numbers (if they differ), the hours the phones are answered, and sources of online support.

How to get results depends on the problem and the company involved. But it never hurts to be persistent yet polite. Sounds obvious, but many callers vent their frustration by yelling at people answering the phone. "When customers call up and they're angry, it's a lot harder to deal with them than if they understand that we're on their side," says a customer service rep at Apple. It's hard to keep your cool with a company that doesn't offer technical support, charges a lot, and has a miserable warranty. But alienating customer service reps is not a good idea.

Consumer expert John Dorfman outlines a 10-step "escalation ladder" for consumer action in his book *A Consumer's Arsenal* (Praeger Publishers, 1976). The steps are: (1) telephone complaints; (2) written complaints to the retailer; (3) complaints to the manufacturer; (4) complaints to a trade association, the Better Business Bureau, or the Chamber of Commerce; (5) complaints to local or state agencies; (6) complaints to federal agencies; (7) legal action, starting with small-claims court; (8) enlisting the help of voluntary consumer organizations; (9) enlisting the help of the media; (10) unconventional tactics, such as picketing.

Unconventional tactics has an interesting ring to it, but often you can get satisfaction simply by calling and asking for it. Some general tips for complaining with clout:

- If the customer service department can't help you, ask to speak to someone with authority who can. (According to Dorfman, asking questions such as "Do you have the power to authorize a refund?" and "Do you have the authority to offer me a replacement?" can save time and irritation.) As always, keep a written record of whom you spoke to, what was said, and the nature of the transaction. And give the company time to respond. (Calling five people on the same day for the same help can dilute goodwill.)

- Keep complaint letters short and civil. List what you want and why you are making this request—a refund on your ImageWriter, for example, because it fails to operate properly despite an upgrade. Include details of earlier contacts with the company (and copies of any additional correspondence) and a reasonable deadline by which you expect a response. Customer service departments won't be happy to read this, but my experience suggests that a letter addressed to an individual gets a better response than one directed simply to the company or a department. (Some companies won't give out the full names of people working in customer service. Try calling the main switchboard, explaining that you need to send a letter, and asking for the name of someone you can write to—it usually works for me.) Finally, make it easy for the company to reach you.

According to Tony Lucich, president of Applied Ideas, customers often fail to include in their letters a phone number and a time they will be available. "They also don't say what they want," he adds. In the case of Applied Ideas, letters from people wanting refunds go to the marketing department; letters from those who want the problem fixed stay with customer service. Whatever the problem, it takes longer to resolve if the company has to guess what you want and track you down to find out.

- Follow the steps of the complaint ladder. (Local consumer agencies can usually offer more immediate help than federal groups, for example.) And weigh the time and energy needed to pursue a complaint against the possible return.

Companies benefit from good cus-
<table>
<thead>
<tr>
<th>Company</th>
<th>Main Number</th>
<th>Customer Service</th>
<th>Tech Support</th>
<th>Hours</th>
<th>Online Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelede</td>
<td>408/985-1700</td>
<td>408/296-8400</td>
<td>408/296-8400</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Apple Systems</td>
<td>415/961-4400</td>
<td>800/344-8335</td>
<td>415/961-0911</td>
<td>CS 7-5 MWF; 8-4 TTh PT</td>
<td></td>
</tr>
<tr>
<td>Aldus</td>
<td>206/622-5500</td>
<td>206/628-2220</td>
<td>206/628-2220*</td>
<td>7-5 PT</td>
<td>AppleLink</td>
</tr>
<tr>
<td>Apple Computer</td>
<td>408/996-1010</td>
<td>408/252-2775</td>
<td>no tech support</td>
<td>7-5 PT</td>
<td></td>
</tr>
<tr>
<td>Ashton-Tote</td>
<td>408/927-5157</td>
<td>213/329-9989</td>
<td>213/329-0086</td>
<td>CS 7-5 MTTF; closes at 3 W PT</td>
<td></td>
</tr>
<tr>
<td>AST Research</td>
<td>714/863-1333</td>
<td>714/261-5006</td>
<td>714/863-9991</td>
<td>7-5 PT</td>
<td>BBS: 714/852-1872</td>
</tr>
<tr>
<td>Braderbund</td>
<td>415/492-3200</td>
<td>800/521-6263</td>
<td>415/492-3500</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Bullseye Software</td>
<td>702/265-2298</td>
<td>main number</td>
<td>main number</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Casady &amp; Greene</td>
<td>408/624-8716</td>
<td>408/624-8716</td>
<td>408/624-8716</td>
<td>9-5 PT</td>
<td>Connect: Kunysz</td>
</tr>
<tr>
<td>Claris</td>
<td>408/987-7000</td>
<td>408/777-8227</td>
<td>408/777-9054</td>
<td>8-5 M-1h; 8-2 F PT</td>
<td>AppleLink</td>
</tr>
<tr>
<td>CMS Enhancements</td>
<td>714/259-9555</td>
<td>714/259-9322</td>
<td>714/259-4373, 4374</td>
<td>CS 7:30-4; TS 7-5 PT</td>
<td>BBS: 714/259-0933</td>
</tr>
<tr>
<td>Cricket Software</td>
<td>215/251-9890</td>
<td>800/531-5236</td>
<td>408/432-1764</td>
<td>CS 8:30-5:30 M-F ET</td>
<td></td>
</tr>
<tr>
<td>DataViz</td>
<td>203/268-0030</td>
<td>main number</td>
<td>main number</td>
<td>9-6 ET</td>
<td></td>
</tr>
<tr>
<td>Davidson &amp; Associates</td>
<td>213/534-4070</td>
<td>800/556-6141;</td>
<td>800/556-6141;</td>
<td>9-5 PT</td>
<td></td>
</tr>
<tr>
<td>Deneba Software</td>
<td>305/594-6965</td>
<td>305/594-6965</td>
<td>305/594-6965</td>
<td>9-5 ET</td>
<td></td>
</tr>
<tr>
<td>Dave Computer</td>
<td>919/763-7918</td>
<td>800/622-7627</td>
<td>800/622-7627</td>
<td>8:30-5:30 ET</td>
<td></td>
</tr>
<tr>
<td>Farallon Computing</td>
<td>415/849-2331</td>
<td>main number</td>
<td>main number</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>First Byte</td>
<td>714/432-1740</td>
<td>800/523-8070 in CA;</td>
<td>800/523-8070 in CA;</td>
<td>8:30-12, 1-5 PT</td>
<td>AppleLink</td>
</tr>
<tr>
<td>GCC Technologies</td>
<td>617/890-0880</td>
<td>800/422-7777</td>
<td>800/422-7777</td>
<td>9-6 ET</td>
<td></td>
</tr>
<tr>
<td>Great Wave Software</td>
<td>408/438-9990</td>
<td>main number</td>
<td>main number</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Informix</td>
<td>913/599-7100</td>
<td>913/492-9922</td>
<td>913/492-9922</td>
<td>8:30-5:30 CT</td>
<td></td>
</tr>
<tr>
<td>Infosphere</td>
<td>503/226-3620</td>
<td>503/226-1407</td>
<td>503/226-1407</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>The Learning Company</td>
<td>415/792-2101</td>
<td>800/852-2255</td>
<td>800/852-2255</td>
<td>7-6 PT</td>
<td></td>
</tr>
<tr>
<td>Lertoset</td>
<td>201/845-6100</td>
<td>800/634-3463</td>
<td>800/634-3463</td>
<td>CS 9-5; TS 9-6 ET</td>
<td></td>
</tr>
<tr>
<td>MacProducts USA</td>
<td>512/343-9441</td>
<td>main number</td>
<td>main number</td>
<td>9-6 ET</td>
<td></td>
</tr>
<tr>
<td>Microanalyics</td>
<td>716/248-9150</td>
<td>main number</td>
<td>main number</td>
<td>9-6 ET</td>
<td></td>
</tr>
<tr>
<td>Microsoft</td>
<td>206/882-0800</td>
<td>800/882-8088</td>
<td>800/882-0808</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Microtech International</td>
<td>203/468-6223</td>
<td>800/626-4276</td>
<td>800/626-4276</td>
<td>9-5 ET</td>
<td></td>
</tr>
<tr>
<td>Mindscape</td>
<td>312/480-7667</td>
<td>312/480-1948</td>
<td>312/480-1948</td>
<td>9-4 CT</td>
<td></td>
</tr>
<tr>
<td>Nordic Software</td>
<td>402/464-6502</td>
<td>800/228-0417</td>
<td>800/228-0417</td>
<td>9-5:30 CT</td>
<td></td>
</tr>
<tr>
<td>Novell</td>
<td>415/996-1999</td>
<td>408/729-6700</td>
<td>800/221-6402</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>QED Information Sciences</td>
<td>800/343-4848</td>
<td>617/237-5656</td>
<td>617/237-5656</td>
<td>9-5 ET</td>
<td></td>
</tr>
<tr>
<td>Quark</td>
<td>363/934-2211</td>
<td>800/543-7711</td>
<td>303/934-0784</td>
<td>7:30-5 MT</td>
<td></td>
</tr>
<tr>
<td>Radius</td>
<td>408/434-1010</td>
<td>408/434-1012</td>
<td>408/434-1012</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Radime</td>
<td>407/994-5585</td>
<td>main number</td>
<td>407/997-0774</td>
<td>CS 8:30-5:30, TS 8-5 ET</td>
<td></td>
</tr>
<tr>
<td>Silicon Beach Software</td>
<td>619/695-6956</td>
<td>main number</td>
<td>main number</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>Simon &amp; Schuster Computer Software</td>
<td>800/624-0024</td>
<td>800/624-0024</td>
<td>212/373-7770</td>
<td>8-5 PT</td>
<td></td>
</tr>
<tr>
<td>SoftView</td>
<td>805/385-5000</td>
<td>800/622-8289</td>
<td>main number**</td>
<td>9-6 PT</td>
<td></td>
</tr>
</tbody>
</table>
After centuries of practice, mankind perfects engineering calculations: MathCAD.

Announcing MathCAD: A Calculating Renaissance For Your Mac.

What the historians will call it, only time will tell.
Perhaps the Century of Speed, or the Era of Ease. But whatever the name, this is the age of MathCAD, the only math package that looks and works the way you think.

MathCAD takes full advantage of the Macintosh® interface, with features that make it simple to enter operators and Greek letters into equations.

MathCAD is the best selling math software in the world because it lets you perform engineering and scientific calculations in a way that's faster, more natural and less error-prone than the way you're doing them now—whether you're using a scratchpad, calculator, spreadsheet, or program that you wrote yourself. It gives you more control and more flexibility than ever before.

MathCAD's live document interface™ lets you enter equations anywhere on the screen, add text, and graph the results. Then print your analysis as a presentation quality document.
And it has over 120 commonly used functions built right in, for handling all kinds of equations and formulas, as well as exponentials, differentials, cubic splines, FFTs and matrices.

No matter what kind of work you do, MathCAD has a solution for you. In fact, it's used by over 50,000 engineers and scientists, including electrical, industrial, and mechanical engineers, physicists, biologists, and economists.

But don't take our word for it. Just recently MathCAD was reviewed as being "everything you have ever dreamed about in a mathematical toolbox." And when it was compared to the competition, it was "MathCAD by a mile."

And if you work with an IBM® PC or compatible, there's a MathCAD version designed exclusively for you. Or if you use both Macs and PCs, don't worry: MathCAD files are completely compatible between the two.

Look for MathCAD at your local software dealer. Or call MathSoft at 1-800-MATHCAD (in MA, 617-577-1017) for more information or for a free demo disk.

Speed, power and flexibility. Enter the new era of engineering and scientific calculations, with MathCAD.

System Requirements: Apple Macintosh Plus, SE or II, with a minimum of 1MB RAM. Supports all ImageWriters® and LaserWriters.*

MathCAD
MathSoft, Inc. One Kendall Square, Cambridge, MA 02139

Available for Macintosh and IBM compatibles. TM and ® signify manufacturer's trademark or manufacturer's registered trademark respectively.

Circle 34 on reader service card
customer service. Honest. A 1986 study by the Technical Assistance Research Programs Institute and the U.S. Office of Consumer Affairs says so. I couldn't find the study itself, but according to an abstract, "proper handling of consumer complaints promotes brand, product, and product line loyalty and can translate to returns on investment of 15 to 400 percent." But wait, there's more: "The study reports that consumer service departments are most successful when they have set up 800 assistance numbers, have trained their personnel in defusing customer anger, have established detailed monitoring systems to follow up complaints, and do not begin complaint-handling procedures with a list of questions identifying account numbers, serial numbers, or consumer data." Mac companies, are you listening?

It was interesting to note, while researching the table, the number of companies that do not allow their customer service and tech support people to fully identify themselves. It's a pretty silly system, designed to keep customers and company reps on an unequal footing right off the bat. The companies who admitted to this practice include Ashton-Tate (which refused to tell me even confidentially who heads its customer service and tech support departments), Broderbund, and Microsoft. Many companies let their employees decide whether they want to give out their names. Radius, Novell, and CMS Enhancements say their customer service people will give you their full names. It's a small point but, like 800 numbers, it tells you which companies really think about their customers.

I didn't find many recent consumer handbooks in the bookstores, but you may be luckier. My library finds include The Consumer Protection Manual, from Facts on File Publications, and the Consumer Sourcebook: 1990-91, published by Gale Research. The Consumer Protection Manual is fairly legalistic, but it offers sound advice on protecting your rights (continues)
You Have a Lot Invested in Savings. Ensure Your Investment With a Mitsubishi Optical Storage Subsystem.

You've invested time and money in your business records, documents and drawings. Many are irreplaceable.

The Mitsubishi® MW-5U1 optical storage subsystem ensures the safety of your files with indelible WORM optical recording. With Mitsubishi, they're safe from overwrite, inadvertent erasure and other hazards that plague traditional storage media.

The optical disk is removable. And removable media means economical, unlimited capacity and easy archiving. Each inexpensive 5¼ optical disk holds an additional 600 megabytes.

Best of all, the MW-5U1 is available as a turnkey subsystem that includes everything you need…Drive. Controller. Cables. Power supply. All in a compact desktop enclosure. With software and user’s manual.

You expect more from Mitsubishi Electronics, the industry leader in optical storage technology, and you get it. The MW-5U1 has the highest performance of any 5¼ optical disk system available. To ensure unparalleled quality and reliability, Mitsubishi manufactures virtually all components of the MW-5U1, including the media itself.

So protect your investment. Just plug the MW-5U1 into your Apple® computer and start saving.

For the nearest Mitsubishi reseller call 1-800-556-1234, ext. 54 in the U.S. and Canada (in California, 1-800-441-2345, ext. 54).

You Have a Lot Invested in Savings. Ensure Your Investment With a Mitsubishi Optical Storage Subsystem.
POWER DRAW
for people who have to be The Best.

Ease of Use: Instant editing access without command keys. Instinctive - not training intensive - spend your time working, not learning. Interactive snap puts you in complete control.

Accuracy and Standards: Tool and Die precision. Cartesian - Azimuth - Gradients - Bearing and Distance. ANSI - ISO - Metric and English units, scales, and sizes.

Power: Full auto-dimensioning. 256+ colors or gray scale. Handle up to 220,000 drawing objects. Lightning Speed.

File Compatibility: Exchange Pict (1 & 2), Bit Map and other CAD files including DXF, easily and quickly.

There are 2 kinds of Professionals. Those who are using PowerDraw and those who should be.

Engineered Software
In the USA Call (919) 299-4843
In Canada Call (204) 453-8111
For Our Distributors In Other Countries Fax: (919) 852-2067

The Accepted Mac® CAD Standard in 14 Countries and 5 Languages
Designed specifically for the Macintosh®

Panorama’s Secret “Eddy” Award Database Recipe Revealed!

INGREDIENTS:
1 FileMaker®
1 SmartForm Designer™
1/2 Excel™ or Wingz™
1 Expert Typist
2 Tsp. MS Word®
1 Tsp. HyperCard®
100 Mhz CPU

Directions: Mix database and form design package, then let simmer for 2 years of development. Add charts, macros, and analysis functions from spreadsheet. Stir in expert typist to reduce keying errors and data entry time. Simmer with mail-merge from word processor and lightly spice with HyperCard buttons. Whip it up with 100 Mhz CPU speed until any trace of usual database sluggishness is eliminated.

Serving Suggestions: This Panorama recipe delivers breathtaking database performance when served on anything from a Mac Plus to a Ici. It contains all the nutritional requirements for improving the productivity of any business, while the taste appeals to both novices and power user gourmets.

Call today for our $9.95 Panorama video taste test!

CONSPICUOUS CONSUMER

73 Months of Inadequate Warranty

with mail-order companies, returning rejected goods that you’ve paid for, and so forth. The Sourcebook is a terrific resource that lists addresses and telephone numbers for national organizations such as the Council of Better Business Bureaus, trade groups, and state consumer agencies. It’s a great place to start if you need to escalate your complaint. Another book of interest is Credit Card Secrets, edited by California attorney Howard Strong. Strong says paying for mail-order purchases of computer hardware and software by check or money order is a big mistake; “buying with a credit card is like having a black belt in consumer karate, if you know your rights and how to get them.” His paperback is a handbook on credit card law and tactics; you can order it for $33.94 (includes shipping) from the Boswell Corporation, P.O. Box 7100, Beverly Hills, CA 90212.

MEA CULPA
In November I made a mistake when referring to GCC Technologies’ HyperDrive upgrade program. Upgrades through the program will net you substantial savings over retail, but they no longer represent a 40 percent discount.
MANAGING YOUR MONEY...
NO OTHER PROGRAM
DOES MORE FOR YOUR MONEY.

Managing Your Money® is the most comprehensive, easy to use money management program available on the Macintosh™! Fully integrated and updated for the new tax laws, MYM Mac is everything you'll ever need to master your personal or small business finances:

- CHECK WRITING AND BUDGETING
- TAX PLANNING
- INSURANCE PLANNING
- FINANCIAL PLANNING
- PORTFOLIO MANAGER
- NET WORTH

And there's more:

- POWERFUL SMALL BUSINESS FEATURES
- EXTENSIVE GRAPHICS & REPORTING
- EXPORTS TO EXCEL® AND MACINTAX®
- NOT COPY PROTECTED

Let Andrew Tobias become your financial advisor and find out why year after year, Managing Your Money is rated the outstanding program in its class.

"...Managing Your Money is the Mercedes of personal finance programs."
— Macweek, 9/13/88

MECA®

Software that makes your personal computer worth having.
© 1988 • MECA • 355 Riverside Avenue • Westport, CT 06880
For Macintosh Plus, SE, II, 512KE: Two disk drives (one being at least 800K).
Who says SuperPaint 2.0 is so great?

"...for plain old drawing and painting, you can't beat SuperPaint."
Errett Fenton, Macworld, August 1989.

"SuperPaint 2.0 is, without a doubt, the best upgrade I've ever paid for."

"SuperPaint remains the best black and white graphics program around."
Laurie Wighan, Publish!, August 1989.

"I've decided it's a better overall product than Canvas... SuperPaint has more to offer."

"...one of the most intuitive implementations of Beziers I have seen."
Carlos Martinez, MacUser, July 1989.

"SuperPaint offers quantity, quality, and depth in each of its options."

"It's a godsend for simple art."
Tom Thompson, BYTE, June 1989.

They Do.

SuperPaint
It just works better.

Suggested Retail Price $199. Upgrade $50 plus tax and shipping. To upgrade, call or write Silicon Beach. System requirements: Macintosh Plus, SE, SE/30, II, IIx or IIcx, System 6.0 or later. The Silicon Beach Software logo is a trademark of Silicon Beach Software, Inc. Silicon Beach Software, Inc. • 9770 Carroll Center Rd., Suite J, San Diego, CA 92126 • (619) 695-6956
Circle 266 on reader service card.
Toward a 24-Bit Color Standard

Is it worth the high price it commands?

By Thom Hogan

Last May I wrote about how the various Macintosh models handle the display. You may have wondered why I spent so little time describing 24-bit color boards. Well, at the time, 24-bit color was still an experimental (and expensive) proposition. And like the old chicken and egg problem, the software didn’t really exist because the hardware wasn’t there yet, and vice versa. The 24-bit color options available early last year tended to be kludgy, unique, and not particularly useful.

The situation is different now. In recent weeks, I’ve sat through dozens of demonstrations of the advanced color capabilities available to Mac II users. My current everyday monitor is a 19-inch Radius display with a speeded-up 24-bit color board. On the shelf behind my desk are a half-dozen soon-to-be-released software programs that understand how to talk to 24-bit color hardware. Obviously, it’s time to get up-to-date on the advances in the display world.

**IT STARTS WITH THE SYSTEM**

You can’t do anything in the 24-bit world without the System 6.0.3 QuickDraw INIT or a Macintosh IIci. I felt like a dummy after wasting the better part of an hour trying to get a 24-bit color board to work on my older Mac II, only to discover I had booted from a drive with System 6.0.2. (This reminds me of the universal law of hardware repair: Always check to see that the machine is plugged in before deciding that you need to replace the power supply.)

Before Apple released the new 24-bit color QuickDraw routines, 24-bit color boards essentially tricked the System in order to render images. Older RasterOps 24-bit boards, for example, patched all the traps in the System that call QuickDraw.

This method was fraught with hidden problems, but to the credit of RasterOps (and other companies), these boards worked quite well, albeit slowly. The slow speed was due to the huge number of pixels being updated by the Mac’s processor, not to any deficiency in the boards themselves.

Apple finally released its own 24-bit color scheme last April, the QuickDraw INIT released with System 6.0.3. Most 24-bit boards use the INIT—it’s in ROM on the Mac IIci. Though it’s actually a 32-bit color protocol, I, like others, still refer to the high-end color solution as 24-bit color because that’s how many bits are used to keep track of color information. By comparison, the standard monochrome Mac monitors use 1 bit, the standard Mac II display uses 8 bits for gray scale or color (if you purchase the full 256K complement of memory), and the new 32-bit QuickDraw protocol uses 24 bits.

The leftover 8 bits in color QuickDraw—called the alpha channel—are reserved for vendor use, meaning that Apple is not going to standardize on a use for them but suggests that they might be used to control video overlays. Overlays are used, for example, during televised football games, to superimpose a player’s name at the bottom of the TV screen. Typically, most of the screen (the background layer) is handled by a signal coming directly from one of the cameras covering the event, while the name (the foreground layer) is created by a character generator located in the TV studio or in a remote truck at the event.

Usually a character generator outputs colored letters on a black (no video) background. Roughly speaking, the black areas in the output are ignored and the colored areas are superimposed onto the background picture. This is a neat trick you might want to duplicate with your Mac in these days of multimedia hype. And that’s where the alpha channel checks in: with the right software, those extra 8 bits per pixel can be used to store information about which layer the pixel is in (foreground or background), whether the background should overwrite the foreground, and other details (other options include the ability to “etch” the background into the foreground, for example). (continues)
Put the NFL at your fingertips.

Hands-on pro football excitement is as close as your keyboard with NFL Challenge from XOR. This exciting, action-packed computer game gives you updatable rosters of all 28 NFL teams, offensive and defensive playbooks, and true-to-life realism with penalties, injuries, substitutions, and more!

Operating on the IBM PC, PC-XT,PC-AT, and their compatibles as well as the Apple Macintosh, NFL Challenge puts you at the heart of the action as you select the starting lineups, drive downfield against the clock, and go head-to-head against the league's most innovative offenses and formidable defenses.

Kick off your home season with this software classic now at your local computer store. Or call 1-800-NFL-CHAL TOLL FREE. Be sure to check out PRO Challenge® Basketball Challenge® Oligopoly® and Bermuda Square® examples of some other First Class Software from XOR.

The problem is, Apple tells the developers exactly what the lower 24 bits of the new QuickDraw pixel format mean, but it doesn't tell anyone what to do about the other 8 bits. I find this remarkable given Apple's intense interest in spawning a desktop multimedia market. Already some companies are using all 8 bits of the alpha channel in their products. The Truevision board, for example, uses these bits for overlays, animation control, and a host of other things. So developers who want their software to be compatible with the Truevision board will adopt that company's definition of the alpha channel.

But what about other hardware vendors? The problem most hardware companies have is making their products distinct from those of other companies. Most hardware companies hate to design their product to someone else's standards. So I've already seen incompatible alpha-channel assignments from several key vendors (Mass Microsystems and Truevision are examples). Quite frankly, if Apple wants multimedia to succeed—but that's another column—it needs to step in and show some real leadership. Hedging on the alpha-channel definition is the type of leadership you'd expect from Charlie Brown, not from a high-tech company.

BUT WHAT ABOUT SPEED?

I'm straying a bit. The issue is whether or not 24-bit QuickDraw is useful or necessary. Key to the protocol's acceptance will be its responsiveness and its usefulness in everyday software products. If every time you try to scroll a 24-bit color image it takes several seconds to update the screen, you're going to get frustrated and look for an alternative. If your software doesn't understand 24-bit color, there's no reason to buy the hardware needed to display it.

As for speed, fortunately Apple built a speedy alternative to 24-bit color into the new QuickDraw: dithering. If the slow updates of 24-bit images really bother you, simply switch (via the Monitors Control Panel device) to 8-bit color. The new QuickDraw will automatically dither the image for you. The result is closer to the real thing than 8-bit color alone, though not nearly as subtle or detailed as 24-bit color. The dithered image provides an idea of what the image (and any changes you're making to it) will look like in its full-color state, but without the speed penalty that 24-bit color usually adds.

Solutions beyond dithering are available as well. Radius, for example, now offers an accelerator board for its 24-bit displays. If you already have a Radius 24-bit display, you need only add the $795 QuickColor accelerator board for a speed boost (the accelerator can be added to any Radius 24-bit system at any time). The typical Mac II averages about 1 million instructions per second (MIPS). The QuickColor board consists of a 6-MIPS RISC processor that talks to the Radius DirectColor display boards through the NuBus block-transfer mode. A supplied INIT captures QuickDraw calls and routes many of them to the QuickColor's RISC coprocessor, which in turn quickly writes new information directly into the regular 24-bit display board. Radius claims that the typical Mac II writes to the display memory through the NuBus at the rate of about 3.8MB a second (that might seem fast, but remember that a 24-bit color image can be 7MB or more on the standard monitor). Radius further claims that QuickColor's use of the NuBus block-transfer mode speeds up writes to display RAM to as high as 27MB per second. Thus, even if the RISC coprocessor handling QuickDraw calls was merely the same speed as the Mac II's CPU (it's actually faster), the display should redraw at a much faster clip.

Unfortunately, Radius's approach has its drawbacks. First, not all QuickDraw operations are accelerated. Fills, patterns, and horizontal and vertical lines are sped up, as are copies of rectangular on-screen regions, but nonrectangular regions, angled lines, changes of one pixel at a time, and many other QuickDraw routines are left to be handled by the Mac II's sluggish CPU. Moreover, there appears to be some overhead associated with trapping the QuickDraw calls, which lowers all those potential speed increases somewhat.

Nevertheless, the QuickColor board does make a substantial difference in the usability of 24-bit color. Curiously, much of the improvement in speed comes with monochrome applications like word pro-

(continues)
cessing, since these applications frequently use large rectangular region copies (during scrolling, for example). As Radius product manager Stephen Becker puts it, “Using 24-bit color with the QuickColor card is almost as responsive as using an unaccelerated 8-bit color card; I tend to leave 24-bit color on all the time now that I have this product.” I agree. Graphic artists tired of bouncing back and forth between 8-bit and 24-bit mode will be happy to discover this board. The QuickColor board is the first option I’ve seen that would tempt me to use my Mac in 24-bit mode all the time.

Apple, too, has a tempting offering if you’re into detailed color images: the Mac IIci. The faster processor (25MHz instead of 16MHz) makes a lot of difference in screen updates, no matter how many color bits per pixel you’re working with. Eight-bit color on a IIci runs every bit as fast as monochrome on the IIx or IIcx. And 24-bit color on a standard-size monitor is very usable (more on that in a moment).

What Apple isn’t telling everyone is that the 32-bit QuickDraw code in the Mac IIci’s ROM is not the same as the QuickDraw that is installed as an INIT in System 6.0.3. This new IIci iteration of QuickDraw has been optimized and is measurably faster (how much, I can’t tell you, since I haven’t had a Mac IIci in my hands for more than a few minutes, and I can’t really afford to buy a new one). Not only that, but software in ROM runs slightly faster than the same software in RAM in the Mac II lineup. Here’s the real kick: take the ROM chips out of a Mac IIci and put them into an SE/30 or IIcx and you’ll speed up the display of that machine. Apple has mumbled privately about “perhaps” offering a ROM upgrade. If you own an SE/30 or IIcx, you should demand the upgrade (expect to pay something for it, of course).

But let’s get back to 24-bit color on a Mac IIci. With an unaccelerated Mac II, IIx, IIcx, or SE/30, I would recommend that you avoid 24-bit color. If you absolutely have to have it, Radius’s QuickColor is a viable short-term solution. But if with the availability of the Mac IIci and RasterOps’s new $995 24-bit color board (the 264), I foresee a new standard for the state-of-the-Mac desktop. The RasterOps board is a nifty bit of engineering in its own right, what with its reduced-power draw (it uses less than 1 amp in my machine) and ability to display images in 24-bit color on the standard Apple 13-inch color display. (It also offers NTSC output.) And the RasterOps 264 installed in a Mac IIci is a dream system for many of us—super performance in all color modes, with truly astonishing display speeds in monochrome. For the past few months I’ve been recommending Apple’s standard IIcx configuration as the high-end choice: Apple display, 4MB of RAM, and an Apple-supplied 80MB hard disk. Not any more. My new recommendation is a Mac IIci with 8MB of RAM (memory has gotten cheaper), the RasterOps 264 video board with the standard Apple 13-inch color monitor, and a 150MB drive (preferably one of the Wren models). You’ll need the extra memory and drive capacity when you start dealing with 24-bit images, and the IIci’s new ROM coupled with the RasterOps board provide high-quality, fast color display.

**BUT WHERE’S THE SOFTWARE?**

All this new nifty hardware leaves us with only one problem—an age-old one at that—where’s the software?

Well, the software scene is slowly shifting. (Ooh, that conjures up images, doesn’t it?) As I write this, SuperMac’s PiXelPaint Professional uses 24-bit color, and beta copies of updates for software abound here in my abode. Besides the image processing programs (like Letraset’s ColorStudio), there’s a wealth of paint and drawing programs about to break the software logjam. Desktop publishing programs like Aldus PageMaker and QuarkXPress seem finally to be addressing 24-bit color well (I’m taking that on the word of others who’ve tried them—my newsletter still uses the good ol’ black-and-white press). All this is well and good for desktop publishers: 24-bit color is actually becoming affordable and usable.

Thom Hogan is president of Macreations, a Macintosh software developer; publisher of The Macintosh II Report; and author of Programmer’s Macintosh Sourcebook (Microsoft Press, 1989).
The latest upgrade for your Mac is absolutely FREE!

That's right. Just fill in and mail us the coupon and we'll start your one year subscription to the MacWarehouse™ Catalog — absolutely FREE.

Everything you ever wanted to know about software, hardware and peripherals for your Mac.

More than eight hundred products carefully reviewed, skillfully described and colorfully photographed. It's THE Macintosh resource for all Mac users!

In approximately four weeks time you'll receive the brand new "HOLIDAY" edition of the catalog and you'll get each new edition (approximately four) during the next twelve months. Turn the page and get a preview of what's to come!

MacWAREHOUSE
1-800-255-6227
**Bigger, better, and more powerful than ever**

**Excel 2.2**

Excel 2.2 delivers a host of improvements and new features. Excel can now use the full memory of your Mac — up to 8 Megabytes. It recalculates up to 40% faster and empty cells consume no memory at all. Cell annotation lets you add notes to any cell and auditing functions help you trace cell references. The new Search and Replace function makes global changes.

Charting is improved — just double-click anywhere on a chart to see the dialog box for all the chart formatting commands. Charts are now dynamically linked to the original worksheet, so the chart automatically reflects any changes in the spreadsheet. Excel 2.2 also supports “warm links” to Word 4.0, so changes to your spreadsheet data automatically appear in your Word documents.

**BUS 0003 NCP**  
**Publisher:** Microsoft  
**Suggested Retail:** $249

---

**Microsoft's basic, “no-frills” word processor**

**Write 1.0**

Microsoft Write is great for people who like Word but don't need all its fancy functions. Microsoft calls it a streamlined subset of Word. Write is fast, and full of useful functions, such as a spelling checker with an expandable 80,000 word dictionary, footnoting, the ability to embed graphics in text, multiple columns, page preview mode, and suppression of headers and footers on title pages. If you don't need mail merge, outlining, glossaries, or style sheets Microsoft Write is right for you.

**WRD 0014 NCP**  
**Publisher:** Microsoft  
**Suggested Retail:** $79

---

**An old favorite gets better**

**Word 4.0**

Word 4.0 adds new page design capabilities to the feature-laden previous versions. Create newsletters with multiple columns, or even movie script-style documents. Design pages with different numbers of columns on the same page. Place sidebars exactly where you want them. Word automatically wraps text around graphics. For creating graphics, Word 4.0 includes SuperPaint at no extra charge. Tables are a breeze. Just tell Word how many rows and columns you need, and it generates your table, with automatic text wraps within cells. Word even has facilities for creating mathematical formulas. Word 4.0 has a spelling checker, hyphenation, Style Sheets, a glossary, automatic indexing, mail merge, and an integrated outliner. It is compatible with the MS-DOS version of Word, and with PageMaker (both Mac and PC versions), so you can exchange files among all four formats. Version 3.0 won the 1988 MacUser/Europe Victor, and the Macworld World Class Award.

**WRD 0022 NCP**  
**Publisher:** Microsoft  
**Suggested Retail:** $249

---
The Cutting Edge series of hard disk drives. If you've suffered through the disk drives (both internal and external versions) plug directly into your Mac's SCSI port and are pre-formatted, so they're ready to use, right out of the box. They're fast, compact, virtually noiseless, and use components from Seagate Technology (the world's leading manufacturer of hard disk drive mechanisms).

The design is not only attractive, but also functional, because it creates a convection cooling current, just as the Mac does. The steel alloy case also helps to radiate heat. All of that means Cutting Edge drives can use a smaller, quieter fan to assist the natural cooling process. A back panel SCSI address switch, plus a second SCSI plug, make daisy-chaining simple and convenient. You can connect up to seven SCSI devices (including scanners and printers) to the Mac, and the address switch tells the Mac where to look for your hard disk on the loop. For greater convenience, the back panel has an extra AC plug.

The internal drives work on the Mac SE, II, llx, and llcx. An LED for the front panel indicates disk access. The drives connect directly to the internal SCSI port, so they do not need an address switch. They do not have fans, because the Mac SE and II already have fans. Their rear mount bracket means that you can keep your double internal floppy disk drives.

All Cutting Edge drives carry the manufacturer's one-year warranty, plus a lifetime warranty on the cables and switches. Also, they come with a generous amount of public domain software, the current Apple System software, the current Apple System software, and freeware hard disk drive utilities, HD Backup, and a personalized copy of the TCE Manager (formatting and diagnostic software), and an anti-virus package.

Inexpensive, dependable external disk drive
800K Disk Drive
The Cutting Edge 800K External Disk Drive makes any Mac easier to use, even if you have a hard disk. It reads and writes both single and double sided floppy disks with equal ease. If you find yourself jumping through hoops every time you need to copy a floppy, you'll appreciate the convenience of having a second floppy disk drive. Just drag the first disk's icon over to the second disk, and let the Mac copy the contents. If you've suffered through the nuisance of trying to boot up a crashed system with a dysfunctional hard disk when you have only a single floppy disk drive, you'll appreciate the extra disk drive. At this price, why put it off?

The Cutting Edge disk drive is quiet, sturdy and reliable, and carries a full one year warranty from the manufacturer. An LED indicates disk access, just like a hard disk drive. For extra convenience, it even has a front panel disk eject button, so you don't have to fool around sticking paper clips through that little hole to retrieve a stuck floppy disk. It's compatible with the Mac Plus, SE, and Mac II; (but won't work with the old 128K or 512K Mac unless you've upgraded it with the new ROMs to a 512KE).
HARDWARE

INTERFACES

Need to hook up a parallel printer to your Mac?

Grappler Interface

The Orange Micro Grappler interface card connects your Mac to most parallel printers. Just plug the Grappler into the serial port, and it converts the output to the Centronics parallel format. If you have an old daisy wheel or dot matrix printer sitting around the office unused, put it to work and alleviate the traffic jam on your LaserWriter.

ACC 0227
Manufacturer: Orange Micro
Suggested Retail: $79

ACC 0237
Manufacturer: Orange Micro
Suggested Retail: $103

ACC 0284
Manufacturer: Orange Micro
Suggested Retail: $103

INPUT DEVICES

The more keys the better

Mac-101 Keyboard

The only extended keyboard available for the Mac 512, 512KE, and Plus. Includes macro software.

INP 0043
Manufacturer: DataDesk
Suggested Retail: $139

Mac-101 Keyboard ADB
For the Mac SE.
INP 0047
Manufacturer: DataDesk
Suggested Retail: $139

Mac-101 Keyboard MacII
For the Mac II.
INP 0048
Manufacturer: DataDesk
Suggested Retail: $139

NEW TURBO MOUSE

Kensington’s New Turbo Mouse speeds up Mac use, and saves desk space. The Turbo Mouse is like an upside-down mouse, or a track ball, so you only need to move the ball in its socket, not the whole assembly. Nudge it for tiny adjustments, or give it a good spin to dash across the screen. The automatic acceleration sensor is like a two-speed automatic transmission. It speeds up cursor movement when you move faster, and slows it down for precise positioning. A second button is a click lock, and you can assign one of seven common functions (Close, Save, Print, etc.) for both buttons at once. This well-designed mouse alternative won the 1988 Macworld World Class Award.

New Turbo Mouse 512, Plus
For the Mac 512, 512KE, and Plus.
INP 0059
Manufacturer: Kensington
Suggested Retail: $109

New Turbo Mouse ADB
For the Mac SE or II.
INP 0060
Manufacturer: Kensington
Suggested Retail: $109

HIGH-TECH ALTERNATIVE POINTING DEVICE

QuadLYNX Trackball

The QuadLYNX Trackball uses Honeywell aerospace technology to give you precise fingertip control over cursor movement. This device offers much greater precision in cursor placement than the standard-issue Apple mouse. Just spin the trackball and the cursor flies across the screen, quickly and accurately landing where you want it. If you’re using a large screen monitor, you need a trackball. It’s also great for desktop publishing, CAD/CAM, graphics, and arcade games.

QuadLYNX Trackball
For the Mac 512, 512KE, and Plus.
INP 0050
Manufacturer: Lynx Computer
Suggested Retail: $65

QuadLYNX Trackball ADB
For the Mac SE or II.
INP 0051
Manufacturer: Lynx Computer
Suggested Retail: $65

A+ Mouse

The A+ Mouse has no moving parts, except for the mouse itself. It uses an infrared LED and a reflective plastic mouse pad to determine its position. The mouse glides over the glassy smooth surface of the pad. Anyone who works with graphics or CAD/CAD applications will appreciate the convenience and precision of an optical mouse. Comes with manufacturer’s lifetime warranty.

INP 0044
Manufacturer: Mouse Systems
Suggested Retail: $63

A+ Mouse ADB
For the Mac SE and II, connects to the Apple Desktop Bus.
INP 0045
Manufacturer: Mouse Systems
Suggested Retail: $79

Kraft Joystick and mouse

For precise cursor control

Kraft QuickStick

The button placement ensures fast action and comfortable use, whether you’re playing an arcade game or working on a complex page layout. Precision gimbals and dual-axis fine-tuners give you complete control over its operation. Comes with manufacturer’s five-year warranty.

INP 0015
Manufacturer: Kraft
Suggested Retail: $59.95

Kraft Premium III Joystick

The Kraft Premium III Joystick is the same as the QuickStick, but it connects to the ADB port of the Mac SE or Mac II. It also works with the Apple IIGs.

INP 0064
Manufacturer: Kraft
Suggested Retail: $79.95

I’m Donna, call me at

MACWAREHOUSE
1-800-265-6227
(1-306-ALL MACS)
INQUIRIES: 1-201-307-0440 CANADA: 1-800-255-0447
ONLY $3.00

MACWORLD • FEBRUARY 1990
**HARWARE MEMORY UPGRADES**

Run your SE up to four times faster with an accelerator

**Marathon 020 Accelerator Boards**

Marathon 020 Accelerators are equipped with a 68020 chip running at 16 MHz. They rival the Mac II’s performance, for a fraction of the cost. Because Marathon 020 Accelerators use a programmable Logic Cell Array controller, you can re-configure them to accommodate future hardware upgrades or to optimize them for specific tasks. The on-board expansion slot gives you back the expansion slot you gave up to install the accelerator.

### Marathon 020 Accelerator Boards

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Suggested Retail</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSE1</td>
<td>Accelerator Card into its socket.</td>
<td>$429</td>
<td>Dove</td>
</tr>
<tr>
<td>MSE2</td>
<td>Includes one megabyte on-board memory.</td>
<td>$719</td>
<td>Orion</td>
</tr>
<tr>
<td>MSE3</td>
<td>Includes 68881 Math Co-processor, no memory.</td>
<td>$599</td>
<td>Dove</td>
</tr>
<tr>
<td>MSE4</td>
<td>Includes one megabyte on-board memory and 68881 Math Co-processor.</td>
<td>$699</td>
<td>Dove</td>
</tr>
</tbody>
</table>

**MacSnap Memory for Older Macs**

MacSnap memory expansion kits give your old Mac (512, Plus, or SE) the power to run the next generation of software. Using MultiFinder, keep several applications open, and switch from one to another without quiting and launching. Or, explore the exciting world of HyperCard. You’ll need at least two Megabytes to run System 7.0 when it arrives. So modernize your old Mac with more memory. It’s cheaper than buying a new computer.

### MacSnap 524E

Expands enhanced Mac 512K to one Mb.

- **DRI 0120**
  - Manufacturer: Dove
  - Suggested Retail: $99

### MacSnap 524S

Expands enhanced Mac 512K to one Mb. Includes SCSI interface and external SCSI connector.

- **DRI 0065**
  - Manufacturer: Dove
  - Suggested Retail: $99

### Affordable Ethernet Connections for the Mac

**FastNet Ethernet Adaptors**

FastNet connects your Macs to Ethernet LANs. It supports TCP/IP, EtherTalk, DECNet, and other protocols, so you can talk to mainframes and minis at Ethernet speeds. The FastNet SCSI and FastNet II are intelligent controllers, with their own 68000 chips and RAM buffers to take the processing load off your Mac.

### FastNet SCSI

FastNet SCSI is an external Ethernet adaptor that works with any Mac with a SCSI port. It is an intelligent controller with its own 68000 chip and 512K buffer RAM, but is not as fast as the FastNet NuBus cards.

- **DRI 0142**
  - Manufacturer: Dove
  - Suggested Retail: $749

### FastNet II

FastNet is an intelligent NuBus card for the Mac II, with 512K RAM, 64K ROM, and a 68000 chip.

- **DRI 0143**
  - Manufacturer: Dove
  - Suggested Retail: $565

### FastNet III

FastNet is a NuBus card for Mac II, but without on-board intelligence and buffering.

- **DRI 0144**
  - Manufacturer: Dove
  - Suggested Retail: $375

**Unleash Your Mac - and save money**

**MacSnap CMOS Memory**

MacSnap CMOS memory expansion kits require less power, so they run cooler than standard RAM chips. Don’t settle for that one Megabyte Mac you bought because you couldn’t afford the deluxe model. Upgrade it to full power with inexpensive, high-performance MacSnap memory.

### MacSnap 2S CMOS

Expands Mac Plus or SE to two Mb. using one Mb. surface mount CMOS chips: expandable to four Mb.

- **DRI 0122**
  - Manufacturer: Dove
  - Suggested Retail: $475

### MacSnap 4S CMOS

Expands Mac Plus, SE or II from one Mb. to four Mb. with one Mb. surface mount CMOS chips.

- **DRI 0123**
  - Manufacturer: Dove
  - Suggested Retail: $997

### MacSnap 8S CMOS

Expands Mac II from one Mb. to eight Mb. using one Mb. surface mount CMOS chips.

- **DRI 0124**
  - Manufacturer: Dove
  - Suggested Retail: $1029

**FastNet SE**

Plugs directly into the SE’s slot, and has 64K RAM and 64K PROM.

- **DRI 0145**
  - Manufacturer: Dove
  - Suggested Retail: $375

**FastNet SE/30**

Plugs directly into the SE/30’s slot, and has 64K RAM and 64K PROM.

- **DRI 0146**
  - Manufacturer: Dove
  - Suggested Retail: $375

**Marathon Racer**

A high-speed cache card with accelerator-like performance designed for the Mac II, plugs into the existing 68020 socket on the Motherboard.

- **DRI 0181**
  - Manufacturer: Dove
  - Suggested Retail: $159

**Open Your Mac in a Snap**

**MacSnap Tool Kit**

The essential tools for opening up your Mac 512, Plus, or SE to install memory upgrades, adaptor cards and fans. Includes the required hex screwdriver, case spreader, and a static strap.

- **DRI 0040**
  - Manufacturer: Dove
  - Suggested Retail: $15
You won't be in the rough when you play Computer Friends, Inc. MacGolf. This is the premium edition of MacGolf Classic (XOR Corp.) which includes the original MacGolf Classic plus much more, for a total of 108 holes to play. New features include 5 enlargement options for close-up viewing, 9 practice greens, a driving range, installability on hard disks and much more. Includes Plus, SE, and II (entertainment) $53.

ACCESSORIES

Apple
- Avery Labels (full line available) ................ 99.
- Color Coded 3.5 Diskette ................ 5.
- Laser 3.5 Diskettes ..................... 6.
- Laser Transparencies ................. 22.

Basic Needs, Inc.
- HardTop Keyboard Covers ........... 15.
- Keyboard Flip ......................... 5.
- Dust Covers - Grey Nylon Ripstop ........... 12.
- Mac SE and excl. or reg. keyboard ......... 11.
- Mac II and excl. keyboard ............ 12.
- Large Screen Monitor Stand .......... 32.

Computer Friends, Inc.
- MacBooker (II W & II W) ............. 41.
- Curtis
  - Computer Tool Kit (52 pc.) ........... 49.
- Curtis II keyboard .............. 5.
- Disk Holder (holds 40) ............. 9.
- Jewel Surge Suppressors ........ Cail.
- Ergotron
  - MacTilt-SE .................. 68.
  - MacTilt II-SE ................. 75.

Goldstein & Blair
- The Macintosh Bible .................. 20.
- I/O Designs
  - ImageWise II Carrying Case ....... 49.
- Macinware IICX Carrying Case ..... 89.
- Macinware Mac II Carrying Case ... 99.
- Macinware Plus Carrying Case ... 64.
- Macinware SE Carrying Case ...... 75.
- Monitorware Apple RGB Case ... 79.
- Ribbons black ..................... 4.
- Kalmar
  - Rolltop Teak disk holder 45 ....... 14.
  - Rolltop Teak disk holder 90 ....... 21.
- Kensington
  - Anti-Glare Filter .............. 33.
  - Apple Security Kit ............ 34.
- Mac II Stand w/Cable Kit ...... 64.
- MasterPiece Mac II 105.
- PowerBacker 360 UPS Line ...... 269.
- PowerBacker 400 UPS Line ...... 279.
- PowerBacker 1200 UPS Line ... 849.
- System Saver ..................... 63.

Mobius Products
- Cordless Mouse ................. 99.
- Fanny Mac GT ................... 59.
- SE Silencer ...................... 39.

DiskFit 1.5 (SuperMac)
A handy utility for backing up your hard disk on a series of floppy disks. It saves time because it backs up only those files which have changed since the last backup. DiskFit can verify each floppy after copying files onto it, so you know that your files are safe. DiskFit also discards old versions of files so your backup set doesn't keep growing. Version 1.5 supports a variety of cartridge tape drives, including the Apple tape backup system. (Utilities) $59.

Polaroid
- Circular Polarizing Filter ........ 35.
- Read-Write
  - CompuDuster .................. 29.
  - Kleen & Dry CRT Pads ...... 5.
  - Computer Care Kit .... 45.

DataStor 8000-Personal Organizer
(Microlytics)
Organization in a nutshell! DataStor 8000 Personal Organizer is a portable, pocket-size information manager that reminds, notes, files, transfers, calculates and organizes your life. Carry important information with you by down loading it from your computer to the Personal Organizer. When you return, any information you entered can be easily uploaded to your computer. It's all you need to get on top of things...and stay there (hardware) $68.

ACCOUNTING AND PERSONAL FINANCES

Aatrix
- Checkwriter .................. 37.
- Payroll 3.5 ................... 109.
- Payroll PLUS or TimeMinder ...... 149.
- BedBoard (Computer Associates)
  - Simpy Accounting ........... 209.

Brown-Wag Publishing
- Madjuggers .......... 159.
- Service Industry Accounting ..... 209.

D.A.C
- D.Easy Light ............. 42.
- Intuit
  - Quicken 1.5 ....... 36.
  - Layered, Inc. at Onece ..... 289.

MECA
- Managing Your Money ....... 124.

Monogram
- Business Sense ............. 289.

Nolo Press
- For The Record ......... 29.
- WillMaker .................. 32.
- Reality Technologies
  - WealthBuilder ............. 165.

Shopkeeper Software
- BillIt 2.0 ............. 99.

Softview
- MacTax 88 ............... 69.
- Taxview 1040 .............. 309.
- Survivor
  - MacMoney 3.5 ....... 60.

BLANK MEDIA

B.A.S.F. made in U.S.A
- DS/DD (box of 10) ............. 15.
- DS/HD Density (1.44 Meg) .... 29.

Peripheral Land, Inc.
- Turbo 40 Cartridge .... 115.

Sony

Casino Master (Centron)
Become a Master of Casino Gambling! Five separate casino games include BlackJack Ace, CrapsMaster, Roulette Master, Pokermaster, and Baccarat Master. Exact table simulation, mouse controlled betting, selectable bankroll, stored win/loss statistics and complete manual included. Now available in dazzling color in the Mac II version! Recommended and used by professional gamblers! (Entertainment) Buy individual games for $27. each or get the 5 game Casino Master Package for $49. or the Deluxe Mac II color version for $55.
Believe it or not, between now and December 22nd, you can place your order with MacWarehouse any time up to 12:00 midnight (E) and still have your package delivered not long after the morning paper! All for our amazingly low $3 overnight delivery charge!

How do we do it? We’ve set up a satellite warehouse at a former U.S. Strategic Air Command base in the midwest. And while you’re fast asleep we pick, pack and fly through the night to deliver your package.

Win the NEW Mac Portable!
It’s here at last! It has all the power and convenience of your Mac in a 15.7 pound portable package.
And you can win the new Macintosh Portable by entering the MacWAREHOUSE PORTABLE COMPUTER GIVEAWAY. Your name is automatically entered into the drawing when you order from MacWAREHOUSE, or when you fill out and send in the Official Entry Coupon below.

SuperCard (Silicon Beach) Your HyperCard compatible “software toolkit” for creating anything from productivity stacks to color multi-media presentations. Provides color Paint and Draw, animation creation, custom menus and windows, full screen support, and the ability to open multiple stacks. (hyperware) $128.
Super 3D Convert 2D drawings into 3D models easily with automatic commands in this powerful graphics program. Shade with multiple light sources and thousands of colors, then animate automatically. (graphics) $319.

MacInTax (Softview) MacInTax '89 guides you through the process of preparing your Federal Taxes (eight state tax modules also available). Just type in the requested numbers, and MacInTax does the rest. When finished, print the completed return on the LaserWriter or the ImageWriter. It reads last year’s MacInTax files and brings forward relevant items. (finance) $69.

Dreams (Innovative Data Design) A powerful precision drawing tool for professionally scaled drawings and general purpose graphics. Dreams offers zoom, rotation, layers, dimensioning, symbol libraries and a vast array of drawing tools, as well as many advanced illustration features. You can merge shapes together, cut edges of objects using other objects as templates... even glue lines and curves together to form unique shapes to be filled with colors or patterns. (graphics) $269.

OFFICIAL ENTRY COUPON
MacWarehouse Portable Computer Giveaway
1690 Oak Street, P.O. Box 1579, Lakewood, NJ 08701

When you order by phone or mail, you are automatically entered in the drawing. You can also mail this coupon or call our contest entry line. 1-800-367-0787.

Name ____________________________
Address __________________________
Apt. ____________________________
City __________________ State ______ Zip ______

MacWAREHOUSE 1-800-255-6227
(1-800-ALL-MACS)

Inquiries: 201-367-0440
FAX: 201-905-9279

Call anytime — day or night 24 hours a day, seven days a week

*Midnight Express service available weekdays.
The Puzzle Storybook
Zug the Megasaurus is back with The Puzzle Storybook for children ages 3-8. Children create pictures, solve puzzles and write stories to combine language arts activities with geometric shapes to build early reading and writing skills. (education) $27.

Managing Your Money
A fully integrated software program addressing every aspect of personal and small business finance. Write and print checks, set up a personal budget, estimate your taxes and more. (finance) $124.

Down Jones News/Retrieval
Down Jones News/Retrieval membership package comes with B-2 Online, a communications software, provides the new user with 5 hours of free online time. Connects with more than 5,000 databases, up-to-the-minute news and financial data, plus extensive reference library. (communications) $24.

MacKNOWLEDGE
MacKNOWLEDGE is the latest communications software available for your Macintosh. Icon-based scripts provide instant access to all major online services with just the click of your mouse. The TAL scripting language provides all the capabilities for customizing and automating your online sessions or the record function will watch your session and create an icon based script automatically. Also provides support of 9600 bps and MNP modems. (communications) $149.

DESKTOP PUBLISHING
Applets
MicroTV ........................................... 289.
Aldus
PageMaker 3.0 .................................... 385.
PageMaker Color Extension .................... 179.
Broderbund
DTP Advisor ....................................... 47.
Data Translation
ProtoMac ........................................... 609.
Emerald City Software
Smart Art I, II, or III .............................. ea. 85.
Icon Simulations
MacKern ............................................. 119.
Lreset
ColorStudio or FontStudio ........................ Call.
ImageStudio ...................................... 275.
Ready,Set,Go! ..................................... 275.
Oldwai
Plus 1.1 ............................................. 115.
Read-It! 2.1 (OCR) .............................. 249.
Read-It! Personal .................................. 98.
Read-It! TS (Thunderscan) ...................... 79.

Exposure (Preferred Publishers)
Integrated CDEV screen graphics utility for screen capture, painting and formatting of color and grayscale images. Unique format includes built-in painting tools and fonts/utilities. $54.

Direct Mail
Complete correspondence solution for labels, envelopes, addresses, form letters and telephones dialing. Easily searches, sorts, and mails address files for select mailing, merging or exporting. Available for DA or application. (business) $54.

Address Book Plus / Address Book Plus with Binder (Power Up!)
Address Book Plus is the most complete and ready-to-use solution for managing names, addresses, phone numbers and other vital information. Users can input, edit and view business and personal contact information, and print it out in a variety of ready-to-use forms including address book pages, rotary-dial or index cards, phone list, mailing labels, and envelopes. It also provides searching and automatic dialing capability in a separate Desk Accessory. (business) Address Book Plus $53 or Address Book Plus w/Binder $99.

EDUCATIONAL/PERSONAL
Bootware Software
ResumeWriter Pro ............................... 58.
BrightStar
Alphabet Blocks 3.01 ............................ 30.
Talking Titles ..................................... 27.
Davidson
Math Blaster ....................................... 27.
Speed Reader II ................................... 27.
First Byte
The Dinosaur Discovery Kit ..................... 27.
The Puzzle Storybook ............................ 27.
The Rhyming Notebook .......................... 27.
Fair Tide Technologies
Navigate mono .................................... 199.
Help Software, Inc.
Desktop Help for Excel ........................... 50.
Learning Company
Reader Rabbit or Math Rabbit .................. 31.
MicroTech
Elementary Signer ................................ 49.
Finger Speller ................................. 29.
The Software Toolworks
Mavis Beacon Teaches Typing ................. 32.
Visionary Software
Synchronicity .................................... 39.
Voice & Video Instruction Videos
HyperCard or Pagemaker 3.0 .... ea. 35.
Word 4.0 Video Tape ............................ 35.

ENTERTAINMENT
Access Software, Inc.
World Class Leader Board ...................... 27.
Artworx
Bridge 6.0 ........................................ 24.
Daily Double Horse Racing ..................... 19.
GraQuest ......................................... 19.
Broderbund
Ancient Art of War At Sea ....................... 27.
Shufflepuck Cafe ................................. 24.
Where in the World is Carmen ................. 27.

WealthBuilder (Reality Technologies)
Turn your Mac into your own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risk that you are willing to assume, WealthBuilder searches for the best investments available to fulfill your objectives. The program also allows you to change any information or assumptions immediately and immediately view its impact on your overall financial picture. WealthBuilder is your personal tool to a brighter financial future. (finance) $165.
Multi-Screen Full Size Display (Mobius)
Expand your vision with a 14 inch monitor. The Display combines a Princeton Graphics 14-inch monitor with the MultiScreen Video Card. Just slide the interface card into your Mac SE and connect it to the Princeton monitor. Enjoy the benefits of a larger screen that can display the full width of a letter-sized page, and over half its length. The software allows you to use your present SE screen in conjunction with your new larger one. You can optimize the display for either 72 or 85 dpi resolution. (hardware) $529.

Prometheus
Acknowledges .................. 289.
MacKNOWLEDGE .................. 149.
Software Venture
Microphone II v.3.0 ............ 219.
Traveling Software
Lap-Link .................... 81.

DATABASE SOFTWARE
Acus
4th Dimension 2.0 ............. 469.
AEC Management Systems
Project Formation Manager 409.
Blyth
Omnis 5 .................. 369.
Claris
FileMaker II ............. 225.
Fox Software
FoxBASE + Mac ............. 295.
Microsoft
File 2.0 .................. 125.
Questa
Double Helix III ............ 349.
GeoQuery .................. 199.
ProVUE
Panorama .................. 205.

DESK ACCESSORIES
Casady & Greene
SuckDuck Ventures ........ 31.
JAM Software
Smart Alarms & Appt. Diary .. 49.
Smart Alarms (1 - 4 users) .. 99.
Smart Alarms (5 - 8 users) .. 149.
Smart Alarms (9 - 16 users) .. 199.
Preferred Publishers
DATABASE ............. 72.
Vantage .................. 55.
SmartScrap & The Cliper 2.0 .... 49.

Computer and Office Supplies
API Software
VISA .......................... 25.
Mastercard .......................... 25.
No surcharge.
Your credit card will not be charged until your order is shipped.
If we must ship a partial order, we pay the freight on the remaining portion.
All U.S. shipments are insured at no extra charge.
C.O.D. orders accepted (add $6.00 including shipping) — $100.00 maximum.
Cash, money order, or cashier's check.
Corporate purchase order accepted subject to credit approval.
All products are covered by a 120 day limited warranty.
Sales tax: CT residents add 6% NJ residents add 6% Ohio residents add appropriate tax.

SHIPPING
All orders add $5.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)
Orders placed by 12:00 Noon (EST) (weekdays) for "in stock" items ship same day ( barring system failure, etc.) for overnight delivery.
C.O.D. orders ship via UPS (Blue Label if you are more than 2 days from us via UPS Ground). Charge is $5.00 including shipping.

"Software replaced immediately. Hardware replaced or repaired at our discretion.

MORE FOR YOUR MONEY...
**G U A R A N T E E**

Many of our products come with a thirty day money back guarantee, if you are not completely satisfied. Ask for details when you place your order.

---

**OVERNIGHT DELIVERY**

**ONLY $3.00**

---

**Visual Information Manager**

Aperture moves Macintosh graphics into a new dimension by integrating a powerful database manager. Aperture allows you to create detailed drawings, attach data to objects in your drawings, produce reports, link drawings together, and display data on your drawings to form complete applications. Whether you are an architect, engineer, designer, or someone who needs to communicate complex ideas and information, Aperture will become your program of choice. (business) $729.

---

**Spectrum HoloByte**

 Falcon 2.0 ........................................ 31.
Falcon color version .......................... 24.
Springboard Hidden Agenda .................... 32.

---

**The Software Toolworks**

ChessMaster 2100 .................................. 32.
Cribbage & Gin King ............................. 39.
Life & Death ........................................ 32.
The Hunt for Red October ........................ 32.

---

**FONTS**

Adobe Type Manager ............................. 57.
Adobe Type Manager Plus .................. 113.
Calligraphy ........................................ 279.
Textures, Fills, and Patterns ............. 129.
Aldus Fontastic Plus 2.0 ..................... 52.
The Art Importer 2.0 ......................... 92.

eQuo 

---

**GRAPHICS AND DESIGN**

3D Graphics Images w/Panorama ............... 82.
Graphics & Symbols ............................ 199.
Business 1 ....................................... 85.
Adobe Illustrator 88 1.8 .................... 279.
Streamline .........................................
Aegis Development, Inc. ........................
Showcase F/X ................................. 199.
Aldus Freehand 2.0 ............................. 345.
Broderbund Drawing Table .................... 75.
Type/Slyle ....................................... 129.

---

**HARDWARE AND PERIPHERALS**

**Cutting Edge**

Two Page Monochrome Monitor .................
DEST 

**DEST**

PC/Scan Plus .................................. 699.
General Computing Company ...WriteMe Ink Jet Printer ....... 585.
magnavox Dream Monitor 14" ................... 535.
Microlytics DataStor-8000 Personal Organizer . 65.
Micronet MSF-3000 Scanner .................. 1589.
Mobilus Multiscreen Video Card w/Princeton 15" monitor .......................... 529.
Gums Crystal Print Publisher ................. 3445.
Seikosha America Seikosha Printer (dot-matrix) .... 235.
from the finder, even if its application is Hyperware and displays it on your screen. It tells it which card has the information, missing. You can specify a compatible substitute based on the document’s creation date, warranty. (input/output) $129. International versions also available.

HyperHit 1.0
Extends the power of HyperCard by giving it the ability to search for cards at lightning speeds. HyperHit creates structured HyperCard files with indexed sort keys, so that your Mac doesn’t have to read every card in every stack to find the right one. It checks the index, which tells it which card has the information, and displays it on your screen. (hyperware) $129.

CanOpen
Information retrieval utility for the Mac. CanOpen will search anywhere, and let you retrieve just about anything, including text, pictures and sounds. Locates text inside pictures, and gives you the whole picture! Anything you retrieve with CanOpen can be stored in its library, so the next time you need it, its just a click away. (utilities) $65.

HandOff
HandOff lets you open any document from the finder, even if its application is missing. You can specify a compatible substitute based on the document’s creator or file name extension, even across networks. Jean-Louis Gasseau calls it “a nice, unobtrusive and very much needed extension to my Macintosh.” (utilities) $35.

HyperDialer 360
(Rensington) Takes over when the power goes off. The Power Backer 360 uses a rechargeable battery to provide continuous electrical power - plus surge suppression and noise filtering. Have you ever lost data or damaged a System File when the lights flickered? Now, for less than the cost of a hard disk, you can keep your Mac humming. (accessories) Provides 360 VA, $269. Power Backer 800, $749. Power Backer 1200 $949.

INPUT/OUTPUT
Cutting Edge
CE-105 ADB Keyboard .......... 129.
DataDesk Intl.
Mac 101 Keyboards .......... 139.
Kensington
Koala
MacVision 2.0 .................. 219.
Kraft
ADB Joystick Premium III (SE&II) .......... 49.
QuickStick .......... 39.
Kurta
IS/ADB Tablet 8 1/2 x 11 .......... 255.
Mouse Systems
A+ Mouse (SE/II) .......... 79.
A+ Mouse (512/Plus) .......... 63.
ZING (Mindscape)
Create 2D images and extrude them into 3D, or use Enabling Technology’s 3D-clip art libraries. You can even scan the image in Rotate, bend, stretch, compress, or shade them. Change the ambient and direct lighting. Make it easy to give your presentations or documents depth, dimension, and added impact. The program supports 16.7 million colors, and is compatible with some of the most popular and advanced page layout, word processing, presentation and graphics packages. (graphics) $139.

Practical Solutions
The Cordless Mouse .......... 57.
Mouse Master .......... 99.
Summographics
Bit Pad Plus .......... 325.

BrainPower
ArchText .................. 199.
Bright Star Technology
HyperAnimator 1.5.1 .......... 59.
interFACE .................. 250.
DataDesk International
HyperDialer ............... 29.
ICOM Simulations
HyperTMCN .......... 59.
MicroMaps
Power Up
Hyper Tutor .......... 29.
Silicon Beach
SuperCard ............... 128.
Softstream International
HyperHi 2 .......... 125.
Springboard
Symmetry
HyperCA 1.2 .......... 49.
TimeWorks
HyperWorks Organizer .......... 60.

LINGUISTICS
Digitalk, Inc.
Smalltalk/V MAC ............. 129.
QuickBasic .......... 65.
Shana Corporation
Prototype .......... 119.
SmithersBarnes
Prototypa .......... 369.
Zeacor
ZBasic 5.0 .......... 89.

32-bit support. A MAP is provided for Mac Plus, SE, SEII, II, llx.

MEMORY UPGRADES/ ACCELERATORS
1 MEG SIMMS
Low Profile, 100ns High Quality Single In-Line Memory Modules for Mac Plus, SE. II, llx. 2 yr. Warranty. New low price $119.

Dove
(full line available)
MaraThon 030 Accelerator .......... 969.
MaraThon 030X .......... 999.
MaraThon Racer .......... 159.
MacSnap 2S .......... 249.
MacSnap 4S .......... 498.
MacSnap 8S .......... 1029.
MacSnap 524S .......... 239.
MacSnap 548S .......... 499.

MODEMS/FAX
Abaton
InterFax12/48 .......... 269.
Best Data Products
SmartOne 2400/1200 .......... 145.
Hayes
Smartmodem 1200 .......... 295.
Smartmodem 2400 .......... 429.
Smartmodem 9600 (V series) .......... 799.
Prometheus
Modem 2400 SE Int. .......... 209.
Modem 2400M .......... 199.

HyperDialer (DataDesk International)
Now you can connect your Macintosh to your existing business or home telephone for automatic dialing with Apple’s HyperCard. DataDesk’s HyperDialer is designed specifically for HyperCard’s touch-tone dialing capabilities and works with-line business phones without requiring a modem or dedicated phone line for automatic dialing. Automatically dials HyperCard, SideKick, Focal Point, C.A.T., SuperCard and QuickDex phone numbers. It connects to Mac speaker port - not a precious serial port. (hyperware) $29.

MACWORLD • FEBRUARY 1990

Circle 78 on reader service card
Tomorrow's Upgrade For Your Mac Is Only $119.*

A Mac Warehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your Kit in your hands tomorrow.

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spreadsheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PLUG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You don't even need a soldering iron. Just open your Mac, slide out the main circuit board, and plug in your memory card. Complete installation instructions are included with each memory kit.

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2) $119 ea.

The chart explains exactly what you need to achieve the desired level of performance.

<table>
<thead>
<tr>
<th>Memory Amount</th>
<th>Upgrade Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 MB</td>
<td>Remove all existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.</td>
</tr>
<tr>
<td>2½ MB</td>
<td>Remove only two 256K SIMMs, install two 1M SIMMs.</td>
</tr>
<tr>
<td>4 MB</td>
<td>Replace all four 256K SIMMs with four 1M SIMMs.</td>
</tr>
</tbody>
</table>

To upgrade an 8-socket Mac II, Iicx, or SE30 to this amount of memory Do this: (install in multiples of four only)

<table>
<thead>
<tr>
<th>Memory Amount</th>
<th>Upgrade Instructions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 MB</td>
<td>Remove all existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.</td>
</tr>
<tr>
<td>5 MB</td>
<td>Keep existing 256K SIMMs, install four 1M SIMMs in remaining sockets.</td>
</tr>
<tr>
<td>8 MB</td>
<td>Remove all four 256K SIMMs install eight 1M SIMMs.</td>
</tr>
</tbody>
</table>

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just $15.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single Inline Memory Modules). Each one megabyte SIMM card holds eight top quality, memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

*Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100 ns Samsung kits is $119. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help make your choice an easy one.

SPEED

Do you need 80, 90 or 100 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by 2:00 a.m. (E), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

MacWAREHOUSE

1-800-255-6227
ORDER TOLL-FREE
24 HOURS A DAY
Inquiries: 1-201-367-0440
Fax: 1-201-905-9279
© 1989 Micro Warehouse Inc.

30 DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your Mac Warehouse Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. Mac Warehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.
HyperHit 1.0

Extends the power of HyperCard by giving it the ability to search for cards at lightning speeds. HyperHit creates structured HyperCard files with indexed sort keys, so that your Mac doesn’t have to read every card in every stack to find the right one. It checks the index, which tells it which card has the information, and displays it on your screen.

Mac-101 Keyboards (DataDesk Intl.)

Features 101 keys including a numeric keypad, a separate T-shaped cursor keypad, Cancel Key, Option and Command keys at both ends, definable function keys, plus scrolling, page control, and zooming keys. Manufacturer’s two year warranty (input/output) $139. International versions also available.

INPUT/OUTPUT

Cutting Edge
CE-105 ADB Keyboard ... 125.
DataDesk Int'l.
Mac 101 Keyboards ... 139.
Kensington
New Turbo Mouse ... 109.
Koala
Mac Vision ... 219.
Kraft
ADB Joystick Premium III (SE/II) ... 49.
QuickStick ... 39.
Kurta
IB/ADB Tablet 8 1/2 x 11 ... 255.
Mouse Systems
A+ Mouse (SE/II) ... 79.
A+ Mouse (512/Plus) ... 63.

MEMORY UPGRADES/ACCELERATORS

1 MEG SIMMS
Low Profile, 100ns High Quality Single In-Line Memory Modules for MacPlus, SE, II, IIE

Dove (full line available)
MaraThon 030 Accelerator ... 969.
MaraThon 030X ... 999.
MaraThon Racer ... 159.
MacSnap 28 ... 249.
MacSnap 4S ... 498.
MacSnap 6S ... 1029.
MacSnap 524E ... 187.
MacSnap 524S ... 239.
MacSnap 548S ... 499.

MODEMS/FAX

Abaton
InterFax/1248 ... 269.

Best Data Products
SmartOne 2400/1200 ... 145.
Hayes
Smartmodem 1200 ... 295.
Smartmodem 2400 ... 429.
Smartmodem 9600 (V series) ... 799.
Prometheus
ProModem 2400 SE Int. ... 209.
ProModem 2400M ... 199.

HyperDialer (DataDesk International)

Now you can connect your Macintosh to your existing business or home telephone for automatic dialing with Apple’s HyperCard. DataDesk’s HyperDialer is designed specifically for HyperCard’s touch-tone dialing capabilities and works with-line business phones without requiring a modem or dedicated phone line for automatic dialing. Automatically dials HyperCard, SideKick, Focal Point, C.A.T., SuperCard and QuickDex phone numbers. It connects to Mac speaker port - not a precious serial port. (hyperware) $29.
Supra
Supra Modern 2400 .............................. 139.
US Robotics
Courier 9600 Modern .......................... 689.

MUSIC AND SOUND

Altech
MIDI Interface ....................................... 59.
Bogas Productions
Super Studio Session 2.0 ........................ 69.
Coda
Finale .................................................. 479.
MacDrums .............................................. 31.
Percussion ............................................ 50.

Electronic Arts
Deluxe Music Construction 2.5 .................. 85.
Deluxe Recorder ...................................... 99.

Esthetic Engineering
Music Mouse ......................................... 49.
Farallon Computing
MacRecorder (records sound) .................... 164.
Screen Recorder .................................... 129.

First Byte
SmoothTalker ........................................ 33.

Great Wave
ConcertVerse+ MIDI/4.0 .......................... 78.

HIP Software
Harmony Grid ........................................ 59.

Intelligent Music
Orchestra .............................................. 59.
Passport Designs
Master Tracks Pro 3.0 ............................ 259.
NoteWriter .......................................... 325.
Passport MIDI Interface .......................... 89.

Primer Software
Different Drummer .................................. 59.

Repertoire
Music Publisher ..................................... 375.
Listen 2.0 ............................................ 62.

NETWORKING PRODUCTS

Connect Inc.
MacNet .............................................. 47.
Dove
FastNet SC4 ......................................... 749.
FastNet III .......................................... 375.
FastNet SE or SE/30 .................................. ea. 375.

Rapport (Kenneth Technology)
Just plug Rapport into the External Disk Drive port on your Mac. Suddenly, your Mac can read MSDOS disks on its Internal Floppy Disk Drive. With an 800K External Disk Drive, you can read, write, and format MSDOS disks. As an added bonus, Rapport can increase the capacity of Mac disks on 12 Mega-bytes on the External Drive. It adds the functionality of Apple’s new FDHD drive — at a lower cost .(drives) $219.

Farallon
Timbuktu 3.0 ......................................... 95.
Timbuktu Remote 1.0 ............................. 129.
TrafficWatch ......................................... 132.
PhoneNET PLUS .................................... 33.
PhoneNET Repeater ................................ 319.
PhoneNET Star Controller ....................... 1065.

Microcom Software
Carbon Copy Mac .................................... 119.
Shiva
NetBridge .......................................... 339.
NetSerial X232 ..................................... 279.

TOPS
NetPrint .............................................. 119.
FlashBox ............................................ 123.
FlashCard ........................................... 159.
Repeater ............................................ 129.
Telecommunications .............................. 29.

TOPS DOS .......................................... 115.

SECURITY AND VIRUS PROTECTION

ASD Software, Inc.
FileGuard 2.0 ...................................... 125.
FileGuard Extend (office 5-pak) .................. 369.

Deluxe Recorder (Electronic Arts)
Deluxe Recorder transforms your Mac and MIDI compatible instrument into a home recording studio and helps you create and perform musical compositions. Use it alone or use it with Deluxe Music Construction Set and your other music software programs. It provides all the power of a multi-track tape recorder with all the vital controls for recording and playing, including fast forward, rewind, overdub, mute solo, punch in/out and more (music) $99.

Spelling/Dictionary
Thesaurus Checkers
Deneba Software
BigThesaurus ........................................ 59.
Spelling Coach Pro .................................. 115.

HJC Software, Inc.
Vrex 0.1 ............................................ 55.
Kent Marsh
MacSafe or NightWatch ......................... ea. 87.
QuickLook .......................................... 37.

Mainstay
AntiToxin .......................................... 59.
Symantec Corporation
S. A. M. ............................................... 83.

SMART TIMING

Abacus Concepts
StatView II .......................................... 295.

BrainPower
StatView 512+ (requires 512K) .............. 149.
D2 Software
MacSpin 2.0 ......................................... 189.

Odesta
Data Desk Professional ......................... 289.
Paracomp
Milo .................................................... 159.
Select Micro Systems, Inc.
Extastix ............................................. 219.

Wolfram Research
Mathematica (SE) ................................. 450.

UTILITIES

Abbott Systems
CanOpener .......................................... 65.

Affinity
Tempo II ............................................. 79.

Aladdin Systems Inc
Programmer’s Assistants ...................... 75.

Shortcut ............................................. 59.
<table>
<thead>
<tr>
<th>POWERFUL SOFTWARE TOOLS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LightningScan</td>
<td></td>
</tr>
<tr>
<td>Lightningscan Plus, SE and II family</td>
<td>(hardware)</td>
</tr>
<tr>
<td>GO Technologies</td>
<td></td>
</tr>
<tr>
<td>Central Point Software</td>
<td></td>
</tr>
<tr>
<td>MacWrite II</td>
<td></td>
</tr>
<tr>
<td>PC Tools Deluxe For Mac</td>
<td></td>
</tr>
<tr>
<td>Dantz Development</td>
<td></td>
</tr>
<tr>
<td>Retrospect</td>
<td></td>
</tr>
<tr>
<td>Emerald City Software</td>
<td></td>
</tr>
<tr>
<td>LaserTrack 2.0</td>
<td></td>
</tr>
<tr>
<td>Fifth Generation</td>
<td></td>
</tr>
<tr>
<td>DiscLock</td>
<td></td>
</tr>
<tr>
<td>FastBack II</td>
<td></td>
</tr>
<tr>
<td>PowerStation 2.5</td>
<td></td>
</tr>
<tr>
<td>Pyro</td>
<td></td>
</tr>
<tr>
<td>Suitcase II</td>
<td></td>
</tr>
<tr>
<td>GO Technologies</td>
<td></td>
</tr>
<tr>
<td>MacTree Plus</td>
<td></td>
</tr>
<tr>
<td>ICOM Simulations</td>
<td></td>
</tr>
<tr>
<td>On Cue</td>
<td></td>
</tr>
<tr>
<td>Insight Development</td>
<td></td>
</tr>
<tr>
<td>MacPrint</td>
<td></td>
</tr>
<tr>
<td>MicroLogic</td>
<td></td>
</tr>
<tr>
<td>AutoSave II</td>
<td></td>
</tr>
<tr>
<td>BackMatic</td>
<td></td>
</tr>
<tr>
<td>POWERIcons or POWERmenus</td>
<td></td>
</tr>
<tr>
<td>Mainstrea</td>
<td></td>
</tr>
<tr>
<td>Capture 2.0</td>
<td></td>
</tr>
<tr>
<td>Microlytics</td>
<td></td>
</tr>
<tr>
<td>GCorder</td>
<td></td>
</tr>
<tr>
<td>Oldувai</td>
<td></td>
</tr>
<tr>
<td>CopShare</td>
<td></td>
</tr>
<tr>
<td>MultiClip</td>
<td></td>
</tr>
</tbody>
</table>

**WORD PROCESSORS AND OUTLINERS**

| DeltaPoint, Inc.      |   |
| FitWrite Professional |   |
| Ashton-Tate          |   |
| FullWrite Professional|   |
| Claris               |   |
| MacWrite II          |   |
| Microsoft            |   |
| WordPerfect          |   |
| New Horizons Software|   |
| WordMaker            |   |
| Idec & Associates    |   |
| EndNote              |   |
| Symmetry             |   |
| Acta Advantage wDA   |   |
| T/Maker              |   |
| WriteNow 2.0         |   |
| WordPerfect Corp.     |   |
| WordPerfect          |   |
| Working Software     |   |
| QuickLetter          |   |

**Laser Printer Stand**

Fits any size printer. Store extra toner cartridges or supplies conveniently underneath. A three- piece metal construction fits any size printer. $28.

**Large Screen Monitor Stand**

Raisers your monitor four inches for easier viewing. Allows you to store your keyboard and other supplies underneath. $39.

**The Keyboard Flip**

This allows you to "flip" your keyboard on its side for storage when not in use. Fits any size keyboard. ($6.)

---

**NEW! Price breakthrough! Under the Mac Drives (Cutting Edge)**

The Cutting Edge Under the Mac Drive hard disk drives are quiet and reliable with access times down to 20 milliseconds making it almost three times faster than most. Push button external SCSI address switch and removable SCSI terminator allow easy daisy chaining up to 7 SCSI devices. Sizes available 20 meg to 80 meg (disk drives) $39. 20 meg only $29. 45 meg only $49. 65 meg only $59. 80 meg only $79.

---

**800K Drive**

The Cutting Edge 800K drive's attractive styling, quiet performance, high-tech reliability make it our most popular floppy drive. Features an LED light to indicate disk access and a hinged door over the disk interlock to keep the mechanism clean. One year manufacturer's warranty. (disk drive) $149.

---

**Two Page Monochrome Monitor**

The Monochrome Monitor (Cutting Edge) fits any size printer. Store extra toner cartridges or supplies conveniently underneath. A three-piece metal construction fits any size printer. $28.

**Large Screen Monitor Stand**

Raisers your monitor four inches for easier viewing. Allows you to store your keyboard and other supplies underneath. $39.

**The Keyboard Flip**

This allows you to "flip" your keyboard on its side for storage when not in use. Fits any size keyboard. ($6.)

---

**Add Your Own Accessories**

Contact MacWAREHOUSE for ordering information and add your own accessories. (Hardware) $999.
Tomorrow's Upgrade For Your Mac Is Only $119.*

A MacWarehouse Memory Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable, overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC

Never again will you have to quit your word processor just to answer a question about a spreadsheet. Install extra memory and you can leave your letter open while you refer to last month's sales figures. You can edit those monstrous scanner files with advanced graphics applications or develop your own custom HyperCard stacks. More memory means more power at your fingertips.

PWG IN INSTALLATION

Adding memory doesn't require technicians in lab coats. You don't even need a soldering iron. Just open your Mac, slide out the main circuit board, and plug in your memory card. Complete installation instructions are included with each memory kit.

WHAT DO I NEED?

Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs — (2@ $119 ea.)

The chart explains exactly what you need to achieve the desired level of performance.

To upgrade a 4-socket Mac Plus or SE to this amount of memory

<table>
<thead>
<tr>
<th>Amount of Memory</th>
<th>Do this: (install in multiples of two only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 MB</td>
<td>Remove all four existing 256K SIMMs, install two 1M SIMMs, leave two sockets for future expansion.</td>
</tr>
<tr>
<td>2¼ MB</td>
<td>Remove only one 256K SIMM, install one 1M SIMM.</td>
</tr>
<tr>
<td>4 MB</td>
<td>Replace all four 256K SIMMs with four 1M SIMMs.</td>
</tr>
</tbody>
</table>

To upgrade an 8-socket Mac II, Ill, Ilex, or IItcx to this amount of memory

<table>
<thead>
<tr>
<th>Amount of Memory</th>
<th>Do this: (install in multiples of four only)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 MB</td>
<td>Remove all four existing 256K SIMMs, install four 1M SIMMs, leave remaining sockets for future expansion.</td>
</tr>
<tr>
<td>5 MB</td>
<td>Keep existing 256K SIMMs, install four 1M SIMMs if remaining sockets.</td>
</tr>
<tr>
<td>8 MB</td>
<td>Remove all four 256K SIMMs install eight 1M SIMMs.</td>
</tr>
</tbody>
</table>

To open your Mac Plus or SE, you'll need a specially designed tool — it's available from us as part of a handy tool kit for just $15.

WHAT YOU NEED TO KNOW

Memory chips come factory-installed on plug-in cards, called SIMMs (Single In-line Memory Modules). Each one megabyte SIMM card holds eight top quality memory chips. We carry chips by all the major manufacturers like Texas Instruments, Intel and Samsung. We also carry the full line of Dove memory products.

*Prices can vary a lot, based on quality, speed and demand. At press time our price for 1MB, 100 ns Samsung kits is $119. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

SPEED

Do you need 80, 90 or 100 Nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor needs 120 (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY

Place your order by 12:00 a.m. (E), weekdays and we'll deliver overnight for just $3.00. There's never been a better time to consider a memory upgrade. Call our toll-free number now and tomorrow morning your Mac will be off to a brand new start.

MacWAREHOUSE

1-800-255-6227

ORDER TOLL-FREE

24 HOURS A DAY

Inquiries: 1-201-367-0440
Fax: 1-201-905-9279

© 1989 Micro Warehouse Inc.

MACWAREHOUSE

30 DAY MONEY BACK GUARANTEE

If, for any reason, you are dissatisfied with your MacWarehouse Memory Kit, you may return it for a full refund within thirty days of purchase. You have to do is call us for a return authorization number and return the product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWarehouse also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.
Introducing Adobe Type Manager From MacWarehouse $57.

NO MORE JAGGED EDGES! Now you can make the output of your ImageWriter or Hewlett-Packard DeskWriter look just like a laser printer, thanks to this sensational new program. But don't stand in line to pay $99 at your local software store. Pick up the phone now, and for just $57 (plus $3 s&h), we'll rush your copy by overnight delivery!

Believe it or not, Adobe Type Manager solves the problem of jagged edges on screen fonts, too. Now, what you see on your screen will more closely resemble what you get from any PostScript printer — no more 24-point headlines that look like brick piles on screen. It's almost like having Display PostScript on your Mac — for only $57.

Adobe Type Manager is compatible with virtually every major application, and it's easy to install on any Mac (running System 6 or later) from a Plus to a IIci. Just a few clicks with your mouse — install it and forget it. Because you'll only need one size of a screen font installed in your System, you can also save megabytes of space on your hard disk. You won't need any additional memory, either.

If you have a non-PostScript laser printer, like Apple's LaserWriter IIISC, Adobe Type Manager will give you PostScript — quality type, without the PostScript expense. And Type Manager includes high-quality outline versions of 13 popular fonts, so it's easy to produce the kind of text you thought only came from a PostScript laser printer.

Our friendly MacWarehouse staff of Mac fanatics is standing by to help with any questions you may have. Remember, nobody beats our fast, dependable, overnight service for Adobe Type Manager or any of the other fine Adobe products.

1-800-255-6227
Mon - Fri 8:00 a.m. - 11:00 p.m. (E)
Weekends: 8:00 a.m. - 8:00 p.m.
Inquiries: 1-201-367-0440
Fax: 1-201-905-9279
© 1989 Micro Warehouse Inc.

Special Offer
Adobe Type Manager Plus: Available for a limited time only. Contains 22 additional typefaces — Adobe Typeface Packages 1-5 and Helvetica Narrow. (These are not included with Type Manager.) Retail value if purchased separately — $885. MacWarehouse price $113.

Circle 78 on reader service card
A Big Screen Monitor Now Makes Big Sense.

Up to now most Macintosh users considered a big screen monitor a luxury purchase. Something desirable, but a purchase which could be put off until prices came down.

Surprise! They just did.

Introducing the Ehman 19" Two-Page Monochrome Display System, the first affordable big screen monitor. At just $899, including card, cable, Stepping Out II software, and a tilt and swivel base, the Ehman monitor means finally doing away with scrolling, squinting and scrunching.

The Ehman monitor matches all the major features of other big screen monitors costing twice as much, including a high resolution of 76 DPI, and a flicker-free refresh rate of 70 herz.

As with all Ehman products, you get a 30-day money back guarantee, a minimum one-year warranty, and our optional 24-hour express service replacement policy. We've even thrown in a $25 dealer installation coupon for quick and easy set-up.

It's the big-screen monitor you've been hoping for. So stop waiting for prices to come down. At Ehman they already have.

Ehman
1-800-257-1666

Circle 154 on reader service card
Radius recently introduced its Radius QuickCAD Graphics Engine, an accelerator board that makes CAD operations up to 30 times faster. The accelerator uses a 6 MIPS Acorn RISC processor for the display-list processing necessary to speed up the vector graphics used in CAD applications.

The board's hardware is very similar to Radius's existing QuickColor accelerator for QuickDraw, but the software supports display-list processing (for vector graphics) in conjunction with CAD applications such as AutoCAD, VersaCAD, MacBravo, and Pegasys. The software also handles the difficult translation between vector graphics and QuickDraw without any incompatibilities, Radius said.

The QuickCAD board works with the 19-inch Radius Color Display, the Radius 8-bit GSC Color Display Card, and Apple's 13-inch color display. It can drive the larger Radius display because both the accelerator and the Radius display adapter implement the faster block-transfer mode of the NuBus.

At press time, Radius expected the Radius QuickCAD Graphics Engine to have a list price of $1495. The accelerator was slated to begin shipping in early November. The Radius Color Display and the GSC Color Display Card list for a total of $6190. For more information, call Radius at 800/227-2795.

—Tom Moran

Life in the Studio Line

The flagship piece of Letraset's new Studio Line series of products is DesignStudio, a $795 feature-packed page-layout application that imports and converts ReadySetGo files and addresses some of that earlier product's shortcomings.

DesignStudio looks like ReadySetGo but adds a PageMaker-like pasteboard interface to RSG's rigid grid, letting you combine both ways of working on the same page. The much-improved text handling offers kerning and tracking from the keyboard to 1/200 em, and tracking operates at three different levels depending on font size. DesignStudio can rotate text and wrap it inside polygons or wrap it nonsymmetrically around graphics, and the program provides an unusual masking capability that lets you place a graphic into a triangular, circular, or other odd-shaped hole and run text around it. DesignStudio also provides an aesthetic rag command that prevents ragged type from lining up.

You can save files in Crosfield format to simplify moving them to a Crosfield prepress system, and Letraset plans to provide special printer drivers for improved printer compatibility. The company will implement four-color support in stages, with the eventual goal of providing prepress quality output with CIE-LUV color model-based technology licensed from Optronics.

A few nice touches include the ability to automatically show numbers as properly formatted fractions; horizontal and vertical rulers that you can set to different units; expanded preferences, (continues)
599 Ways to Avoid Helvetica

600 Typefaces

They just won't fit on a page. This is the Image Club PostScript Typeface Library. 600 licensed "brand name" typefaces compatible with your Mac or PC and any PostScript printer. The typefaces are sold on floppy disks or separate families as illustrated here or the entire library of 600 fonts as a new Letterpress CD-ROM available for $999.

Desktop Typepens

The Letterpress CD-ROM features a special program developed by Image Club that looks at any typeface you have on disk and makes a list of all the fonts that are not compatible with your desktop. For $999, you can get a new Letterpress CD-ROM with all the fonts you need for your desktop.

PostScript Art Files

If you include with every font is a PostScript artwork file that can be used with Adobe Illustrator or Aldus Freehand. Modifying, rotating, stretching, and creating your own is easy. Each font has a minimum purchase price of $50. Please note that typeface families cannot be split up.

Prices & Discounts

Whether you buy fonts as disks or online is up to you. Each font has a minimum purchase price of $50. Please note that typeface families cannot be split up.

Discounts

If you buy fonts as disks, you get 10% off for 20 fonts and 25% off for 100 fonts. For online orders, you get 15% off for 20 fonts and 25% off for 100 fonts.

Letterpress CD-ROM

Letterpress CD-ROM has full disk of 400 fonts for $999. Each font is $50 minimum purchase. You can get a new Letterpress CD-ROM with all the fonts you need.

Ordering

For orders within the US, call 800-661-9410. For a free catalog or orders outside the US, call 403-262-8008. Fax 403-261-7013.

Image Club Graphics • 51902 Eleventh Street S.E. Calgary • Alberta • Canada • 26-3G • PHONE (403) 262-6008 • FAX (403) 261-7013
When the San Francisco Examiner’s mainframe went down, reporters wrote on laptops, and artists laid out pages on generator-powered Macs.

When the Earth Shook, the Mac Was There

Tuesday, October 17: The earthquake struck shortly before sundown, cutting electrical power to most of San Francisco. Crowds gathered in the smoke-filled, pitch black streets to stare at an occasional battery-operated portable television, but most San Franciscans knew little about the quake’s impact around the Bay Area.

Without power to the System Integrator Incorporated (SII) System 55 publishing system they share, the morning Chronicle and afternoon Examiner had to improvise fast. Using generators and their art departments’ Macs, each paper put out a special edition the next day full of half-page photos showing the buckled freeways, flaming houses, and collapsed buildings, with maps of the destruction sketched out in Adobe Illustrator.

To save time, said John Melendez, who runs the Examiner’s computers, “people were doing stories on paper, on typewriters, and then entering them into MacWrite. Most of the people had to learn MacWrite on the fly. It was a problem, with reporters putting in tabs and returns.”

The MacWrite documents were imported into QuarkXPress, printed as running columns on a laser printer, and then cut out and pasted up by hand. The edition was printed at plants that had power, and Wednesday’s 16-page Examiner, with a healthy variety of fonts and formatting, hit the streets as a classic piece of early desktop publishing. News-hungry San Franciscans didn’t seem to mind. According to Examiner managing editor Frank McCulloch, the paper’s circulation more than doubled, to 300,000.

The Chronicle sold about 600,000 copies of the 8-pager it whipped up on the art department’s six Mac IIs, two IIX machines, and Varityper VT600 and 11-by-17-inch VT600W laser printers. Steve Outing, who runs the Macs, said the paper used its normal display fonts, which were already rendered in Fontographer. For half-toning photos, “We used our Canon Laser Copier.”

The Examiner’s Melendez is perfecting his Quark templates now and creating detailed plans for deploying people on the Macs, “just in case it happens again.”—D.L.
Are you one of those people who considers tax preparation only slightly less painful than childbirth?

Do you wait until the point of no return before doing yours? Or pay a lot of money to an accountant and evade the whole thing?

Has form 4868* become an annual ritual?

Then you may be startled to learn that there are thousands of people out there—Macintosh® users just like you—who actually enjoy preparing their taxes.

---

MacTax makes all the necessary changes.

Automatically.

When you're finished—which shouldn't take long, even if it's your first time—your laser or dot matrix printer spits out your return as exact replicas of official IRS forms.

Of course, you do have to sign, date, stamp and mail the return yourself. But you have to do that even when you use a professional.

Speaking of professionals, hundreds of them secretly use MacInTax to prepare the returns of people just like you.

No kidding. We've got letters.

Call us at 1-800-622-6829 and we'll read you a few.

---

As easy as filling in the blanks on your choice of over 75 forms, schedules, worksheets and statements that pop up on your screen in the exact IRS format.

Don't know which forms you need? Don't worry. MacInTax helps you decide.

Aren't sure what belongs on which line? MacInTax fills you in: IRS instructions are on-line for every line. And Softview is always on the end of your telephone line.

Can't tell when a form is complete? MacInTax tells you what's done, what isn't and what's left.

Afraid of making a mistake? Don't be. MacInTax checks your input, helps prevent illogical, inconsistent or incomplete entries and performs all tax calculations—and recalculations—for you.

When an entry you make on one form, schedule, statement or worksheet affects the entries you've already made on others, MacInTax makes all the necessary changes.

---

*Automatic Extension of Time to File
Compatibility with AppleTalk Phase 2, which supports Ethernet and TokenTalk, has also been added to MacLan Connect with release 1.1. MacLan Connect also doubles as a gateway between dissimilar PC-based LANs such as Novell's NetWare, Banyan's Vines, 3Com's 3+, and Ungermann-Bass's Net-1.

MacLan Connect 1.1 remains priced at $995 for a license that permits unlimited users on an AppleTalk network. Registered users can upgrade for $95. For more information, call Miramar Systems in Santa Barbara, California, at 805/965-5161.

--Scott Mace

The Polyglot

HyperCard

Every kind of computer speaks a different language and has its own way of sending and receiving data—isolating machines in the digital equivalent of the Tower of Babel. When Macintosh users want to communicate with minicomputers or mainframes, they must use a common terminal, and they must know and use the other machine's command syntax.

A new package called MitemView helps developers distill their mainframe knowledge into HyperCard stacks called Application Interface Modules (AIM). Inside the MitemView stacks are XCMDs that provide a pattern-recognition capability labeled WHOOP (Watch Host Operating Patterns), which monitors and records commands as they come down from the mainframe. An AIM developer can then map the mainframe commands into HyperCard scripts, where they can be translated into English and displayed on a card. The end-user can reverse the process by clicking on a button, executing a HyperCard script that sends commands to the mainframe—all without the user even knowing that another computer is online. MitemView also manages lower-level functions such as screen buffering and terminal protocols.

At Uniformed Services University in Bethesda, Maryland, where doctors train for the military, microcomputer manager Steve Brown is using a beta of MitemView to build a unified Macintosh front end to the medical library's computers. The library's primary machine is a Convergent Technologies CG 5000A minicomputer running a turnkey library-maintenance package that holds the library's central catalog, maintains the library's database, tracks acquisitions, and performs other functions. The library also has three CD ROM drives daisy-chained on an AppleShare server running Aries MedLine. Presenting the catalog under HyperCard, Brown said, has made it possible to "index the call number and provide a map, a floor plan, on the Mac screen showing where [each] book is located." Brown didn't think that Acknowledge, Prometheus's telecommunications application generator (the closest comparable product), would work as well as MitemView: "Acknowledge [has] a very rich and intelligent telecom procedural language . . . but we wouldn't have as much flexibility to manipulate the info coming from the mainframe; we couldn't move the data from Acknowledge to HyperCard."

MitemView should be available now. The developer toolkit lists for $995 and requires 2MB of memory; and the run-time version, whose price is based on quantity, requires 1MB of memory. For more information, contact Mitem in San Jose, California, at 408/559-8801. —D.L.

Third Parties Line Up behind the Portable

Perhaps the most remarkable thing about the recent introduction of the Macintosh Portable in Los Angeles was the number of third-party hardware products announced for it at the same time. The announcements ranged from high-speed communications devices to tiny hard disks and a new category of Mac add-in: the Static RAM (SRAM) module.

Abaton announced its InterFax Portable 24/96, a fax modem for the Portable. The device is a combination 2400-bps MNP Class 5 modem and 9600-bps CCITT Class 3 fax modem that fits into the Portable's modem slot. The Hayes-compatible InterFax Portable 24/96 is scheduled to ship in the first quarter of 1990. For more information, call Abaton in Fremont, California, at 415/683-2226.

Two 2400-bps modems for the Portable were introduced by Megahertz Corporation. The EasyTalk A124 is a Hayes-compatible modem that lists for $399. The EasyTalk A124M, also Hayes compatible, adds MNP Class 5 data compression and lists for $499. Both are slated to be available now. For more information, call Megahertz in Salt Lake City, Utah, at 800/527-8677.

Traveling Software showed LapLink Mac III, which supports Mac-to-Mac file transfers via cable, modem, AppleTalk, and a direct SCSI connection to the Portable. LapLink Mac III includes a custom serial cable (continues)
RasterOps 24-bit color for MacII & SE/30.

How we broke technology barriers, to deliver the worlds most advanced 24-bit color board.

The new RasterOps ColorBoard 264 rewrites the price book for 24-bit color.

Combine it with Apple's® 13" color monitor, or any Mac-compatible 640 x 480 monitor. You get advanced, third-generation 24-bit color, allowing you to display over 300,000 colors simultaneously.

If you have an Apple 13" color monitor, then you are ready for 24-bit color.

If you are going to buy a 13" color monitor, this is the only board you should consider.

Why? For the quality design and features described in this ad.

And for real, 24-bit color. 24-bit systems let you work with over 16 million colors simultaneously. This is the most accurate way to produce true-to-life colors. With 24-bit color, you can display and manipulate photographic quality images, to create stunning presentations and documents.

24-bit color unlocks the potential of desktop publishing, presentations, and video.
Apple's 32-bit QuickDraw™ is the standard.
Now, we have made it affordable.

$995.

RasterOps 264 Chip Set

Barrier: Providing professional color capability to Macintosh® users at a price everyone can afford.

Breakthrough: Resulting from many man-years of engineering development time, RasterOps has reduced the large number of components needed (sometimes as many as thirty) to produce 24-bit color video display cards, to a set of two proprietary custom chips utilizing the most advanced VLSI chip design and manufacturing technology. Selecting the most advanced high density CMOS chips throughout, this board has the lowest chip count of any 24-bit card in the industry. The fewer the chips, the less the heat, and the more reliable the product.

SetGamma and DirectSetEntries

Barrier: To see the effects of color corrections in real time, as you make adjustments to gamma, brightness and contrast.

Breakthrough: Your ColorBoard 264 directly supports Apple's DirectSetEntries and SetGamma QuickDraw instructions in hardware. Instantly see the effect of changes to your color image. You can watch the color tones change as you move the mouse. Without this dynamic support, you have to guess at the color correction, enter the new value, and wait for the new screen to repaint. No waiting with the 264.

300 nanosecond Bus Cycle

Barrier: 24-bit color takes a lot of memory. One screen image can take up to 900,000 bytes. Slow memory slows your screen draw time.

Breakthrough: These 1 Megabit Video RAMs provide more memory in less space, and operate at 100 nanosecond speeds, providing the fastest possible read-write cycles available on the Macintosh, at 300 nanoseconds.

Color Modes

Barrier: The color mode of the display (2, 4, 16, 256, or millions) affects the speed of your work. When you are word processing you want documents to scroll fast.

Breakthrough: With RasterOps' custom Very Large Scale Integration CMOS chips, all color modes are available including 2, 4, 16, 256, or millions of colors. You decide what color level you need and when you need it.

ColorBoard 264/II For Any Mac II: $995.
ColorBoard 264/SE: $1295.

All registered and unregistered trademarks are the sole property of their respective companies.
**Dual Oscillators**
- **Barrier:** With the onrush of multimedia and video applications, our customers don’t want to invest in a board that locks them out of video.
- **Breakthrough:** Two separate oscillators. The left to support Apple’s 13” color monitor at a resolution of 640 by 480, and the right oscillator to output 8-bit gray scale video directly to VCRs or TV monitors. It will also output RGB NTSC video for external encoding in 24-bit True Color. When you need video, (and it’s coming fast), you’re ready.

**DAC 473**
- **Barrier:** Convert a 24-bit image from digital values in memory to analog signals of Red, Green, and Blue, using the least amount of power and board space.
- **Breakthrough:** We are the first to use this advanced, DAC (Digital to Analog Converter) 473. The single, low power chip does a better, faster job, and replaces 3 chips. If you want the best, ask for the DAC 473.

**SMOBC Fabrication**
- **Barrier:** The accepted, easy way to manufacture a board is wave soldering. But this doesn’t allow efficient use of robots, and doesn’t create a “Clean” board.
- **Breakthrough:** We use an advanced, Solder Mask Over Bare Copper board fabrication technology and surface mounting of components through efficient, dependable robotics. Note the clean, simple appearance of this board. When you turn the board over, you will see a smooth golden surface, the trademark of a SMOBC board. It costs more and requires a greater design effort, but the benefit to you is a more reliable board.

**Power Draw**
- **Barrier:** Power and heat. Your board draws its power through the NuBus. Apple specifies a maximum of 2.1 Amps per slot. Many boards require over 4.0 Amps. Amps mean heat, which is deleterious to your Macintosh, and a drain on the power supply.

**Auto Sensing**
- **Barrier:** Allow user to change monitors and frequency without setting a switch, changing an oscillator, or making a selection from the control panel.
- **Breakthrough:** Circuitry that automatically senses which monitor you are using and switches automatically from 66.7 Hz to 30 Hz. You just plug in your Apple-compatible monitors, the board will take care of the necessary adjustments.

**Bus Buffering**
- **Barrier:** The NuBus transmits power spikes and bus noise. These can destroy data as well as circuitry on the display card. Spikes can also cause pixels to trip, causing spots on the screen.
- **Breakthrough:** We designed sophisticated bus buffering circuitry to isolate the hostile NuBus environment from critical components on the board, protecting your video investment, and your data.

**DAC 473 Literature**
For your nearest dealer and literature on the most advanced Macintosh graphics products, call: Information Hotline: 1-800-952-6300. Dept X24
The simple truth is, the business of business is to grow. The sad truth is, most accounting software can't handle that. Built-in obsolescence seems to be a standard feature. Which is the most compelling reason to consider ACCPAC® Simply Accounting® for your Macintosh.

It offers all of the features you need to get up and running quickly today, as well as the more advanced options you'll need tomorrow.

No other package can get you off to such a fast start. "Easy to learn and a snap to use," InfoWorld called Simply Accounting, "simply magnificent."

And unlike other accounting packages which come with just General Ledger, Accounts Payable and Receivable, Simply Accounting gives you more advanced modules as well, like Inventory, Job Costing, and Payroll.

It all adds up to the best all-in-one accounting software you can buy. And it's backed by the world's leading independent software company.

To find out more, call 1-800-531-5236. In Canada, call 1-800-663-6904.
that can connect a Mac Plus, SE, SE/30, Mac II, IIx, or IIcx to each other or to IBM's PC and PS/2 series and compatibles. The new version transfers up to 750 kilobits per second between Macs. Slated to ship in November for $189.95, LapLink Mac III includes the cable, a 3/4-inch Mac disk, and both a 3/4-inch and a 5 1/4-inch disk for the IBM machines. For more information, call Traveling Software in Bothell, Washington, at 206/483-8088.

Adaptec demonstrated its Nodem LAN interface unit, which connects the Mac Portable to Ethernet networks through the SCSI port. The Nodem, intended for use in the office only, can also link a desktop Mac to Ethernet. It will retail at $545 for Thick Ethernet, $595 for Thin Ethernet, and $645 for Ethernet that runs over twisted-pair wires. For more information call Adaptec in Milpitas, California, at 408/945-8600.

MicroNet Technology will offer the Low-Power MicroPak, an internal one-third-height, 40MB hard disk for the Portable. The unit will use the same Conner drive that Apple is currently using and will have all the same powersaving features, according to MicroNet. Slated to ship in October, the drive will retail for $729. For more information, call MicroNet in Irvine, California, at 714/837-6033.

Iomega Corporation announced a Bernoulli Portable 44 for the Macintosh, a battery-powered version of the company's removable storage device. Slated to ship in December of 1989, the Portable 44 measures 10.5 inches by 10 inches by 2.75 inches and is rated to withstand 1000 g of shock. It will retail for $2199 including carrying case, utility software, battery charger, and powersaver software. For more information, call Iomega in Roy, Utah, at 801/778-1000.

KMW Systems Corporation said that its TwinAxcess series of protocol converters will now allow the Mac Portable and other Macs to communicate locally or via modem to IBM midrange systems including the AS/400, System 34, System 36, and System 38. The protocol converters let the Macintosh emulate an IBM 5251 or 5291 terminal. File transfers are possible using KMW's TwinAxcess Link software on the Portable and equivalent file-transfer software on the IBM system. The one-port TwinAxcess Series III is available now for $1295. The TwinAxcess Series II, also shipping, ranges from $1695 for a two-port model to $3595 for a seven-port model. For more information, call KMW Systems in Austin, Texas, at 512/358-3000.

MicroTouch Systems introduced a touch tablet that replaces the Portable's trackball and a touch screen that fits over the Portable's LCD display. Currently shipping, the first version of the $235 UnMouse touch-sensitive tablet will sit beside the Portable. A version designed to fit in the space taken up by the Portable's trackball is scheduled to ship in January. The UnMouse and the Mac 'n Touch touch screen both offer 1000-by-1000-point resolution. The $695 touch screen lets you give mouse-click commands either by tapping on the screen or by lifting your finger off the surface. It is available now. For more information, call MicroTouch Systems in Waltham, Massachusetts, at 508/694-9900.

CD Technology introduced its Porta-Drive, a CD ROM player for the Portable and for IBM-compatible computers. Based on a Toshiba drive, the Porta-Drive can operate from an optional battery pack. It retails for $895. For more information, call CD Technology in San Jose, California, at 408/432-8689.

Pinnacle Sales International showed its LXPi plus 2, a 2MB SRAM add-in module for the Portable. To achieve the 2MB capacity on one module, PSI used 1-megabit SRAM chips, which are currently in scarce supply. The 2MB modules have sockets for attaching more than one module at a time, allowing for configurations with 3MB, 5MB, or 7MB of SRAM. Now shipping, the LXPi plus 2 was expected at press time to retail for about $1500. For more information, call PSI in San Jose, California, at 408/559-8544.

Lind Electronic Design Corporation has announced two products for the Portable, a 12V DC power adapter that connects to a car's cigarette lighter, and a battery charger that works only with spare Mac Portable batteries. The 12V DC power adapter has a suggested retail price of $69.95, while the battery charger retails for $99.95. Both were slated to be shipping now. For more information, call Lind Electronic Design in Saint Louis Park, Minnesota, at 612/927-6303.

Apple peripherals currently shipping for the Mac Portable include the $449 Macintosh Portable Data Modem 2400, the $649 1MB Memory Expansion Kit, the $49 Rechargeable Battery, the $125 Battery Recharger, the $69 Numeric Keypad Module, the $499 SuperDrive Upgrade, and the $1199 Internal 40SC Hard Disk. Apple also said that in the future it intends to introduce its Portable Video Adapter, which will support... (continues)
Corporate Training Solution

How to Learn As Much As You Can, As Fast As You Can on the Macintosh Computer

An interview with Randall D. Smith, corporate CEO who has supervised the training of over 20,000 Macintosh users.

Q. Are corporations wasting money buying Macs?

Only if they spend thousands of dollars on computers and then don't spend any money on training. You can save milliseconds by upgrading your computer or days by upgrading the skills of the operator.

Q. Why is Macintosh training so critical today?

If you look at the Macintosh today and the Macintosh of two years ago there is no comparison. Then if you look at the size and features of leading programs such as Excel, Word, FileMaker, & PageMaker you'll hardly recognize them compared to a few years ago. The bottom line is that we now have more features, more speed, more capabilities,... which is great! But, we've also made training a necessity instead of a luxury.

Q. How can an investment in training pay off in real dollars?

Our company is a great example of training which dramatically contributes to our bottom line. Using industry standards, based on our volume, we should have 65 employees. We have 15. The only reason we can do so much business with so few people is that every employee is trained on the Mac. Each employee has a broad knowledge of Excel, Word, FileMaker, PageMaker, etc.

Q. Realistically what training alternatives does a company have?

Basically only three: You can leave the training to the individual, start your own in-house training, or hire an outside firm.

Q. What are the pro's and con's of each option?

1. There are some great training aids for the individual. There are video tapes, audio tapes, and step-by-step manuals. The problem is that many individuals lack the motivation to really commit to learning on their own.

2. An in-house training program is good except that many times you have the blind leading the blind. If a company relies totally on inside training, creativity suffers because ideas are inbred. Mistakes are perpetuated and new, innovative techniques aren't always introduced.

3. Outside training companies are great except they tend to be extremely expensive and very slow in their training techniques. A company with 3,000 Mac users will have a difficult time finding an outside training company that can fill their needs. A recent MACWEEK article suggested that classroom training is really the best alternative, yet at $500 per day too expensive.

Q. So what's the solution?

Up until 2 years ago I didn't think there was a good solution. I was running a company with five Macs and couldn't find adequate training anywhere. That's why I started MacAcademy.

Q. How was MacAcademy a solution?

MacAcademy has become an excellent corporate training tool because of a unique combination of format and price. We first made MacAcademy a workshop format so that people could ask questions to a real live human being. We secondly offered the program in 65 cities so that large companies could be assured of the same quality for all of their employees.

The next step was to hire instructors that not only knew the programs but used them daily in business. Of over 200 applicants we choose only 5 to be MacAcademy instructors.

Our final step was to charge only $249 for an entire 2 day workshop featuring the Mac, Excel, FileMaker, PageMaker, Works, Word, and HyperCard.

Q. So what has been the response?

Over the past 18 months over 22,000 people have attended MacAcademy. Every Fortune 500 company but two has sent someone to MacAcademy.

On a scale of 1 to 5 they have given our program an average rating of 4.5 which is excellent on the rating form. Our biggest indication of satisfaction has been that companies will send one person the first time we come to town and twenty or thirty the next time MacAcademy is in their area. In fact many companies like General Electric, NASA, Mobil Oil and Motorola have hired our instructors to do on-site training. The bottom line is that MacAcademy has provided a real jump-start to thousands of Mac users at a very reasonable price.

Q. Has the success of your program attracted any competitors?

I don't mind competition...fair competition that is. But sad to say, over the past few months a few companies have tried to trick companies into sending people to a MacAcademy look-a-like program. They copied our format, our price, our schedule, our locations, and even did a duplicate of our brochure. If you don't look real close you will think that you're signing up for MacAcademy when it's really a cheap imitation. We've had irate calls from people who got burned going to a workshop that looked just like us but wasn't.

Q. How does a company get information on the original MacAcademy?

For a complete schedule call 904-677-1918, FAX 6717 or write: MacAcademy 477 S. Nova Rd. Ormond Beach, FL 32174.

MacAcademy™

8-bit gray-scale and color displays.

And for the IICi
For the Macintosh IICi and the IIcx, CMS Enhancements announced a 200MB 3 1/2-inch internal hard disk. Scheduled to ship at the beginning of October 1989, the unit has a suggested retail price of $2595. For more information, call CMS in Tustin, California, at 714/259-9555.

DayStar Digital has begun shipping the first cache RAM board designed for the Cache Connector in the IICi. The DayStar Fast Cache IICi Board retails for $995. For more information, call DayStar Digital in Flowery Branch, Georgia, at 404/967-2077.—T.M.

The Future of Music
When the opera VALIS premiered at the Massachusetts Institute of Technology’s Cube performance hall, the Mac II was a star even though it didn’t take a bow. VALIS, based on a science fiction book of the same name by Philip K. Dick (VALIS stands for vast active living intelligence system), was composed by MIT professor Tod Machover. Machover developed a futuristic sound—a quality reflected in the production’s haunting set, which resembles a giant circuit board and piles of monitors forming towers and cliffs.

To “use computers as live performance instruments,” Machover said, he came up with something he calls hyperinstruments. A hyperinstrument uses MIDI to link a computer to an instrument being played by a person, and then the computer alters the music in ways such as delaying notes a few microseconds or sensing the tempo of the rest of the orchestra and changing the hyperinstrument’s sound to match in real time. In VALIS, a Mac II controlled a grand piano hyperinstrument.

According to Joe Chung, an MIT graduate student and the programmer who wrote the software to drive the hyperpiano, “The bottom line was balancing function with speed. Allegro LISP is not a super-fast language, but it is flexible.” Chung said that whenever he had to redesign a hyperinstrument, LISP made it easy to rewrite its software. Machover and Chung also used minicomputers to create some unique musical effects. For example, at one point the vowel sounds of the word VALIS are played as eerie musical notes until they gradually become recognizable.

Machover thinks that computers like the Mac II will make it possible for people working on home systems to create special effects like the ones he developed for the professional performance of VALIS. “Imagine: Instead of buying a record of a Beethoven symphony, you buy a disk, and you become a conductor. You could bring up the horns. You could hush the strings.” Until then, the rest of us will depend on programming wizards like Machover and Chung to expand our musical horizons.

The VALIS opera is available on CD or cassette for $19.95 from Bridge Records in Great Neck, New York, at 516/487-1662.
—Neil Shapiro

Lights, Camera, MediaTracks
For people who want to do multimedia without megabuck multihardware, Farallon is almost ready to ship MediaTracks, a vast enhancement to ScreenRecorder. The original ScreenRecorder’s ability to record and play back events on the Macintosh screen was practical for knocking out self-running demos and simple tutorials, but its lack of editing tools frustrated many would-be Bergmans. MediaTracks is a complete time-domain editing system; it allows you to record “tares” of what passes across the Mac’s screen, cut them into “clips,” and modify them in many ways.

After separating your clips, you can rearrange them and synchronize sounds to them. You can also import and superimpose color graphics (MediaTracks only records in black and white, even from a color screen) or

(continues)
For All Those Who Think That Programming One Of These,

Requires One Of These...
8-bit gray-scale and color displays.

And for the Ilci
For the Macintosh Ilci and the Ilcx, CMS Enhancements announced a 200MB 3 1/2-inch internal hard disk. Scheduled to ship at the beginning of October 1989, the unit has a suggested retail price of $2595. For more information, call CMS in Tustin, California, at 714/259-9555.

DayStar Digital has begun shipping the first cache RAM board designed for the Cache Connector in the Ilci. The DayStar Fast Cache Ilci Board retails for $995. For more information, call DayStar Digital in Flowery Branch, Georgia, at 404/967-2077.—T.M.

The Future of Music
When the opera VALIS premiered at the Massachusetts Institute of Technology’s Cube performance hall, the Mac II was a star even though it didn’t take a bow. VALIS, based on a science fiction book of the same name by Philip K. Dick (VALIS stands for vast active living intelligence system), was composed by MIT professor Tod Machover. Machover developed a futuristic sound—a quality reflected in the production’s haunting set, which resembles a giant circuit board and piles of monitors forming towers and cliffs.

To “use computers as live performance instruments,” Machover said, he came up with something he calls hyperinstruments. A hyperinstrument uses MIDI to link a computer to an instrument being played by a person, and then the computer alters the music in ways such as delaying notes a few microseconds or sensing the tempo of the rest of the orchestra and changing the hyperinstrument’s sound to match in real time. In VALIS, a Mac II controlled a grand piano hyperinstrument.

According to Joe Chung, an MIT graduate student and the programmer who wrote the software to drive the hyperpiano, “The bottom line was balancing function with speed. Allegro LISP is not a super-fast language, but it is flexible.” Chung said that whenever he had to redesign a hyperinstrument, LISP made it easy to rewrite its software. Machover and Chung also used minicomputers to create some unique musical effects. For example, at one point the vowel sounds of the word VALIS are played as eerie musical notes until they gradually become recognizable.

Machover thinks that computers like the Mac II will make it possible for people working on home systems to create special effects like the ones he developed for the professional performance of VALIS. “Imagine: Instead of buying a record of a Beethoven symphony, you buy a disk, and you become a conductor. You could bring up the horns. You could hush the strings.” Until then, the rest of us will depend on programming wizards like Machover and Chung to expand our musical horizons. The VALIS opera is available on CD or cassette for $19.95 from Bridge Records in Great Neck, New York, at 516/487-1662. —Neil Shapiro

Lights, Camera, MediaTracks
For people who want to do multimedia without megabuck multihardware, Farallon is almost ready to ship MediaTracks, a vast enhancement to ScreenRecorder. The original ScreenRecorder’s ability to record and play back events on the Macintosh screen was practical for knocking out self-running demos and simple tutorials, but its lack of editing tools frustrated many would-be Bergmans. MediaTracks is a complete time-domain editing system; it allows you to record “tapes” of what passes across the Mac’s screen, cut them into “clips,” and modify them in many ways.

After separating your clips, you can rearrange them and synchronize sounds to them. You can also import and superimpose color graphics (MediaTracks only records in black and white, even from a color screen) or (continues)
Expanded choices, extraordinary support, professional features.

Meet MacLangelo/24. It's the 24-bit color board that puts the power of pinpoint color accuracy on practically any Mac II color screen. Large or small.

In fact, MacLangelo/24 offers the widest range of compatibility and the most in-depth support for the monitor of your choice.

Support like user-selectable gamma correction for different monitors. And 72 dpi on 13", 16" and 19" models. Even a five-year warranty.

How about applications compatibility? MacLangelo/24 runs 32-bit QuickDraw. It lets you switch between 1, 8 and 24 bits per pixel without having to reboot. And it gives you 100% function-key customization.

MacLangelo's Zoom magnifies your work up to 400%, and Pan lets you quickly see anywhere within the expanded desk of its Extended Screen feature.

With MacLangelo/24 from National Semiconductor. It's the true-color board that makes a full-featured professional out of practically any monitor.

(800) 538-8510
In California (800) 345-4006
Outside U.S. (408) 562-4719

National Semiconductor,
Compatible Products Group,
750 Central Expressway, M/S 34-10,
Santa Clara, CA 95050-2627.
Dealer inquiries welcome.

MacLangelo is a trademark of National Semiconductor Corporation. Other product names are trademarks of their respective owners. © 1989 NSC

Circle 196 on reader service card
use MediaTracks' MacDraw-like graphics tools to draw or write on top of a clip. You can also "sew" buttons on to perform many useful tasks. For example, you can add a button that lets you insert a pause or jump to another clip. You might even use buttons to build interactive tutorials or demos, in which clicking on one of these buttons takes the user to a more detailed description of something. You can also call MediaTracks tapes from HyperCard, and Farallon plans to make MediaTracks compatible with MacroMind Director, SuperCard, 4th Dimension, Omnis 5, and many other applications that can launch other applications.

What's missing? Demanding users will clamor for MIDI, real video, and frame-grabber support; color tapes; and the kinds of special effects common in video postproduction. Farallon is already considering adding most (though not all) of these capabilities. MediaTracks should be available sometime in the first quarter of 1990. At press time, pricing was set for less than $300, and Farallon planned to provide an inexpensive upgrade path for ScreenRecorder owners; MediaTracks will also be available bundled with MacRecorder (a hardware/software combination for recording and editing sounds) and sold as Multimedia MediaTracks; pricing for the set had not been decided at press time. Utilities for playing tapes directly or from inside HyperCard can be distributed royalty free. For more information contact Farallon in Berkeley, California, at 415/849-2331.—D.L.

Apple Bobs Back after Great Quake

In the aftermath of the devastating earthquake centered only a few miles from its headquarters in Cupertino, California, Apple moved quickly to resume its normal operations. The company shut down all of its 50 Bay Area buildings the day after the quake to allow engineers to inspect for structural damage. By the third day Apple had reopened about 80 percent of the closed facilities and expected all but one building to be in full operation at the one-week mark. That building, De Anza III, suffered water damage and structural problems and will be remodeled earlier and more extensively than was already planned.

Apple's Fremont manufacturing plant, perhaps the most crucial of its Bay Area operations, was back in operation only two days after the quake. By the same time its distribution sites and shipping department were both functioning as usual. The company temporarily shifted technical-support functions to support centers in other parts of the country. There was no loss of information on Apple's file servers, and its minicomputers, mainframes, and two Cray supercomputers suffered no damage.

Several Apple representatives credited the company's rapid recovery to its emergency planning and to a good communications network, made up of employees who exchanged information from their homes via phone, online bulletin boards, and electronic mail. A general broadcast message on the company's voice-mail system gave the employees a number to call for information on the condition of the buildings.

On Friday, three days after the quake, a tour of several Apple buildings in Cupertino revealed mostly cosmetic damage, although a number of windows and glass doors had popped out of their frames during the temblor. The floors of most cubicles were covered with scattered books and papers, with the odd monitor or aquarium fallen here and there. The only confirmed Apple casualty of the quake, an employee who suffered a broken leg, was in good condition. Morale was high as employees at one group of buildings attended a picnic breakfast set up under a tent in a nearby parking lot. Inside, as employees in the closed cafeteria began their cleanup, the jukebox played "Rock Steady."—T.M.

Automating Connectivity

Third Wave Systems is using a version of CL/1, the language under development at Apple for letting Macs access data in SQL databases, to show how applications based on standard Mac software can grow into Mac-to-mainframe solutions. Third Wave's Automated Publishing System (APS) Report Generator uses Fairfield Software's CL/1-based Clear Access for Full Impact to create an interface between mainframe databases and Ashton-Tate's graphical spreadsheet, Full Impact.

For many years the state of Maine has produced an annual report comparing performance and expenditure (continues)
For All Those Who Think That Programming One Of These,

Requires One Of These...
Introducing Desktop Programming From Serius.

Let's face it. Developing programs on a Macintosh® is not an easy, every-day task.

If only there were a way to quickly and easily create a custom application. Without having to learn complicated programming languages like C or Pascal. Now there is.

It's called Serius 89™. An amazing new software package that gives Macintosh users the power to create their own custom applications. On the top of their desk and with the touch of a finger.

Now you can save countless hours of development cost with Serius 89 because you can develop your own applications without the need to hire a systems analyst.

With Serius 89, you simply “draw” applications using drag and click actions on a mouse.

Serius 89 is very much like your favorite desktop publishing program. It presents a pallet of programming components easy to identify, easy to use and Hyper-Card® compatible. As fast as you can select icons and link them together on the screen, Serius 89 Object Interaction Protocol™ connects the chains of functions and converts them into a bug-free application.

When the programming is completed, you can compile and save it as a stand-alone application. Even the icon that the Finder displays can be custom designed. The new program can be immediately used by anyone—not just the programmer, because it operates transparently with familiar Macintosh techniques.

So, whether you are an experienced Macintosh programmer or not, you now have the power to program even the toughest applications right on your desktop!

For more information, call us at 1-800-876-6847, or 1-801-977-9077.

Serius 89 works with all Macintosh computers from the Plus to the Macintosh II, including the SE-30 and the new 8x Serius. The Serius logo, Serius 89 and Object Interaction Protocol are trademarks of Serius Corporation. All other product names mentioned are trademarks or registered trademarks of their respective holders. © 1989 Serius Corporation.
Accelerator II, IIx and IIcx™

DayStar Accelerators put the speed of leading-edge technology into the Macintosh II, IIx and IIcx. They create a professional platform which yields real gains in productivity. Even the most complicated graphics begin to flow smoothly from one command to the next. Have time to create more powerful results. Available in 25, 33, 40 and 50 MHz configurations for the Macintosh II, IIx and IIcx.

Fast Cache IIc

The high-performance cache card for Apple's new Mac IIc. This powerful new cache memory board plugs directly into the Mac IIc's cache connector. Fast Cache IIc™ boosts processing speed up to 40% by caching the 68030 processor at zero wait-states. That's why Apple® builds a cache connector into every Mac IIc.

System XCI™

Break the NuBus® performance barrier. DayStar's XCI backplane connects XCI (Extended CPU Interface) cards directly to every DayStar Accelerator. These dual ported boards operate through NuBus at 10 MHz or up to 50 MHz via the XCI backplane. XCI equipped professionals can incorporate superfast RAM, SCSI and 24 bit Video in their NuBus slots.

LT200™ LocalTalk Interface Boards...

The transparent PC to LocalTalk connection. DayStar's LT200 allows users to connect IBM® PC, XT, AT, PS/2 Micro Channel or compatibles to LocalTalk® networks.

DayStar stands behind its products with cost effective upgrades that guarantee access to the latest technology. Toll-free technical support puts us just a phone call away. DayStar products are supported by a full one year limited warranty.

Call 1-800-962-2077 or Macamerica at 1-800-535-0900 today for more information and the nearest Authorized DayStar Dealer.

Available exclusively through dealers and value added resellers
5556 Atlanta Highway, Flowery Branch, GA 30542, (404) 967-2077

Other brands and product names are trademarks or registered trademarks of their respective holders.
Product specifications are subject to change without notice. ©1989 DayStar Digital, Inc.
Maine Governor John McKernen and Third Wave’s Greg Melick look over a volume of reports that graphically describe Maine’s education budget. Third Wave Systems developed macros to automate generating the reports in Full Impact from data on a Unisys mainframe.

Third Wave took on this job, frame. Created graphs, automatically page-layout details. Including data collection, this first draft blocks, and took care of other state’s Unisys mainframe’s state averages. Last year Third Wave took on this job, devising a system to download ASCII data from the state’s Unisys b900 mainframe into Full Impact spreadsheets. Full Impact macros then created graphs, automatically produced customized text blocks, and took care of other page-layout details. Including data collection, this first draft of Third Wave’s publishing system produced 14-page reports for 283 school districts in 8 working days, compared to estimates of 18 to 25 weeks from other vendors bidding for the job who planned to use standard desktop publishing tools. The report’s graphics format communicated information so much more effectively than the tables of statistics in earlier reports that it not only assisted local school boards in making budget decisions but also—by being widely reprinted in local newspapers— influenced Maine voters.

The national attention this project shone on Third Wave forced it to make some strategic decisions. First, the company expanded efforts to produce its APS Report Generator, a general-purpose report generator. Second, the firm decided to use the Fairfield Software product because it can handle low-level communications protocols, avoiding the need to construct a different communications interface for every type of mainframe and minicomputer. The APS system can now take data from any mainframe or mini SQL database, move it into Full Impact, and construct graphics-based reports from fields selected by users through a simple arrangement of buttons and menus.

The APS Report Generator is one of the first completed applications using CL/1 to give the Mac a window on organization-wide data stored on larger computers. For details on APS and its applications, contact Third Wave Systems in Brunswick, Maine, at 207/725-6188, or Ashton-Tate at 800/437-4329, ext. 3601. For details on Clear Access contact Fairfield Software in Fairfield, Iowa, at 515/472-7077.

—Charles Seiter

**Data Analysis, Xerox Style**

The graphic-oriented minds at Xerox have not been idle since the 1970s, when Xerox researched and laid the foundation for what evolved into the Mac. The Analyst, which Xerox refers to as an “integrated hypermedia system,” provides a desktoplike Information Center, a coherent home where people who analyze information can access tools and link and keep track of related information in almost any format. An enhanced version of The Analyst and a second-generation product called HyperFormance are now in development.

The Analyst provides a spreadsheet, a database, page-layout capabilities, forms design, mapping, image processing, graphics, outlining, word processing, and text searching, all of which can share data in some unusual ways—for instance, scanned images can be dumped into spreadsheet cells and manipulated with functions—because data and applications alike are objects in Smalltalk 80, the object-oriented programming environment underlying The Analyst.

Version 4.0 of The Analyst (loosely scheduled for early 1990) will add many multi-user capabilities, such as letting users share Information Centers across a network, SQL support for transparent access to widely distributed databases, record locking and password protection, and electronic mail. The Analyst will be able to launch non-Smalltalk applications and use their files; and color support may also make its way into the product. Also scheduled for 1990 is HyperFormance, an Analyst-like product that will run under the less expensive (and less powerful) Smalltalk/V. HyperFormance will start out as a bare-bones Information Center and a forms-design module and add other modules later. (Bear in mind that forms in Smalltalk have little in common with graphic design: a form is a user-definable window, a data receptacle (continues)
You don't have to discard your IBM mainframe emulator, but you might once you've seen the Netway family of LAN-based gateways. The first stand-alone gateways that connect Macintosh and PCs directly to your IBM mainframe—without costly emulator boards, control units, and re-cabling.

For small LocalTalk or EtherTalk workgroups, plug into the Netway 1000. It works with every Mac, from 512K to IleX, and every PC compatible. Right out of the box. Saving you about $16,000 worth of emulators on a 16-node network.

For your departmental connections, choose the Netway 2000. Using the high-power 10 MIPS SPARC chip, the Netway 2000 connects all the Macs and PCs on your LocalTalk, Ethernet, and Token Ring networks to up to two IBM mainframes.
Texas Instruments' basic microLaser printer lets users upgrade to PostScript, up to 35 fonts, and as much as 4.5MB of RAM.

TI Printer Can Upgrade to PostScript

The microLaser, a low-end laser printer from Texas Instruments, lets users upgrade to PostScript, AppleTalk, and more memory. The microLaser uses a new Sharp print engine with a rated speed of 6 pages per minute at 300-by-300-dpi resolution. The basic model has a suggested list price of $1999, comes with 512K of RAM, and is compatible with Hewlett-Packard's LaserJet series II printers. TI will also offer the microLaser PS113, which adds Adobe PostScript, 13 PostScript fonts, and another 1MB of RAM. A third version, the microLaser PS35, includes PostScript, 35 PostScript typefaces, and 1.5MB of RAM. It lists for $3999. Buyers of the basic microLaser can upgrade to the PS113 with a $499 add-in board, or to the PS35 for $995. RAM on any of the microLasers can be expanded up to 4.5MB at a suggested retail price of $495 per MB.

The printer weighs 33.5 pounds and measures only 14.2 inches deep by 13.4 inches wide by 10.5 inches high. The microLaser also offers two font cartridge slots, a 250-sheet paper input tray, and front-panel control. The front-panel control includes the capability to store up to four preset configurations for quick setup of frequent jobs.

The microLasers all include a Centronics-compatible parallel interface. TI will also provide optional RS232, RS422, and AppleTalk interfaces. Prices for the interfaces had not been set at press time. The company expected to begin shipping the microLaser models late in the fourth quarter of 1989. For more information, call Texas Instruments in Austin, Texas, at 800/527-3500.—T.M.

Survey: Multimedia

Our survey this month deals with multimedia—how many use it, how many don’t, and why. Despite all the deserved attention multimedia is getting, only 18 percent of responding readers said they use one or more multimedia applications on their Mac.

Among those who do run a multimedia application, 78 percent said they use it for presentations, 47 percent said they use it for education, 42 percent said they run multimedia databases, 38 percent reported putting their documentation in multimedia, and 36 percent said they use multimedia techniques for training. Ninety-one percent of current multimedia users said they set up their own application, 5 percent said an outside consultant or developer set it up, and 5 percent said an in-house expert developed it (results add up to more than 100 percent due to rounding).

Among responding subscribers who don’t use multimedia, 53 percent said they had no current need for it, 23 percent said they needed to learn more about it, 17 percent said it’s too expensive, and 3 percent said their current system is insufficient for the task.—T.M.

Why NOT Multimedia?

Do you currently use a multimedia application on your Mac?

What is the primary reason you don’t use multimedia devices or applications?

No need for it

I need to learn more about it

Too expensive

Won’t work on my system

Other

Eighty-two percent of responding readers do not currently use any multimedia application.
Easier Done.

1. Introducing Adobe Type Manager.
   It's easy to get your hands on Adobe Type Manager™ at your nearest Adobe Authorized Dealer. And at $99, it's hard to pass up.

2. It's even easier to install Adobe Type Manager. Just a few mouse clicks and your Macintosh™ display will look better than ever.

3. Introducing Adobe Type Manager.
   But the easiest part of all is seeing how Adobe Type Manager improves your ImageWriter® text. Just command it to print and watch what happens.

These unretouched photographs make it easy to see what a difference Adobe Type Manager makes.
I


e easier to understand how Adobe Type Manager was introduced to the world. Prior to 1984, most people thought of computers as excessively complicated, overly technical and, in most cases, far too intimidating.

But that all changed with the introduction of the Macintosh, followed a year later by the arrival of the LaserWriter, the first laser printer to rely on a completely new "page description language." The PostScript language from Adobe Systems.

Suddenly, the desktop publishing revolution was born.

Simply stated, PostScript stores descriptions of font characters as smooth outlines comprised of mathematical formulas, rather than the more typical bitmaps. So, no matter how jagged the type might look on a Macintosh screen, it comes out crisp and clean on a PostScript-equipped laser printer.

To say this new technology changed the face of computing would be a monumental understatement. Yet, the initial excitement about desktop publishing has now given way to higher expectations from Macintosh users everywhere.

Users just like you.

Adobe Type Manager puts Adobe's industry-standard PostScript language technology right on your display—where it's easy to see there really is no comparison.

Your displays to be clear, smooth and legible. You want what you see on your display to correspond as closely as possible to what the printed page will look like. And, most importantly, you want to be able to print high-quality text on your low-cost printers.

Adobe Type Manager satisfies all those demands.

When added to your system software (System 6.0 or later), it builds individual characters at any size from PostScript outline fonts—

The same fonts used by PostScript printers.

Adobe Type Manager is actually based on the PostScript language's capability to create and scale fonts to different sizes. So it's very fast and very compact.

And, at just $99, it's very affordable. In fact, at that price, Adobe Type Manager probably offers more value than any other Macintosh software.

It's also very easy to install and operate.

You see, Adobe Type Manager is completely transparent to both you and your software applications.

So all you'll see is a better image. Once it's installed in your System Folder, Adobe Type Manager intercepts QuickDraw font requests and generates the screen bitmaps (at the requested size) from a PostScript outline font. So, whether your text is regular, bold or italic, it looks smooth and readable from the largest point sizes to the smallest.

Then, when you print to your Apple ImageWriter or Hewlett-Packard DeskWriter, Adobe Type Manager automatically generates the requested printer font bitmap to produce beautiful, letter-quality text from any application.

That's because Adobe Type Manager is compatible with virtually all major Macintosh software—from programs for word processing and spreadsheets to page layout and presentations.

Which means it won't change the way you work.

Just the way you look.

And every Macintosh user can look better, because Adobe Type Manager requires just one megabyte of memory. That way, every Macintosh from a Plus to a IIfx can take advantage of its unique outline font technology.

Speaking of fonts, every copy of Adobe Type Manager includes high-quality outline versions of the 13 most popular fonts. They'll enable you to produce the kind of high-quality text from your ImageWriter or DeskWriter you thought only came out of a laser printer.

If you want to add more fonts, you can pick up the ATM Plus Pack, giving you the 22 additional outline fonts from Apple's LaserWriter and ImageWriter.

Times*

Kursiv, Oblique, Bold & Bold Oblique

Courier

Medium, Oblique, Bold & Bold Oblique

Symbol

ABXGRH OXK MNO

Adobe Type Manager includes high-quality outline versions of these 13 most popular Macintosh fonts. You can also add any PostScript outline fonts, including those from the Adobe Type Library.

And, ATM Plus Pack is specially-priced at just $198.

Adobe Type Manager also works with other Adobe PostScript language fonts, including the more than 500 typefaces from the Adobe Type Library. We could go on, but you probably have the picture by now. Suffice it to say, Adobe Type Manager is a lot better to look at than it is to read about.

Because, quite frankly, words don't do it justice.

So call us at 1-800-344-8335 (outside the U.S. and Canada, call your local distributor) for the name of your nearest Adobe Authorized Dealer.

When it comes to improving your image, it doesn't get any easier than this.

Adobe Systems Incorporated
Now that Adobe Type Manager software has cleaned up your text, give it a change of face with new TypeAlign.

Because while ATM™ gives you great-looking text, TypeAlign allows you to print any number of different ways—up and down, at any angle, even along arcs and complex curves. And you can do it using inexpensive printers like Apple® ImageWriters® and HP DeskWriters® and Paintjets®. So now you don't need a laser printer to get professional-looking results.

You don't need to be a professional designer to use TypeAlign, either. Since it's a desk accessory, you install TypeAlign once in your Macintosh® computer, and then use it in just about any application. You'll find it incredibly easy to create even complicated-looking effects—no special drawing programs or skills needed. So go ahead, put a new face on your reports, slide presentations, charts, whatever.

How does TypeAlign work? First, use a tool to draw an arc, straight line or freehand curve. The freehand

Introducing TypeAlign™—a new desk accessory exclusively

TypeAlign is a trademark and Emerald City Software is a registered trademark of Emerald City Software. Adobe and PostScript are registered trademarks and Adobe Type Manager and ATM are trademarks of Adobe Systems Incorporated.
a change of face.

tool is especially handy for wrapping type around any object or shape. Then, type a word or phrase — it appears automatically on the line you just drew. You can even adjust the spacing between the letters and words until it’s just the way you like it. Will a shadow or outline look even better? Give it a try — you’ll see the effect instantly on screen.

When you’re satisfied, paste your creation into a document, then print it out on any ATM-supported printer or other device, including ImageWriters, LaserWriters® and DeskWriters. Of course, TypeAlign works with any Adobe® PostScript® font, too.

Let’s face it. If you have ATM, you need new TypeAlign. Especially with a suggested retail price of only $99.95. To find out where you can buy it, call Emerald City Software at 1-800-223-0417, in CA 415-324-8080.

for Adobe Type Manager™ owners.
DATA SAFETY

BY CHERYL ENGLAND SPENCER

David Brody, a marketing engineer at Western Digital, has one of the few Macintosh IIs in a largely IBM company. Think about what that means for Brody—all the Mac Plus, SE, and even IBM PC owners borrow his computer on a regular basis. After all, they cannot be blamed for wanting to play color versions of Crystal Quest, Tetris, and Shanghai on a Macintosh.

At first, Brody didn’t mind sharing his Mac. But then someone in the office developed a strange penchant for opening his files and editing the technical articles he had written. So Brody installed DiskLock from Fifth Generation Systems to prevent people from accessing his hard disk. Now whenever Brody goes to lunch, he pulls down the DiskLock desk accessory to lock his disk; the screen blanks out and a dialog box requesting a password appears. When Brody comes back he types in his password and the Macintosh desktop reappears.

Some might argue that denying access to information is antithetical to the Macintosh ideal, but for an increasing number of users, some level of data security is a necessity. Businesses must ensure the confidentiality of personnel and financial records.

Networks must be protected against prying eyes and viral threats. And as Brody’s case illustrates, a large number of people just haven’t learned computer etiquette.

Fortunately, a great many products are available for protecting your system and data. You can physically lock up the Macintosh and its peripherals, you can protect only crucial files, or you can control who has access to your hard disk. I’ll explain the various types of protection available, their pros and cons, and make some recommendations for a variety of situations.

LEVELS OF SAFETY

Any good security scheme works by providing a hierarchy of increasingly restrictive levels of access. For instance, network servers such as TOPS and AppleShare request a password from users when they attempt to log on. Anyone who provides the correct password gains access to the file server. Not everyone who can access the server, however, should be able to see all of the files on it. Thus, a more restrictive level of protection is needed.

The interaction between a relational database,
such as 4th Dimension or Double Helix II, and a network provides a good example of how levels of access might be restricted. A database allows you to lock your records in such a way that only specified users can access the information. This feature is only active, however, when the database application is running—a sophisticated snoop can use a file editor such as Fedit to browse through the database file without opening the application.

A network-resident database, on the other hand, takes on the network software's security features—thus, even when the application is not running, it is protected. Under AppleShare, for example, a database administrator can give each user read or write privileges for each file or folder. More sophisticated servers, such as Dayna Communications' Novell implementation, give the administrator even more flexibility. Using a Novell server, for instance, the administrator can protect specific parts of a file (say, a certain field in database records) or assign write-only privileges to data-entry clerks who must be able to enter data, but who should not be able to change data.

**Encryption**

Many people, however, are more concerned about keeping the data on their hard disk secure than they are about protecting their portion of data on a corporate, networked database. Fortunately, for these folks, lots of programs are available for individual users. These programs tend to be less expensive and easier to use than the network security solutions.

To protect the files on an unguarded hard disk, many security programs provide an encryption feature that transposes information so that it can't be read. Only someone who knows the proper password can decrypt the information. Otherwise, encrypted files and folders can be treated like any other files; they can be moved, duplicated, backed up, or sent over a modem.

One of the most secure encryption schemes is the Data Encryption Standard (DES), a scheme certified by the National Bureau of Standards in 1978 and again in 1988. The difficulty in breaking an encryption scheme depends on the number of possible passwords. DES offers a maximum of 72 quadrillion possible passwords. If you were to write a program that allowed your Mac II to cycle through the DES passwords, it would take thousands of years to try every password combination. To decrypt files efficiently, you would need to build a special computer with one million specialized chips, each one testing one million passwords per second. After ten hours you would have a 50 percent chance of finding the correct password. And you would have spent close to $20 million.

You don't have to use DES, however, to secure data. Many programs offer proprietary encryption schemes that only a highly trained cryptologist could break.

**Problems with Encryption**

For all of the security it provides, encryption also has many problems. Several times while writing this article, I heard stories of files irreparably damaged by encryption programs. No single program was to blame; instead, encryption keys sometimes just "go bad."

If you encrypt files, you are well-advised to keep a backup copy of the original, unencrypted data (safely locked away, of course). Not only can keys go bad, but if you forget the password for the only copy of an encrypted file, you can never recover that information. Some programs encrypt the original file and others encrypt a copy; the best programs give you a choice (see "Access-Control Programs" and "Encryption Products").

The programs also offer a wide range of other easy-to-use features. Some programs, such as Sentinel, MacSafe, and Camouflage, let you create groups of files and folders (and subfolders) to encrypt. This feature not only cuts down the number of passwords you have to remember (one for each group, instead of one for each file), but it also provides an easier way to
### ACCESS-CONTROL PROGRAMS

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$99.95</td>
<td>$189</td>
<td>$395</td>
<td>$249</td>
<td>$195</td>
<td>$75</td>
<td>$149.95</td>
<td>$149.95</td>
<td>$99.95</td>
<td></td>
</tr>
<tr>
<td>Encryption Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compression</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>DES</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Proprietary encryption methods</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Encrypts subfolders</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Encrypts files</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Encrypts folders</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Encrypts applications</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Overwrites source file</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Supports groups of files</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Can open one member of group</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Reencrypts files at shut down</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Passwords</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum number of characters</td>
<td>n/a</td>
<td>26</td>
<td>255</td>
<td>unlimited</td>
<td>31</td>
<td>28</td>
<td>200</td>
<td>200</td>
<td>255</td>
<td></td>
</tr>
<tr>
<td>Case sensitive</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Must type twice for verification</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Access Control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prevents access to</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hard disk</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>individual partitions</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>individual files</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>folders</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>floppy disks</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>removable media</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Offers group-access privileges</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Protects files from modification</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Protects folders from modification</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Prevents applications from being copied</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Protects files from deletion</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Protects folders from deletion</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Blanks screen after user-specified time</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td>Provides audit trail</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td></td>
</tr>
</tbody>
</table>

1 Password protects.
2 Write access only.
3 Only when the hard disk or files are locked.
4 With Finder 6.0 only.

Work. For instance, you can decrypt a group of files that you want to work with all at once, and then when you shut down the Mac the files will automatically be re-encrypted. Since these programs require you to manually move the files to a special folder, however, people who work on lots of different files every day will still find this method cumbersome.

Advanced Security, from Advanced Gravis, offers a sign-in feature whereby you enter your password once and then you can encrypt or decrypt files in any folder. That's a step in the right direction, since you don't have to create special sets of files, nor do you have to remember numerous passwords. But the catch is remembering to sign out—otherwise, anyone can open your encrypted files.

The biggest problem with encryption, however, is the amount of time it takes to encrypt and decrypt files or folders. Because of the complex computations involved, encryption is slow. For instance, Symantec Utilities for Macintosh II (SUM II) took 28 seconds to encrypt a 91K WriteNow document using a proprietary algorithm. The fastest encryption program, Camouflage, fromusrEZ Software, took almost 8 seconds to encrypt the same file using the more complex DES algorithm. Although that's a big improvement over SUM II, it's still about the same amount of time as it would take to copy the file.
If you have a large body of confidential data that you need to access on a regular basis, encryption will be too cumbersome to use. But if you need to send data out-of-house safely, either over a modem, a dedicated data line, or on a floppy disk in the mail, encryption is an ideal solution. Packer, from Bobbing Software, was originally created as a compression utility during the days when 400K floppies were the norm. The company threw in the encryption capability as an afterthought. Now, however, this simple, inexpensive program provides a good alternative for users who want to safeguard data as it is sent over telephone lines. Likewise, the latest versions of the popular shareware utilities, StuffIt and PackIt, also offer encryption.

Unless you use Camouflage or Advanced Security, however, the person receiving your encrypted file must have a copy of the program you used for encrypting in order to decrypt it. Camouflage and Advanced Security both let you encrypt files in such a way that people who don't have their own copy of the application can still decrypt the file using the correct password.

The only other way to encrypt data as it is sent over phone lines is by a scrambler such as the TeleScrambler I from Metme. You install one Tele-Scrambler into each modem being used. The Tele-Scrambler scrambles the data being sent so that it can't be intercepted and understood. Tele-Scramblers cost $995 a pair.

**Hardware Devices**

Encryption programs offer a sure, if awkward, way to protect specific files, and an excellent way to transmit data over telephone lines, but they can't keep others from deleting files, using potentially virus-infected files, or stealing the hardware itself. (Although, if a thief steals your Mac and the data is encrypted, you can at least rest assured that confidential information can't be read.) And, since most programs don't let you encrypt your System Folder, there's no way to stop people from modifying its contents. Worse, someone could use Fedit to extract information from temporary files that programs such as Microsoft Word store in the System Folder.

The most obvious way to keep someone from performing any of these nasty tricks is to make sure no one has physical access to the Macintosh—for example, by keeping the Macintosh behind locked doors. Alternatively, you can use hardware devices like Ergotron's The Muzzle, locks and cables such as Mac Lock from MacProducts and MacKablit from SecureIt, Checkmate's MacSaver board, or Viking Tech's (KeyLock) floppy drive covers, to prevent people from starting up the Macintosh, inserting floppy disks, or stealing the Mac itself. Or, users on a budget can lock up power cords, cables, and the keyboard at night.

If you aren't particularly worried about someone walking off with the hardware, you can use a Bernoulli Box from Iomega or a Syquest-based removable cartridge drive to store sensitive data. It's a heck of a lot easier to lock up a data cartridge than it is to lock up a whole system. These drives are especially suited to an environment where several people share one Macintosh. Users have their own cartridges, which they take away with them when they are finished using the Mac.

**Software Access Control**

While you pay a high price for many of the hardware devices, several software programs offer sufficient access-control features at much lower cost. Programs such as DiskLock, NightWatch, and MacLock (Verge Technologies) are designed specifically to lock your hard disk when you shut down the Macintosh. There's no way anyone can mount the hard disk without
Knowing the proper password, even if they boot from a floppy.

These programs also offer schemes for overriding the password in case you forget it. The NightWatch scheme works much like a bank's automated teller card. Some trusted person, say a network administrator, uses the NightWatch Administrator disk to create a User disk for each person who needs access to the hard disk. Whenever you want to start up the hard disk, you insert your User disk and enter your name and password. The User disk unlocks the hard disk and then restarts the Macintosh from the start-up disk. If someone forgets his or her password or is absent, the NightWatch Administrator disk can be used to override the User disk.

DiskLock lets you install a master password that can override any other password. Both of these methods are secure, but I prefer DiskLock's scheme since no extra disks are required to start up. In addition, DiskLock can lock files and folders.

Other programs, such as Empower, can lock individual hard disk partitions. Don't confuse locking a partition with simply password-protecting it, however. Some partitioning programs, such as ALsoft's MultiDisk utility, offer password protection, but you can still look at data in the partition with one of those handy resource-editing utilities.

Any program that prevents access to a hard disk is an excellent choice for people who need to protect data when they aren't around—say at night or during lunch breaks. But because they don't encrypt files, programs that lock your hard disk do no good if you forget to shut down the Mac. For the forgetful, many of these programs provide timed lock-out features. You specify how long the Mac remains idle before the program locks the hard disk and displays a dark screen with the password dialog box.

But be wary of programs such as Kent Marsh's QuickLock or Berkeley Systems' After Dark, which dim the screen and display a dialog box into which you must type a password before the screen reappears. Since the programs do not actually lock the hard disk, they can be bypassed by booting from a floppy. With QuickLock, you can quickly darken the Mac's screen by moving your cursor to a specified area and clicking, thus instantly covering sensitive data when someone comes into the room. To make these programs truly effective security aids, however, you'll need to use them in conjunction with a program that locks your hard disk or folders or encrypts data.

Multiuser Considerations

In situations where many people must share a Macintosh (at a university, for instance) locking the entire hard disk is not feasible. To fit individual schedules, the Mac must be left on most of the time or the password must be given to so many people that leaks easily occur. One solution might be to use a product like Empower that grants privileges to groups of users for various files and folders on the disk. Empower, which is based on the AppleShare privilege system, lets a system administrator designate groups of users...
who are assigned read and write privileges. Any user who creates a file, however, can become the owner of that file and can set privileges for it.

Controlling application copying or file deletion and System modification is a bit trickier. BulletProof, from Spectra Micro Development, lets you make files invisible and protect files and folders from modification or deletion. Although that sounds ideal, the program works by simply changing three bits (one for each feature) in a file's Finder attributes. Anyone handy with a file editor like ResEdit, Fedit, or SUM II can easily change the bits back again so that the file is no longer invisible or protected. Files made invisible on the desktop can still appear in the Open dialog box of the program that created them. Many invisible files can also be displayed by a program such as Central Point Software's PC Tools Deluxe. If your goal is just to protect files from being inadvertently deleted, you can always lock the file using the System's Get Info box.

Two programs that I saw in prerelease form, A.M.E. from Casady & Greene and FileGuard Extended Edition from ASD Software, offer elegant solutions for multi-user situations. (FileGuard Extended Edition shipped just as this article went to press.) Both let you set various levels of file, folder, and disk access for individual users, and both let you protect applications from being copied or deleted using a much more complex scheme than BulletProof. A.M.E. even lets you restrict access to desk accessories, printers, and modems and prevent unauthorized applications from being installed.

**Network Considerations**

Networks present the biggest security problems. The more people sharing hardware, the greater the potential for security leaks. Some products, such as Solana's R-Server, Infosphere's software bridge Liaison, and Shiva's NetModem, let you divide a network into zones. You can then restrict a user's access to certain zones and therefore to the Macs and peripherals in those zones.

In-house users don't provide the only threat, or even the biggest threat, to network security. Dial-in access opens up networks to tampering from outsiders. Products such as Tri-Data's Oz Guardian modem, LeeMah's TraqNet Controller/InfoKey, and Liaison address the problem with call-back capability. People calling into the system enter a password; the modem hangs up and automatically calls the telephone number associated with the password. If the user is authentic and is calling from the proper telephone, then access is granted. If not, then the person is cut off. This setup is highly secure—only glitches in the telephone system could cause a break in security.

One of the biggest holes in any network is the electronic mail system. For instance, QuickMail stores messages as files on the mail server's hard disk. Anyone who can access that machine can read these messages. If you delete your messages, but have the mail log feature enabled, copies of the messages will remain on the mail server until its hard disk is erased or until your mail log is cleared. (This is the type of scheme that tripped up...
Oliver North.) Even if you delete your messages and the mail log is disabled, copies remain on the server for at least several hours. The only way to ensure that your messages are safe is to delete all copies immediately from your hard disk and from the server. To ensure privacy for all QuickMail users, you should lock the mail server in a closet.

**The Virus Panic**

Electronic mail provides a notoriously easy— and fast— way for villains to distribute a virus. Dr. Harold Highland, editor-in-chief of Computers & Security, tracked the rapid spread of nVIR when it first hit. Early one morning he got a call from Princeton University, saying its Macs had been hit; by that evening, he was receiving calls from Stanford University reporting the same virus. A week later, nVIR showed up at a Finnish university and ten days later reports of nVIR were coming in from Singapore and Australia. “That virus travelled around the world in about two weeks,” says Highland. “Unfortunately, the Mac is very susceptible to viruses.”

To protect yourself from a virus, you shouldn’t put any untested software on your Mac’s hard disk. You can use a virus-detection program such as Virex, from HJC Software, or SAM, from Symantec. These two are the best of their kind. HJC offers an excellent upgrade path and SAM has a lot of configuration options. Both products automatically check floppy discs as they are inserted for known viruses.

**A Solution for Every Situation**

With all the products and possible combinations, it’s easy to get confused. My personal favorite program is DiskLock. I can easily lock my disk or folders with a single menu command, and without having to shut down my Mac. That’s quite handy when I get called into an emergency meeting or get dragged away from my desk to answer a question.

If you need to send confidential files via modem or electronic mail, then you’ll want an encryption package. If you send files to only two or three people, then you could opt for one of the general utilities packages such as SUM II or PC Tools Deluxe, or for StuffIt or Packer, which are inexpensive and provide compression. If you send files to a lot of different people, however, you’ll be better off with Advanced Security; at $149.95 the program costs more but lets you encrypt files so that the recipient can decrypt them without owning a copy of Advanced Security. Camouflage offers the same capability and has a smoother interface and more features, but at $349 it’s overpriced.

For environments where several people use a single Mac, my first choice is a combination hardware and software solution. Any Mac left out is subject to theft, so I recommend purchasing The Cavalier security plate from FMJ or Padlock from Doss Industries to attach the Mac and any peripherals to a desk. You should also get a Bernoulli Box or a Syquest drive so that users can take their data with them. To protect the System Folder and the applications on the hard disk, I’d use Empower to set read-only privileges for everyone except the system administrator.

If the hardware is too pricey for your budget, you should look at A.M.E. or FileGuard. Both products offer numerous features that you can mix and match based on the experience level and trustworthiness of the users. Keep in mind, however, that these products are very complex and require a designated person to set up and reconfigure them.

Network administrators can solve many problems by locking the network server in a closet. They can then use AppleShare to control access privileges. If further restrictions are needed, such as the ability to control application copying, I’d consider A.M.E. or FileGuard. And any network that allows remote dial-in should include a modem with call-back capability. No matter what your situation, however, you’ll need a good virus-detection program. And though you’ve heard this a million times, you should always keep a current backup copy of your hard disk.

Remember, these products are designed to keep important information from going out. It doesn’t take much—a forgotten password, a corrupted encrypted file, or a telephone glitch—to keep you out as well.

See Where to Buy for contact information.
A growing number of studies link intensive computer use to a host of painful and even debilitating maladies. Meanwhile, scientists argue the possible long-term effects of computer radiation. What steps can you take to make your workstation safer?

Rick Pearsall of Denver, Colorado, had no idea what was happening to his hands. He used to enjoy playing the guitar after getting home from his job as a Mountain Bell directory assistance operator. But in 1985, the pain and tingling that started in the little finger of his left hand soon spread up his arm, making guitar-playing—and keying in data on the computer—excruciating.

An orthopedist diagnosed Pearsall's ailment as carpal tunnel syndrome, a painful and debilitating disease of the median nerve in the wrist, and linked the condition to Pearsall's constant, repetitive hand movements at the computer keyboard. Today, even after expensive surgery to ease pressure on the nerve, the 31-year-old says that chronic pain makes it difficult to drive long distances, to haul firewood, or sometimes, even to hold a paperback novel.

"It's frightening," he says, "especially because doctors can't really tell you when you'll get well. My savings are about to run out, but it's tough to find a job when you can't use your hands."

Pearsall's injury is hardly an isolated case. More than half of all video-display terminal (VDT) users responding to various surveys in the United States have complained of musculoskeletal disorders, eyestrain, chronic headaches, and other ailments, according to a report from the National Academy of Sciences. At Pearsall's former workplace, Mountain Bell of Denver (now US West), 187 out of 500 directory assistance operators who work with computers have filed disability claims for VDT-related hand, arm, and neck injuries in the past four years.

Macintosh users are not immune to these disorders. A Macworld survey sent to 1000 subscribers found that almost a third of the 470 readers who responded had experienced health problems they believed were related to computer use. Of the subscribers with health complaints, 64 percent reported back or neck pain, 56 percent had had eye problems, and another 12 percent had developed strain injuries from repetitive motion. Significantly, a full 80 percent of Macworld subscribers using computers at work reported that their employers had failed to inform them of possible dangers.

Employers, however, are beginning to find out how devastating it can be to overlook the issue of ergonomics. At the Fresno Bee, in Fresno, California, one-third of the editorial staff using computers suffers from musculoskeletal disorders, according to the Northern California Newspaper Guild, which lodged a complaint with the state's Occupational Safety and Health Agency. OSHA recently sided with the Guild, ordering the Bee to provide adjustable furniture, hourly breaks, and ergonomic training (the Bee is appealing this decision, because, according to the paper, it is already "in voluntary compliance"). At the Los Angeles Times, 200 out of 1100 reporters and editors have sought medical attention for repetitive strain injuries (RSI) since 1985, resulting in hundreds of thousands of dollars in disability claims and lost work time and a newsroom "that
A WORKSTATION THAT WORKS

Today's ergonomists recognize that there is no perfect position that workers can maintain all day. For most people, a comfortable workstation is one that can accommodate two or more positions, enabling you to adjust your chair, monitor, and keyboard to fit your current task or inclination. Most people find the upright and slightly reclined positions portrayed here best for computer use. If you do a fair amount of traditional desk work, you'll probably want a chair that supports a forward-leaning position as well.

Screen Posture always follows the eyes; screens placed too low or angled improperly are a major source of slouching (A). The distance from the screen to your eyes should be only slightly greater than the distance you normally maintain between reading material and your eyes (B). (Bifocal wearers may require a steeper screen angle than the ones portrayed.)

Chair Seat contours should follow the contours of your back. Adjust chair height so that you don't feel pressure on your tailbone (seat too low) or lower thighs (seat too high). Ergonomists used to recommend 90 degrees as a good angle between thighs and spine, but recent research shows that more people favor a more open posture (C).

Keyboard Your arms should be relaxed at your side, with elbows a few inches from your body (D). Position your chair and keyboard to minimize reaches. When you change position, from upright to reclined for example, be sure to reposition your keyboard (and screen). An adjustable keyboard stand, which enables you to use the mouse without a stretch, is useful for this purpose, but you can also place the keyboard in your lap.

Desk A comfortable desk height is particularly important if you keep the keyboard on your desk. If you don't have a keyboard stand and you work at a nonadjustable surface that's too high, try raising your chair and putting a platform or box beneath your feet. If your desk is too low, try fastening blocks to the ends of the legs.

Copy Stand If you often look at paper documents when you work, use a copy stand, mounted so that it puts your work in the same plane and at the same height as the screen. If you look at the hard copy more than the screen, orient your chair or screen such that the copy stand, rather than the Mac, is directly in front of you.

You Keep moving—motion makes the blood flow. And remember to take a break from computer work every hour. Prepared with the assistance of Eileen Vollwitz, PT, of Back Designs, in Oakland, California—Joe Matazzoni

WARNING: COMPUTING CAN BE HAZARDOUS TO YOUR HEALTH

Compounding the worry over these complaints is the controversy over computer radiation. In Oakland, California, a recent case-control study by Kaiser Permanente Medical Center of 1583 women who work at computer terminals for more than 20 hours a week have an 80 percent higher risk of early and late miscarriages than women who do similar work without using VDTs. Kaiser researchers caution that their study didn't isolate the cause for the higher rate of miscarriages, but stress the need for further investigation into pregnancy and VDT use.

Disturbing as some of these reports and statistics may be, many hazards associated with computer use are entirely preventable. By learning the common causes of computer distress and making some basic changes to their workstation and work habits, most people can avoid joining the growing ranks of casualties of the computer revolution.
ON-THE-JOB STRAINING

Perhaps the most talked-about computer disorders these days is the host of painful and often disabling hand, back, arm, and neck disorders linked to keyboard work. Like Rick Pearsall, some Macintosh users who spend long hours at the keyboard have been stunned to find themselves suffering from the same numb or swollen fingers, aching wrists, wrenched necks, and nerve damage most of us associate with factory work.

These conditions, which include tendinitis, are known collectively as repetitive strain injuries. Discussing RSI in Improving VDT Work (Department of Preventive Medicine, University of Wisconsin, 1986), ergonomicist Steven Sauter, now with NIOSH, explains that computer users often repeat nearly identical keystrokes at a high rate of speed, tens of thousands of times a day. Since each keystroke requires muscles to contract and tendons to move, the tendons can become irritated as they slide over bone and against tissue, causing painful inflammation.

In a busy medical office 22 stories above downtown San Francisco, orthopedic surgeon Robert Markison explains how the form of RSI known as carpal tunnel syndrome can develop during VDT work. Tapping the underside of his wrist next to the palm he says, “You’ve got a regular superhighway of tendons here—nine in company, with the median nerve, each wrapped in its own lubricating envelope. They’re all in an unyielding fiber bone tunnel that won’t open up for anybody—not a chiropractor, not anybody. It, with repetitive motion, one of the ingredients that almost guarantee eventual injury, and possibly disability.”

Dr. Markison, the former chief of hand surgery for San Francisco General Hospital, estimates that he has treated several thousand cases of computer-linked hand disorders. Of those occurring during the past five years, he identifies “two hundred” as Macintosh-related injuries, he says, with a few dozen requiring surgery.

There is no evidence that Macintosh users develop more cases of RSI than other computer users. Some Mac users, however, may develop injuries in their mouse hand and shoulder if their workstation requires long, high reaches to the mouse that strain the muscle origins near the elbow, according to Dr. Markison.

But hands and arms are not the only trouble areas. Another ingredient of RSI is the prolonged sitting involved in VDT work, which puts particular stress on the back and legs. In one NIOSH survey, 71 percent of the operators reported lower back discomfort occurring from a few times a week to every day.

Not surprisingly, many computer devotees find it hard to understand why they are being injured on their sleek, high-tech machines rather than, as one injured reporter put it, “on a clunky, old, mechanical typewriter.” Occupational health experts reply that although some typists do develop RSI, computer users are at greater risk because they simply make more keystrokes. Researchers also point out that the typewriter encourages a greater variety of movements, such as those needed to insert paper, while a computer screen can be so mesmerizing that many of us work for hours in the same position without a break.

“The computer is so seductive, so inviting and insidious,” says L.A. Times editor Noel Greenwood. “It says, ‘Keep using me, don’t get up, you can change that sentence right now, with a flick of your finger.’

“One day I sat here working furiously, all hunched over the keyboard for five hours,” continues Greenwood. “The next morning I couldn’t lift my head out of bed. My neck hurt so bad that I couldn’t even turn my head. So any time I’m tempted to doubt RSI sufferers, I remember that.”

What Greenwood likely experienced were the aftereffects of static muscle loading, which occurs when the muscles of the shoulders, legs, neck, and hands remain in a prolonged state of contraction. Because the muscles are not periodically relaxed, circulation is decreased. Nutrients carried in the blood are not supplied rapidly enough, while waste products like lactic acid build up in the muscle tissues, causing soreness and pain.

Dr. Markison thinks that some static loading problems and injuries result from what he views as poor keyboard design. The effort required to hold hands flat above a keyboard while typing, he explains, puts a continual strain on the muscles and tendons. Much RSI could be prevented, in his opinion, by adopting the “pup tent” or split keyboard, promoted by California inventor Tony Hodges, which allows users to type with the palms facing each other—a design that several German studies say causes far less strain on the upper body than flat keyboards do.

Although no American computer manufacturers have yet implemented Hodges’s split keyboard design, RSI’s cost to business may encourage innovation. Workers’ compensation claims for RSI...
have doubled in the last two years, prompting Business Week to dub the disorder “the fastest-growing occupational disease of the 1990s.” One case of carpal tunnel syndrome can cost up to $10,000 when workers’ compensation, medical expenses, sick leave, and rehabilitation are taken into account. Given these costs, Roger Stephens, the only full-time ergonomist with federal OSHA, estimates that RSI costs employers several billion dollars a year.

The injuries, moreover, exact costs that cannot be measured in dollars and cents. “I’ve watched my skilled desk editors go on disability and struggle back to work part-time, dulled by pain medication,” writes RSI victim John Taylor, then news editor of the Fresno Bee, in the May/June 1989 bulletin of the American Society of Newspaper Editors. “I’ve seen marriages in danger of breaking up. I know of homes put on the market because disability pay is bread-and-butter wages. It makes me bridle over stories about editors at other papers who view RSI as a new trick malcontents have come up with to get even with management.”

The unsympathetic editors may be taking their lead from The American Psychologist, the journal of the American Psychological Association, in which two researchers recently ascribed RSI largely to worker dissatisfaction with boring, stultifying computer jobs. Although few of us would dispute the notion that mind-numbing work can cause job dissatisfaction and tension, new scientific research supports orthopedists’ contention that RSI is a physical disease.

In a study published in the April 23, 1988, issue of the respected medical journal Lancet, Australian medical researchers describe a case-control study in which they took muscle biopsies of 29 women with RSI, and observed striking abnormalities in both muscle tissue and cells. These biological changes, they concluded, “cannot be accounted for by any known psychological mechanisms.”

Thousands of miles from Australia, Catherine Burke, 32, of Vallejo, California, recently underwent surgery on both hands for carpal tunnel syndrome, which she developed during months of intensive work on an IBM computer, and later a Macintosh, whose keyboard she recalls setting on a table so high she had to arch her wrists to type—an ergonomic no-no.

“... I don’t think the computer companies...

### STAY LOOSE

Taking a break every hour to do a few stretches can reduce the muscular tension that builds up during prolonged bouts at the computer. These stretches were selected with the needs of computer users in mind; feel free to add any favorites of your own to your routine.

**Extend and separate the fingers until you feel the stretch (A); hold for 5 seconds. Relax, then gently bend your fingers for 5 seconds (B). Repeat 5-10 times.**

**To relax the shoulders and upper back, lace your fingers behind your head and pull your shoulder blades toward each other until you feel tension through the upper back. Hold for 5-10 seconds, then relax. Repeat 5-10 times.**

**In a standing position, slowly raise and lower your arms while turning your head from side to side until you feel a gentle stretch. Repeat 5-10 times.**

**An excellent stretch to do when you find yourself slumping forward. Lace your fingers behind your back with the palms facing in. Slowly raise and straighten your arms. Hold for 5-10 seconds. Repeat 5-10 times.**

**To stretch your calves, lean on a support, and slowly move your hips forward until you feel a stretch in the straight leg. Keep the heel of the straight leg on the floor and toes pointed forward. Hold for 30 seconds without bouncing, then switch legs.**

—Joe Matazzoni

Prepared with the assistance of the Spine Center of the East Bay, in Oakland. Some exercises adapted from "Computer and Desk Stretches," by Bob and Jean Anderson.

Mild discomfort is natural when stretching; if any of these stretches cause pain, discontinue.
had a responsibility to warn me [about RSI],” she says, “but it would have helped a lot if they had.”

Asked if Apple Computer has developed a package insert cautioning users about RSI and how to avoid it, Apple corporate public relations spokesperson Stacey Byrnes said no, “but we’d definitely consider doing something like that if there was a real need for it.” When asked whether Apple was doing any research on RSI, she said it wasn’t. “Apple is not aware of any problem among Macintosh users,” she said, noting that the company hasn’t received any complaints.

Industry groups often say that it is not the computers themselves that are to blame for health problems, but how the devices are used. “There is no demonstrable link between the use [of computers] and adverse health effects,” says Linden Heck, of the Center for Industry Technology (COT), an information clearinghouse funded by computer manufacturers and large business users. While not everyone would concur with Heck’s statement, virtually everyone, including the COT, agrees with the growing number of studies that show that frequent rest breaks and ergonomic improvements can significantly reduce pain and discomfort among computer users. Here are some ways you can help protect yourself.

• Set up your workstation to eliminate poor or uncomfortable posture and long reaches (see “A Workstation That Works”).
• Avoid cradling a telephone between your neck and shoulder when talking and keying in data. Use a headset.
• When you’re working intensively at the computer, break away and do something else for 15 minutes every hour; some users set their watch timers to remind themselves when to rest. Several times an hour, do a series of gentle exercises (see “Stay Loose”).
• Don’t exceed 10,000 to 12,000 keystrokes (roughly 1700 words) an hour.
• Preventing problems is much easier than curing them. Seek medical treatment from a specialist at the first sign of RSI. Warning signals include muscle tenderness, pain; aching and tiredness of the wrists, arms, shoulders, or neck; muscle spasms; and numbness and tingling.
• If you smoke, quit—particularly if you are undergoing surgery for a repetitive strain injury. Nicotine shits off small- vessel circulation and will make recovery more difficult.

**Of Sight and Sore Eyes**

“After one all-day stint on a VDT, I woke up the next clay with my eyes solid red, I mean blood red,” recalls an editor at the L.A. Times. “I looked like I’d gone on a 20-day binge. I looked in the mirror and practically scared myself.”

Eye strain has been one of the most common complaints of computer users since the advent of office automation, according to a report from the National Academy of Sciences, and the problem hasn’t gone away. Although the National Research Council issued a report in 1983 concluding that “no scientifically valid evidence has linked VDT use to long-term ocular damage,” several studies since that time have suggested that eye problems continue to plague VDT users.

In 1986, a research unit at the State University of New York College of Optometry found that “eyestrain, blurred near vision, eye irritation, headaches, and double vision all had an independent, statistically significant association with increased VDT use.” And in Massachusetts, a recent health study found that clerical workers who used computer terminals for seven or more hours a day experienced 72 percent more eye strain or sore eyes than clerical workers who worked on VDTs fewer hours a day.

The jury may still be out on computers and long-term ocular damage, according to some experts. No surveys, including an Italian study of 29,000 people, have linked VDTs to permanent eye damage, but at the University of California at Berkeley Optometry School’s Video Display Terminal Clinic, Dr. James Sheedy and colleagues found an unusually large number of the clinic’s patients, all VDT users, had trouble focusing their eyes. Out of 150 patients who had worked on VDTs an average of six hours a clay for four years, two-thirds—including 41 patients in their twenties and thirties—had focusing problems. Sheedy, who called the findings “surprising,” had estimated that only 5 percent of an average group of young people would have focusing problems.

Sheedy stresses that the study did not prove the problems were caused by computer use, but told one reporter, “We have to seriously consider whether the VDT might be causing some breakdown in the eye-focusing mechanisms.”
Experts point out, is that like the general population, VDT users tend to have uncorrected visual defects, such as farsightedness, of which they are unaware. Under the strain of intensive VDT work, these weaknesses can lead to eyestrain and other problems. Many of these vision problems can be corrected through proper lenses or special glasses, while other problems stem from poor workstation design and glare.

Among the ways computer users can protect their eyes:

- Get a full eye checkup before buying a computer or doing computer work, even if you are already wearing glasses or have twenty-twenty vision, and schedule a follow-up visit at least once a year.
- Avoid facing windows at your terminal, because, in the words of one ergonomics manual, intense light in the field of view “may flood the eye and wash out the image of the character cast upon the retina.” If you have to sit next to a window, sit at a right angle to it, with the display screen perpendicular to the pane to cut down on the glare.
- In general, the American Optometric Association recommends that lighting for computer users should be about half the level of normal office lighting (20 to 50 footcandles is the recommended range). At the office, you can achieve this by simply unscrewing half the bulbs in your area. Since some people notice a flicker with the traditional, 60Hz fluorescent lights, several experts suggest eliminating them entirely or replacing the 60Hz ballasts (transformers) with high-frequency, solid-state ballasts.

- Cut down on glare by using window coverings such as curtains, blinds, and awnings to control light entering the windows. To avoid reflections that can reduce legibility, don’t place the workstation directly underneath overhead lighting.
- The wall or other surface behind your computer should be about the same level of brightness as your screen. Watch out for very light or glossy paint finishes in VDT workplaces: these can cause bothersome reflections.
- If you can’t control glare in your area, get a filter screen. Mac users should avoid most conventional filters, however, because they will reduce contrast on the reverse-display Macintosh screen rather than enhancing it. Ask for a “high light transmission” filter.

**The Radiation Question**

No issue in the computer safety debate is as thorny, emotional, or complex as that which revolves around the electromagnetic emissions produced by display monitors. A three-part series by Paul Brodeur published in the *New Yorker* under the title “Annals of Radiation: The Hazards of Electromagnetic Fields,” recently brought this little-publicized topic to the national stage (June 12, 19, 26, 1989). Although some scientists and computer trade groups maintain that VDT emissions are harmless, more and more scientists, including some officials from NIOSH, reluctantly concede that we simply do not know enough to say with certainty that VDT emissions are safe.

The emissions produced by computer monitors include X rays, ultraviolet radiation, infrared light, and a range of electromagnetic fields. The earliest controversy over VDT radiation focused on X rays, a hazard experts now agree is negligible since these rays are blocked by the glass screen. Instead, researchers are investigating the health effects of emissions that, until recently, were considered perfectly safe: low-frequency electromagnetic fields.

Over the past ten years, most business groups and government health agencies, including the Food and Drug Administration, have maintained that low-frequency fields and other VDT radiation pose no hazard. Some computer manufacturers laughingly pointed out that the low-frequency fields emitted by VDTs were weaker than those emitted by toasters and electric blankets. Unlike ionizing radiation, such as X rays, low-frequency electromagnetic fields cannot break apart, or ionize, atoms—a feat that scientists link to cancer and other health problems. For decades, many physicists have argued that nonionizing radiation could not affect the body unless it was strong enough to produce heat or an electric shock.

Beginning in the sixties, however, and mushrooming in the seventies and eighties, hundreds of laboratory experiments have suggested something different. A number of experiments have indicated that pulsed, 60Hz electromagnetic fields—a type created by power lines, video-display terminals, and even indoor home wiring and home appliances—can induce biological changes, including changes in DNA synthesis, in animal cells exposed to them. Epidemiological research, such as the Kaiser study, which linked heavy VDT use to miscarriages, and other studies that have found an association between exposure to high power lines and childhood cancer, have fueled the growing concern.

Particularly startling to researchers were signs that, unlike exposure to doses of x-radiation, less exposure to electromagnetic fields is not necessarily better; some low-frequency fields appear to affect cells only at lower doses or only at certain frequencies, or “power windows.”

Such findings, and others, have led to a profound shift in thinking about the electromagnetic fields that are part of our everyday life. While a number of studies have failed to find a link between VDT use and increased rate of miscarriages or fetal abnormalities, and other studies show no affect from exposure to 60Hz fields, this year a comprehensive background paper from the Office of Technology Assessment (OTA) declared that the growing mass of evidence shows that low-frequency electrical fields too weak to heat a living organism can still affect it. According to the OTA, human beings may be at risk from exposure to very weak electromagnetic fields from VDTs, high voltage wires, and other ordinary power sources—such as electric blankets.

To what extent we should be concerned about these possible risks remains a topic for debate. Experts such as OTA study coauthor M. Granger Morgan, head of the Department of Engineering and Public Policy at Carnegie Mellon Univer-
sity, stress the need for more research. “There are clear effects on living systems that have been documented, but one can’t say that these translate to health risks given the incomplete nature of the knowledge available,” Granger said. “It’s like trying to guess what picture is on a puzzle when you have only some of the pieces.”

Meanwhile, manufacturers are adopting a cautious attitude. “Of course we’re concerned, and we’re following all the studies closely,” says Apple spokesperson Stacey Byrnes. “The safety and well-being of the customer is our highest goal, and we use the same equipment.” She says that Apple complies with all governmental standards for VDT radiation.

The government, which has no regulations governing low-frequency radiation emitted by VDTs, does not suggest extra precautions for pregnant VDT users, nor do computer manufacturers. Commenting on the Kaiser study on pregnancy and VDT use, Linden Heck of the Center for Office Technology notes that among the women with high VDT use who showed an elevated risk, the risk was statistically significant only among administrative support and clerical workers—not management—leading some researchers to suspect stress or other factors.

Nonetheless, given the evidence that dangers may exist, some health experts advise erring on the side of caution. The New York Occupational Safety and Health Committee (NYOSHC) urges women to ask to be transferred to non-VDT work during pregnancy or while seeking to get pregnant. Louis Slesin of VDT News, a newsletter devoted to computers and health issues, suggests that women who must work with computers during pregnancy use a liquid crystal display. The Safe Computing Company, of Needham, Massachusetts, makes a 10-inch, 8-bit grayscale LCD monitor for the Mac that the company says emits no electric or magnetic fields (800/222-3003, $1395). (Wearing a lead apron is not a solution for pregnant women, as the weight could be harmful to a fetus.)

In the absence of governmental policies governing low-frequency fields, computer users can take some steps to cut down on potentially harmful VDT emissions. Since the computer’s high voltage power source, the flyback transformer, is located in the back or the side of a VDT, the emissions are higher at the back of a terminal, and wall dividers are no protection. Computer users should sit at least 4 feet away from the back side of any other terminal. Some experts recommend sitting 28 inches from your screen—but check with your optometrist to see whether this poses a vision problem.

In addition, groups such as NYOSHC recommend installing radiation filters over the monitor screen. Although filters do not block the entire magnetic field (they miss the pulsed, 60Hz field of greatest concern to some researchers), they do screen out part of it, as well as the electric and static fields. Filters should always be grounded—that is, come with a wire to attach to the screen (“an ungrounded filter isn’t worth a tinker’s damn,” groused one radiation specialist). Research in Sweden and the United States has shown that static fields in front of a monitor cause ions and floating pollutants to assume a positive charge and head for the nearest negative ground—usually the user’s face. This can lead to persistent rashes, but a good filter will cut the static fields down to almost zero. The NoRad Corporation of Santa Monica, California, says it is developing a filter to block the entire magnetic field, and hopes to have a product on the market by the end of 1989.

For the long term, Macintosh and other computer users may want to urge the government to do more comprehensive studies of VDT emissions and other low-frequency electromagnetic fields. As Paul Brodeur concludes in the New Yorker, “The de facto policy that power lines, electric blankets, and video display terminals are innocent until proven guilty should be rejected by sensible people everywhere. To do otherwise is to accept a situation in which millions of human beings continue to be test animals in a long-term biological experiment whose consequences remain unknown.”

Given the speed at which the new technology was rushed onto the market and into millions of homes and offices, it is not surprising that the computerization of America should be attended by a host of unpredicted and unwanted side effects. In addition to maintaining a healthy skepticism about premature assurances that all is well, the most important thing Macintosh users—and their employers—can do is to learn to take on-the-job computer safety issues seriously. As RSI sufferer Rick Pearsall of US West says, “Take some precautions or you’ll regret it. Unlike a computer, our bodies have parts that can’t be replaced.”

Diana Hembree, a contributing editor at Parenting magazine, is currently on leave from the Center for Investigative Reporting, where she works as a coauthor, writing for the Columbia Journalism Review, broke the story of widespread RSI among computer users in the United States. CIR associate Katherine Webster helped research this article.
\[
\int_{a}^{1} \frac{1}{\sqrt{a^2 - x^2}} \, dx = \frac{\pi}{2}
\]

\[
\int_{0}^{\infty} \frac{x^m (1-x)^n}{(m+n+1)^{\ell+m+n+1}} \, dx = \frac{m! \, n!}{(m+n+1)!}
\]

\[
\int_{0}^{\infty} \frac{\sin (p \pi)}{1 + x} \, dx = \pi \sin (p \pi)
\]

provided that \(0 < p < 1\).
STARING AT A PAGE scattered with math symbols is enough to drive most of us over the brink. Suppose you had a friend who could solve even the most labyrinthine differential equations with ease? What if that friend was willing to solve all your math problems? The friend might even tutor you—initiating you into the secrets of math arcana, correcting you when you err, and all with infinite patience. A fantasy? Not if you plug the newest math applications into your Macintosh.

Computers have long excelled at number crunching, but few realize that they now have the ability to crunch symbols, as well. Symbolic computer mathematics was developed in the 1970s for mainframes and minicomputers. Today the most powerful, easiest-to-use of these symbolic math programs are found on the Macintosh.

Educators and students are obvious beneficiaries of the emerging math technology, but an increasing number of professional mathematicians, physicists, and engineers are taking advantage of the new tools. From high school students to professors of astrophysics, there’s something for everyone in the world of Mac mathematics. Read on for a guided tour of this surprising software universe.

**Symbol Processors**

**Mathematica 1.2** has inspired a great deal of excitement in the math software market. Created by the celebrated Stephen Wolfram, the well-publicized product performs both symbolic and numeric computation, and it defines the standards for utility and accuracy in both areas. In addition, it is available in versions tailored to 386-based PCs as well as to Next, Sun, and many other workstations.

One of Mathematica’s chief strengths lies in the fact that the American university community has developed add-on packages for the program. Covering topics that are not contained in Mathematica itself, these packages include such topics as general relativity and fluid dynamics.

Another feature that sets Mathematica apart from its competitors is its graphics capabilities. Mathematica produces publication-quality 2-D and 3-D graphs with detailed control of color, shading, and information content (see “MegaMath”).

And Mathematica is comprehensive. It includes most of the facilities necessary for completing Ph.D.-level thesis work, as well as a careful interface to and from the programming base already existing in C and FORTRAN. (You can use C routines in Mathematica and Mathematica routines in C, for example.)

Finally, Mathematica comes with a 750-page book by Wolfram that is the best manual yet produced in this market. If you are working with symbolic math programs, this is not a trivial consideration. The quality of the manual is particularly important in this case because Mathematica’s Help system deals only with the details of the Macintosh implementation—not with the intricacies of the program itself.
Despite all these pluses, Mathematica may not be your automatic first choice for all math computing needs. If you simply need a little help with your freshman calculus homework, or you want to tally some figures to help you select electronic power-supply components, using Mathematica could be roughly equivalent to steering a 747 to your corner grocery.

Also, Mathematica 1.2 for the Mac II demands 4MB of RAM. (For convenient use with an SE or a Plus, you'll also need 4MB of RAM and, as with most math programs, a 68881 accelerator/coprocessor board.) And not much of this space is required for interface beautification; Mathematica operates on plain text commands, requiring that you pay attention to capitalization, spacing, and punctuation.

If you want nice-looking pages of math symbols, the manual suggests that you use its TeX (a popular academic typesetting program) export feature or other external printing support. The program can handle nearly any mathematical task, including beautiful printing of symbols and graphics, but mastering the program requires serious commitment. (For an in-depth review of Mathematica, see Macworld, December 1988.)

Maple 4.2, recently developed at Canada's University of Waterloo (the source of an amazing number of high-quality commercial software products, including leading Pascal and C compilers for IBM PCs), is Mathematica's strongest competitor. Notwithstanding its discouragingly austere interface—it is adapted to work on a large spectrum of workstations and minicomputers—Maple's amazing range of computation facilities is comparable to, and in several areas beyond, that of Mathematica.

Users with a programming background will recognize that Maple is rather like an interpreted version of C that includes the world's largest set of math libraries. The range of functions that comes with Maple is impressive (see "Symbolic Differentials"). There are special packages for differential forms, group theory, number theory, and routines for symbolic solution of ordinary differential equations. In addition, there is even a package offering calculus for students.

Like Mathematica, Maple employs text commands and offers you the option of formatting Maple files for symbol output using a variant of the ubiquitous TeX format. Similarly, graphics files can be saved or plotted as PostScript files using a variation on the usual plotting commands. As an alternative to TeX output, users of text-based programs may want to invest in one of the symbol processors designed for desktop publishing. These programs let you write out equations in symbols for inclusion in ordinary word processing and page-layout documents. (Three of these—Formulator, Expressionist, and MathType—were reviewed in Macworld, November 1989.)

The Mac version of Maple includes a cheery Mac-specific manual accompanied by a 400-page system-independent manual that barely has room to include a terse listing of all program functions. The online Help feature is equally concise, but it does offer a few useful examples of function use at each call.

Maple does require nearly 8MB of hard disk space to operate properly, and it contains so many files that you will probably have to increase the space you normally allocate to the Finder. But it runs with 1MB of RAM, a distinct advantage for students or others with budget and memory constraints.

On a low-end system, Maple is much easier to use than Mathematica for many types of problems, and both symbolic and numerical calculations proceed with acceptable speed on a plain SE. If you don't require advanced graphics (Maple offers only a modest set of 2-D plots), but you do want to explore the full range of modern symbolic/numeric computation, Maple deserves serious consideration.

Theorist is an ambitious attempt to combine a real Mac WYSIWYG math-symbol interface with Mathematica-quality graphics and professional-level symbolic computation abilities (see "Coming Soon"). Developed by Prescience, the creators of Expressionist, the first release

MegaMath
Mathematica combines a huge repertoire of symbolic/numeric computational techniques with the finest graphics capabilities offered by any program. The command-driven interface is sometimes awkward, and the program demands 4MB of RAM, but for many advanced tasks it's the only choice.

Symbolic Differentials
Maple's plain-text interface is deceptive; it is a sophisticated program that rivals Mathematica in computational power. This screen shows Maple solving an ordinary differential equation (de3) symbolically.
of Theorist may be available by the time you read this. It is not as comprehensive in functionality as Maple or Mathematica, but the early versions tested by *Macworld* were significantly easier to use than Theorist's text-based competitors.

**Student Symbol Processors**

*Milo* was the first product to perform symbolic computation in real Macintosh style, using traditional math notation on screen (see "Critical Math"). This laudable convenience is somewhat offset by the program's limitations. In Mathematica or Maple, for example, you can simply type in an expression and count on the program's rule libraries and artificial-intelligence/pattern-recognition capabilities to direct manipulations. Milo, on the other hand, often expects you to select or formulate applicable transformation rules yourself. For repetitive problems in a well-defined area, this is acceptable and even efficient, and there are clear pedagogical advantages.

Milo does require more planning and labor than the high-end systems, but the solution to your calculus problem will look like the one in the book, and you may have a better understanding of how the problem was solved than you would with a totally automated system.

Besides owning Milo, Paracomp also owns the rights to a high-quality C-language mathematical library, and the company is currently working out an interface to use this library to boost Milo's modest rule base with these tools. (For more on Milo, see Reviews, *Macworld*, July 1989.)

**PowerMath II 2.5** weighs in at a sleek 132K and has the distinction of providing a reasonable number of symbolic computation operations within the memory constraints of nearly all Mac owners. It performs symbolic differentiation and integration, does matrix manipulation, and solves sets of linear and non-linear equations. Professional users with large tasks will probably find it too slow for convenient use, and engineers interested in numerical results will likely prefer one of the programs described below, but

**MATH VISIONS**

Visualizing often helps us to understand a complex math problem. While comprehensive programs like Mathematica can include most of the familiar graphing and plotting styles, most computational programs benefit from supplemental graphing packages. A great many of these are on the market; what follows is a nonexhaustive list of some of the more popular scientific graphing programs.

Lascaux Graphics produces some outstanding visualization aids: $f(z)$ ($59.95), Fields and Operators ($59.95), and 4 Dimensional Hypercube ($24.95). New to the Mac, these programs are expressly designed to develop your intuition with problems involving functions of complex variables, vector calculus, and projections of geometrical objects in hyperspace on a plane. The ability to see the mappings of a complex plane directly often lets you guess solutions to whole classes of problems.

Another new program, DeltaGraph ($195, DeltaPoint), is capable of generating a wide variety of 2-D and 3-D graphics in color from spreadsheet or other tabular data, and it can be used for exploring functions in mathematics and for dazzling presentation-quality business graphics, as well (see "Plotting Away").

Other packages, designed mainly for graphing, offer general-purpose computational capabilities. If you have tables of experimental data and you want to explore them graphically (perhaps after a few simple data transformations), these programs may be a better choice than the symbolic/numeric math programs. Some representative current offerings are listed below.

**Igor 1.1** ($195, WaveMetrics) is a 2-D plotting program with an emphasis on signal processing. Igor ("the scientist's assistant") offers Fourier and inverse Fourier transforms of data, curve fitting to a variety of waveforms, and a macro language for generating arbitrary transforms of data. This program offers quick calculation and plotting, with superior high-resolution LaserWriter graphics.

**KaleidaGraph 1.1** ($179, Abelbeck Software) offers a respectable array of 2-D plots, combined with a pop-up RPN scientific programmable calculator for data transformation. A drawing tools palette and facilities for chart enhancement bolster this program's credentials for presentation graphics.

**Passage** ($200, Passage Software) for the Plus/SE and **Passage II** ($395) for the Mac II include x-y plotting, data smoothing, numerical integration and differentiation, and Fourier/inverse Fourier transformation of data series. Both programs offer polynomial curve fitting and algebraic data transformation; Passage II supports color and direct math coprocessor access for improved plotting speed.

**Parameter Manager Plus 3.0** ($595, GenRad), is specifically designed for analysis of tabular experimental data, and it features an added-cost communications module that can control data-acquisition boards or download data from other peripherals. Besides more than 20 styles of scientific and statistical chart types and a command language with more than 100 functions, PM Plus lets you develop new chart types that can be saved as defaults for automated data analysis.

**DScience** ($495, Spectra Blue) is the largest of these programs and requires a Mac II or higher. DScience performs user-defined convolutions on data as well as Fourier operations and curve fitting. The program also offers statistics functions and can do matrix transformations of tabular data, either imported or entered in DScience's internal spreadsheet. Of the programs mentioned here, DScience alone can perform contour and surface plots—in color—of large (more than 100,000) sets of data points.

**MacSpin 2.0** ($300, D² Software) is a specialist's program, developed exclusively for plotting multivariate data for 3-D viewing. Popular among statisticians for inspection of complex, clustered data sets, the program also allows algebraic transformation of variables and plotting of smooth functions in 3-D, as well as discrete statistical point sets.
PowerMath II’s leisurely pace has great educational value—you can watch how the program derives its answers as it lists each intermediate step on the screen, one step at a time.

**Number Processors**

**MathCAD 2.0**, a successful program for IBM PCs and compatibles, is now available on the Mac. Although programs ported from the PC frequently offer a disappointing plain-text interface, MathCAD has almost every nicety you could wish for: symbol menus, in-document scalable plotting regions with 3-D plots, and WYSIWYG equation representation for easy production of reports (see “What You See”). Using the symbol and operator menus, you construct problems in familiar math notation and direct their solution with a few simple commands from the Calc menu. The attractive and well-produced documentation could meet the standards of Claris or Microsoft, a rare circumstance for science and engineering software.

The basics for engineering and physics calculation are included in MathCAD, along with a helpful set of expandable examples based on textbook engineering problems, such as beam bending and anharmonic vibration. MathCAD also handles numerical calculation on complex numbers, vectors, and matrices; it performs iterative calculation (automatic repetitive calculation stepping through a series of test values) in several styles; and it solves linear and nonlinear equations. The program also includes packages for statistical calculation and for Fourier and inverse Fourier transforms. The calculation speed is acceptably optimized—Fourier transforms of several thousand real data points and inversion of a $10 \times 10$ matrix both take less than 3 seconds on a Macintosh IIX.

**Coming Soon**

Theorist, slated for release at the end of 1989, attempts to combine color graphics, symbolic computation, and palette-based WYSIWYG equation entry.
I say less than 3 seconds because the program's screen refresh is quite slow and inconsistent; it is possible that the calculations are significantly faster than you can detect from observing the screen. Also, the program often leaves statement fragments lying scattered on the screen, forcing you to issue the Redraw command. A complex screen full of symbol or plotting elements invariably takes several seconds to redraw, even on a IIX. This infelicity in the implementation of an otherwise attractive program should have been fixed before release.

**MatLab 1.1**, geared mainly for the kind of matrix computation needed by electrical or structural engineers, appears at first glance to be a specialist's program. In practice, a wide variety of problems in applied mathematics can be recast as matrix problems. One benefit of the Mat-Lab approach is that it encourages Mat-Works (MatLab's creator) to optimize the matrix computational algorithms for each computer: on a Mac IIX, MatLab takes two seconds to invert a 50 x 50 matrix or to Fourier transform 4096 complex data points. This is nearly 40 percent faster than MatLab's performance on a Mac II. No other program discussed in this article can approach MatLab for sheer numeric throughput.

The originators of the program have the refreshing honesty to call the Plus/SE version Edu-MatLab, seemingly indicating that they intend it for demonstration purposes only. This modesty is almost misleading—the SE version of MatLab can handle matrices nearly as large as the maximum size specified by MathCAD and at speeds that no other firm would find embarrassing.

MatLab features a built-in programming language that is used in the interactive mode and is also used to construct scripts called M-files that automate processing of batch computations (see "And the Number Is"). Besides the expected matrix operations—inversion, factorization, eigenvector/eigenvalue calculation—MatLab offers regression, a library of signal processing functions (filtering, FFT), functions of mathematical physics, and numerical integration; and it solves nonlinear and differential equations. Although it is not emphasized in MatLab's documentation or advertising, the program is generally faster on most examples at unconstrained optimization and at solving systems of nonlinear equations than TK Solver Plus and Eureka (discussed below), programs that ostensibly specialize in just these functions.

The program allows you to create graphics, including 3-D mesh and contour plots, which can be saved as PICT or PostScript files. And you can enhance MatLab with three different toolboxes covering different aspects of linear and nonlinear systems theory. These are high-level professional packages for use in design of control systems and circuits. They're not for everyone, but as vertical-market software, they do represent a significant bargain.

**TK Solver Plus 1.1** is the latest incarnation of a program that dates back to the dawn of personal computing. There were several versions of TK well before there was a Macintosh, and these days TK can be used with most minis and personal computers.

In the TK vision of the world, all computations are at heart spreadsheet computations. The program forces you to define your problem in terms of a set of variables on one sheet; the rules connecting the variables on another; and functions, units, lists of various types, and plots on still other sheets (see "Multiplatform Advantage"). Although the TK format seems restrictive at first, it actually imposes a useful discipline on problem organization, a discipline that becomes particularly important when you are working on large engineering problems with dozens of variables in odd units.

Because it is not always obvious how some types of problems should be set up in TK, the program package provides a library of examples that cover numerical

---

### Critical Math

Milo offers symbolic computation with a WYSIWYG interface. Although it lacks the giant rule bases offered by Maple and Mathematica, it's an easier program to use for undergraduate-level problems.

### What You See

At present MathCAD is the only numerical math package with a WYSIWYG interface, mixing graphs and equations (in symbols) on document pages. MathCAD offers a wide range of facilities and, as you might expect, superior report generation.
differentiation, matrix math, the use of TK's large library of built-in advanced functions, statistics, financial applications, and a variety of engineering computations. Similarly, one can buy Solverpacks for most areas of mechanical engineering, electrical engineering, architecture, and finance. If most of your work concerns calculating variations on a theme in a well-defined area, these special packages can be a cost-effective productivity tool.

Ambitious users willing to learn a new style of programming can use TK Solver Plus to mimic many of the aspects of an engineering expert system in which a matrix of IF-THEN-ELSE statements and logic-valued functions make decisions about which computational paths to pursue. The less ambitious may be content with purchasing canned programs.

Eureka: The Solver is a less formidable solver-type program available in PC and Mac versions from Borland International, a major force in PC databases and programming languages. Basically Eureka focuses on solving sets of linear and non-linear algebraic equations, and even a beginning user can accomplish these functions after only a few minutes of practice. Eureka has a respectable graphing function, including an interactive zoom, and it is singularly adept at preparing reports for summaries of calculations.

Thirty scientific and financial functions are included as part of Eureka's programming language, and an array of examples demonstrate how to solve problems from undergraduate physics through linear programming. Although Eureka is more limited in scope than a general-purpose equation processor such as MathCAD, Eureka features a particularly robust solution algorithm (less-capable algorithms can hang up with poorly considered initial values). Eureka provides you a relatively compact, low-cost way to add equation-solving to your software repertoire.

MathView Professional, the oldest of the programs discussed here, can't really be viewed as a MathCAD competitor. Lacking a programming language, MathView is more like the world's most sophisticated scientific calculator. It's as though you designed a calculator with buttons for all the topics in Abramowitz and Stegun's famous Handbook of Mathematical Functions and then threw in seven buttons for numerical integration in different styles and six more buttons for solving differential equations.

It offers most common types of statistical distributions, matrix operations, and routines for solving partial differential equations. Completing the package, MathView offers function plotting in 2-D and 3-D. While the interface seems basic by current standards, the underlying routines are as sophisticated as any except

Plotting Away
DeltaGraph is a new package that lets you plot spreadsheet or other tabular data in a vast variety of formats, supplementing the capabilities of graphics-poor computational programs.
MatLab’s; and MathView can invert matrices and sum series as fast as MathCAD.

**SUMMING UP**

Mac users now have access to all the mathematical power tools—from simple engineering aids to symbolic computation systems capable of proving theorems in automata theory—produced by university computer science and engineering departments. Before choosing from among these applications, however, please note that one of the main investments you will make is time. It is more efficient to learn a single software package that can handle your work load over the next few years than it is to juggle three or four different programs that deal with distinct classes of problems.

If you use this guideline, the choices are fairly clear. For algebra, calculus, and upper-division college work, Milo works well; Maple and Mathematica can handle nearly anything up to the very cutting edge of contemporary research (the choice between the two depends on your hardware platform and graphics ambitions). When Theorist arrives, nestled somewhere between Milo and Mathematica, it promises to be another serious choice.

Among the numerical programs, MatLab is the undisputed choice for computation-intensive engineering work; TK Solver Plus offers the advantage of solution packages for business and finance, as well as a list of engineering topics. MathCAD has the only general-purpose numerical math system that exploits the Mac interface for communicating results in reports.

The pioneers in math program development wanted to produce an intelligent blackboard, a system that could understand symbolic equations and carry out computations according to a library of rules. In varying degrees of thoroughness and efficiency, this goal has been reached, and the Macintosh has evolved into the ideal platform for such programs.

As Macs incorporate more memory and faster CPUs and math coprocessors, we can expect WYSIWYG versions of the major symbolic math programs and ever larger rule libraries for the smaller programs that are already symbol based. Our ability to solve complex mathematical problems is being extended phenomenally. Even today, with just a little exposure to the software, we can accomplish math tasks that required the talents of a near-genius only a decade ago. See *Where to Buy* for contact information.

Charles Seiter has been studying symbolic computation since the appearance of MACSYMA, and he was a beta tester for most of the programs in this article.
A review of 1989, the year the Mac turned five, prosperity beckoned, and plenty of other stuff happened

Middle-Aged Crazy

If you figure that computer years are like dog years—each one the equivalent of seven in a human's life—the Macintosh turned 35 at the beginning of 1989 and hit 40, the September of its years, just around the time the leaves started dropping. And sure enough, the signs of middle age were everywhere in the world of Macintosh. Consider its life span: Pulled from the womb (after a perilously long incubation) in 1984, Baby Mac was barely able to perform the functions of life. In 1985, a somewhat gangly adolescent acquired its first hard drive, along with a few pieces of functional furniture—Microsoft Word and a few other software offerings—and set off to make its way in the cold world. The big break came just at adulthood, 1986, when the Mac matured into a Mac Plus connected to a LaserWriter running PageMaker. Its twenties were heady times, but we could detect a more serious

by Steven Levy
side coming to the fore in 1987 and 1988—the thirtysomething years—when the software base stretched for miles, the Mac II was introduced, and Mac started courting impressive partners like Digital Equipment Corporation.

In 1989 the Mac, with a touch of distinguished gray (OK, platinum) at its sideburns, was finally as prosperous as its parents hoped it would be. Its tastes became more worldly; it now drove around in a powerful 68030 processor, and when it came to internal memory, external storage, and even screen size, its earlier accommodations seemed strictly grade-school issue. Luxury was the Mac's reward for its success.

But strange things often happen at this point in life. As soon as you pause to bask in the warm glow of achievement, you become aware of the cold draft of eternity blowing from the other direction. We all die eventually, and many of us have been known to spend a few of our middle-aged years going, well, a little batty as we come to terms with the prospect. Why shouldn't a computer go through the same stage?

It's easy to identify the pathology: On one hand there's an urge toward caution—so as not to jeopardize previous gains. On the other hand, there's a certain latent panic that things have to be done because tomorrow, you're dust. On the job, of course, the Mac is better than ever. But everywhere you looked in the world of Macintosh, there was a hint of instability—a middle-age crisis that added an air of mild hysteria to 1989.

**Year of the CPU, and the CPU, and the CPU** Apple promised us we'd have a lot of new Macintoshes this year, and they delivered a bushel. Put it this way—if Isaac Newton had been sitting under the Apple Computer tree, he'd have needed a crash helmet.

Did we need all those Macintoshes? Who knows? They just kept coming. They all seemed to have a few things in common, though. The processors were generally the Motorola 68030. The floppy drives...
were the HDFD SuperDrives, which store up to 1400K of data and can read MSDOS-formatted disks as well as Macintosh disks. In almost all cases, the new computers were designed to be nearly as inexpensive to produce as the earlier, lower-power models. And not one computer was a dud: all of them provided some feature or capability that users desired.

Thus, while one message that came through clearly was that Apple was committed to constant improvement on the Macintosh line, an unintentional message was also transmitted: Don’t rush out to buy a new Mac, because in two or three months Apple might announce something better. Just ask the folks who plunked down premium bucks for a Macintosh II, orphaned just as surely as if its parents, like young Bruce Wayne’s, were gunned down on a street corner.

**The SE Turns 30** In January Apple gave us the SE/30. This logical evolution of the original Mac had the essential accoutrements of the Macintosh IIx—namely the 68030 chip, a math chip, and the superdrive. As long as you didn’t mind the small screen, this was obviously the Macintosh to buy. In fact, one day this will probably replace the SE itself.

**Mac in a Box** The most significant new computer, though, was unveiled in April in a hitchless coast-to-coast press conference. This was the Macintosh IIcx (notice how dull and middle-aged these computer names are?). The IIcx obviously is destined to be the new workhorse of the line, thus assuring that it won’t be supplanted for at least a year or so. It’s a more compact version of the Macintosh IIx, elegant, powerful, and with the aura of a winner. Apple couldn’t make enough of them, which turned out to be a problem when sales of other models sagged while people waited for IIcx’s.

Later in the year, Apple introduced an enhanced version of the IIcx, the IIci. With its 68030 processor running at a clock speed of 25 megahertz, the ci cost $1600 more than the cx, which means you’re paying about a hundred bucks for each additional megahertz. But to get a really significant speed gain, you have to add a cache card and a video card. Only then can you sleep soundly, secure in the knowledge that you have the most powerful Mac—so far.

Significantly, Apple did not unveil any machine that attempted the jaw-dropping pyrotechnics provided by its prodigal founder, Steve Jobs, with his Next computer. Like most baby-boomers reaching middle age, Mac is waiting for its biological clock to reach midnight before it conceives the offspring that will supplant it.

**At Long Last Laptop** The most heralded introduction, though, was that of the Macintosh Portable. Apple had been stalling Mac users for years, insisting that it wouldn’t introduce a laptop until the technology was up to Apple’s standards. Well, the Portable is a breakthrough product, especially in terms of screen resolution and power-conservation technology. But at $6500 and 15.7 pounds, it’s the Roseanne Barr laptop—you need a big lap and lots of money.

Meanwhile, those looking for less-opulent laptops could consider third-party options like the Wallaby, a $3000 system that uses the ROM chips from an existing Mac Plus or SE to power a very nifty 9-pound computer with a clear LCD screen. Or you could do what everybody else does—stick the standard Macintosh in a case and watch the damned movie while you’re on an airplane.

**Buzword of the Year** When it was not shoveling new machines into the pipeline, Apple was hawking something called desktop media, also referred to as multimedia or desktop MTV. Most of John Sculley’s speeches revolved around this concept and seemed to be aimed at sparking a new boom as big as the celebrated desktop publishing explosion. Apparently not everybody at Apple shares Sculley’s optimism, however: as evangelist Jim
Things are looking up for Steve Jobs. In 1989 he not only signed financing and distribution deals, but actually shipped machines.

Most Unreadable Mac-Generated Charts

The set of avant-garde bar graphs included in Apple's 1989 third-quarter report. You have to stare at it for about an hour before you can see how sales relate to income and earnings. Of course, Apple didn't intend it that way, we're sure.

Trashy Video of the Year

Industry gadfly and Apple groupie Chuck Farnham, whose hobby is gleaning inside information from Apple, is preparing a documentary on beating Apple security.

Armstrong told MacWeek, "It will take another three or four years before multimedia is in the mainstream, so we don't want to build expectations."

No matter; multimedia is infused with sizzle, the quality that pumps adrenaline to a middle-aged heart. And so companies began claiming that their products were part of the multimedia revolution—whatever that was. Among the firms that piggybacked on the Apple push were a number of so-called information providers, ranging from Newsweek to ABC to Time Warner.

Boardroom Blues Apple executive offices in Cupertino must have been a very interesting place in 1989, at least during the rare times when half the people weren't on sabbatical. After all, according to Dataquest this was the year Macintosh sales figures surpassed those for IBM PCs. It was also the year when continued reorganizations by Apple commander in chief Sculley culminated in a company organized around polar opposites—product manager Jean-Louis "The Dark Prince" Gassée and a newcomer from an insurance company, Apple America head Allan Loren. Somewhere along the line, Apple management, which had been acquiring a reputation for genius, lost its luster.

Some of the actual blunders—a misjudging of the crisis in memory chips, and the cafish fourth-quarter price increase—occurred in 1988. But it was in 1989 that Apple had to answer for them. Earnings were lower than expected and critics were so numerous that John Sculley bitterly remarked to the New York Times that "Apple-bashing is in."

Interface Wars (continued) One of the bashers' favorite topics was Apple's insistence on pursuing a lawsuit against its largest software supplier, Microsoft, on the grounds that Microsoft's Windows software running on the IBM PC infringes on Apple's copyrighted Macintosh operating system. For those keeping score, there were two rulings on the case this year; one
going in Apple’s favor and the other going in Microsoft’s.

**Battening Down the Hatches** And for those who savor the rambunctious Apple culture that flourished in Mac’s youth, there was yet another worry: the director of security at Apple, a former G-man, instituted an “Information Protection Program.” In response, a group calling itself nuPrometheus got hold of part of the priceless code of the Mac operating system and sent it to a few journalists.

We never did get to find out whether the group had all the codes, because the magazines earmarked to be the intermediaries between the bandits and their would-be beneficiaries refused to run the ads upon which the information-drop scheme depended. Considering Apple’s hacker roots, though, there was a certain delicious irony to the company’s plan to seal itself from outsiders. The whole episode ranks up there with another revisionist classic of 1989—Jefferson Airplane’s Grace Slick explaining that the famous line “feed your head” really meant “go home and read a book.” Grace was kidding, though.

**Thanks for Everything** Apple honchos designated 1989 the Year of the Customer, and promised better support. The only tangible sign of this was a letter sent to all registered Mac users—the first ever—giving them information on various upgrades available for their equipment. In general, Apple’s attitude toward its customers was still characterized less by handshakes than by the back of the hand. Product warranties remained at 90 days instead of the industry standard of a year. Meantime, for those who wanted to keep their Macintoshes current, Apple’s upgrade prices were still prohibitively high.

**Can’t Beat the System** Breaking tradition, Apple announced its new system software—System 7.0—almost a year before its scheduled release sometime in 1990. Developers and customers welcomed the chance to plan ahead, and there was much drooling over some of the promised features: virtual memory, an improved Finder, outline fonts, tear-off menus, and a new print architecture. Once all the smoke clears and the software developers bring out new releases with System 7.0 in mind, perhaps the most useful advance will be interapplication communication, which makes it possible for one program to instantly update documents in other programs; if you change the wording of a story in your word processor, the changes will show up in the page-layout software as well.

Of course, the system will have its price—it won’t work with less than 2 megabytes of RAM, and you’ll certainly want more. And cynics say that Apple announced it early—before it could say for certain all the features that will be included—more to preempt Adobe Type Manager and IBM’s Presentation Manager than out of an urge to help customers. But we won’t complain—unless this agreeable announcement becomes a persistently vaporish dream.

**Software: The Ships Come In** Speaking of vaporware, this is the year some long-delayed products finally stumbled to the finish line. We recall hearing, back when we were sitting on Granny’s knee, announcements about products like Wingz, Microsoft Word 4.0, and the second release of 4th Dimension. Well, Granny’s long buried, but in 1989 we finally got to see these beauties in shrink-wrap. What a trend—actually shipping products!

In other software news, there was no product that did to . . . well, anything, what VisiCalc did for spreadsheets. But plenty of people were trying to think one up.

**Hardware: So What Else Is New?** The wonderful, expensive world of color grew in importance this year, with the introduction of zillions of monitors, 24-bit boards, and even printers. No one introduced a cheap CD ROM drive, but the base of ROM disks grew slowly and steadily.
Heigh-Ho, Knowledge Navigator!

At January Expo in San Francisco, Kinetics brought a costumed Clayton Moore, the original TV Lone Ranger, to promote its LAN Ranger product, and gave out black masks.

But John, Tell Us What You Really Think

Adobe head John Warnock called the Apple-Microsoft font technology announcements "the biggest bunch of garbage and mumbo jumbo I've ever heard in my life."

It'll Never Fly

Apple's new advertising campaign has a story line about how some hotshot guys in marketing use desktop media to sell their bosses on the idea of a combination car-and-helicopter. Right.

If the year had its ups and downs for Apple, consider the plight of its competitors. IBM, still plagued by clone competition, had the embarrassment of being passed by the Mac in sales; and its Presentation Manager, which is supposed to make DOS more Mac-like, is still not fully implemented. Compaq Computer, though, had another strong year, and overall the MS-DOS installed base still dominates the personal computer world.

In the workstation market, potential Apple rival Sun Microsystems experienced its first quarters in the red. But it was a good year for former Apple chairman Steve Jobs's Next Computer, which not only arranged a distribution deal with Businessland and got financing from Japan, Inc. (in the form of Canon), but actually shipped machines. Watch out.
was not all. In September, at the Seybold Publishing Conference, Apple and Microsoft (deep sounds from electric organ) announced an alliance: Apple will use Microsoft's Bauer Postscript clone, while Microsoft will be adopting Apple's new, open standard—a font technology code-named Royal—that could supplant PostScript. Talk about a royal screwing! This forced Adobe chief John Warnock, who was looking like Meryl Streep after the dingo got her baby, to take the extraordinary step of releasing the previously top-secret specifications for Type-1 fonts. The font wars had gone ballistic, and unbelievably enough, the winners will possibly be the users, who eventually stand to benefit from the cheaper and more accessible standards.

In the Army Now The thrill we used to get when we saw a Macintosh on the desk of some celebrity, or even a suspended Fortune 500 knowledge worker, is no longer there. The Macintosh is now a noncontroversial purchase. But it is news when Macs invade entirely new markets. Like the federal government. In 1989, we saw Macs purchased in bulk by NASA, the Postal Service, and, in a contract that could bring Apple $800 million in five years, the air force. Maybe helping nukes hit their targets wasn't what Andy Herzfeld had in mind, but after all, a "realistic" attitude toward business as usual is another typical sign of middle age. On the other side of the balance sheet, Apple gave a bunch of computers to the Peace Corps.

All in all, a good year for the Macintosh, if not a totally triumphant year for its manufacturer. Be thankful that the Mac, unlike many of its would-be competitors over the years, survived long enough to suffer a midlife crisis at all. Fortunately, the song we'll be humming as middle age progresses won't be "Only the Good Die Young." Instead, something appropriately smug, if somewhat prematurely senile—maybe the Barry Manilow classic, "Looks Like We Made It."
What's the hottest idea in Macintosh programming? Hints: Apple thinks it's so important that engineers are writing the System 7.0 Finder with it. The development environment for the Next computer is based around it. The answer is object-oriented programming, or OOP, and it has been hailed as one of the most important building blocks of next-generation software.

From a programmer's perspective, OOP simplifies development of large, complicated software applications by making code easier to understand and maintain. This means that programmers can think more about how an application should work—and less about writing it.

For users, OOP means better applications—more accurate, flexible, and extendable than those currently available. Because OOP makes programming easier, it allows end users a chance to customize existing applications or develop new ones. Users can combine applications and exchange information between those applications, or control several applications with a script.

**The World Is an Object**

Now that you know the whys of OOP, let's take a closer look at the concept with an example: HyperCard and HyperTalk. Yes, HyperCard's language, HyperTalk, is an object-oriented language. In fact, if you've done any HyperTalk programming, you've already used some basic OOP principles.

The fundamental building block of OOP is the object. An object combines information and any operations that can be performed on that information into one single bundle. (In OOP lingo, this bundling is termed *encapsulation*; the operations are *methods*.)

An object performs one of its methods when you send it a *message*. The important thing is that the message doesn't have to tell the object *how* to do something, only *to* do it. So, to get a HyperCard button to highlight when a user clicks on it—one of its methods—you simply check a box. Doing so sends a message to the button object telling it to perform that operation. The object interprets the message and is responsible for finding and executing the appropriate method. You needn't write anything that tells the button what steps to take to highlight itself; you just ask it to highlight.

Think of objects as computer chips—small modularized units with built-in sets of instructions to perform small operations, ready to be combined into a larger program. For example, a background, card, field, and button are all...
Many of us believe in the promise of OOP to help bring about the great software of the future.

—Scott Knaster
objects in HyperCard that come with sets of instructions to do things—highlight, scroll, and so on. Put those objects together with customizable scripts, and you create a stack, which is itself an object. You'll get an idea of how much easier OOP makes programming if you imagine trying to write the visual effects available in HyperCard yourself.

**Family Trees**

Two other features of OOP help ease the programming burden. First, objects that respond the same way to a particular message can be grouped into classes. That way, you don't have to describe the message behavior of every object separately. For example, there are several different types of buttons (opaque, transparent, and so on) in HyperCard, but they all react the same way to messages. As a result, buttons are a class.

Second, one class of objects can inherit characteristics from another class. When you create cards in a stack, they can inherit properties from background cards. Any buttons, fields, or graphics on a background card do the same thing, or look the same, on a card. Just as classes let you avoid describing one by one how similar objects behave, inheritance means you don’t have to start class descriptions from scratch.

**Object-Oriented Languages**

To take advantage of OOP features, you need a programming language or toolkit that supports them (see “OOP Languages and Tool Kits”). There are essentially three types of OOP languages.

Pure OOP languages provide all four object-oriented capabilities: encapsulation, message passing, inheritance, and user creation of classes. Hybrid languages offer object-oriented extensions to traditional procedural languages such as C or Pascal. Finally, languages that don’t permit full use of inheritance and/or classes are called object-based languages. HyperTalk is an object-based language, because it has only five classes.

Apple's—and thus the Mac's—involvement with OOP goes back long before HyperCard and HyperTalk. In fact, objects are second nature to Mac users. When you select an icon from the desktop and the file menu suddenly activates, you're experiencing OOP firsthand, Macintosh style. Thanks to that object-oriented heritage, there is a variety of OOP languages for the Mac, ranging from old standbys to new visual languages (see “Programming OOP with Pictures”).

**Pure OOP**

Developed at Xerox Palo Alto Research Center (PARC) in the 1970s, Smalltalk is the language most associated with OOP. (In fact, it was seeing a user interface written in Smalltalk that inspired a certain gentleman named Steve Jobs to create a computer. You know the rest of the story.)

The three implementations of Smalltalk-80 available for the Mac provide not only the language itself, but also a comprehensive programming environment, including compilers, debuggers, and class browsers. In Smalltalk, everything is object-oriented—from the language to its development environment.

Smalltalk-80 from ParcPlace Systems, a spin-off of Xerox PARC, is the complete, standard version of Smalltalk (not surprising considering ParcPlace's origins). Digitalk's Smalltalk/V Mac offers a subset (about 80 percent) of the Smalltalk language. And finally, there is Apple's unsupported version of Smalltalk-80 version 0.4; it is still being sold through the Apple Programmer's and Developer's Association (APDA), but Apple has no plans to update the language.

**Hybrid OOP**

As revolutionary as Smalltalk is, the language still hasn't made tremendous inroads into the world of commercial-application development, primarily for one reason: any applications written in Smalltalk must run within the Smalltalk development environment.

In order to take advantage of OOP, then, programmers are turning to hybrid languages. Because they are based on familiar programming languages, hybrids mean a shorter OOP learning curve. In addition, programmers can still use any code previously written in a hybrid's base language.

Hybrid languages offer a choice between programming the old-fashioned way or the OOP way. You can use the OOP extensions all the way through a program, in some part of the program, or not at all, depending on the application you're coding. Flexibility can present a problem, however. You're not forced to think in terms of objects—as you are in Smalltalk. It's up to you to decide when an object-oriented approach is appropriate and when it isn't. Bouncing back and forth...
between OOP and traditional programming can get complicated, especially for large applications.

**Pascal**

Apple's Object Pascal is actually Apple's second hybrid extension to Pascal. (The first was Clascal, the development language for the Lisa.) With Apple's presence behind it, Object Pascal has become the standard OOP Pascal hybrid on the Mac.

Standard Pascal has four structured types: arrays, sets, files, and records. To permit OOP, Object Pascal adds a new type, objects. An object is similar to a record in that it can consist of several fields; however, it also contains its own private procedures and functions—its methods.

Three products support Object Pascal. Macintosh Programmer's Workshop (MPW) Pascal from Apple is an Object Pascal compiler designed for use with MPW—Apple's integrated development environment, or shell. You can buy the compiler and shell separately or bundled through APDA.

Another compiler is TML Systems' TML Pascal II. TML Pascal runs under the MPW shell. Unlike MPW Pascal, the shell comes automatically bundled with the TML Pascal compiler.

The compiler in Think Pascal version 2.0 from Symantec also supports Object Pascal. Included with the compiler is the Think development environment, which comes with debugging aids and a syntax-checking editor.

**Hybrid OOP languages**

are based on familiar programming languages like C, Pascal, and LISP

While there are at least four object-oriented extensions to the C language, C++ from AT&T Bell Laboratories (also the birthplace of C) appears to be the Macintosh standard. Apple has made a strong commitment to C++; software engineers

Traditional programs (code and data) and object-oriented programs (objects and methods) differ greatly in structure. It is much more difficult to add functionality to a traditionally structured application than to one created with OOP.

For example, take a word processor that allows you to incorporate graphics and spreadsheet tables into a document. In a traditional application, the programmer starts with a word processor core and adds code for displaying and printing graphics, and for displaying and printing tables. This approach presents several problems. Adding more code makes the entire application larger and slower. Also the application supports only those graphics and spreadsheet formats that the programmer has written code for. Should a new format become popular, the programmer has to go back into the application and write new code specifically to support that format.

An object-oriented word processor, meanwhile, treats data as objects, whether they are text, graphics, or spreadsheet tables. The objects themselves incorporate methods for displaying or printing. All the main word processing application has to do is send the graphics or spreadsheet object a message to display or print itself. To add support for a new graphics format, the programmer need rework only the graphics object. The main application remains untouched. Because an application created in OOP is modular in nature, you can easily add graphics capabilities to a spreadsheet, or word processor capabilities to a graphics program.
When Steve Jobs introduced the Next computer, in October 1988, one of the most striking demonstrations he did was to program an OOP application simply by dragging icons and linking them. Within the past year, the Mac has garnered its share of visual OOP programming languages.

In many ways, Prograph from TGS Systems represents a visual alternative to MacApp. Prograph's Application Builder features a hierarchy of system classes that correspond to the major user interface elements of a Macintosh application (see "A Class Act"). You write the function of an application (a word processor, for example) in Prograph's visual language. You then combine the main application code with the user interface by defining methods for menu items and windows.

Maxem Corporation's Cause is a visual, object-based programming language geared primarily to nonprogrammers. It breaks down programs into two parts, resources (like classes) and steps (like methods). You use the resources—windows, files, reports, and items—to design the look-and-feel of a program, then link them with steps like compute, display, or dialog (see "Step by Step"). Cause is especially good if you're interested in designing a simple, custom database. Maxem also offers a version of Cause for the IBM PC, so you can run programs on both the Mac and the PC.

Serius89 from Serius Corporation comes in two versions, Serius89 Programmer and Serius89 Developer. Serius89 Programmer is similar to the Interface Builder available on the Next machine, in that you link previously written objects, buttons, and menus to create an application (see "Putting It All Together"). Serius89 Developer, which is analogous to the Next Application Kit, allows you to write new objects for use with Serius89 Programmer; Serius recommends that users of the Developer version have previous programming experience.

are using it to write future system software. Another object-oriented extension to C is worth a passing mention even though it's not available on the Mac. Objective-C from Stepstone forms the basis for the Next's development environment (see "What's Next?" Macworld, January 1989).

There are differences between the OOP implementations for Object Pascal and C++. First, unlike Object Pascal, the OOP cornerstone of C++ isn't a new data type. Rather, AT&T chose to extend a current C data type called STRUCT.

Second, you can't necessarily just compile C++ code to generate an application. In some cases, C++ is really a C preprocessor. That means C++ source code has to be translated to C source code and then compiled. Because there are two steps involved, such products are called two-pass compilers. Products that allow direct compilation of C++ source code are called one-pass compilers.

Two versions of C++ exist for the Mac. One is Glockenspiel C++ for A/UX, Oasys's version of the UNIX operating system.

In October, Apple introduced its version of MPW C++, a two-pass compiler. It includes Apple's version of AT&T's CFront 2.0 C++-to-C translator. MPW C++ fully supports AT&T's language definition, and includes some enhancements to support the Mac and Object Pascal functions.

Symantec, meanwhile, opted not to wait for the translator, making Think C version 4.0 the first Mac C compiler to offer object support and a C-based class library. The object extensions in Think C are actually a subset of C++, and provide OOP classes, methods, and inheritance.
(This subset is often referred to with tongue in cheek as C+-.) Because it is a subset of C++, classes of objects written in Think C can be used in C++ programs.

**Other Languages**

It's not surprising that OOP hybrids exist on the Mac for a variety of traditional languages besides Pascal and C. Both Macintosh Allegro Common Lisp from APDA (formerly Coral Software's Allegro Common Lisp) and ExperCommon LISP from ExperTelligence provide object-oriented extensions to LISP programmers under MultiFinder. Franz's Allegro CL offers the same capabilities under A/UX. There's even Quintus Prolog, an object-oriented extension to Prolog available from Quintus Computer Systems.

Apple's language Object Assembler, available as part of MPW Assembler, provides class definitions for the Motorola 68000 assembly language. Object Logo, a language that extended OOP to Logo, was another Coral Software product acquired by Apple; at this writing, it is unclear if Apple intends to continue selling it. HMSL from Frog Peak Music is an object-oriented extension to FORTH specifically written for experimenting with MIDI synthesizers.

**Don't Call Us, We'll Call You**

Languages that support OOP offer powerful tools for writing better applications. But the real power of OOP appears when application tool kits are available for an OOP language. For example, HyperTalk—the language—is nice, but it's HyperCard—the tool kit—that really lets you do things with HyperTalk. Tool kits like Apple's MacApp offer a framework around which you can build an application.

MacApp is a complete, self-contained application that implements most of the Mac user interface. Essentially, MacApp gives you all the common user interface elements you'd otherwise have to write correctly on your own. It has menus that pull down and windows that scroll, it works with desk accessories, and it prints on the ImageWriter and LaserWriter. MacApp even knows that after you choose a menu item, Undo should reverse it.

What's left for you to do? What you want the application to do. Think of building a bookshelf. MacApp provides the wood and nails, but everything else—how wide, the number of shelves—is up to you. MacApp itself is written in Object Pascal. You combine and link MacApp's window, menu, and other objects with your own Object Pascal code. This still isn't a trivial task, but it is a lot better than starting from scratch.

There are some limits to MacApp. It can only build applications—not DAs, INITs, or F-keys. MacApp increases the size of an application built with it by 40K to 50K, as opposed to an application not built using it. And the number of objects

---

**Inheritance Explained**

Inheritance lets objects that have the same behaviors (called methods in OOP) share code. Here the Animal class has three methods: eat, sleep, and breathe. Cat, a subclass of Animal, inherits all three Animal methods, and adds a method that distinguishes it from all animals—meow. Any object belonging to a class (or subclass) is called an instance of that class. Scruffy, an instance of Cat, can meow (a method inherited from the Cat subclass), as well as eat, sleep, and breathe (methods inherited from the Animal class). Fred, another instance of Animal, shares the Animal class methods eat, sleep, and breathe. But not being an instance of Cat, Fred doesn't meow.
it can handle is limited. Nevertheless, using MacApp means that you can spend more of your programming time working on the function of an application than on its interface.

Although Symantec has announced its intent to support MacApp with Think Pascal, the only compilers that currently do are MPW Pascal and TML Pascal II.

Apple is planning future Mac environments that must be programmed with object-oriented techniques

Apple has provided the ability for MPW C++ code to interact directly with the next release of MacApp.

Symantec has developed its own Think Class Library (TCL), which comes complete with Think C, for C programmers. TCL implements all of the standard Mac user interface components and behaviors, such as windows, menus, controls, and palettes. Special items such as floating windows and tear-off menus are also provided. In addition, Invention Software offers an object-oriented source code library called Object GrafPak that works with Think C. With Object GrafPak, you can customize an application to generate color line graphs, scatter plots, and bar charts, among others.

Another application framework, Hoops Graphics System from Ithaca Software, is available on Macs; on Apollo, Sun, and Digital Equipment Corporation workstations; and on IBM PCs. Hoops contains all of the tools necessary to build 2-D and 3-D interactive graphics applications, including rendering capabilities. Currently, the only Mac language Hoops supports is Think C.

MetaCourier from Symbiotics is an object-oriented programming tool for networking. It allows Mac application developers to write programs that can access resources—databases, expert systems, and spreadsheets—on other computers such as the VAX and IBM PC via Ethernet.

ExperTelligence’s ExperAction is an application-development system based on Flavors, an object-oriented extension to LISP. Neuron Data’s Nexpert Object provides a hybrid rule-based and object-oriented framework for building expert systems. It can link to standard database products such as Excel and Oracle, and supports the MPW library and Apple’s CL/1 database connectivity language. Nexpert Object is available on a variety of hardware platforms ranging from the Mac to UNIX workstations.

Looking OOPward

"Apple has made a long-term commitment to OOP," according to Jean-Louis Gassée. Indications are that object-oriented programming will become an even more integral part of Macintosh system software. Indeed, Apple is planning future Mac environments that must be programmed with object-oriented techniques.

The goal is to extend the Macintosh’s OOP framework—from working within one application (MacApp), to working between several applications on a Mac, and ultimately to working between several applications on multiple Macs across a network. What happens with that framework is not only up to developers but also users.

Working with OOP requires learning a different style of thinking. But the power of relatively limited OOP environments like HyperCard shows how quickly anyone can build an application, given the appropriate framework. See Where to Buy for contact information.
The table Apple would have designed, had they gone into the furniture business.

Any company with the vision to create a product as elegant and useful as the Macintosh would have hit it big in any industry. Fortunately, Apple chose computers.

We, on the other hand, chose to make furniture. More specifically, the MacTable. Like the Macintosh itself, the MacTable was created to put information at your fingertips, quickly and easily. We accomplish this by thinking of the workspace not as an inflexible monolith, but as a network of individual surfaces onto which you can place each of your Mac components, like your printer, modem, external drive, mouse, even manuals. Everything with plenty of elbow room, easily within reach, and there when you need it. Next, each surface tilts to optimize your eye-to-screen and hand-to-component efficiency. Rest assured that as your comfort increases, so does your productivity.

Finally, there's the overall design — sleek, contemporary, and mindful of the future of your computing needs. Because MacTable's surface panels can be arranged, your workspace can accommodate any model of Macintosh, from the Plus to the Mac II... to who knows what.

Surprisingly enough, all of this Mac-like versatility and European beechwood framing is more than affordable: only $299 for MacTable and $159 for the optional roll-away cabinet (doubles as a Laserwriter stand), $279 for the matching, ergonomically balanced chair, lateral file cabinet $239; bookshelves $119; and two-door cabinet $159.

MaCTable. It's the workspace that organizes the tools that organize your life. And it's available by calling (800) 722-6263 which, by the way, is not Apple's phone number.
The portable computing world isn't very forgiving. The moment you grab your portable computer and walk out the door, your data is at risk. One bump. One wrong step. One clever thief. And your valuable data could be gone forever. But thanks to the rugged, removable design of the new Bernoulli Portable 44 for Macintosh, you'll never have to face that prospect.

Engineered for the new Apple Macintosh Portable, the lightweight, battery-powered Bernoulli Portable protects data from the shakes and jolts inherent in travel. Unlike hard disks, patented Bernoulli Technology* makes the Bernoulli Portable virtually head-crash free. And 44MB removable Bernoulli Disks can withstand shocks of 1000Gs without data loss.
Bernoulli Disks also allow you to remove your data from the drive and carry it separately and safely, in case your hardware is stolen or damaged. Beyond that, Bernoulli provides unlimited storage and backup capacity, with 22msec effective access time, and Reed-Solomon data protection that's 15 times more effective than that used on a typical hard disk.

As the leader in removable mass storage, Iomega also has a complete line of single- and dual-drive 44MB Bernoulli products that offer the same benefits for Macintosh as well as IBM* users in desktop environments.*

So make sure your data arrives with you. Contact an Iomega representative or call 1-800-777-6649 for complete specifications on the Bernoulli Portable 44 for Macintosh. And discover what it means to have secure data. No matter where you go.

*Bernoulli File Exchange software allows data migration between IBM and Macintosh. Bernoulli and Bernoulli Technology are registered trademarks and Bernoulli Means Security For Your Data is a trademark of Iomega Corporation. Apple and Macintosh are registered trademarks of Apple Computer, Inc. IBM is a registered trademark of International Business Machines.
MICROSOFT MAIL 2.0

Electronic Mail Program

Pros: Servers forward mail automatically; fast searches for user names; local and global address lists simplify addressing; network administration DA; links to Microsoft Word and Microsoft Excel; saves space by storing only one copy of multiple-address messages. Cons: No user-defined address lists; only one enclosure allowed per message.

Company: Microsoft Corporation. Requires: Mac 512KE; AppleTalk network. List price: Server starter kit $395 (includes software for one server and one user); each additional user $125; 20-user pack $1495.

A new generation of electronic mail has finally arrived from Microsoft. Microsoft Mail 2.0, which was based on an acquired product, Inter Mail, is a rewritten mail package that exhibits the simple look of InterMail but few of its problems.

Creating the Postal Service

Installing the mail server is extremely easy. You simply run the Microsoft Mail server installer on an appropriate Macintosh (the Mac you are already using as a file server, for instance) and restart the computer. Server administration, which includes creating users, user passwords, and groups, is done via the Microsoft Mail desk accessory. Initially, the server administrator logs in as Network Manager with mail as the password (changing the password is highly recommended, however, for security reasons).

The mail server can also be run in the background on a Mac, but only with caution. My tests indicate that running the mail server in the background slows the

Mac's normal response to any mouse or keyboard event considerably.

Each server installation disk is serialized, so you must purchase a separate copy of the Microsoft Mail server package for each server you plan to install on the network.

Using the Microsoft Mail administrator desk accessory you can quickly and easily add users and groups to any server on the network. Unfortunately, you must use the Chooser DA to select the server you want to access and administer; there's no way to switch from server to server within the Mail DA.

Anyone can create a new message form for MS Mail 2.0 using Form Designer, a program that uses HyperCard as the interface for form creation (forms are limited to a Mac SE screen size). But new forms must be installed by the administrator before they can be used—an example of the Microsoft Mail philosophy of centralizing control of Mail's appearance.

The Address, Please

Microsoft designed its mail system with the large corporate network in mind—this is particularly evident in the way Microsoft Mail 2.0 handles user lists. Each server sends its user list to every other server, creating a global list of all users on each server. If a new server becomes part of the network, the global user list is automatically updated.

In large networks, this global list can seem overwhelming to the user. Imagine scrolling through a 5000-name user list to find the one you want. Fortunately, Microsoft lets you simplify the user list in three ways. First, you can type in any user's name as an address in the blank provided; the name is accepted as long as there's a match in the list. Second, you can search the list by typing in a few characters and clicking on the Search button, which leads to a display of possible matches. Third, you can restrict your list to the local, rather than global, list (see "Big or Small?").

Big or Small?
This composite screen shot shows the difference between the global (top) and the local (bottom) user lists.
Making It All Fit
The basic Microsoft Mail user window shows you all of your mail, with icons to indicate the type of message (a phone icon for a phone message, for example) and its urgency (urgent messages have an exclamation mark). The left side of the window contains icons for the four message types available with this setup. If more message types were available, this would be a scrolling list of icons.

Sorry, Addressee Unknown
When a server is unable to forward a message within a given amount of time (set by the server administrator), the message is returned to the sender with this status message.

local list contains only those users assigned to your selected server.)

As a user, you can neither create your own groups for addressing messages nor create special address lists. All groups are defined by the server administrator, and Microsoft Mail does not support custom address lists.

Getting the Mail Through
On a user’s Mac, Microsoft Mail is an 87K INT and an 18K desk accessory. As a user, you must first select (through the Chooser DA) a server; thereafter, you can ask Microsoft Mail to store your name, password, and server for automatic log-in each time you start your Mac.

The mail window has a simple layout, with a list of messages on the right and a scrolling list of icons on the left that represent the different message forms available (see “Making It All Fit”). For example, there is an exclamation mark for urgent messages and a paper clip for enclosures. If gateways are installed for communicating with other mail systems such as AppleLink or VAXmail, icons representing those services are also included in the list. Unfortunately, Microsoft Mail’s icons are too small for my liking. And even though Microsoft Mail uses a two-level priority system (Normal and Urgent) for messages, it will not let you sort your mail by priority or sender to simplify searches; mail is sorted by time and date only.

You can send mail to any user without knowing, or caring, which server the recipient’s connected to. Microsoft’s store-and-forward technology takes care of forwarding mail from one server to another. If a server is out of commission or disconnected for more than a predetermined period of time, the mail is returned to you as undeliverable (see “Sorry, Addressee Unknown”).

Did the Postman Ring Twice?
Now that Microsoft controls the development of its mail package entirely, Mail the second time around is a considerable improvement. Few of its predecessor’s (InterMail) quirks are left in this new version. The mail database on the server is designed to maintain only one copy of any message or enclosure, regardless of the number of addresses, reducing the amount of storage required for messages. Plus, Microsoft Mail 2.0 now automatically recovers unused fragmented space in the database, getting rid of one of InterMail’s biggest failings (and a cause of many crashes).

Microsoft Mail 2.0 is well designed for both small and large networks alike. Its interface is easy to understand. And Microsoft’s attention to different ways of handling large user lists makes Mail easier to use on large networks. Depending on the number of users on your network, though, the price of Microsoft Mail can become much more expensive than its current main competitor, CE Software’s QuickMail.—Dave Kosiv

See Where to Buy for contact information.
The Spectrum/24 that I used installed without difficulty and worked smoothly in almost every way. The documentation was well written and provided a good mix of technospeak and easy-to-understand instructions.

I used the Spectrum/24 board with a Sony GDM-1952 19-inch monitor (1024 by 768 pixels) and the Apple 13-inch AppleColor RGB Monitor (640 by 480 pixels). This board can support many different monitors. If SuperMac hasn’t included your monitor, there is still a good chance you will be able to program the board to use it.

If you are using a standard Apple color or monochrome monitor, you can simulate a 19-inch (or larger) display using the hardware pan function. All Macintosh software, including the Finder, believes that the display is 1024 by 768 pixels, though the actual monitor is only displaying 640 by 480 pixels. When you move your mouse past the monitor’s border, the screen pans across the larger virtual desktop. I use the Spectrum/24 with BarnesyscanXP and a medical imaging package; the hardware zoom and pan is extremely useful as it obviates the need to purchase a 19-inch monitor. The board also supports 2x zoom.

The Spectrum/24 supports a variety of virtual desktop sizes, including 1024 by 768, 1024 by 1536, 2048 by 1536, and a whopping 4096 by 1536 pixels. In comparison, the Macintosh SE’s screen has only 512 by 342 pixels. At any size larger than 1024 by 768, you run into restrictions on the pixel size. (Remember that displaying 24-bit pixels takes three times as much memory as displaying 8-bit pixels. In the case of 1024 by 768 pixels, it takes 3MB of video RAM.)

Moving around these huge virtual desktops can take time, too. At the largest size, the virtual desktop is the equivalent of a 56-by-21-inch monitor.

SuperMac has kept within Apple’s hardware guidelines in every respect save one—power usage on the NuBus. The Spectrum/24 draws over 2 amps, which can cause problems when used with other boards in the Macintosh. SuperMac does not mention this in the manual.

The QuickColor Graphics Accelerator works with or without the QuickColor board. The DirectColor/24 is the actual display board and the QuickColor works with it to provide improved performance. The boards I worked with made extensive use of surface-mounted technology and had few engineering changes. Both installed and worked perfectly. Radius also provides a grounding strap to avoid destroying the boards with static electricity.

The DirectColor/24 board allows you to work with 1-, 8-, 16-, or 24-bit pixels on the screen at an extremely high resolution of 1152 by 882. With so many pixels in a 19-inch display, the resolution becomes a crisp 82 dots per inch (dpi). Because this display also causes the Mac’s text and images to be a bit smaller than normal, Radius includes a utility that displays menus in Chicago 18-point type (the normal is 12-point).

Radius also provides a well-designed Control Panel device to reduce the mouseing around one does with the larger displays; this tear-off menu utility is a real wrist-saver.

Page layout and prepress applications benefit from being able to display entire pages at a time; similarly, MultiFinder takes advantage of the much larger desktop. Radius has oriented this product toward a market of graphic artists and printing professionals who need the higher resolution.

The DirectColor/24 only works with 19-inch Radius monitors, which weigh in at around 85 pounds and are expensive. Radius offers the option of buying a less expensive 16-bit board and upgrading later to 24 bits. With the ever-decreasing cost of memory, this might be an effective solution if you want to try out photorealistic imaging less expensively. Like the other 24-bit graphics boards, the DirectColor/24 draws more power than the Apple guidelines allow.

The World of Reviews

The QuickColor Graphics Accelerator (top) and the DirectColor/24 (middle) both from Radius, and the Spectrum/24 (bottom) from SuperMac Technology

Radius QuickColor Graphics Accelerator

With the greater processing demands of 24- and 32-bit pixels, QuickDraw becomes less than quick. By using an Acorn RISC processor to offload some of the graphics processing, the QuickColor Graphics Accelerator works with the DirectColor boards and a seldom-used memory transferring mode of the NuBus built into every Macintosh II, IIx, and IICx to increase speed.

The QuickColor accelerator is designed to work silently and efficiently and does so admirably. You can quickly become used to the speed increase in a very short amount of time. The accelerator board’s performance is most noticeable with text drawing. Using a word processor in 32-bit mode can be irri­tatingly slow, but the QuickColor accelerator board speeds up the text display to 8-bit mode. Radius also lets you disable the board by pressing the Caps Lock key.

One caveat: QuickDraw will undoubtedly continue to change. Graphics acceleration requires an understanding of the (continues)
Now that you bought Excel...

Now, for the first time, a complete accounting Microsoft Excel spreadsheet General Ledger AR/AP/Inventory program that looks like manual books, works like manual books yet offers all the advantages of computerization. Accounting the way you've learned it, translated to the speed and power of Microsoft Excel, the ultimate spreadsheet. No long start-up periods, no extensive employee training, no difficulty in audit... just the most logical, fastest, most flexible way to keep books you've ever seen. For information, call Absolute Solutions at 1-800-458-3399 in CA, 1-800-633-7666 Natl., 1-619-966-8000 Intl.

...Computerized Classic Accounting™

“CCB is the most unique client accounting package available to date...CCB takes relatively time-consuming and cumbersome tasks and makes them simple...CCB represents the most powerful interactive analysis tool reviewed to date”

-Bob Wolf, Computers in Accounting

“CCB is the only computer accounting product that returns us to real accounting”

-Dr. Samuelson, Pepperdine University

ABSOLUTE SOLUTIONS INC.
3142 Vista Way, Suite 400, Oceanside, CA 92056

©1989 Design/Photography Masterson Productions

Circle 474 on reader service card
structure of QuickDraw, and for this reason Apple has suggested that developers restrain from delving into acceleration. The relatively low cost of the board, however, offsets these concerns somewhat. I would highly recommend the QuickColor accelerator board to anyone who requires better drawing response and doesn’t have too much concern for what Apple might have up its sleeve.

Nice If You Can Afford It

Because both boards use Apple’s 32-bit QuickDraw, they run in similar ways. The boards respond identically to software, even to the point of sharing bugs. For some reason, HyperCard will not run in 1-bit mode with the 32-bit QuickDraw patch installed. Apple recognizes this problem and intends to fix it in the next version of HyperCard. Similarly, Adobe Illustrator 88 and SimCity will not run with 32-bit QuickDraw installed, no matter what the bit setting. These programs run fine with these boards if you remove 32-bit QuickDraw (though the boards will not run in 16-bit mode or 24-bit mode without 32-bit QuickDraw).

If you are using 32-bit-compatible applications such as PixelPaint Professional or BarneyscanXP, there is nothing like seeing true color on the Macintosh. Similarly, if you have access to high-end RGB scanners, such as the Barneyscanner (for 35mm slides), the Mac becomes an exquisite imaging system.

Both display boards provide extremely high image quality, though the DirectColor board, with its higher resolution, is oriented toward the more demanding user. Perhaps the biggest difference between the two boards lies in cost. Radius addresses the expense problem by offering a 16-bit version of the DirectColor that can easily be expanded to support the full 24-bit spectrum; this savings is offset, however, by the additional cost of the QuickColor board which is highly recommended for use with the Radius graphics board. SuperMac, on the other hand, provides a board that works with any monitor and is lower priced.

—Peter Marx

See Where to Buy or circle 803 (DirectColor/24), 804 (QuickColor) on reader service card.

### Antiviral Software

**ANTITOXIN 1.0**

**Pros:** Detects common viruses. **Cons:** Limited functionality; awkward user interface; thin documentation. **Company:** Mainstay.

**Requires:** Mac Plus. **List price:** $99.95.

**ANTI-VIRUS KIT 1.0**

**Pros:** Not limited to specific viruses—provides general protection against any destructive program, excellent documentation on detecting and preventing viral infections. **Cons:** Misses detecting some infected files; reports some noninfected files as being infected. **Company:** 1st Aid Software.

**Requires:** Mac 512KE. **List price:** $99.95.

**SYMANTEC ANTIVIRUS FOR MACINTOSH 1.0**

**Pros:** Good user interface and functionality. **Cons:** Requires updates to handle new viruses. **Company:** Symantec Corporation.

**Requires:** Mac 512KE. **List price:** $99.95.

**VIREX 2.1**

**Pros:** Best all-around functionality. **Cons:** Updates expensive. **Company:** 2KE.

**Requires:** Mac Plus. **List price:** $99.95.

For those of you who have been lost deep in the Amazon for the past few years, computer viruses are little programs that can infect files on your floppies and hard disks, propagating and spreading just like the real thing; and like the real thing, they can cause serious problems, such as deleting files, damaging documents, and wiping out entire disks. A number of public domain and shareware programs help detect, limit, and wipe out viruses; here are four commercial products designed to do the same.

There are some obvious difficulties in testing antiviral programs. One does not lightly infect one’s own system with an existing virus, much less a new one (provided such is available). So the test was limited to having each program scan a disk that had several infected files containing the Scores and nVIR viruses, the remnants of a rather virulent outbreak I suffered late last year. Then an infected program was (gulp!) launched, allowing the automatic checking programs to attempt to detect virus actions.

**AntiToxin**

This package consists of two parts: the program AntiToxin, which examines whole disks or individual files for specific viruses, then removes the viruses when found; and the AntiToxin INIT, which prevents infected applications from being loaded and executed. AntiToxin checks for the Scores, nVIR, Hpat, INIT29, and ANTI viruses. Viruses are removed automatically, unless you hold down the Option key while selecting commands from the File menu.

**Symantec AntiVirus for Macintosh (SAM)**

SAM consists of one program to detect existing viruses and another to guard against future infections. SAM Virus Clinic (continues)
Your word processor alone.

New Springboard Publisher™ II

can turn ordinary pages into great looking pages.
The same day you buy it!

Extend the power of your word processor.
Springboard Publisher II provides everything you need to turn ordinary pages into impressive, persuasive documents.

It's easy! Start with your word processor file and then add page layout, graphics and special effects. Just point and click to put wherever you want, whenever you want.

EPS, PICT and paint graphics.
All the graphic tools you'll require are built right in .. no need to buy extra programs or switch applications. The text tools are there too, including a speller, search and replace, hyphenation, and a unique typing window for speed.

There's more. Six SmartArt™ PostScript effects from Emerald City Software® let you rotate text to any degree, add shadow or distance, make text arc or fade, even stretch text as big as your page. And you'll receive 500 pieces of clip art or 36 newsletter templates FREE when you buy—a $4995 retail value!

Try before you buy. We'll send you a live, hands-on demo disk for just $9.95, refundable upon purchase. And remember all Springboard software is satisfaction guaranteed or your money back. Call 1-800-445-4780, Ext. 6101 and discover how quick and easy great pages can be. Only $199.95

Springboard

7808 Creekridge Circle • Minneapolis, Minnesota 55435

Circle 185 on reader service card
scans a given volume and displays detected viruses; you can then ask it to attempt to remove viruses from specific files. SAM Intercept, launched at start-up, performs a number of checks, such as scanning floppies inserted into the system's disk drive for viruses and intercepting virus-specific actions. SAM checks for the Scores, nVIR, Hpat, INIT29, ANTI, MEV#, and AIDS viruses.

**Virex 2.1**

Like most of the antiviral programs, Virex 2.1 provides two programs: Virex, which checks disks for computer viruses and repairs infected files; and VirexGuard, which detects viruses on inserted disks and in opened files. Virex checks for the Peace, Scores, nVIR, nFLU, Hpat, INIT29, ANTI, MEV#, and AIDS viruses. It also has a Record/Scan function that, much like Inoculator in the Anti-Virus Kit, saves size, resource, and checksum information for each file on a disk. Then it lets you double-check that information later to help detect infection by unknown viruses.

**Anti-Virus Kit**

This package takes a very different approach from the other three. Instead of targeting specific viruses, it checks for virus-related actions and results. It has three separate programs: VirusGuard, Inoculator, and Same/Diff. VirusGuard is a CDEV, a program that starts running when you start up the system and that can be controlled via the Control Panel. VirusGuard monitors the activities of currently running programs, bringing up alert boxes when it detects suspicious behavior. Inoculator, on the other hand, keeps track of the files on a given disk and alerts you when any files unexpectedly change. Same/Diff performs a detailed comparison of two files—for example a current file and an archival copy—so that you can check for possible viral infections.

AntiToxin, SAM, and Virex each found all six infected files on the test floppy, though their diagnoses differed in a few cases. Anti-Virus Kit detected only three of the six infected files, completely missing the Scores and nVIR infections in the System file on the floppy, as well as the dummy Notepad and Scrapbook files created by the Scores virus. Anti-Virus Kit also mistakenly acted as though three different music applications on the root volume were infected. All four programs blocked attempts to launch the two infected applications from the floppy.

Recommendations? It's a toss-up between Virex 2.1 and SAM. Both have a scan/repair program, but Virex has more features than SAM Virus Clinic (including the Scan/Record feature) and gives more complete diagnoses. Both also have a watchdog INIT, but SAM Intercept is more flexible, allowing you to set the level of examination. It also performs more tasks than VirexGuard, such as volume and file scans at start-up and shutdown. If I had to pick just one it would be SAM, mostly because of Intercept's features; after all, that's the program that gets used the most.

AntiToxin is a distant third to both. While it shares Virex and SAM's two-pronged approach, it's less functional than either one. In addition, the user interface is awkward and unsatisfactory. For example, you can't see a list of the infected files while running AntiToxin; instead, you have to choose the Save As option from the File menu, then open up the resulting text file with an editor or word processor. Were AntiToxin half the price of the other packages it would be a good low-cost alternative; but it's the same price as SAM and Virex.

Three packages put you onto the upgrade treadmill (Virex has already gone through five versions, with HJC charging $15 per upgrade or $75 per year for an upgrade subscription). Anti-Virus Kit avoids that problem by not tying itself into specific viruses, but it also misses some viruses that you may want detected ahead of time—especially if the infected files might get passed on to someone who doesn't have an antiviral program. The idea behind Anti-Virus Kit is a good one, but it must detect existing viruses better (and not detect nonexistent ones) before it can compete with the other packages.

While $100 is a bit to plunk down for an antiviral utility, all it takes is one disaster—such as my combined Scores/nVIR infection last year—to convince you that the investment is worthwhile. And since you can buy any of these programs from mail-order firms for around $65 to $70, money is even less of a factor. If you really can't afford any of these programs, get one of the PD/shareware programs—but do get something.—Bruce F. Webster

See Where to Buy or circle 706 (AntiToxin), 707 (Anti-Virus Kit), 807 (SAM), 825 (Virex) on reader service card.
Cricket Now Has Something
No Mouse Can Resist.

Mac users in Business and Graphic Arts have
long found the superior graphics of Cricket alluring.
Now, Cricket Presents, Graph, and Draw have
something you'll find even more irresistible. It's the
promise of greater innovation and long-term back­
ing that comes with the name Computer Associates.
With the addition of CA-Cricket® to its roster of
Macintosh products that already includes such
renowned programs as Bedford Accounting soft­
ware, Computer Associates makes yet a further
commitment to all Mac users.
It's a commitment that goes beyond giving you
the best service and support in the industry. It's
a commitment to back your graphics products
with the same kind of innovative graphics
technology we've already made available to
thousands of companies throughout the world.
For more information about CA-Cricket's
graphics packages and our new support
program, SupportPlus," call 1-800-531-5236.
(In Canada,
1-800-663-6904.)
It's sure to be food
for thought.

Circle 15 on reader service card
**REVIEWS**

**LIGHTNINGSCAN**

**Hand-Held Scanner**

**Pros:** Generates gray scale. **Cons:** Difficult to scan straight; software adapted from another product. 
**Company:** Thunderware. **Requires:** Mac Plus; System 6.0.3; Finder 6.1. **List price:** $495.

A hand-held scanner seems like a good idea. Imagine a scanner that costs only $500; scans photos, text, or line art up to 4 inches wide; and can be stored in a desk drawer. Both the ScanMan from Logitech and the LightningScan from Thunderware make these promises and more. However, problems with both their hardware and software add up to a handful of frustration.

**Scant Setup**
The scanning units of ScanMan and LightningScan are actually identical devices built by one Japanese company. In addition to the hand-held scanner itself, however, each one needs a SCSI controller box (which doesn't slip so easily into a desk drawer). Logitech's sleek and attractive box looks like an Apple external floppy drive. Thunderware's larger box is less elegant, sized halfway between a modem and a small hard disk. It's this controller box and the accompanying software that distinguish the two scanner systems.

The controller box plugs into the Mac's SCSI port. If you have an external hard disk, you'll have to disassemble the ScanMan and remove its internal terminators before attempting to daisy-chain it—a process that's much harder than it needs to be. In contrast, the LightningScan comes with an easy-to-install external terminator.

Once you've set up the system and installed the software, you're ready to scan. Both scanners come with a desk accessory that enables you to scan from within any program. In theory, once you've scanned an image, you can simply copy it from the DA and pop it into a graphics, database, or page-layout program.

**Scanned Goods**
To scan, you place the hand-held unit at one edge of an image. While pressing a button on the scanner, you drag it across the image. A row of glowing LEDs bounces light off the page, and the scanner's sensors receive the image; the bitmapped result appears on the Macintosh screen as you go. The immediacy is thrilling—an image on paper becomes an electronic image at your command. Furthermore, the clarity is excellent, as long as you realize that the scanner doesn't register grays; instead, it converts any gray shade to a dither pattern (a collection of black and white dots that simulate a shade of gray).

After you've worked with one of these scanners for a while, however, two problems become apparent. First of all, as you can imagine, it's difficult to scan straight. Even if you're a surgeon with the steadiest hand in the business, it's hard not to wiggle the unit while you drag it. For casual use a perfectly aligned scan isn't vital. But for optical character recognition and forms generation, the resultant scans just aren't accurate enough.

The other problem with a hand-held scanner is simply its size: you can't scan an image that's more than 4 inches wide. Of course, this is an obvious trade-off—to get a scanner that fits in your hand, you lose the ability to scan a full page. If you want to scan columns in a phone book, for instance, you'll be in good shape. But you can't scan both halves of a page and then try to fit them together in a graphics program; it's virtually impossible to join two separate scans seamlessly.

**DPI-Opener**
A switch on the side of the scanner lets you select a scanning resolution of 100, 200, 300, or 400 dots per inch. The problem is that the Mac screen resolution is only 72 dpi. (These scanners were originally developed for IBM computers, not the Mac.) So, to keep the one-dot-per-pixel relationship between image and screen, the software must display a screen image much larger than the original.

At this point scanner software becomes important. Both scanners' accompanying desk accessories attempt to alleviate the size problem by offering an actual-size view. When you choose this command from the menu, the image appears at 72 dpi—at the original image's correct size. Unfortunately, the ScanMan software accomplishes this feat by cramming the 200 dpi (or whatever multiple of 100 you specify) into a smaller area. The result is a muddy, blotchy, sometimes unrecognizable collection of black pixels. If you save the document in TIFF or PICT format, you can open it using a graphics program, content at least that your printouts will display the actual-size image at its full, scanned resolution.

The LightningScan software's Original Size command, on the other hand, has the intelligence to selectively weed out the superfluous pixels, so an image is still recognizable even when shown at 72 dpi. LightningScan's software is superior in another way, too: it can turn the dithered black-and-white scanned image back into a gray-scale image, helping to compensate for the scanner's inability to perceive grays. Once the image has been converted to gray scale, you can adjust the brightness and contrast levels without rescanning. (Of course, you won't be able to see the gray-scale image unless you have a Mac II with a gray-scale monitor.)

(continues)
Introducing MacPathWay Access.

So you won’t be stranded, MacPathWay Access links your Macintosh with a wide range of system platforms, including VMS, SUN OS, UNIX-based systems, and MS-DOS environments.

MacPathWay Access allows you to freely cruise the islands in your corporate network, using multi-vendor protocols in a TCP/IP-based environment.

Easy to install and easy to use, you can transfer files and log-in to remote computers—all while using the familiar Macintosh interface.

For the distributor nearest you, call 1-800-872-8649 (in California 1-800-962-8649) or write The Wollongong Group, Inc., 1129 San Antonio Road, Palo Alto, CA 94303.

PATHWAY FROM WOLLONGONG

©1989 The Wollongong Group, Inc.
All other product names are the trademarks of their respective manufacturers.
The more you work with numbers, the more you'll like working with Wingz. Wingz is the fastest, easiest way to transform your raw data into eye-catching persuasive graphic presentations. What more can we say? Wingz simply has more. Which means every other spreadsheet has less.

**Wingz Has Drawing Tools.**

The Wingz drawing tools give your work a finished look quickly and easily, without using another software application. Choose from line, arc, circle, rectangle or polygon tools. And after you've drawn the basic shapes, you can color, size, group and move them.

**Wingz Has 3D Graphics.**

3D graphs make your data more understandable and more impressive. And Wingz is the only spreadsheet with built-in 3D graphic capabilities. Wingz features 3D bar, 3D line, 3D layer, 3D step, 3D pie and 3D combination graphs. You can change the rotation, elevation and viewing distance of your 3D graphs.

**Wingz Has Unlimited Color and Font Selections.**

Color enhances the appearance of your data. And Wingz maximizes your use of color. In fact, the number of color choices is limited only by your hardware. If you have a 24 bit color system, you'll have over 16 million color choices when you enter our custom color mixing dialog box.
HE ET WI TH HYP ERS CR IP T ®

WINGZ HAS HYPERSCRIPT.

You don't have to be a rocket scientist to do powerful, work-saving programming in Wingz' HyperScript. (Although a lot of rocket scientists are using Wingz.) HyperScript unleashes the full power of the Macintosh.* HyperScript uses intuitive English language commands, not abstract jargon.

For example, to hide the cell grid with Excel macros would require:

(DISPLAY (false, false, true, true, 0)

To perform the same action in HyperScript:

HIDE CELL GRID

It's that simple.

WINGZ HAS HAPPY USERS.

According to International Data Corporation (July, 1989), Wingz ranked number one in user satisfaction among Macintosh spreadsheet users.

WINGZ HAS FUTURE USERS.

The same survey found Wingz an eye-popping two-to-one favorite when people were asked which spreadsheet they intend to buy in the next six months.

WINGZ HAS BUTTONS.

Buttons can make your spreadsheet as easy and natural to use as the radio or the dishwasher. They're easier and faster than menus or typing in commands. (You can also put other Macintosh controls, including radio buttons, check boxes and slide bars, directly onto the worksheet.) Just as important, buttons unleash the power of HyperScript. So you can attach lists of frequently used commands to buttons, and then execute them with the click of a mouse.

NOW IF WINGZ HAS ALL THIS, SHOULDN'T YOU HAVE WINGZ?

Just call toll-free 1-800-331-1763, ext. 1000, to find the Wingz dealer nearest you. In Canada call 416-566-7024.

Circle 390 on reader service card

©Copyright, 1989 Informix Software, Inc. Informix and HyperScript are registered trademarks and Wingz is a trademark of Informix Software Inc. Apple and Macintosh are registered trademarks of Apple Computer, Inc. All other trademarks are used for information purposes only and are the property of their respective companies. International Data Corporation is the sole source of the information.
Sink your teeth into our high-performance family of reliable hard and optical disk subsystems.

Choosing the best subsystem for your storage-intensive, high-end Macintosh® applications just got easier. Storage Dimensions' new MacinStor family comes with everything power-hungry Mac® users want in a total mass storage solution.

We have something for every taste.

MacinStor gives you a wide range of storage solutions—from 40 to 650 MB, internal or external hard disk. Plus, exciting optical products including our 732 MB WORM drive and our ultra-fast 1 GB erasable optical drive. All are fully tested and ready to run. And because they're designed specifically for the Macintosh environment, MacinStor subsystems have the look, feel and user-friendly interface you expect.

You get more crunch per byte. MacinStor won't leave you hungry for performance, serving up some of the industry's highest data transfer rates and fastest seek times. And each MacinStor unit comes preformatted with our complete package of disk management software including formatter, partitioning and diagnostics. You also get our latest software advancements, like automatic reallocation of bad blocks, password protected partitions, A/UX support, backup, disk optimization, data encryption and data recovery.

Here's more food for thought.

One of the best reasons to buy MacinStor is the company behind it. Storage Dimensions has always been known for delivering innovative, high-quality products at prices that won't ruin your appetite.

For More Information, Call (408) 879-0300
Even so, the LightningScan software is far from ideal. It's confusing and difficult to learn, and it's the same software that comes with the company's other low-cost scanner, the ThunderScan. Unfortunately, it has no Save command (only a Save As command), no close command, and has four unintuitive graphic tools. Furthermore, many scanning options are dimmed in the LightningScan's menus and dialog boxes because they pertain only to the ThunderScan. The fact that Thunderware didn't take the time to perform at least a cosmetic rewrite of its ThunderScan software doesn't say much for the company's commitment to the LightningScan.

**Scanning the Horizon**

Both companies say that improved software is in the works. Logitech claims that its new software will also be able to recreate gray scale and that it will include a more intelligent actual-size option that won't reduce images to illegibility. Until these scanners improve, however, having one in the hand isn't worth $500.

—David Pogue

*See Where to Buy or circle 752 (LightningScan), 808 (ScanMan) on reader service card.*

---

**PUBLISH IT 1.1**

**Page-Makeup Program**

**Pros:** includes page layout, graphics, and word processing tools; excellent text- and graphics-manipulation tools; sophisticated typography; flexible page views; text runaround inside and outside of irregular objects; compact and fast. **Cons:** iffy imports of formatted text; no undo for text changes; poor hyphenation; ruler guides, and batch spelling check; no gray-scale TIFF support; no crop marks; limited to eight QuickDraw colors.

**Company:** Timeworks. **Requirements:** Mac 512KE; 1MB for spelling checker. Hard disk and System 6.0 recommended. **List price:** $395.

Remember Scoop, the Swiss army knife of desktop publishing software? It's back under the name Publish It—heavily debugged and with a cleaner interface, manuals, and online help, but containing essentially the same large assortment of features.

Although there are dozens of bells and whistles scattered throughout this program, its word processing and painting tools are limited. It does an impressive job of making pages, however—especially in terms of bringing robust draw tools to page make-up.

**Setting Up Pages**

Publish It offers left and right master pages, plus a "master" master page for elements that you want to repeat on every page. There's also a scratch page where you can put items to make them accessible from every page. There are seven zoomed views, from 12 percent to 800 percent. You can view single or double pages, single pages with the scratch page, or fully editable thumbnails (up to 12 across). The editable thumbnails are great for linking text frames or moving elements between pages.

The program lets you use one vertical and one horizontal ruler guide, but they're the same on all pages, and it's hard to reposition them. And Publish It's Floating Rulers feature is not as useful as multiple, adjustable ruler guides would be.

The program's alignment grid uses the familiar rows-and-columns block layout, with an option to use interval spacing (1/6 inch, 1/4 inch, and so on, up to 1 inch). There is no custom grid option, however, and the number of ruler increments doesn't change when you zoom in and out. Publish It's grid system is not nearly as nice as PageMaker's, but it's effective and workable, especially with Publish It's excellent alignment controls (left, center, right, top, middle, bottom).

Publish It imports formatted text files from MacWrite 5.0, WordPerfect, WriteNow, Microsoft Works, and Word 3, and graphics in Paint, PICT, PICT2, EPS, and TIFF (black-and-white only) formats. However, it doesn't bring in all the formatting from Word files, and it misinterprets some formatting, notably right indents.

**Text and Type**

Text is contained in frames, which you link by clicking on them one after another with the linking tool (there are also methods for autolinking). Text can automatically flow outside (or inside!) of objects, and you can control how far from an object you want the text to wrap.

Type size and leading range from 4 to 127 points in increments of hundredths of a point. You can specify leading in lines, points, or points that are added to the autoleading value. You can specify space after a paragraph but not before.

You can also compress and expand type by percentage, and both automatic and manual kerning are provided, though you specify manual kerning in absolute rather than relative units. You can apply positive or negative kerning to selections of text, which provides good local control over tracking, making it easy to copyfit paragraphs.

(continues)
"I drove for 12 hours to attend MacCamp™ and I would do it again!"

Do what again? Attend MacCamp™! For over 5 years Financial Freedom Report has served the Macintosh user as a Value Added Reseller (VAR) and software developer. We have come to know the Macintosh inside and out. MacCamp was a natural development in the course of this evolution.

What we heard from you was: “Show me how.” And that is what we did!

MacCamp is an intensive 2 day training seminar that will “SHOW YOU HOW” to better utilize the Macintosh and its most popular software applications. Introduction and advanced workshops are offered on the Mac, Microsoft® Word, Microsoft® Excel, FileMaker® II, PageMaker® and Hypercard™.

The Cost to you is $249.00. This includes the 2 days plus materials, lunch and more. As one person put it: “I learned enough in the first class to more than pay for the workshop!” That is known as value.

And that is exactly what you will receive from MacCamp — VALUE! Additionally that translates to more profitability for your company. And that is what you need to look for in a training program. There are many programs out there that provide training, but there is only one MacCamp. After all, who would you want to get answers from — the ones who make the stuff or some user that “think” they know all the answers but don’t even scratch the surface.

Some of our Clients and what they are saying.

Cornell University
Motorola.
GTE
Citibank
ABC News
Poloroid
Novell
Joint Chiefs of Staff
Illinois Bell
MCI
NBC

"I drove 3 hrs each way for the 2 days and I would do it again! The seminar was well worth the time." Marsha J. Swaminathan

"WOW! Finally a Training Program where the instructors were great, very friendly and really knew the software programs. They were able to talk in “English” so that I could understand what was being taught. My knowledge of software has been enhanced tremendously.

Thanks for everything. I definitely recommend your program to everyone that owns a Macintosh." William K. Lindsey

"We attended a training session conducted by MacCamp instructors. We found the session to be extremely informative and also enjoyable.” Aileen D. Zanco; San Rafael, CA

MacCamp Schedule
Find a location nearest you and plan to attend.

December
Washington, DC
Charlotte, NC

January
Portland, OR
Seattle, WA

February
San Francisco, CA
Glendale, CA

March
San Diego, CA
Phoenix, AZ
Albuquerque, NM
Denver, CO

The training you asked for . . . The results you need . . . at a Price you can afford!

MacCamp™

THE ultimate in Macintosh™ training.

Call or write today for more information or to make reservations to attend MacCamp in your area.

Group rates are available.

MacCamp 1831 Fort Union Blvd., Salt Lake City, Utah 84121
Call toll free 1-800-338-9715 Fax (801) 942-7489

© 1989 Mark O. Haroldsen, Inc.
You can fine-tune letter and word spacing for justification, and you can also set margins from fully ragged to fully justified. Hyphenation is a batch operation—select the text, then hyphenate all at once—but this feature is mediocre, so plan on scanning columns and adding some hyphens yourself.

Publish It lets you set justification and tabs (left, right, center, and decimal, with optional leaders) from a tab ruler, but you can't set indents on the ruler—only from menus and dialog boxes. Special justification options let you slant the margins to the right; slant them to the left; form a vee; or make a pyramid. You can also align text in the middle, top, or bottom of a frame, or you can feather out the text with leading to fill the frame.

You can build paragraph styles that include both paragraph and character formatting, based on text you have formatted. Publish It does not import styles from Microsoft Word, however; all text comes in hard formatted.

The spelling checker is slow and clunky in batch checking mode—too slow for much serious use, but handy for occasionally checking words. The thesaurus is quirky at best. The only synonyms it finds for distribution, for instance, are circula-

Choose Your Palette
Publish It boasts four separate tool palettes. The first contains pagemakeup tools; the second lets you change the settings for fills, lines, and so forth; the third is a palette of drawing tools; and the fourth is for painting.

Painting, Drawing, and Object Manipulation
Publish It offers a simple set of black-and-white painting tools for editing TIFF and MacPaint files, and you can convert any text or graphic object into a bitmap and blend bitmaps together. There's a complete set of drawing tools, including three unusual tools: diamond, starburst, and grid. There is no multipoint bezier tool, however.

Publish It lets you resize objects by percentage, bring to front and send to back, group and ungroup, align and align to grid, rotate (in 1-degree increments), flip, and create two smaller duplicates from one object. You can use pattern fills and tints in 1 percent increments, eight QuickDraw color layers, a variety of horizontal and vertical line weights, and arrow-endings for lines. It's not Aldus FreeHand, but it is a satisfactory environment for manipulating page elements.

You can print in black and white, in color, or with each color as a separate overlay (there's an "invisible" color layer for nonprinting comments). Publish It prints what it calls registration marks, but no crop marks. It can print facing pages on a single sheet and even collate them into a book. You can also print any thumbnail view.

Manuals, Online Help, and Reliability
The manuals do a good job of getting you up and running, and they answer most questions. Sophisticated users will be frustrated by some cursory explanations, but all users will be delighted by the indexed online help. Sample documents are provided, but they don't always take advantage of Publish It's advanced features. And, as is so often the case with templates, they're boring.

I had trouble with the program crashing, but several other users report a stable, bug-free experience. (My system is the probable culprit.) I had difficulty positioning the text cursor—another reason not to use Publish It as a word processor. The program works, however, and it performs fast—not surprising, since it's packed into only 240K of assembly-language code.

Publish It has to live or die on its page-makeup prowess. It brings the power of drawing tools to page makeup, but there are some drawbacks. The program's importing of formatted text is weak compared with that of its competitors, and its drawing powers don't match those of FreeHand or even SuperPaint 2.0. Publish It needs polish in the little things that make all the difference (undo for text changes, ruler guides, a grabber hand for moving around, useful ruler increments, conversion to open and closed quotes and em dashes on import, gray-scale TIFF support, crop marks).

Why should you buy Publish It instead of one of the big three? Any of three reasons: you have a 512KE. Plus, or SE that calls for a small, fast program; you can't afford both a text-capable draw program like FreeHand and a page-makeup program; or to complement other programs already in your library.—Steve Robb
See Where to Buy or circle 798 on reader service card.
So It Is Written...
So It Shall Be.

Means that OmniPage can read virtually any font, in sizes that range from 8 pt. to 72 pt.

This unique landscape feature means that spreadsheets and financial documents are only a scan away. A great addition to your royal granary if storing and accessing numerical data really counts!

Multiple column feature means that complex, compound pages of text and graphics can be handled—automatically.

Transitional Editor™ lets you review scanned text before exporting it to a file. Cut, copy, paste, insert and delete text—or take advantage of the powerful search and replace tools which allow you to modify a page.

Reads and outputs underlines, bold faces and italics.

Supports the most popular word processing programs for the Macintosh, including Microsoft Word and MacWrite.

Supports 11 of your favorite Indo-European languages, including French, German and Spanish.

IFYSScan™ interface takes full advantage of Macintosh's incredible ease-of-use.

OmniPage 2.0 has even more features than ever before — this translates into the most comprehensive page recognition software available anywhere — for any dynasty — at any price.

The bottom line in page recognition software — eliminating excessive key strokes* for all time.

OmniPage 2.0 now available!

*Egyptian scribes had a real time of it when it came to excessive key strokes. Each letter, or hieroglyph, had to be individually etched into stone. And we complain today about writer's cramp?

OmniPage is a registered trademark of Caere Corporation. Transitional Editor and IFYSScan are trademarks of Caere Corporation. Apple and Macintosh are registered trademarks of Apple Computer, Inc. Microsoft Word is a trademark of Microsoft Corporation. MacWrite is a trademark of Claris Corporation. Egyptian bust of Ramses II courtesy of the Rosicrucian Society of San Jose, California. ©Copyright 1989 Caere Corporation. All rights reserved.

Caere Corporation
100 Cooper Court
Los Gatos, CA 95030
1-800-535-SCAN
TK Solver Plus further encourages you to cobble together hybrid models, since variables, rules, and other elements can simply be cut and pasted from one set of sheets to another.

As seems to be the fate of many programs that include a System Independent Reference Manual (that’s not just System 4.2 vs. 6.02—they mean independent of computer hardware entirely), the interface gives you screens of plain text rather than math symbols, and memory management is a problem. If, for example, you set a single global font and size for all output, the program will crash on larger problems under MultiFinder unless you make a generous allocation of memory—one large enough to suggest that you won’t be happy doing real problems on a stock SE or Plus. Nonetheless, if you have a dog-eared copy of Fink and Beaty’s Standard Handbook for Electrical Engineers on your desk, this program can be a relentlessly practical choice.

Automated Paper

Rather than stacks of spreadsheets, MathCAD presents you with a clean screen, a symbol palette with real math symbols for defining equations, and a large amount of behind-the-scenes programmed intelligence. Both notationally and in its set of functions and graphing facilities, MathCAD is something like the world’s most highly evolved version of interpreted BASIC for scientists, a version that accepts WYSIWYG equation input, graphs with a single command, and remembers whatever variables you care to improvise. For smaller problems this gives great flexibility, and it encourages you to write down a few equations in textbook notation as a starting point and then build larger problems from this simple core.

The facilities supporting this carefree approach to computation are impressive. Besides expected functions (transcendents, including hyperbolics; basic statistics; solve functions) MathCAD offers Bessel and gamma functions, Fourier transform and its inverse (see “Obvious Symbol—(continued)
Best Performer!

FoxBASE+/Mac: The Most Celebrated Mac DBMS
Now Includes a Powerful Report Writer!

New FoxReport!

FoxReport lets you create virtually any columnar or free-form report—without any programming! FoxReport includes:

- **Page Layout**: Designate many layout settings for your report: number of columns, left margin setting, column width, space between columns, measurement size for each page, and more!
- **Report Layout Window**: Define the different areas within your report, using FoxReport's new “band” system. Start with the default bands: Page Header, Body, and Page Footer, then bring in other bands like Title, Summary, Column Headers and Footers, etc.
- **Object Menu**: Control the Type Font, Sizes and Styles of text objects. Fill and Pen options let you change the color and shading of almost every object!
- **Page Preview**: “What-You-See-Is-What-You-Get” design ensures that the report on your screen is exactly as it will appear in print!
- **Label Generator**: Create labels of almost any size and configuration. You can even include pictures anywhere on the label space!

New Features!

- **Enhanced XCMD/XFCN Support**: Load up to 16 external XCMDs and XFCNs, then access them directly from within FoxBASE+/Mac 2.00 programs!
- **Language Enhancements**: Other features include: support for custom hierarchical menus, new commands to help handle resources, new system functions to improve filename and screen management, and much more!

Perfect Connectivity!

FoxBASE+/Mac 2.00’s Multi-User version allows complete data and application sharing between networked Macs and PCs! (when used with FoxBASE+/LAN). It also runs on the most popular network systems: AppleShare, Novell and 3Com! . . . And It’s Faster Than Ever!

Order or Upgrade Now!

FoxBASE+/Mac Version 2.00 is the new Leader of the Mac! And at only $495 ($695 for Multi-User), it’s a phenomenal bargain! If you’re already a FoxBASE+/Mac registered user, you can upgrade to Version 2.00 for just $75!

To order your copy (or ask for a FREE demo disk), call (419) 874-0162. Or visit your local quality software dealer.

After all, when it comes to the Macintosh, Nothing Runs Like a Fox!

FoxBASE, FoxBASE+/Mac, and FoxReport are trademarks of Fox Software. Macintosh is a trademark of Apple Computer, Inc.
In MathCAD you can set out a problem in standard
math notation and direct the program to evaluate any
expressions you have defined.

Matrices, operators, curve fitting with splines, and several styles of iterative
equation solution. Complex-number
computation is included, and it’s possible
to evaluate contour integrals in the com-
plex plane in just a few lines. Graphs
include both standard X-Y plots in 2-D,
and 3-D surface plots with user-control-
able shading. What more could you want?

Basically, you could want some re-
finement of the Mac-specific details. On a
Mac Ilx running only under the Finder,
MathCAD seems entirely reliable; on a
stock SE with MultiFinder the program
crashed on several matrix and graphing
tasks. On both machines, the screen tends
to accumulate junk, so you have to redraw
the screen a lot. MathSoft has dili-
gently updated its IBM PC-based product and is
likely to do so for the Mac as well, but it’s
remarkable that this otherwise admirable
program could be released with such
obvious practical and cosmetic flaws. For
preparing clear representations of prob-
lem definition and solution, including
sophisticated engineering analyses,
MathCAD is still a standout, but the cur-
rent version requires a sometimes un-
pleasant amount of hand labor for best
results.

Adding It All Up
Ideally, a numerical computation pro-
gram should offer an interface that uses
standard math symbols, assemble computa-
tions for you in a form that facilitates
documentation of problems, and include
libraries offering most of the functions
from postgraduate-level applied math-
ematics. And there shouldn’t be any inter-

face deficiencies. TK Solver Plus and
MathCAD both provide about 75 percent
of this ideal. You might also consider in-
specting Matlab, if you do heavy-duty
computational work, or Mathematica, if
you need to explore a variety of ap-
proaches to individual problems. How-
ever, both TK Solver and MathCAD repre-
sent easy-to-learn alternatives to tradition-
al programming languages, with
enough functionality and extensibility to make the Mac a favorite computational
tool.—Charles Seiter
See Where to Buy or circle 774 (MathCAD), 821 (TK
Solver Plus) on reader service card.

WORKPLUS COMMAND 2.0

Pros: Adds powerful macro programming
language to Microsoft Works; comes with numerous
useful preprogrammed macros, including automatic
toolbars that make common tasks available with a
single keystroke. Cons: Mac language may be too complex for
most Works users. Company: Lundeen &
Associates. Requires: Mac Plus; 2MB hard disk;
Microsoft Works. List price: $149.95.

WORKPLUS SPELL 2.0

Pros: Fast; accurate; flexible; customizable,
accurate hyphenation routine; well-designed keyboard
glossary and word count features. Cons: Works
only within Microsoft Works. Company: Lundeen
& Associates. Requires: Mac Plus;
Microsoft Works. List price: $99.95.

Well before Microsoft released
Works 2.0, the upgrade path
from earlier versions had al-
ready been defined by a superbly engi-
neered pair of software add-ons, Works-
Plus Spell and WorksPlus Command.
Developed independently by Tim Lun-
deen, Works’ original author, they melded
into Works as seamlessly as if they were
standard equipment.

But Microsoft chose other ways to
integrate spelling correction and macro
making. Undaunted, Lundeen has re-
sponded with new releases of Command
and Spell, boldly claiming that each is far
superior to its built-in counterpart. My
comparisons hack him up—the question
you’ll have to answer is whether the
improvements you pay for in Spell and
Command outweigh the free ride you get
in Works.

Spelling It Out
Back before Microsoft released Works 2.0,
WorksPlus Spell was a must-buy; but the
appearance of Works’ own spelling checker
makes the purchase less urgent. Yet Spell
don’t only outdoes Works in both spelling
acumen and performance but has extra
features not found in Works alone.

Spell turns in an impressive perfom-
rance at finding and correcting spelling
mistakes. Spell can set to check as you
type and pause over far real words as errors. Curi-
ously, many of the words omitted by
Works’ dictionary come from the personal
computer domain—it blows the whistle
on resize, macro, desktop, and spread-
sheet—but even common, ordinary words
such as beeping embarrassing the get the red
flag. By contrast, Spell pauses over far
fewer legitimate words.

Both spellers let you add your own
words to the dictionary, of course, and
each offers a number of useful options
governing the checking process. But Spell
has one accuracy-promoting feature that
Works alone can’t touch: the dictionary
can be customized on a document-by-
document basis. If you’re fond of abbre-

(continued)
viations or acronyms in your professional correspondence, but don't want the alphabet soup approved automatically in letters to your mother, Spell can make the necessary adjustments.

I can't confirm Lundeen & Associates' claim that Spell is several times faster than the Works spelling checker, but in my own informal time trials it did consistently finish first. Certainly, Spell seems noticeably more responsive and can check a few selected words much more quickly than Works alone. The new version also adds one important speed-up feature: Spell now remembers what it has already checked, so when you call on it again for the same document, it just checks the changes you've made since the last run.

If you're a Works devotee, Spell's superior spelling talents may be enough by themselves to make you want to buy it. When you add in Spell's other features, the tug on the old purse strings becomes almost irresistible. Spell adds automatic hyphenation to your text documents, something the unaided Works lacks completely. It also has a "mini-macro" glossary feature that transforms abbreviations you've concocted (a single key will do) into complete words or sentences as you type.

In Command

Now that we've mentioned macros, let's tackle WorksPlus Command, the macro product for Works. With Works' own crude but effective macro-recording facility now on the scene, Command may be overkill for most Works users. Still, Command gives you far more control over automating Works' functions, and again, it offers additional features that make Works work better.

As in earlier versions, the package comes with a diverse set of preprogrammed macros. While they do whet your appetite for building custom macros, the macros that come with Command are more than stale tutorials. Among the functions they add to Works are automated log-on to telecommunications services, search and replace in database and spreadsheet files, and (along with many other text-oriented macros) style sheets for one-shot paragraph formatting (see "Working with Style"). Even if you never create your own macros, the prefab ones are well worth the price of admission.

Command offers two different ways to create your own macros: you can either record keystrokes and mouse events as you work, or you can write out macros in Command's powerful macro language. Even with the simpler record-as-you-go technique, Command has considerably more power than Works' macro maker—you can build in simple dialog boxes to get user input without any programming, for example.

But with the macro language and supporting tools, Works verges on becoming a programming environment for custom applications. Macros you write yourself can include loops, variables, and conditional branches (if you're in a database document, macros can sort; if you're editing text, they can check spelling). To give Works your own feel, Command includes a capable dialog box generator. An advanced macro debugger completes the package.

In version 2.0, Command gets an important structural improvement and a few minor revisions and additions, but it's functionally largely the same as before. The big change is that it runs considerably faster and needs less memory since macro source code files are now stored separately from the compiled macros.

The only problem with all of Command's power is that Works was designed for beginning and intermediate users. I remain dubious that many of those who picked Works for its simplicity over inherently more powerful applications will be interested in macro programming on the scale Command permits. If you're a fan of Works, my advice is to buy Command for the built-in macros, and consider everything else gravy.—Steve Cummings

See Where to Buy or circle 827 (WorksPlus Spell), 826 (WorksPlus Command) on reader service card.

MACENVELOPE PLUS 1.0

Envelope and Mailing List Utility

Pros: Dramatically simplifies envelope printing; accepts imported graphics for return-address logos; has helpful database-like sorting and searching capabilities and adequate import/export capabilities.

Cons: Doesn't permit mixing of type styles within a text block on the envelope. Company: Synex.

Requires: Mac 512KE. List price: $295.

MACINVOICE 1.02

Invoice Utility

Pros: Extremely easy to use; has macro feature for quick form fill-out. Cons: Doesn't permit editing of invoice layout; no import/export feature. Company: Synex.

Requires: Mac 512KE. List price: $69.95.

MACPHONEBOOK 2.0

Phone Book Printing Utility

Pros: Correctly handles the complex formatting required for printing double-sided pages in proper order. Cons: Doesn't share files with MacEnvelope directly; autodailing not available as a DA. Company: Synex.

Requires: Mac 512KE. List price: $79.95.

A trio of programs from Synex—MacEnvelope Plus, MacInvoice, and MacPhonebook—attempts to fill specialized needs left unmet by larger programs. Targeted primarily at small businesses, each of the three focuses narrowly on: printing one type of document—envelopes, invoices, or telephone directories. MacEnvelope Plus, the best of the little family, is an extension of earlier versions of MacEn-

(continues)
New Forms of Business.

Paperwork. The essential inconvenience.
Whether it's invoices, travel expenses, office memos or tax returns, Informed™ and Macintosh® computers can help you change mountains of paperwork into well-organized forms of information. It's a new way to draw, fill out and manage forms.

Design and Draw. Informed Designer™ comes packed with high performance drawing features. All to help you draw crisp, professional looking forms in no time at all. Grids, guides, rulers, tables, fields, combs, lines, ovals, rectangles, arcs, polygons, type — plus a whole lot more. With over 1/1000th of an inch accuracy.

Draw or scan. Make revisions in minutes. No more obsolete forms.

Fill Out. With Informed Manager,™ filling out forms becomes an effortless, error free task.
Add intelligence to your forms so they can think for themselves. Eliminate repetitive typing with powerful calculations, choices and automatic lookups. Create customized on-line help to answer common questions.
Just imagine the results. Assured accuracy on picture perfect forms.

Store, Sort, Search, Retrieve. Since Informed Manager is actually a database, you can organize and manipulate forms like never before. Search and sort at blinding speeds. Print single forms or group them for batch printing.
And because forms are stored electronically, you print less. The bottom line is less paper, less cost.

So it's time to think about forms the new way. Just give us a call. We'd be happy to tell you more. Then form your own conclusion.

Get Informed.

For more information, please call or write:

Shana Corporation
Advanced Technology Center
105, 9650 - 20 Avenue
Edmonton, Alberta Canada T6N 1G1
TeL (403) 463 - 3350 FAX (403) 428 - 5376
AppleLink CDA0004 MacNet SHANA

Copyright © 1989 Shana Corporation. Informed, Informed Designer and Informed Manager are trademarks of Shana Corporation. Macintosh is a registered trademark of Apple Computer, Inc.

Circle 297 on reader service card
velope. It lets you print mailing labels as well as envelopes in standard and custom formats, add PICT graphics to your envelopes as return addresses, and print postal bar codes for speedier delivery of letters (see "Addresses Plus"). In addition, you can exchange name and address records with other programs in several file formats. My only complaint is that although you can use different fonts for the address, return address, and a message, you can’t mix fonts or styles within one of these items—you can’t, for example, print the addressee’s name in bold and the rest of the address in plain type.

MacEnvelope Plus adds several features that do a better job of meeting the volume-mailing needs of businesses and other organizations. The biggest change is in capacity: while MacEnvelope stored only 1600 records, MacEnvelope Plus stores up to 100,000. You can now assign one or more 1-character flags to each record. These serve as codes for categorizing addresses according to whatever scheme you devise: A for awful customer, F for fabulous, and so on. And Plus gives you much more control in selecting which records to print, export, or delete—for any of these operations you can specify a range of names, zip codes, or flags, or a combination of these criteria. Plus can also recognize imported records that duplicate ones already in your mailing list. I can’t imagine managing mailing chores for a small or midsized business without MacEnvelope Plus.

That Small Black Book

On to MacPhonebook, which is primarily designed to help you print phone directories and address books. You can type in names, phone numbers, and addresses or import them from a database program or from MacEnvelope Plus (see “MacPhonebook”). When you’re ready to print, you choose one of four different formats, ranging from a little black book you can stuff in your wallet to a corporate-style desk directory.

MacPhonebook does the hard work for you; you choose the format, and the program breaks up the names and numbers into pages that print nonconsecutively on both sides of each piece of paper.

A few minutes of snipping, folding, and stapling and voilà—you have a finished phone book in alphabetical order, with all the pages printed on both sides. The program even provides you with a few vinyl covers.

There’s quite a bit of overlap of capabilities between MacPhonebook and MacEnvelope Plus. Obviously, both store and print names and addresses; in fact, MacPhonebook can even print labels. Unfortunately, while you can transfer data back and forth in MacEnvelope Plus format, the two programs can’t share the same files directly. If you want to store the same names in both programs, you must waste disk space on duplicate files and waste time on the export/import cycle. Like the earlier MacEnvelope, MacPhonebook has a capacity of just 1600 names—a bit limiting for some midsized firms.

MacPhonebook can also dial a telephone for you via modem. This function works fine, as far as it goes. But since MacPhonebook isn’t a DA, the autodialing feature isn’t always available when you need it.

MacInvoice

MacInvoice is the least flexible of the three Synex utilities, but it may still fill a niche at some small companies. MacInvoice’s only contribution is to provide one generic invoice form, which you fill out and print as often as you like (see “One Size Fits All”). You can’t customize the layout of the form, though you can change the titles on the fields.

A couple of modest frills ease the process of filling out invoices. You can call back information in one or more fields from a previous invoice to avoid retyping repeated information. You can also create quick macros for filling in a frequently used phrase—for example, you could use a UPS or Federal Express macro to fill in the Shipped Via field on each invoice. MacInvoice will print a summary journal that contains invoice numbers, dates, addressees, and amounts, and points out breaks in invoice numbering sequence.

Unfortunately, there’s no function for calculating totals, sales tax, and so on, automatically.

But MacInvoice’s most serious limitation is the lack of an export function. Though the invoices you fill out and print on the Mac look nice, you have to retype the same information to get it into a database or accounting program. Despite its inflexible invoice design, however, MacInvoice may make sense for you, especially if you don’t want to pay for the privilege of designing your own forms with a dedicated forms-design package.

—Steve Cummings

See Where to Buy or circle 753 (MacEnvelope Plus), 761 (MacInvoice), 766 (MacPhoneBook) on reader service card.
One of the best arguments for owning the new generation of Macintosh personal computers is the new generation of Macintosh software.

Presenting FullWrite Professional and Full Impact from Ashton-Tate.*

FullWrite Professional combines a full featured set of powerful writing and publishing tools with an interface that's so easy-to-use, it could only have been written for the Macintosh.

Full Impact brings the promise of Macintosh to reality for the users of spreadsheets. Full Impact's accessible power lets you quickly place charts, graphs, text and numbers all on one page. All at one time.

Together, FullWrite Professional and Full Impact let you take full advantage of the full power of the Macintosh II CX. For a free sampler of either FullWrite or Full Impact, call 1-800-437-4329, ext. 2102. And who could argue with that?
MACSPRINT II

Cache Board for the Mac II

Pros:
Inexpensive; easy to use; four-year warranty.

Cons:
None.

Company:
Orchid Technology.

Requires:
Mac II.

List price:
$299.

With the introduction of the 68030-based Macintoshes (IIx, IIcx, and SE/30), users of plain Mac IIs have longed for greater speed at a reasonable price. The Apple upgrade to a IIx logic board is priced at just over $2000 (not including the high-density disk-drive upgrade). Third-party Mac II accelerators are another option, but I don't know of any priced under $1000. The MacSprint II speed-up board changes all that. At $299, it's an inexpensive cache board that provides a speed boost rivaling those of expensive CPU upgrades.

Instead of replacing the Macintosh's CPU with a faster one, the MacSprint relies on a small circuit board that contains a 32K static RAM cache. The cache improves storage of recently used data or instructions in its ultra-high-speed RAM, thus eliminating the wait state. It is faster to retrieve the information from the cache than from system board RAM or a disk, and the cache's performance boost—20 to 30 percent—is within a few percentage points of more expensive CPU upgrades.

Prove It

The real-world and software-benchmark tests I performed failed to confirm Orchid Technology's claim that the MacSprint II "boosts Macintosh II performance up to 30 percent," but it may prove true for certain tasks and applications.

In the Word 4.0 search-and-replace test, which substituted periods for spaces in 7000 instances, MacSprint II achieved a 21 percent speed improvement. The incremental fill test required Full Impact to fill each cell in a 256-by-256 matrix with the sum of the previous cell plus 144; here MacSprint increased the speed by 17 percent.

The remainder of the tests were performed using Speedometer 2.1, a shareware utility for measuring the Mac's performance. The basis for comparison is the Mac SE with an Apple HD20 internal hard disk, which is assigned a value of 1.0. In other words, a stock Mac II has a performance rating 3.89 times faster than a stock SE; with MacSprint II installed, it is 4.5 times faster than the SE.

Subjective Impression

The numbers don't tell the whole story though. Quitting to the Finder, searching, replacing, and scrolling are all definitely faster with the cache on. Benchmarking the screen-refresh rate is almost impossible without sophisticated test software, but there was a perceptible speedup with the cache turned on. PageMaker and Word scrolled and refreshed the screen faster, and most operations in drawing programs like Canvas 2.0 or MacDraw II seemed faster, too.

After a few days of use, I found I could tell within minutes whether the cache was on or off. I was pleased with its performance and found no software or hardware incompatibilities in over six weeks of heavy use with dozens of programs. In fact, MacSprint II worked so well that rather than return the review unit, I simply bought it.

Installation

Installation is not for the faint of heart. If you're not comfortable prying chips loose and disconnecting disk drives, you should have MacSprint installed by a professional service technician. Thanks to the clear and concise eight-page manual, I had no trouble installing the board, though it did take me half an hour (the box says "installs in five minutes"). Be careful though—the pins on both the 68020 chip and the MacSprint II are easy to damage.

Once the board is installed and you've reassembled the Mac, you simply copy the MacSprint CDEV into the System Folder and restart.— Bob LeVitus

See Where to Buy or circle 770 on reader service card.
JMP™ to All the Right Conclusions.

New JMP Statistical Visualization Software from SAS Institute Inc.

Make the quantum leap in data discovery with JMP—the easiest, fastest, most reliable way to visualize your data. Yours today on the Apple Macintosh®.

JMP lets you combine powerful statistics and graphics in one highly interactive process. Just point and click. Tools for manipulating, analyzing, and storing data all fit together so that one simple command generates a whole series of results!

Data Analysis with a Visible Difference

JMP organizes classical statistics in six logical areas: Distribution of Y's, Fit Y by X, Fit Y by X's, Specify Model, Spin, and Y's by Y's. Each area comes complete with appropriate graphics. There's always a picture available for visually exploring your data, so you can make discoveries that just aren't possible through numeric reports alone.

Generate leverage plots for a point-by-point view of hypothesis tests...means comparison circles for viewing differences among group means...and multidimensional data views such as spinning plots, biplots, and scatterplot matrices. JMP handles all combinations of measurement levels—interval, ordinal, and nominal—with appropriate statistical methods.

Call Today for a Free Technical Summary

JMP brings you superior statistics and graphics...backed by a full year of free technical support.

For more details about JMP, call our JMP Sales Department at (919) 467-8000. In Canada, call (416) 443-9811.

JMP™ From SAS Institute Inc., the number one name in data analysis software.
To open a new account in Quicken you will first set its starting balance and define the account type as either home, business, or for use with the MacIntax tax-preparation program. Within these three account types Quicken provides three extensive sets of income and expense categories, and you can customize these—at any time, even when you are entering a transaction. You can also assign a monthly budget amount to each category, which helps you keep tabs on your actual spending and saving activities.

Data can be entered in either the Enter Transactions screen or the Write Checks screen. Enter Transactions can be used for any type of transaction—deposits, withdrawals, or handwritten checks. Write Checks is used for checks that you intend to print. As you enter data, Quicken provides several shortcuts. Check numbers and dates can be changed in the Write Checks window by pressing the plus (+) or the hyphen (-) key, for instance. Split transactions can be entered by typing the first few letters of each category or selecting the appropriate categories in the transaction list. You can also use the option to keep lists of account categories and recurring transactions in the Write Check window, which helps speed the data entry process.

You can set up recurring transactions, specifying the type, the payee or a description, the categories it will be split between (and the amounts, if you wish), and any memo you want. You can also enter the recurring transaction's next due date or a group classification. You can use the Group Entry window to select either the due date or group classification to record your transactions quickly.

Checks and matching window envelopes suitable for most dot-matrix and laser printers can be ordered from Intuit. Quicken even includes a HyperCard stack, CheckArt, to personalize your checks with an emblem or logo.

What's New?

Although not dramatic, the changes introduced in 1.5 are welcome. Most can be classified as improvements rather than new features. Quicken now lets you print three different styles of checks: standard, wallet size, and voucher (payroll type). If you use a LaserWriter, you can print partial sheets (there are three checks per sheet). Version 1.5 also allows you to allocate up to seven payroll deductions—up from five in version 1.0.

The biggest change, however, is in Quicken's financial reporting facilities (see "Reports"). You can now create multiple-column reports, such as a profit and loss statement that shows the different time periods for expense and income categories. Also, any change made to a transaction in the report is automatically reflected in the report totals.

Quicken is targeted for home and small business use. If your major financial activities center around a single checking account, this is the program to have. When tax time comes around, a few mouse clicks will produce reports that you can use in your returns. Data can also be exported from Quicken to a SYLK file (for further analysis in Excel, for instance), a text file (for further editing), or for use with MacIntax.

The program's biggest limitation is its inability to handle transactions involving multiple accounts. You can create separate accounts for checking, savings, certificates of deposit, mutual funds, and so on, but Quicken can only deal with one account at a time. To transfer funds from your savings to your checking account, you'd have to record a withdrawal from the savings account, close that account, open the checking account, and enter a separate deposit. Similarly, there's no easy way to produce a net worth statement without making a special assets/liabilities account that you must periodically update by entering the current balances from each of your other accounts.

In short, as your financial situation becomes more complex, you may outgrow Quicken. Nevertheless, until your needs change, Quicken is the place to start. It's not an everything-but-the-kitchen-sink personal finance program, but what it does, it does extremely well.

—Steven Schwartz

See Where to Buy or circle 799 on reader service card.
CAUSE introduces personal programming — a new technology that lets you create software without learning a language. With CAUSE, use a graphical interface and object-oriented programming techniques to build applications in hours instead of months. Without any code or syntax. Users can create those elusive solutions. Programmers can develop as fast as they can prototype.

Naturally, CAUSE implies EFFECT. EFFECTS are applications written with CAUSE, and published by Maxem. Submit your CAUSE-generated applications to Maxem, and publish software without the hassles of marketing and distribution, only the hassle of cashing your royalty check. Get in touch with the future; call Maxem 1-800-336-6296 or write Maxem, 7855 South River Parkway, Tempe, AZ 85284.
Now the person making the presentation can make the presentation.

The old adage, "If you want something done right, do it yourself," couldn't be more true than when you're making a presentation. Or, right now, more possible.

In fact, all you'll really need is Microsoft® PowerPoint® software and an Apple® Macintosh® to run it.

It's the easiest, most cost-efficient way to assemble a professional-looking presentation from conception to completion, right from your own desktop.

PowerPoint gives you the power to create your own picture-perfect overhead transparencies, flipcharts, 35mm color slides, speaker notes, and audience handouts. In such record-breaking time that there'll be nothing for you to do the night before the big day but sleep.

Its built-in word processor (complete with spelling checker) and drawing tools allow you to mix text and graphics in countless ways. You can use different typefaces, logos, special effects like shaded backgrounds, dropshadows, and diagrams. Or you can copy charts, tables, and illustrations from other programs, like Microsoft Excel and Adobe Illustrator 88 with a simple cut and paste.

You can also standardize a format automatically. And you can easily make global changes with the Slide Master, which instantly executes your revisions throughout.

At any point along the way, the Slide Sorter feature lets you view slides one by one or scan your entire presentation at a glance, or simply rearrange the order with a point and click.

Then, whenever you're ready, you can print out all your presentation materials—from attention-getting overheads to handy speaker notes—without ever leaving your desk.

If 35mm slides are in order, simply send your presentation to the nearest Genigraphics® center, the leading presentation graphics service bureau, and your slides will be on their way in 48 hours.

And remember, the best part of doing a presentation all by yourself comes afterward. When you get all the credit.

I want to do it myself. Please send me a FREE Working Model of Microsoft PowerPoint for the Macintosh.

Name: __________________________
Address: ________________________
City: ____________________ State: __________
Zip: ____________________ Phone: _______

Call (800) 541-1261 Dept. K26. Or mail to Microsoft, Attention PowerPoint Working Model, One Microsoft Way, Redmond, WA 98052-6399.

Microsoft
Making it all make sense

For more information, call (800) 541-1261. Dept. K26. Outside the U.S. and Canada, call (206) 882-8661. ©1989 Microsoft Corporation. Microsoft, the Microsoft logo and PowerPoint are registered trademarks and Making it all make sense is a trademark of Microsoft Corporation. Apple, Macintosh and Mac are registered trademarks of Apple Computer, Inc. Geographics is a registered trademark of Geographics Corporation. Adobe Illustrator 88 is a trademark of Adobe Systems Incorporated.
A NEW TRADE ROUTE

A direct route should be possible by sailing westward
- Shorter, therefore faster and safer
- Hitherto unexploited by the English or Portuguese

New World Expeditions — March 14, 1491

With artfully designed PowerPoint overheads, your presentation will be the center of attention.

The PowerPoint Slide Sorter lets you put your presentation in order with a simple point and click.

You'll create 35mm slides in your choice of 16.8 million decorator colors with a Mac® II.

The Slide Show feature turns your Macintosh into a projector—for quick rehearsals or slick on-screen presentations.

PROPOSED ROYAL FUNDING

ADVANTAGES FOR SPAIN

REMEMBER to bow to Isabel and Ferdinand
Congratulations on their recent victory over the Moors
Agree with their decision to start the inquisition
Remind them that a new world is waiting!

With PowerPoint, it's easy to print out your speaker notes, or handouts with up to two, three, or six slides of your presentation on a page.

Your audience will flip over charts like this, created entirely with PowerPoint.

EXPEDITION SCHEDULE

The Macintosh PowerBook is the perfect partner for your presentation.

With PowerPoint, you can also add background music to your presentation.
Regardless of what world you live in, Tecmar delivers the dependable, cost-effective tape backup systems you're seeking.

**Mac World**

Tecmar's QT-Mac80™ and QT-Mac40™ are the proven choice for SCSI tape backup for the pure Mac environment, with network support for effective backup and archiving under TOPS®, AppleShare®, and Novell®. Including our exclusive QuickTurn™ Quality Service and two-year warranty, you couldn’t ask for a better Mac tape backup solution.

**Applications Guide**

<table>
<thead>
<tr>
<th>Apple® Macintosh®</th>
<th>IBM®/Compatible</th>
</tr>
</thead>
<tbody>
<tr>
<td>QT-Mac80 40MB SCSI</td>
<td></td>
</tr>
<tr>
<td>QT-Mac80 80MB SCSI</td>
<td></td>
</tr>
<tr>
<td>QT-Mac150* 290MB NuLink Interface</td>
<td></td>
</tr>
</tbody>
</table>

* Bundled with NuLink for total Macintosh solution. PC and PS/2 host adapter board also available. Call for details.

**Mixed World**

We've even bridged the gap between PC Bus, Micro Channel™, Bus and NuBus™ with our new QT-Mac150™ and NuLink™ interface board, which now, for the first time ever, give you a single-drive solution for mixed environments.

So get the best for both worlds. For the name of your nearest dealer, call us today at (216) 349-1009 or toll-free at (800) 624-8560.

Tecmar, Inc., 6225 Cochran Road, Solon, Ohio 44139-3377.

All Tecmar products are trademarks or registered trademarks of Tecmar, Inc. Other brand and product names are trademarks or registered trademarks of their respective companies.

©Copyright Tecmar, Inc., a subsidiary of Rexon, Inc., 1989. All rights reserved.
In designing a room layout, you can draw an overhead plan, rely on one of those room-design kits with little plastic shapes that stick to a board, or you can create a layout in a drawing program. All of these approaches let you determine which pieces of furniture will fit where, but they don’t allow you to see how the room will look when you stand, say, by the window. MacInteriors, in contrast, lets you create pieces of furniture, put them in a room, and view the results from virtually any angle.

MacInteriors comes with a few ready-made items, but you will probably need to make some of your own. The program’s Design mode features a few simple tools for drawing 2-D rectangles and polygons, as well as 3-D cubes and prisms that you piece together to construct furniture and other items.

As you work on one view you can open other windows for alternate views. Each item can be displayed as a solid object or as a wire frame, and solid objects can be filled with a pattern. There is no on-screen ruler, but a dimension box in the screen’s lower-left corner shows you an item’s size as you draw. You don’t need to be precise, however, because you can call up a dialog box and specify the item’s exact length, breadth, and depth.

When you finish building something, you merge all of its component pieces and save the finished whole to a library. A library, which holds up to 64 items with up to 64 surfaces each, is linked to the file it is created in, but you can save a file as a stationery pad and use its library for new plans.

Creating Your Personal Space
MacInteriors’ easy-to-follow tutorials take you through the steps of making a file cabinet and a simple desk. They also teach you how to create various types of rooms in the Planning mode, which is similar to the Design mode with its dimension and sizing dialog boxes, but uses a different collection of tools. A room-drawing tool, which works like the typical rectangle tool, lets you quickly create simple rooms. A fixture tool is used to draw individual right-angle walls and to place doors and windows. A diagonal fixture-tool lets you create walls that aren’t at right angles.

Learning how to place objects when planning a room, however, can be frustrating. For example, one of the exterior walls I was drawing kept appearing in the wrong place on the screen. Doors and windows often showed up at right angles to the wall or in a wall on the wrong side of the room. Moving the cursor to where I wanted an item to appear rarely corrected the problem. I found it easier to let things fall where they would and then move them than to figure out how to get them to appear in the right place as I drew them.

When your overhead plan is finished, you call up items of furniture from the library and position them. You can rotate an item and you can flip an item on any or all of its axes.

Room with a View
MacInteriors can seem like little more than a temperamental drawing program until you take advantage of its power to display a layout from any angle or elevation. In the Perspective window you can call up a dialog box (see “Change Perspective”) that allows you to see how things look from anywhere in the plan. And redraw is accomplished relatively quickly in simple room designs, although it gets sluggish in layouts that have many surfaces, such as irregularly shaped items created with the prism tool or complicated desks or chairs.

The layout can be scaled to fit the screen, to be actual size, or to be any size in between. You can gather several different views into one window (see “Multi-view Window”), and you can print any of the views on an ImageWriter, LaserWriter, or plotter (with MacPlot, Microspot’s optional plotter driver).

If you want to produce three-dimensional renderings of room layouts and you’re not a designer by trade, you should consider MacInteriors. Be prepared, however, to spend a considerable amount of time building a library of furniture, planning your layout, and—most important—getting the program to do what you want it to do. With patience and perseverance, however, it works.—Gerry Lukos

See Where to Buy or circle 754 on reader service card.
Our standards are the toughest part of our 3.5" diskette.

We’ve got you covered. The rigid plastic jacket of our 3.5" Micro Diskette is molded to our own specifications for unsurpassed protection. And, our clipping level is 44% higher than industry standards. Call 800-343-4600 for the name of your nearest BASF supplier.

Depend on it.

BASF
SUPERGLUE II 2.01

Print-to-Disk Utility

Pros: Extremely versatile way to share Macintosh documents; allows Post-it-style notes to be attached to documents; easy to use.


CANOPENER 1.0

Document-Browsing Utility


Although we’ve been hearing about a paperless office for years, people still use paper, partly because it’s a lot easier to manage than electronic documents. Two new products, SuperGlue II and CanOpener, are designed to give electronic documents some of the same advantages as paper ones.

SuperGlue II, like its predecessors Glue and SuperGlue, is a print-to-disk utility. Documents printed with SuperGlue II, instead of on an actual printer, become electronic documents that can be shared over networks or distributed on floppy disks. These documents can then be viewed and printed without using the application that created them. You needn’t own, for example, eight copies of PageMaker just so everyone in your office can help proofread the newsletter. SuperGlue II even includes a viewer application that can be distributed without license fees.

SuperGlue II improves on its predecessors by allowing certain modifications to be made to the printed document. You can extract the text from the document or substitute different fonts while preserving the line or character spacing of the original. Unlike earlier Glue products, SuperGlue II can match fonts by name instead of number, so the mysterious font changes that used to occur can be prevented.

SuperGlue II includes a handy F-key called OneTimer that can invoke the SuperGlue II driver once, then return the system to its regular printer. Longtime Glue users will appreciate this convenience. An even more impressive feature is GlueNotes, an electronic equivalent to Post-it sticky notes (see “Pasting In Comments”). With GlueNotes, any document can be circulated among SuperGlue II users in a workgroup, annotated, and returned to the document’s creator for revision. After annotating, you can exchange just the notes file—a big timesaver when working with large documents by modem.

Browse Any Document

One advantage to paper documents is that if you remember seeing some scrap of information somewhere, but don’t remember exactly where, you can often locate it by doing an exhaustive search of nearby papers. With electronic documents, however, your information could be buried in folders on a huge hard disk, and your search could involve tediously opening each document in turn and laboriously relaunching many different applications.

Abbott Systems’ CanOpener is a clever utility designed to make just this sort of search easier. It extracts pictures, text, icons, or sounds from documents and searches folders or entire disks for specified text strings, storing any items it finds in a Scrapbook-like library. Even better, CanOpener can access information in almost any document, regardless of its creator.

The most striking thing about CanOpener is its graphic design. From the packaging, with its bold images and poster-size reference sheet, to its user interface with 3-D buttons and animated cursor, the product sets a new standard for Macintosh visual aesthetics (see “A New Interface”). It’s functionally efficient, too. The window can be reduced to an icon to avoid desktop clutter, buttons can be selected and pushed without using the mouse, and CanOpener remembers a number of default settings between sessions.

But CanOpener’s advanced user interface is also one of its shortcomings. While it looks great on a color or gray-scale monitor, it’s a bit confusing when first viewed in black and white. When shrunk to an icon, CanOpener causes MultiFinder’s shut-down operation to fail. It would be nice if searches, which can be quite time-consuming, could be done in the background. Still, these are minor complaints. For finding, extracting, and archiving information from documents created with many different applications, CanOpener can’t be beat.

Both SuperGlue II and CanOpener include application versions as well as fully functional desk accessory versions, so they are equally at home with or without MultiFinder. Documentation and support are good for both programs.

It will be a long time, if ever, before computers replace paper completely. Still, with SuperGlue II to serve as a copy person and CanOpener for an electronic file clerk, adapting to the electronic office might not be as traumatic as some have feared.—Ron Risley

See Where to Buy or circle 815 (SuperGlue II), 717 (CanOpener) on reader service card.
In less than thirty minutes, an 8-bit Abaton Upgrade can invade your Apple scanner. Leaving you with more detail in your scanned images than before. Because Abaton's 8-bit Upgrade lets your 4-bit Apple scanner read 240 more shades of gray than the current 16. So your black and white images have all the rich details found in your original photos.

And this invasion won't be a nightmare. Just place your order, and within 48 hours, a technician will call to schedule the 30-minute upgrade at your home or office. There's no risk, since your upgraded scanner is covered for 90 days.

Or you can extend the warranty to suit your needs. But best of all, the Abaton 8-bit Upgrade makes it easier for you to publish. You can see every page before it's sent to a phototypesetter. And that's a publishing plus.

If you want all the gory details on Abaton's 8-bit Upgrade invasion, call Abaton at 1-800-444-5321, and let Abaton make your ideas easier to publish.
MOBIUS MULTISCREEN 2.0

MultiScreen Video Board for the Mac SE

Pros: Works well with inexpensive 14-inch monochrome monitors and Apple 12-inch monitor. Cons: Uneven driver support; documentation needs some polish.


You’re sick of opening, closing, and juggling windows. You think squinting at the SE’s screen might be damaging your eyes. You really can’t justify buying a costly full-page or dual-page display or a Mac II. Mobius Technologies’ MultiScreen—which lets you attach to the SE the various Apple monitors available for the Mac II, inexpensive IBM PC-compatible monitors, and Apple-compatible portrait displays—may be your solution.

MultiScreen consists of a video board, which plugs in to the SE’s expansion bus slot, and software to drive various monitors. I tested MultiScreen with the Princeton Graphics MAX-15, the NEC MultiSync II, and the Apple 12-inch monochrome displays on a standard dual-floppy SE. For the Apple 12-inch display, you’ll need a longer power cord than the one that comes with the Mac II. Also, the Mac II’s interface cable is barely long enough to provide the 15-inch corridor necessary between the two screens, so you might want to invest in a longer one.

Installation is clearly explained, and it’s simple enough provided you have access to the long torx screwdriver required to open Mac Pluses and SEs. (I managed to break two of the hex nuts on the back of my Mac by overtightening them with a ratchet driver, so save tire-changing torque for your car.)

Warning: Unless you have technical training or knowledge to work inside the Mac, don’t do it. High-voltage components may cause physical harm to you as well as to the machine.

Software installation is simple: you copy the MultiScreen INIT file into your System Folder and choose the display and resolution. You can change optional features any time by clicking the MultiScreen icon in the Control Panel.

It’s important to follow the instructions on how to position the external monitor. If you put it too close to the SE, electromagnetic interaction between the SE’s transformer and the transformer in the monitor will produce horizontal scan lines on the SE. In the case of the NEC MultiSync, I couldn’t get the SE and the monitor far enough apart (I tried up to 3 feet) to restrain their transformers from interfering with each other. For some inexplicable reason, the mouse pointer was also slowed down.

MultiScreen lets you either switch to a larger external screen or extend the SE’s screen by adding on the width of another monitor. Although the latter option takes some getting used to, it allows you to have one set of windows open on one screen while you work on a document on another. This makes MultiFinder’s ability to toggle between multiple applications and documents without sorting through all your layers a bit easier. When you are scrolling through documents, MultiScreen’s SpeedScroll facility speeds up QuickDraw an average of 20 to 30 percent.

Configuration choices include being able to work on only the SE or the external screen, or being able to work on both, with the external monitor on whichever side you prefer. In this configuration, the software allows the pointer to move freely between the monitors as if they were one large screen. You can line up the external screen with the SE screen for better horizontal movement between the two. The menu bar can be displayed on either screen, so you can use one screen as command central and the other to display documents. And if you ever want relief from the white screen, the inverse video toggle can paint a much darker picture.

Some of MultiScreen’s nicer features are a screen saver for both screens and a magnifier for enlarging images from 2 to 8 times (available only when working exclusively on the external monitor). Even though dialog boxes will still be normal size, you can opt for a larger menu bar and cursor, and you can turn the menu bar into QuickKey-accessible pop-up menus. You can also automatically add zoom boxes to document windows.

My favorite feature is that not only can you move the pointer freely between the two screens at their central meeting point, but you can also exit at the left edge of one screen, sneak around back, and enter through the right edge of the other. Imagine being able to jump between columns A and O without scrolling on a spreadsheet that spans the width of two monitors. The save-screen-to-disk-or-printer facility is a nice idea, but it regularly crashed on my system. Another annoying feature is the x-y mouse position counter at the bottom of the screen that doesn’t seem to serve much purpose.

MultiScreen’s software offers resolutions of 640 by 480, 720 by 540, and 800 by 560 pixels. At the higher settings, more is visible on screen but the text and graphics shrink. As with full page displays, the main advantage of MultiScreen is to extend your visual window, not necessarily to enlarge or sharpen the elements on the screen.

If you’ve got extra Samsung, NEC, or Tatung monitors around, I’d recommend using them with a MultiScreen-equipped SE, but I wouldn’t buy them specifically for that purpose; I found the driver support for them uneven. However, when used with an Apple 12-inch or Apple Portrait monitor, a Sony MultiScan, or a Princeton Graphics Max-15, the Mobius MultiScreen board provides an inexpensive solution to SE microscopy.

—Nancy Canning

See Where to Buy or circle 782 on reader service card.
Your Assurance of Quality and Performance in Imagesetting

When you see this seal on Varityper® Series 4000 imagesetters, it’s your assurance that the equipment you’re buying has been engineered with a distinct advantage... Full Page Buffering™. This feature, which allows a full page to be processed and printed without interruption, provides the highest output quality and system performance. With Full Page Buffering, you get better quality and improved performance over other Adobe PostScript® imagesetters, which periodically halt printing to process more data only to then resume printing.

Full Page Buffering makes Varityper imagesetters:
#1 in Quality—Continuous imaging eliminates the problems associated with start/stop schemes and provides greater long term reliability.

#1 in Speed—Varityper has the fastest image recording systems. Full Page Buffering allows them to run without interruption. It’s just that simple.

#1 in Performance—Offering the broadest line of imagesetters with Adobe’s PostScript interpreter. From the 4300P and the 4200B-P for photomedia, to the VT600W and VT600P for high resolution on plain paper, Varityper is the name to remember for imagesetting quality and performance.

Call now for details.
Toll Free:
1-800-631-8134
In NJ: 201-887-8000, Ext. 999

Varityper
a Tegra Company

Varityper is a registered trademark of Varityper, Inc.
PostScript is a registered trademark of Adobe Systems, Inc.
Full Page Buffering is a trademark of Varityper, Inc.

Circle 93 on reader service card
This month we look at two special-purpose graphics packages, a handwriting-analysis tool, and a program that provides amortization tables.

**Mum's the Word 1.1**

Mum's the Word (Terrace Software, $125) provides graphics tools and a database to help you plan a garden. The program includes an object-oriented graphics screen, similar to the early versions of MacDraw, along with a Plant Catalog database of over 300 plants.

Double-clicking on a name in the plant index displays specific information about that plant, such as hardiness, height range, optimal spacing, recommended season for planting, and any negative features. You can edit the record to reflect your actual experience and you can add new records for plants not included in the catalog.

The most powerful feature of Mum's the Word is its ability to create a custom index that contains only those plants that meet your personal criteria for class, type, hardiness, planting season, color, blooming season, and ideal soil and light conditions.

To use Mum's the Word to plan your garden, you set the scale and draw the shape of your garden using the drawing tools. Next, you use the database to help decide which plants to include and to determine their best location. You then draw the beds. Finally, you drag each plant's name from the index to its designated bed. Whenever you double-click on a bed, the database record of the plant appears on the screen.

Although the graphics section of this program is customized for landscaping, there is no reason you couldn't use Mum's the Word as a general-purpose drawing program. It provides a grid (but no Snap To function), and has all the major drawing tools, a full pattern palette, and eight line thicknesses.

If your garden contains the same plants year after year, you'll probably have no trouble laying it out with a general-purpose graphics program or even pencil and quadrille paper. But if you want to experiment with new plants and try out different arrangements, Mum's the Word can save you hours of thumbing through plant catalogs and gardening manuals.

**MacStickers 1.0**

MacStickers from International Computer Services ($49.95) is a bitmapped paint program supposedly customized for designing and printing labels such as bumper stickers, disk labels, and badges. Actually, the program offers only a small set of templates for bumper stickers two or three to a page, large and small name badges, and disk labels. The package includes a 32-sheet assortment of colored and white heavy stock and adhesive-backed sticker pages.

While MacStickers is slower than the present generation of paint programs and lacks multiple windows and tear-off menus, it does have two features not found in some other paint programs. The first is a library where you can save objects and then paste them into a document with one mouse click. The second, a Pen Transfer Mode window, gives you six options for drawing an image on screen. For example, you can choose whether newly drawn objects should always appear in front of or behind previously drawn objects.

I recommend a full-featured paint program if you can afford one. You'll have no problem creating your labels. But if you can live with a paint program that is slightly less than state of the art, MacStickers gives you about the best value for your money that I've seen in a long time.

(continues)
The MacStickers Library

This window makes it easy to save and use symbols that you might need for stickers and badges. The program comes with about 25 images, but you can add more. You browse through the library by clicking the Prev or Next buttons. Clicking the Copy button copies and pastes the figure into the document. Although you can name each image, the program doesn't sort them in alphabetical order, so it can be cumbersome to find images in a large library.

AmPack 4.2 and AmPack Plus 4.2

AmPack (Softflair, $49.95), a program that determines loan amortization figures, is intended not for loan officers but primarily for borrowers. AmPack Plus ($89.95), which adds a number of features, is for bankers, real estate brokers, and other professionals who deal with loans.

The main window includes Loan Amount, Interest Rate, Term in Years (you can change Years to any of six other intervals such as Weeks or Bi-Weeks), Payment Amount, and First Payment Date (input in this box is optional). Fill in any three of the nonoptional boxes, and the program solves for the fourth. For example, you can type in the prevailing interest rate and term period along with the maximum amount of available money for monthly payments, and the program gives the maximum loan amount. You can then do "what-if" analysis to see how changing the term or interest rate affects the maximum loan amount.

AmPack also creates in-depth reports that can be viewed on screen, printed, or pasted to the Clipboard in either text or data (tab-delineated) form. The report lists periodic payment, interest payment, principal payment, and principal balance for every month (or other interval) that the loan will be outstanding.

AmPack Plus takes into account a large number of loan options when generating the report. For example, the first payment can be modified based on the number of days interest is accrued, the loan can be amortized as interest or principal payments only, payments' due dates can be scheduled to skip specific days or a given month each year, and the effect of unscheduled interest or principal payments can be listed. AmPack Plus can also figure the annual percentage rate based on points and fees, and can generate a rate disclosure statement.

AmPack Plus is excellent for professionals who do not have access to a corporate mainframe to generate loan reports. The advantage of AmPack is less clear; if you are shopping for the best mortgage, a ten dollar amortization book might be a more cost-efficient alternative. However, if you want to discover how best to invest in real estate, AmPack can be a helpful guide.

Handwriting Analyst 3.1

Handwriting Analyst from CIASA ($69.95) asks you approximately 80 multiple-choice questions about the handwriting you want to assess. It then generates a seven-page, single-spaced report, describing the person whose writing it is according to six headings: Physical and Material Drive, Emotional Characteristics, Intellectual Style, Personality Traits, Social Behavior, and Vocational Implications. You can analyze either the subject's signature (which indicates his or her public image), text (which indicates real personality), or both. If you choose to analyze both, discrepancies between the public image and the real personality are listed side by side in the report.

The multiple-choice questions are clear and easy to follow. For example, the Y Loop Fullness screen offers five choices: Full, Moderate, Thin or Retraced, Downstrokes Only, or Mixed. Each screen of options has one or two associated instruction screens that fully describe each of the choices. The manual also contains handwriting samples illustrating each option. The package even comes with an acetate template to help you measure letters and determine slant.

The report seems particularly geared toward employers, since much of it deals with ability to work with others, level of desire for money, and problem-solving ability. But there is also enough information to meet most general users' needs.

The program's basic approach to graphology can result in statements that seem somewhat contradictory. For example, in one of my tests, the subject was described variously as "not restless or a go-getter . . . less physically active than most people" and as having "a lot of vitality and a zestful, exuberant attitude." This problem notwithstanding, Handwriting Analyst was accurate about four times out of five, as far as I could ascertain.

Because the program is basic and because, as nonprofessionals, most of us make some errors in answering the multiple choice questions, it would be a mistake to rely on Handwriting Analyst as the sole tool for assessing a prospective employee, tenant, or customer. But it can be useful for gathering general information to then corroborate through other means. Also, if you're thinking about studying graphology seriously, this program might be a good way to get your feet wet, and the manual offers suggestions for further study. Even if you don't have a serious interest in handwriting analysis, this program can be a nice icebreaker at parties. 

See Where to Buy or circle 783 (Mom's the Word), 771 (MacStickers), 705 (AmPack), 705 (AmPack Plus), 739 (Handwriting Analyst) on reader service card.
If you’re looking for world class solutions to all your peripheral needs, ask for Microtech International products. Superior quality and reliability put them in a class by themselves.
### PROGRAMS PLUS

**CALL MONDAY THRU FRIDAY 9 AM - 9 PM SATURDAY 9 AM - 6 PM (EASTERN TIME)**

**WORD PROCESSORS & DESKTOP PUBLISHING**

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Software</td>
<td>DocuComp</td>
<td>$119.</td>
</tr>
<tr>
<td>Aegis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Showcase/FX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aldus Corporation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cola Extension</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aldus Persuasion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PageMaker 3.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ashton Tate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broderbund</td>
<td>DTP Advisor</td>
<td>$47.50</td>
</tr>
<tr>
<td>Caere</td>
<td>Omnipage</td>
<td>$545.</td>
</tr>
</tbody>
</table>

**Micro Planner 6.1 by Micro Planning Int.**

**Micro Planner** is the highest rated project management software and "The Choice for Corporate America" according to MacUser magazine (October 1989). Micro Planner is a powerful yet easy to use project management program that uses critical path (PERT) and powerful resource management capability to help managers get projects done on time and on budget. **$325.**

**NETWORKING SOFTWARE & HARDWARE**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE Software</td>
<td></td>
</tr>
<tr>
<td>QuickMail 1-5 users</td>
<td>$169.</td>
</tr>
<tr>
<td>QuickMail 1-10 users 2.0</td>
<td>$249.</td>
</tr>
</tbody>
</table>

**Mac Pro Keyboard by Key Tronic**

Power-on your Mac with a keyboard that feels better, lasts longer and offers more for your money. Key Tronic's new ADB-compatible 105-key Mac Pro features a large, L-shaped Return key for faster data entry with fewer errors. Dual-legend keycaps assure ease of operation. Plus, you get Tempo II, the award-winning macro package — absolutely FREE. Backed by a three-year warranty. **$119.**

**NETWORKING SOFTWARE & HARDWARE (CONTINUED)**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olduvai Software</td>
<td>$109.</td>
</tr>
<tr>
<td>Orange Micro</td>
<td>$209.</td>
</tr>
<tr>
<td>Shiva</td>
<td>$329.</td>
</tr>
<tr>
<td>Tacit Software</td>
<td></td>
</tr>
<tr>
<td>TOPS Tops 2.1 Mac</td>
<td>$145.</td>
</tr>
<tr>
<td>TopCash</td>
<td></td>
</tr>
<tr>
<td>TurboBridge</td>
<td>$309.</td>
</tr>
</tbody>
</table>

**Number Maze by Great Wave Software**

**Number Maze** combines the fun of solving mazes with the challenge of solving math problems. Includes math levels from simple counting and picture edition for young children to multiplication, division, and word problems for older children. **$26.**
FEDERAL EXPRESS $3 OVERNIGHT DELIVERY

Canvas 2.0 by Deneba Software

Canvas 2.0 is one of the top graphics programs, includes many new features: unlimited layers, positioning to 1/16,000 inch, Bezier curves and polygons, and 24-bit color on the Mac II. Converts bit mapped images into objects. Canvas 2.0 rivals CAD programs. For business graphics, presentations, desktop publishing, engineering or architecture, Canvas 2.0 helps you create. ... $169.

Modems

Abaton InterFax 1249. ... 265.
Anchor Automation MacPac 2400E w/ software & cable. ... 169.
Applied Engineering DataLink Express. ... Special 189.
Best Data Products SmartOne 2400/1200 w/software & cable. ... Special 145.
Hayes Microcomputing SmartModem 2400 W/Smartcom II. ... 429.
Practical Peripherals Practical Modem Min 1200SA. ... 77.
Practical Modem 2400SA. ... 179.
MacCommPack (2400SA w/Microphone & Cable). ... 225.

MacLuggage for the Mac SE by I/O Design

MacLuggage features a tear and soil resistant Cordura outer shell and ultra high density foam. It has compartments which holds mouse, cords, extended keyboard and external hard drive. Comes in navy, platinum and black. ... $69.

DESK ACCESSORY PROGRAMS

Affinity Microsystems

Affinity MicroSystems

Tempo II SPECIAL 75.
Affinity II. ... 42.
Casady & Greene, Inc QuickDex 1 AA. ... 31.
CE Software DiskTop V4. ... 65.
Deneba Software

Comment 2.0. ... 58.
Icom Simulations MacKern. ... 114.
Jam Software

Smart Alarms w/ApiP. Diary. ... 49.
Smart Alarms Multi-User Apip Diary (1-4 Users). ... 99.
Smart Alarms Multi-User Apip Diary (5-8 Users). ... 149.
Smart Alarms Multi-User Apip Diary (9-15 Users). ... 199.
Solutions, International

SuperGlu II. ... 61.
Symmetry HyPERDA (Req. 5/2K). ... Special 49.

2400MFAX by Prometheus

The 2400MFAX is part of the new ProModem Data/Fax Series. The 2400MFAX adds Group III, originates only 4800 bps data modem at a price comparable to 2400 bps modem at a price comparable to standard 2400 bps modems. Get the convenience and flexibility of your own personal data and fax modem whether at the office, home or on the road. The 2400MFAX Data/Fax modern includes two popular software packages, BackFAX and MackNOWLEDGE. ... $209.

DATABASE MANAGEMENT

Acus II 4th Dimension V2.0. ... 469.
Acus II 4th Dimension (Free UPGRADE). ... 339.
Activation Report for Hypercard. ... 65.
Apple Computer HyperCard. ... 42.
Blith Software

Borland Reflex Plus. ... 185.
Claris FileMaker II. ... 219.
Exodus

Retriever. ... 59.
Fox Software

FoxBASE + v2.0 SPECIAL Special 279.
FoxBASE + Multi-User v2.0. ... 355.
FoxBASE + Runtime v2.0. ... 155.
Generation Four

MultiUser Business Administration Series. ... 89.
MBA Client. ... 115.
MBA DistList. ... 115.
MBA Docutrak. ... 115.
MBA Inventory. ... 115.

Go Master by Toyogo

Go: the oriental strategic board game originated in China 4,000 years ago. "If you are looking for a captivating game suitable for children or mathematicians... I strongly recommend you try the Nemesis software." Modern Electronics. ... $49.

WealthBuilder by Money Magazine

WealthBuilder by Money Magazine turns your Mac into your very own financial planner. Taking into account your financial profile, the goals that you want to accomplish and the risks you are willing to assume, WealthBuilder recommends the best investments available to fulfill your objectives. Now for a limited time, buy WealthBuilder and get Quicken free (a $59.95 value). ... $149.
Muzzle by Ergotron

The Muzzle prevents data tampering, application theft and virus infection. The Mac II Muzzle ($68) locks the CPU cover protecting the internal hard drive/memory and expansion boards while the power cover prevents unauthorized use. The Mac SE Muzzle ($62) secures either or both floppy drives while the power cover prevents unauthorized use. Protect your equipment today.

HYPERMEDIA & LANGUAGES

Bantam Publishing
Complete HyperCard Handbook ........ 22.
Beacon Technology
HyperBible King James .................. 143.
HyperBible International ................. 165.
Borland
Turbo Pascal ................................ 68.
Bright Star Technology
Hyper Animator ............................. 99.
Microsoft Quick Basic ..................... 65.
Millennium Software
HyperX .................................. 69.
Oduval Corporation
Oduval PLUS ................................ Special 99
Power Up Hyper Tutor ................... 29.
Smathers Barnes
Prototyper ................................ 17.
SoftStream UltraSpec ..................... 95.

Vocabulearn by Penton Overseas

Dynamic foreign language program for the Mac! This interactive Hypercard Stack is available in five languages and two levels. Each program contains 2 90-minute audio cassettes, complete word list and HyperCard Version 1.2.

HYPERMEDIA & LANGUAGES (CONTINUED)

Broderbund
Whole Earth Catalogue (CD ROM) ........ 89.
Consulair
Mac 68020 Dev. System .................. 57.
Digital, Inc.
Smalltalk/xmac ........................... 125.
Hyper Press
Icon Factory ................................ 29.
Script Expert ................................ 45.
Intelligent Developer ..................... 219.
Icon Simulations
Hyper MON ................................ 59.
TMON ..................................... 88.
Individual Software
101 Scripts & Buttons-HyperCard, ................ 35
Manx
Adect C .................................. 62.
Adect C Unicode ......................... 62.
Adect C + MPW .......................... 84.
Adect C + SDB ......................... 94.

MAC-101 Keyboard by DataDesk

Replace your Mac's keyboard with the MAC-101 by DataDesk. The positive tactile, firm feel 101 includes a full numeric keypad, 16 function keys, 6 page control keys, and a T-style cursor pad. Includes 101-Keys desk accessory software, a powerful macro utility that allows you to exploit the full power of the function keys in almost any Mac application. Available in ADB and non-ADB versions. ................ $139.

Leprechaun by Shodan

Leprechaun lets you step into an enchanting world where you are the leprechaun king. A strategy game for everyone with 175 levels. Includes built-in editor, full color graphics and digital sounds. Macintosh Plus or later ......................... $35.

BLANK MEDIA

Double Sided 3 1/2" Diskettes
BASF 3 1/2" DD/DD (box of 10) ........ 14.
Cenctech 3 1/2" DD/DD Color (10) .... 15.
Sony 3 1/2" DD/DD (box of 10) ....... 15.
Maxell 3 1/2" DD/DD (box of 10) ....... 15.
Verbatim 3 1/2" DD/DD (box of 10) .. 14.

High Density 3 1/2" Diskettes
Sony 3 1/2" HD/DD (10) ................. 29.
Verbatim 3 1/2" HD/DD (10) .......... 29.

Dolphin Flipper 44MG Cartridge .......... 115.

Verbatim 3V2' OS/DD (10) ............. 29.
Sony 3V2' OS/DD (10) .................. 29.
Centech 3V2' OS/DD (10) .............. 29.
Dolphin 3V2' OS/DD (10) .............. 29.

Peripheral Land
Turbo 40 Cartridge ...................... 109.

WordMaker by New Horizons

The new high performance, personal word processor for the Macintosh. WordMaker's intuitive design makes it easy to learn and to use. It has a fast WYSIWYG display, headers and footers for both left and right pages, color capability, multiple document support, a 100,000 word spelling checker, print merge, and more. You can even wrap text around irregularly shaped graphics. It reads and writes MacWrite files for compatibility. ................ $85.

OUR POLICY

★ VISA and MASTERCARD accepted. No surcharge.
★ Your credit card is not charged until we ship.
★ If we must ship a partial order, the shipment that completes the order is sent freight free.
★ All shipments insured; no additional charge.
★ Upon receipt and approval, personal and company checks are accepted.
★ Prices subject to change without notice. All items subject to availability.
★ COD maximum $1000, cash or certified check. COD orders ship via UPS Blue Label unless UPS ground delivers next day
★ 120 day warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion.
★ Call us anytime Monday thru Friday 9 to 9:00 Eastern Time, or Saturday 9:00 to 6:00 Eastern Time. You can call our business offices Monday thru Friday 9:00 to 5:30 Eastern Time at (203)375-3560.
★ Purchase Orders accepted at our discretion, for more information call (203)378-1926, 9:00 to 5:30 Eastern Time. Purchase orders are sent UPS Ground at actual shipping costs.

SHIPPING

★ Continental U.S. Add $3.00 per order to cover Federal Express Standard Overnight Service, unless UPS ground delivers next day. Some areas require an additional day.
★ All instock items shipped at 7:00PM Eastern Time Monday thru Friday will be shipped on the same day for immediate shipment. Prices subject to change without notice. All items subject to availability.
★ All states except orders shipped within CT, add 8% tax.
★ COD maximum $1000, cash or certified check. COD orders ship via UPS Blue Label unless UPS Ground delivers next day.
★ 120 day warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion.
★ COD maximum $1000, cash or certified check. COD orders ship via UPS Blue Label unless UPS Ground delivers next day.
**FoxBASE+/Mac by Fox Software**

Awarded MacUser's Editors' Choice and InfoWorld's Product of the Year and selected for MacWeek's Top Ten New Products. FoxBASE+/Mac combines blazing speed, programming power and complete database compatibility. It's perfect for novices, demanding developers and power users. FoxBASE+/Mac has a form generator, application generator, complete template language system and a report writer. $279.

**DISK DRIVES/HARD DISKS/UPGRADES**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integra 60</td>
<td>$799</td>
</tr>
<tr>
<td>Integra 80</td>
<td>$935</td>
</tr>
<tr>
<td>Dove Computer Marathon 300</td>
<td>$969</td>
</tr>
<tr>
<td>MUSE 4 (14 Mhz w/1MB &amp; Math Chip)</td>
<td>$899</td>
</tr>
<tr>
<td>MacSnap 524E (512K to 1MB)</td>
<td>$185</td>
</tr>
<tr>
<td>MacSnap 548E (512K to 2MB)</td>
<td>$375</td>
</tr>
<tr>
<td>MacSnap 548E (512K to 2MB w/SCSI)</td>
<td>$419</td>
</tr>
<tr>
<td>MacPlus 2 (MacPlus to 2MB)</td>
<td>$32</td>
</tr>
<tr>
<td>MacSnap 524E</td>
<td>$438</td>
</tr>
<tr>
<td>MacSnap 2SE</td>
<td>$549</td>
</tr>
<tr>
<td>MacBottom HD-45</td>
<td>$625</td>
</tr>
<tr>
<td>MacBottom HD-84</td>
<td>$849</td>
</tr>
</tbody>
</table>

**GRAPHICS SOFTWARE**

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Home Design</td>
<td>$32</td>
</tr>
<tr>
<td>Bathroom Design</td>
<td>$49</td>
</tr>
<tr>
<td>CommResidential Furnishings</td>
<td>$32</td>
</tr>
<tr>
<td>Flow Charts &amp; Schedules</td>
<td>$16</td>
</tr>
<tr>
<td>Home Landscaping</td>
<td>$16</td>
</tr>
<tr>
<td>Kitchen Designs</td>
<td>$49</td>
</tr>
<tr>
<td>Landscape Architecture</td>
<td>$49</td>
</tr>
<tr>
<td>Graphsoft Mic. Card</td>
<td>$497</td>
</tr>
<tr>
<td>Blueprint</td>
<td>$295</td>
</tr>
<tr>
<td>Informix Wing</td>
<td>$259</td>
</tr>
<tr>
<td>Innovative Data Design Dreams</td>
<td>$362</td>
</tr>
<tr>
<td>Residential Construction</td>
<td>$135</td>
</tr>
<tr>
<td>MacDraft 1.2B</td>
<td>$142</td>
</tr>
<tr>
<td>I.S.I. Precision</td>
<td>$155</td>
</tr>
<tr>
<td>I.8 Software</td>
<td>$999</td>
</tr>
</tbody>
</table>

**Dynaex by Portfolio Systems**

Dynaex is the fast-on-line personal database that easily prints double-sided address pages for Filofax and most organizer systems. Includes "no-fuss" laser paper and powerful database functions like find, sort, and select. $89.

**DISK DRIVES/HARD DISKS/UPGRADES (CONTINUOUS)**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cutting Edge 800k Drive</td>
<td>$149</td>
</tr>
<tr>
<td>Cutting Edge Mac 20</td>
<td>$341</td>
</tr>
<tr>
<td>Cutting Edge Mac 45</td>
<td>$399</td>
</tr>
<tr>
<td>Cutting Edge Mac 60</td>
<td>$499</td>
</tr>
<tr>
<td>Cutting Edge Mac 80</td>
<td>$585</td>
</tr>
<tr>
<td>Removable 45MB Hard Drive</td>
<td>$899</td>
</tr>
<tr>
<td>Dataynics 120</td>
<td>$399</td>
</tr>
<tr>
<td>Dataynics 360</td>
<td>$575</td>
</tr>
<tr>
<td>Dataynics 360</td>
<td>$759</td>
</tr>
<tr>
<td>Dataynics 40</td>
<td>$879</td>
</tr>
<tr>
<td>Dataynics 48</td>
<td>$979</td>
</tr>
<tr>
<td>Dataynics 60</td>
<td>$1299</td>
</tr>
<tr>
<td>Dataynics 80</td>
<td>$1599</td>
</tr>
<tr>
<td>Dataynics 100</td>
<td>$1999</td>
</tr>
<tr>
<td>Dataynics 120</td>
<td>$2399</td>
</tr>
<tr>
<td>Dataynics 150</td>
<td>$2799</td>
</tr>
<tr>
<td>Dataynics 180</td>
<td>$3199</td>
</tr>
<tr>
<td>Dataynics 200</td>
<td>$3599</td>
</tr>
<tr>
<td>Dataynics 250</td>
<td>$3999</td>
</tr>
<tr>
<td>Dataynics 300</td>
<td>$4399</td>
</tr>
<tr>
<td>Dataynics 350</td>
<td>$4799</td>
</tr>
<tr>
<td>Dataynics 400</td>
<td>$5199</td>
</tr>
<tr>
<td>Dataynics 450</td>
<td>$5599</td>
</tr>
<tr>
<td>Dataynics 500</td>
<td>$5999</td>
</tr>
<tr>
<td>Dataynics 550</td>
<td>$6399</td>
</tr>
<tr>
<td>Dataynics 600</td>
<td>$6799</td>
</tr>
<tr>
<td>Dataynics 650</td>
<td>$7199</td>
</tr>
<tr>
<td>Dataynics 700</td>
<td>$7599</td>
</tr>
<tr>
<td>Dataynics 750</td>
<td>$7999</td>
</tr>
<tr>
<td>Dataynics 800</td>
<td>$8399</td>
</tr>
<tr>
<td>Dataynics 850</td>
<td>$8799</td>
</tr>
<tr>
<td>Dataynics 900</td>
<td>$9199</td>
</tr>
<tr>
<td>Dataynics 950</td>
<td>$9599</td>
</tr>
<tr>
<td>Dataynics 1000</td>
<td>$9999</td>
</tr>
</tbody>
</table>

**PLUS by Olduvai Corp.**

The HyperCard upgrade you've been waiting for! PLUS features 256 colors, animation, cards and windows of any size, irregularly shaped buttons, full text styling and database fields, in a HyperCard-like environment. Program PLUS using PPL, an extension of HyperTalk that's fast and easy to learn. Use PLUS for presentations, education, multimedia, databases, personal productivity. Includes introduction to Programming, Online Help and sample stacks. $999.

**TOLL FREE**

1-800-832-3201 (USA)
1-800-344-7753 (CANADA)

FAX: 203/381-9043
Inquiries: 203/378-3662
Canada: 1/800/344-7753
75 RESEARCH DRIVE
STRAFORD, CT 06497
1/800/832-3201
45 MB Removable HDD by Cutting Edge

The Cutting Edge 45 MB Removable Cartridge Disk Drive offers the convenience of removable media with the reliability of Winchester technology. The new drive features the popular Syquest mechanism and includes one cartridge. $899.

EDUCATIONAL/CREATIVE SOFTWARE

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mavis Beacon Typing</td>
<td>$32.</td>
</tr>
<tr>
<td>Deluxe Music Construction Set V2.5</td>
<td>$84.</td>
</tr>
<tr>
<td>Alphabet Blocks</td>
<td>$30.</td>
</tr>
<tr>
<td>EDUCATIONAL/CREATIVE SOFTWARE</td>
<td></td>
</tr>
<tr>
<td>Deluxe Recorder</td>
<td>$95.</td>
</tr>
<tr>
<td>First Byte</td>
<td>$12.</td>
</tr>
<tr>
<td>String Quartet, Country or Heavy Metal</td>
<td>$12.</td>
</tr>
<tr>
<td>Super Studio Session</td>
<td>$65.</td>
</tr>
<tr>
<td>Bright Star Technology</td>
<td>$27.</td>
</tr>
<tr>
<td>Talking Tiles</td>
<td>$27.</td>
</tr>
<tr>
<td>Alphabet Blocks</td>
<td>$30.</td>
</tr>
<tr>
<td>Broderbund Typel</td>
<td>$19.</td>
</tr>
<tr>
<td>Sense Geometry, Calculus or Physics</td>
<td>$58.</td>
</tr>
<tr>
<td>Where in the World is Carmen San Diego?</td>
<td>$27.</td>
</tr>
<tr>
<td>Where in the USA is Carmen San Diego?</td>
<td>$29.</td>
</tr>
<tr>
<td>Where in Europe is Carmen San Diego?</td>
<td>$27.</td>
</tr>
<tr>
<td>Jams Sessions</td>
<td>$29.</td>
</tr>
<tr>
<td>Carina Software Voyager 1.0</td>
<td>$69.</td>
</tr>
</tbody>
</table>

Two Page Monochrome Monitor by Cutting Edge

The Cutting Edge Monitor includes the interface card and matches just about all the features of other big screen display systems costing twice as much. It has a flicker-free refresh rate of 70 Hertz and a high resolution of 72 DPI. Comes with a 1 year warranty and 30 day money back guarantee. $935.

EDUCATIONAL/CREATIVE SOFTWARE (continued)

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coda Mac Drums</td>
<td>$31.</td>
</tr>
<tr>
<td>Perceive</td>
<td>$50.</td>
</tr>
<tr>
<td>Female</td>
<td>$399.</td>
</tr>
<tr>
<td>Davidson &amp; Associates</td>
<td>$27.</td>
</tr>
<tr>
<td>Speed Reader II</td>
<td>$27.</td>
</tr>
<tr>
<td>Math Blaster or Word Attack!</td>
<td>$27.</td>
</tr>
<tr>
<td>Electronic Arts</td>
<td>$19.</td>
</tr>
<tr>
<td>Mavis Beacon Typing</td>
<td>$32.</td>
</tr>
<tr>
<td>Deluxe Music Construction Set V3.5</td>
<td>$64.</td>
</tr>
<tr>
<td>Deluxe Recorder</td>
<td>$45.</td>
</tr>
<tr>
<td>First Byte</td>
<td>$27.</td>
</tr>
<tr>
<td>Dinosaur Discovery Kit</td>
<td>$27.</td>
</tr>
<tr>
<td>Puzzle Storybook or Rhyming Notebook</td>
<td>$27.</td>
</tr>
<tr>
<td>Great Wave Software</td>
<td>$26.</td>
</tr>
<tr>
<td>Kids Time</td>
<td>$28.</td>
</tr>
</tbody>
</table>

Hard Disk Drives by Cutting Edge

The hard drives range in capacity from 20 to 180 Megs. They are fast (aver. access time 20-28 ms) and each has quality and dependability built in as evidenced by an average 70,000 hrs MTBF. The streamlined design fits comfortably under the Mac.

ACCESSORIES

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Gravies</td>
<td>$69.</td>
</tr>
<tr>
<td>MouseStick (Plus or ADB)</td>
<td>$69.</td>
</tr>
<tr>
<td>Altra Felix ADB</td>
<td>$125.</td>
</tr>
<tr>
<td>HardTop Kybd Cover</td>
<td>$14.</td>
</tr>
<tr>
<td>HardTop Image Ii Cover</td>
<td>$16.</td>
</tr>
<tr>
<td>Laser Printer Stand</td>
<td>$28.</td>
</tr>
<tr>
<td>Large Screen Monitor</td>
<td>$29.</td>
</tr>
<tr>
<td>CH Products Roller Mouse ADB</td>
<td>$119.</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td></td>
</tr>
<tr>
<td>Cutting Edge MOK-105KS w/Quickeys</td>
<td>$133.</td>
</tr>
<tr>
<td>MacKeyboard/Beige</td>
<td>$7.</td>
</tr>
<tr>
<td>MAC-101 Keyboard/Beige</td>
<td>$139.</td>
</tr>
<tr>
<td>MAC-101 ADB Keyboard/Platinum</td>
<td>$139.</td>
</tr>
<tr>
<td>Foreign Keyboards Available</td>
<td>$75.</td>
</tr>
<tr>
<td>Ergotron Mousecleaner 360°</td>
<td>$15.</td>
</tr>
<tr>
<td>MacII (Mac SE or II)</td>
<td>$68.</td>
</tr>
<tr>
<td>Muzzle SE</td>
<td>$62.</td>
</tr>
<tr>
<td>Muzzle Mac II</td>
<td>$68.</td>
</tr>
</tbody>
</table>

ACCESSORIES (continued)

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parafon MacRecorder Sound System</td>
<td>$164.</td>
</tr>
<tr>
<td>GDT Softworks Print-Link Collection</td>
<td>$65.</td>
</tr>
<tr>
<td>JetLine Express</td>
<td>$36.</td>
</tr>
<tr>
<td>Macintosh Bible 2nd ed</td>
<td>$18.</td>
</tr>
<tr>
<td>I/O Design</td>
<td></td>
</tr>
<tr>
<td>MacLuggage in Navy, Black or Plat</td>
<td>$59.</td>
</tr>
<tr>
<td>Mac Plus Carrying Case</td>
<td>$59.</td>
</tr>
<tr>
<td>MacSE Carrying Case</td>
<td>$69.</td>
</tr>
<tr>
<td>MacCX Carrying Case</td>
<td>$69.</td>
</tr>
<tr>
<td>ImageCarrying Case</td>
<td>$49.</td>
</tr>
</tbody>
</table>

Bomber by Inline Design

Bomber is an intensely realistic adventure recreating the sights, sounds and split second decisions of young B-17 crews in the sky's over Nazi Germany. Digitized sound, animation and a 10 man crew HyperCard required. Mac Plus-Mac Ili...$25.

Micro TV by Aapps Corp.

Aapps Micro TV is a Nubus card that displays real time TV and other video sources in a window on a Macintosh II in 128 gray scale. $275.

ACCESSORIES (continued)

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kalmar Designs</td>
<td></td>
</tr>
<tr>
<td>Teakwood Roll-Up Top Cases</td>
<td>$25.</td>
</tr>
<tr>
<td>Deluxe Neopole Micro Cabinet (holds 40 disks)</td>
<td>$21.</td>
</tr>
<tr>
<td>Triple Micro Cabinet (holds 135 disks)</td>
<td>$31.</td>
</tr>
<tr>
<td>Kensington Mouseway (Mac II)</td>
<td>$7.</td>
</tr>
<tr>
<td>ImageWriter ImageWriter/II Cover</td>
<td>$9.</td>
</tr>
<tr>
<td>Macintosh Plus SE/Dual Cover</td>
<td>$9.</td>
</tr>
<tr>
<td>Apple Security Kit</td>
<td>$34.</td>
</tr>
<tr>
<td>Artigal Colorizing Filter</td>
<td>$33.</td>
</tr>
<tr>
<td>Mac I Stand and Cables Kit</td>
<td>$64.</td>
</tr>
<tr>
<td>Mac I Monitor Stand</td>
<td>$64.</td>
</tr>
<tr>
<td>Power Terrace Surge Suppressors</td>
<td>$22.</td>
</tr>
<tr>
<td>Model FX Protector 10</td>
<td>$15.</td>
</tr>
<tr>
<td>Modern FX Protector 20</td>
<td>$25.</td>
</tr>
<tr>
<td>Printer Muffler (80 &amp; 132)</td>
<td>$43.</td>
</tr>
<tr>
<td>Printer Muffler 80</td>
<td>$43.</td>
</tr>
</tbody>
</table>

Ribbons


Sorps

High Trek ImageWriter II Carry Case...$49. High Trek Mac Plus Carry Case...$59. High Trek Mac SE & ext Kybd Carry Case...$69. Targus ImageWriter II Carry Case...$43. Macintosh Plus Carry Case...$53. Deluxe MacPlus-MIDI...$69.
MacConcept 3.0 by Klex Software
The 3D conceptual design system, sophisticated enough for engineers to illustrate complex wireframes, yet simple enough for artists to manipulate them into masterpieces. It provides multi-dimensional spatial design features that match those found in industry's most sophisticated design systems. Those include real-time dynamic rotation and perspective, multiple design levels, animation and floating point accuracy. $999.

PRINTERS, DIGITIZERS & MONITORS

<table>
<thead>
<tr>
<th>App</th>
<th>Micro</th>
<th>Special</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apps</td>
<td>Micron</td>
<td>$275</td>
</tr>
<tr>
<td>Complete PC</td>
<td>165</td>
<td></td>
</tr>
<tr>
<td>Complete Hand Scanner 400</td>
<td>195</td>
<td></td>
</tr>
<tr>
<td>Complete Hand Scanner OCR</td>
<td>189</td>
<td></td>
</tr>
<tr>
<td>Complete Full Page Scanner</td>
<td>585</td>
<td></td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>Two-Page Display</td>
<td>Special 935</td>
</tr>
<tr>
<td>Digital Vision</td>
<td>Monochrome Monitor</td>
<td>Special 195</td>
</tr>
<tr>
<td>Computer Eyes Mac</td>
<td>Computer Eyes Mac II</td>
<td>649</td>
</tr>
<tr>
<td>GCC Technologies</td>
<td>WriMove Printer</td>
<td>555</td>
</tr>
<tr>
<td></td>
<td>Personal Laser Printer</td>
<td>1755</td>
</tr>
</tbody>
</table>

Super/SuperLaserSpool by SuperMac Software
SuperSpool ($58) and SuperLaserSpool ($88) take control of printing in the background and return the Mac to your control in seconds. These best-selling print spoolers are the fastest available and include a special desk accessory that lets you delete documents from queue, re-order them, reroute documents to other printers and preview or zoom in on documents.

SPELLING & GRAMMAR CHECKERS

<table>
<thead>
<tr>
<th>Software</th>
<th>Word Finder</th>
<th>Synonym Finder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denbea Software</td>
<td>Big Thesaurus</td>
<td>59</td>
</tr>
<tr>
<td></td>
<td>Spelling Coach 3.0</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Professional</td>
<td>115</td>
</tr>
<tr>
<td></td>
<td>Electronic Arts</td>
<td>52</td>
</tr>
<tr>
<td>Lundeen &amp; Associates</td>
<td>WorksPlus Spell</td>
<td>55</td>
</tr>
</tbody>
</table>

Gravis MouseStick by Advanced Gravis
Gravis and Data East have joined together to create a sensational challenge by including Super Hang On with every Gravis MouseStick. The MouseStick offers incredible precision, versatility, and durability As one MouseStick user states, "A definite must for the Mac user increases productivity in DTP and graphics, as well as making games much more fun." Available in ADB, Plus and Apple IIGS versions. $69.

FileGuard Extended Ed. & FileGuard 1.04 by A.S.D.
FileGuard Extended Edition ($129) protects your hard drives from unauthorized access (including security bypass with a system diskette), copying and erasure, applications and files from unauthorized access, deletion and/or illegal copying (including system folder) from altercations by unauthorized users. FileGuard 1.04 ($95) is for those who require file protection only (encryption/decryption that is quick and automatic).

UTILITY SOFTWARE

<table>
<thead>
<tr>
<th>Software</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>Adobe Acrobat</td>
</tr>
<tr>
<td>Apple</td>
<td>MacWrite</td>
</tr>
<tr>
<td>Apple</td>
<td>MacPaint</td>
</tr>
<tr>
<td>Abbott Systems</td>
<td>Inc.</td>
</tr>
<tr>
<td>ALSoft</td>
<td>Master Juggler</td>
</tr>
<tr>
<td></td>
<td>Multi Disk</td>
</tr>
<tr>
<td></td>
<td>Disk Express II</td>
</tr>
<tr>
<td></td>
<td>Font/DA Juggler Plus</td>
</tr>
<tr>
<td>A.S.D.</td>
<td>TWINS</td>
</tr>
<tr>
<td></td>
<td>FileGuard v1.04</td>
</tr>
<tr>
<td></td>
<td>FileGuard II</td>
</tr>
<tr>
<td>Berkeley System Design</td>
<td>After Dark</td>
</tr>
<tr>
<td>Stepping Out</td>
<td>55</td>
</tr>
<tr>
<td>Beyond Inc.</td>
<td>Menu Font 2</td>
</tr>
<tr>
<td></td>
<td>Boriand Sidekick 2.0</td>
</tr>
<tr>
<td>Bravo</td>
<td>SPAMM</td>
</tr>
<tr>
<td>Central Point Software</td>
<td>Copy II Mac (Includes MacTools)</td>
</tr>
<tr>
<td>CE Software</td>
<td>QuickKeys (Macro Program)</td>
</tr>
<tr>
<td></td>
<td>MoaPackage Plus Utilites</td>
</tr>
<tr>
<td>Dantz Software Development</td>
<td>Retrosp</td>
</tr>
<tr>
<td>Dayna Communications</td>
<td>DiskMounter</td>
</tr>
<tr>
<td>Digital/Click</td>
<td>Calculator Construction Set v2.0</td>
</tr>
<tr>
<td>Faraon Computing</td>
<td>Screen Recorder</td>
</tr>
<tr>
<td>Fifth Generation Systems</td>
<td>Suitecase II</td>
</tr>
<tr>
<td></td>
<td>Disklock</td>
</tr>
<tr>
<td></td>
<td>FastBack II</td>
</tr>
<tr>
<td></td>
<td>Power Station</td>
</tr>
<tr>
<td></td>
<td>Pyro</td>
</tr>
<tr>
<td></td>
<td>HJC Vax</td>
</tr>
<tr>
<td></td>
<td>com Simulations On Cult</td>
</tr>
<tr>
<td></td>
<td>Idealform MacLabeler Plus</td>
</tr>
<tr>
<td></td>
<td>Insight Development MacPrint</td>
</tr>
</tbody>
</table>

Kens Marsh QuickLock | 57 |
| Loop Software | Picturebook | 40 |
| Lundeen & Assoc. | WorksPlus Command | 85 |
| Magic Software | Auto Save II | 78 |
| | POWERCONS | 29 |
| | POWERMenu | 39 |
| | Back-Matic | 50 |
| | AntiTaxon or ClickPaste | 55 |
| Microlytics, Inc. | GOffice v2.0 | 46 |
| | Mousepad | 27 |
| | Redux | 51 |
| | ScreenGems | 39 |
| Oldwave Software | MultiClip | 22 |
| | FileGuard 1.04 by A.S.D. | 22 |
| | Read-It O.C.R. Personal | 97 |
| | Read-It O.C.R.2.1 | 239 |
| PCPC | HF5 Back-Up 3.0 | 54 |
| Peripheral Land | TurboOptimizer | 59 |
| | TurboBack | 51 |
| | TurboCache | 69 |
| | TurboSpool | 69 |
| SuperMac Software | SuperSpool 50 | Special 68 |
| | SuperLaserSpool 20 | Special 88 |
| | DiskIt 1.5 | 58 |
| | Sentinel 22 | 12 |
| | Symantec | Utilities for Mac (SUM II) | 95 |
| | Symantec AntiVirus for Mac (SAM ) | 83 |
| | TExpoint Option | 49 |
| | Williams & Macias DiskFinder | 25 |
| | myDiskLabeler w/Color | 28 |
| | myDiskLabeler w/useWrite Option | 33 |
| | StickyBusiness | 89 |
| XTree Company | XTree | 52 |

Insight Business Services
Insight Business Services, the #1 award winning accounting package for the Macintosh, consists of 6 stand alone or fully integrated modules. Now includes IMPORT capabilities. SAVE $$$ NOW on 3-Pak Holiday Special. $995.
**BUSINESS SOFTWARE**

<table>
<thead>
<tr>
<th>Company</th>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abacus Concepts</td>
<td>StatView II (Mac+, SE, II w/68020 &amp; 68081)</td>
<td>279</td>
</tr>
<tr>
<td>A.E.C.</td>
<td>FastTrack Schedule</td>
<td>114</td>
</tr>
<tr>
<td>AEC Information Manager</td>
<td>405</td>
<td></td>
</tr>
<tr>
<td>Antic Software</td>
<td>Flexforms Business Template 1</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Flexforms Business Template 2</td>
<td>49</td>
</tr>
<tr>
<td>Ashton Tate</td>
<td>Mainstay</td>
<td>199</td>
</tr>
<tr>
<td></td>
<td>Microsoft Micro Planning</td>
<td></td>
</tr>
<tr>
<td></td>
<td>International</td>
<td></td>
</tr>
</tbody>
</table>

**MICRO TRADING SOFTWARE**

<table>
<thead>
<tr>
<th>Company</th>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chang Laboratories</td>
<td>KeyPlanner</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Mac Flow 3.0</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Mac Schedule</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Micro Planning International</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Micro Planner</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Pro Plus</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td>WallStreet Investor v3.0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satori Software</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Bulk Maker 3.3</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>Bulk Maker Plus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smartform Designer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select Micro Systems, Inc.</td>
<td>209</td>
</tr>
<tr>
<td></td>
<td>Extratix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SoftStream Endeavour Planner</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>SoftView MaciUse</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Form Set Business Forms</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Symmetry KeyPlan</td>
<td>279</td>
</tr>
<tr>
<td></td>
<td>Syntex MacPhoneBook</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mac Envelope</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Mac EnvelopePlus</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Systat Systat 4.0</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>(Specify MacPlus, SE or Mac II)</td>
<td>459</td>
</tr>
<tr>
<td></td>
<td>Faststat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For the Record</td>
<td>28</td>
</tr>
</tbody>
</table>

**DATA LINK EXPRESS MODERN**

Introducing DataLink Express, the first fully Hayes compatible 2400 baud modem designed specifically for the Mac. With the first comprehensive status light array, “Line Engage” indicator and upgradeable design (adds send-Fax capability and MNP error correction), comes complete with a perfectly matched Mac-platinum case, a Macintosh-type serial port input, a DB-25 connector and communications software. $189.

**ENTERTAINMENT SOFTWARE**

<table>
<thead>
<tr>
<th>Access</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Class Leader Board</td>
<td>27</td>
</tr>
<tr>
<td>Golf</td>
<td></td>
</tr>
<tr>
<td>Accolade</td>
<td>27</td>
</tr>
<tr>
<td>Hard Ball or Mean 18</td>
<td></td>
</tr>
<tr>
<td>4 &amp; Inches</td>
<td>27</td>
</tr>
<tr>
<td>FastBreak</td>
<td>27</td>
</tr>
<tr>
<td>Grand Prix Circuit</td>
<td>30</td>
</tr>
<tr>
<td>Activation Manhole</td>
<td>30</td>
</tr>
<tr>
<td>Manhole CD-ROM</td>
<td>35</td>
</tr>
<tr>
<td>Cosmic Osimo</td>
<td>42</td>
</tr>
<tr>
<td>Artwork</td>
<td></td>
</tr>
<tr>
<td>Graffiti or Daily Horse</td>
<td>19</td>
</tr>
<tr>
<td>Racing</td>
<td></td>
</tr>
<tr>
<td>Battlefield</td>
<td>24</td>
</tr>
<tr>
<td>Bullets Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td></td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>Foker Triplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
<tr>
<td>Bethesda Softworks</td>
<td></td>
</tr>
<tr>
<td>Wayne Gretzky Hockey</td>
<td>39</td>
</tr>
<tr>
<td>Broodbound</td>
<td></td>
</tr>
<tr>
<td>Random Act of War or At Sea</td>
<td>26</td>
</tr>
<tr>
<td>ShufflePuck Cafe or Star Wars</td>
<td>24</td>
</tr>
<tr>
<td>SmCity</td>
<td>29</td>
</tr>
<tr>
<td>SmCity Supreme Pack</td>
<td>48</td>
</tr>
<tr>
<td>Bell City Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td>32</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>Foker Triplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
<tr>
<td>Bullets Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td>32</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>Foker Triplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
<tr>
<td>Bullets Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td>32</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>FokerTriplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
<tr>
<td>Bullets Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td>32</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>Foker Triplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
<tr>
<td>Bullets Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td>32</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>Foker Triplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
<tr>
<td>Bullets Software</td>
<td></td>
</tr>
<tr>
<td>Morality's Revenge</td>
<td>32</td>
</tr>
<tr>
<td>Bullseye Software</td>
<td></td>
</tr>
<tr>
<td>Foker Triplane Flight</td>
<td>24</td>
</tr>
<tr>
<td>Simulator</td>
<td></td>
</tr>
</tbody>
</table>

**ScriptEdit by Somak Software**

ScriptEdit is a powerful desk accessory for HyperCard. Edit multiple scripts simultaneously, globally search-and-replace, custom editing with XCMD, script compare feature and much more! Includes installation stack with tips. $51.

**BLUEPRINT by Graphsoft**

Blueprint is a professional-level 2D CAD program that has it all at a price you can afford: Layers, fillets, DXF, constraint palette, auto-dimensioning, high precision, hacking, EPS, symbol library plus more. Unsurpassed quality. $295.

**ENTERTAINMENT SOFTWARE (continued)**

<table>
<thead>
<tr>
<th>Access</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Dreams Block Out</td>
<td>27</td>
</tr>
<tr>
<td>Hollywood Shuffle</td>
<td>27</td>
</tr>
<tr>
<td>Crystal Quest</td>
<td>25</td>
</tr>
<tr>
<td>Critter Editor</td>
<td>41</td>
</tr>
<tr>
<td>Centron</td>
<td>45</td>
</tr>
<tr>
<td>Casino Master</td>
<td></td>
</tr>
<tr>
<td>Casino Master (Mac II)</td>
<td>50</td>
</tr>
<tr>
<td>DataEast</td>
<td></td>
</tr>
<tr>
<td>Super Hang On</td>
<td>27</td>
</tr>
<tr>
<td>DataSoft Time &amp; Magic</td>
<td>29</td>
</tr>
<tr>
<td>Hunt for Red October</td>
<td>32</td>
</tr>
<tr>
<td>Discovery Software</td>
<td></td>
</tr>
<tr>
<td>Arkonoid</td>
<td>26</td>
</tr>
<tr>
<td>Electronic Arts Bards Tale</td>
<td>32</td>
</tr>
<tr>
<td>Chuck Yeager Flight Simulator</td>
<td>32</td>
</tr>
<tr>
<td>Starfleet I</td>
<td>36</td>
</tr>
<tr>
<td>One-On-One, Pinball</td>
<td></td>
</tr>
<tr>
<td>Construction Set, Seven</td>
<td></td>
</tr>
<tr>
<td>Cities of Gold, SkyFox,</td>
<td></td>
</tr>
<tr>
<td>Patton vs. Rommel</td>
<td>15</td>
</tr>
</tbody>
</table>

** 데이터 박스 프로노미스**

대화형 모드로 배포하는 기술

Dialoger

Dialoger는 이용을 통해, 개발 및 컨트롤 다이얼로그의 전자화 되는 HyperCard입니다. 완벽한 코딩과 사용자 환경. 개발이 더욱 용이해집니다. $69.

**BUSINESS SOFTWARE**

<table>
<thead>
<tr>
<th>Company</th>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chang Laboratories C.A.T.</td>
<td>KeyPlanner</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Mac Flow 3.0</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>Mac Schedule</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Micro Planning International</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Micro Planner</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Pro Plus v3.0</td>
<td>385</td>
</tr>
<tr>
<td></td>
<td>WallStreet Investor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Satori Software</td>
<td>78</td>
</tr>
<tr>
<td></td>
<td>Bulk Maker 3.3</td>
<td>185</td>
</tr>
<tr>
<td></td>
<td>Bulk Maker Plus</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Smartform Designer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Select Micro Systems, Inc.</td>
<td>209</td>
</tr>
<tr>
<td></td>
<td>Extratix</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SoftStream Endeavour Planner</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>SoftView MaciUse</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Form Set Business Forms</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Symmetry KeyPlan</td>
<td>279</td>
</tr>
<tr>
<td></td>
<td>Syntex MacPhoneBook</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mac Envelope</td>
<td>55</td>
</tr>
<tr>
<td></td>
<td>Mac EnvelopePlus</td>
<td>147</td>
</tr>
<tr>
<td></td>
<td>Systat Systat 4.0</td>
<td>165</td>
</tr>
<tr>
<td></td>
<td>(Specify MacPlus, SE or Mac II)</td>
<td>459</td>
</tr>
<tr>
<td></td>
<td>Faststat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>For the Record</td>
<td>28</td>
</tr>
</tbody>
</table>
ACCOUNTING PACKAGES

<table>
<thead>
<tr>
<th>Package</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aatrix Software</td>
<td>$149.95</td>
</tr>
<tr>
<td>Aatrix TimedTender</td>
<td>$25.95</td>
</tr>
<tr>
<td>Aatrix Checkwriter v2.0</td>
<td>$59.95</td>
</tr>
<tr>
<td>Aatrix TimeCard</td>
<td>$69.95</td>
</tr>
<tr>
<td>Aatrix Payroll</td>
<td>$99.95</td>
</tr>
<tr>
<td>Aatrix Payroll Plus</td>
<td>$149.95</td>
</tr>
<tr>
<td>Aatrix TimeMinder</td>
<td>$149.95</td>
</tr>
</tbody>
</table>

ACCOUNTING PACKAGES (CONTINUED)

<table>
<thead>
<tr>
<th>Package</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intuit Quicken v1.5</td>
<td>$36.95</td>
</tr>
<tr>
<td>Layered Insight One Write</td>
<td>$99.95</td>
</tr>
<tr>
<td>Special</td>
<td></td>
</tr>
<tr>
<td>Insight Expert INV or Time Billing</td>
<td>Special 395</td>
</tr>
<tr>
<td>Insight Expert GL, AR, AP</td>
<td></td>
</tr>
<tr>
<td>or Payroll</td>
<td></td>
</tr>
<tr>
<td>Special</td>
<td></td>
</tr>
<tr>
<td>MECA</td>
<td></td>
</tr>
<tr>
<td>Managing Your Money</td>
<td>$124.95</td>
</tr>
<tr>
<td>Special</td>
<td></td>
</tr>
<tr>
<td>Money Magazine</td>
<td></td>
</tr>
<tr>
<td>WealthBuilder</td>
<td></td>
</tr>
<tr>
<td>Special</td>
<td></td>
</tr>
<tr>
<td>MacKids Preschool Pack</td>
<td>$49.95</td>
</tr>
</tbody>
</table>

MacKids Preschool Pack

MacKids Preschool Pack includes six educational lessons in color. It teaches your child the ABCs, shapes, counting, and more in a fun and exciting manner.

TEMPO II

Tempo II is the next generation in high-speed small business accounting. Inlcuded in one seamlessy integrated module are four full reiterated applications: General Ledger, Accounts Receivable/Billing, Accounts Payable/Payroll.

COMMUNICATION SOFTWARE

<table>
<thead>
<tr>
<th>Package</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compuserve</td>
<td>$285.00</td>
</tr>
<tr>
<td>Compuserve Starter Kit</td>
<td>$24.95</td>
</tr>
<tr>
<td>DateVis MacLink Plus/Translator</td>
<td>$124.95</td>
</tr>
<tr>
<td>MacLink Plus with Cable</td>
<td>$119.95</td>
</tr>
<tr>
<td>Dow Jones</td>
<td>$59.95</td>
</tr>
<tr>
<td>Hayes Smartcom II 1.1</td>
<td>$285.00</td>
</tr>
<tr>
<td>Infosphere</td>
<td></td>
</tr>
<tr>
<td>Liason</td>
<td></td>
</tr>
<tr>
<td>Special</td>
<td>$169.95</td>
</tr>
<tr>
<td>Insigna SoftPC</td>
<td>$245.95</td>
</tr>
<tr>
<td>MaccKnowledge</td>
<td>$59.95</td>
</tr>
<tr>
<td>MetaComet</td>
<td>$215.00</td>
</tr>
<tr>
<td>Accu-Weather Forecaster</td>
<td>$57.00</td>
</tr>
<tr>
<td>Software Ventures</td>
<td></td>
</tr>
<tr>
<td>Microphone I v3.0</td>
<td>$99.95</td>
</tr>
<tr>
<td>Solutions, International BackFax</td>
<td>$124.95</td>
</tr>
<tr>
<td>Synergy Software, VersaTerm</td>
<td>$88.00</td>
</tr>
<tr>
<td>Traveling Software, LAP-LINK</td>
<td>$61.00</td>
</tr>
</tbody>
</table>

WIN A JACKPOT BONANZA

Programs Plus is making an offer that you can't refuse — the chance to win a gift certificate for $500.00 in merchandise.

It's easy to enter, simply place an order before January 31, 1990 (or complete this form, drop it in an envelope and mail it to us).

Name

Address

City/State/Zip

Contest Rules

1) No purchase necessary to win. 2) Prize will be one gift certificate only. 3) Original entries only. 4) All entries must be received by January 31, 1990. Sponsor is not responsible for late, lost, or misdirected mail. 5) Winner selected by Independent Certified Public Accountant for Programs Plus in random drawing. 6) Odds of winning depend on number of entries. 7) Winners responsible for taxes. 8) Programs Plus will announce winner on or about February 9, 1990. 9) Winners notified by mail. 10) If unable to contact winner, an alternate will be selected by random drawing. 11) Contest is open in U.S. residents except where prohibited by law. 12) Employees of Programs Plus and suppliers are not eligible.

HyperDA 1.2

HyperDA 1.2 is the next generation in high-speed small business accounting. Inclucded in one seamlessly integrated module are four full reiterated applications: General Ledger, Accounts Receivable/Billing, Accounts Payable/Payroll.

NOMER OFFERS FREE TECHNICAL SUPPORT 1-800-832-3201

Nisus by Paragon Concepts

With Nisus, word processing comes of age. Only Nisus has unlimited undo's, graphics within text, recordable macros, Easy Grep, effortless indexing, footnotes/endnotes, hyphenation, 10 clipboards, automatic repagination, on-screen/printing line numbers, intelligent spell checking, plus all the replace and replace power of QUCED IM. And it's not just for superusers — Nisus needs only a Mac Plus or larger.

$245.00

HyperDA 1.2 by Symmetry

This desk accessory allows you to access HyperCard stacks anytime, on any Mac from the 512k and up. Browse, search, phone dial, copy text and graphics even print stacks. New version 1.2 allows you to add or modify text in existing text fields.

$49.00

WIN A JACKPOT BONANZA

Programs Plus is making an offer that you can't refuse — the chance to win a gift certificate for $500.00 in merchandise.

It's easy to enter, simply place an order before January 31, 1990 (or complete this form, drop it in an envelope and mail it to us).

Name

Address

City/State/Zip

Contest Rules

1) No purchase necessary to win. 2) Prize will be one gift certificate only. 3) Original entries only. 4) All entries must be received by January 31, 1990. Sponsor is not responsible for late, lost or misdirected mail. 5) Winner selected by Independent Certified Public Accountant for Programs Plus in random drawing. 6) Odds of winning depend on number of entries. 7) Winners responsible for taxes. 8) Programs Plus will announce winner on or about February 9, 1990. 9) Winners notified by mail. 10) If unable to contact winner, an alternate will be selected by random drawing. 11) Contest is open in U.S. residents except where prohibited by law. 12) Employees of Programs Plus and suppliers are not eligible.
If Your Hard Drive Is Too Limiting

Consider One That Has No Limits.

DirectDrive 40 by Jasmine

$699

Jasmine 40 MB

Ehman 45 MB Removable

$799

With conventional hard disk drives there is a basic problem: When you run out of storage, you run out of storage. Period. To get more you'll have to buy another hard drive.

Unless you consider the Ehman removable alternative.

At just $799, our 45MB Removable Hard Disk Drive is only $100 more than the price of a Jasmine 40MB hard drive. But, the Ehman removable gives you two, three, ten, or twenty times more capacity just by adding $99 cartridges. The sky is the limit, but the price is down to earth.

The 45MB is based on award winning SyQuest technology, with 25 millisecond access speed and a 30,000 hour reliability rating. You're buying the best technology available at the best price available.

As with all Ehman products you get a 30-day money back guarantee, a lengthy warranty, and our optional 24-hour express service replacement policy.

The Ehman 45MB Removable Hard Disk Drive is a better way to get the mass storage and computing capacity you've been needing. So why be limited by conventional hard drives, when you can have Ehman's unlimited capacity for just a few dollars more.

1-800-257-1666

All product names mentioned are trademarks of their respective holders. Prices subject to change without notice and may not reflect limited-time pricing.

Circle 500 on reader service card
NEW PRODUCTS

Edited by
Mary Margaret Lewis

This section covers Macintosh products formally announced but not yet evaluated by Macworld. All prices are suggested retail. Please call vendors for information on availability.

HARDWARE

Dart Card
High-speed, solid-state SCSI RAM drive compatible with Mac Plus and all later models. Can be configured to provide up to 64MB of storage. $2695 with 10MB installed. Newer Technology, 316/685-4904.

FilmPrinter Plus
Upgraded version of Mirus FilmPrinter. Includes SCSI and parallel ports for computing across multiple personal-computer platforms, and camera that allows frame counts and camera control to be incorporated into various software drivers. $5995. Mirus, 408/980-7773.

EasyStreet Net/Mac
Mac/PC network communications system that allows Macintoshes to share files and peripherals with each other and with IBM PC compatibles. Uses menu selection to set up serial connections over one or more NewBridge data controllers. For networks of up to 16 ports $250; for networks of up to 56 ports $450. NewBridge, 703/834-3600.

HammerDAT and HammerTape FMF
Tape backup systems. The hammerDAT uses helical-scan digital audiotape technology to store up to 1.3GB of data onto a single 4mm DAT cartridge. The hammerTape FMF uses mainframe technology to back up 570MB at a rate of up to 54MB per minute. hammerDAT $3995; hammerTape FMF $9995. FWB, 415/474-8055.

Hand-Held Scanners
Monochrome and color hand-held scanners. Monochrome model scans at 400 dpi; uses variable image to create bayer, mesh, or spiral dithering patterns for monochrome line art and halftones. Color model provides three-color, single-pass scanning for a palette of more than 4000 available colors. Monochrome model 400A $500; color model 270A $850. Accel, 714/757-1212.

HP PaintJet XL Printer
Runs two times faster than original PaintJet. Recommended usage has increased from 20 pages per day to up to 60 pages per day. Uses both 8½-inch and 11-by-17-inch paper. $2495. Hewlett-Packard, 619/592-4676.

ImageScanner 1200
Scanning subsystem for high-resolution scanning and imagesetting capabilities. Lets user capture and edit continuous-tone and line-art images, which can be output to any VariType PostScript laser imagesetter. $28,995. Varityper, 201/887-8000.

Lasergraphics LFR

Lasergraphics LFR

Microtech OR650
Erasable, rewritable optical storage system that uses high-capacity, removable storage media. Based on ANSI, ECMA, and ISO standards, and on Sony magneto-optical erasable mechanism for increased archiving speed. Subsystem (includes cartridge) $4795; additional cartridges $299 each. Microtech, 205/468-6223, 800/325-1895.

Phone Line Manager
Voice/data switch that automatically routes and sends voice, fax, and modem calls over a single phone line. Connects directly to existing phone line. $249. LaCie, 503/684-0143.

(continues)
**PrecisionColor Calibrator**
Display calibration device that works with Radius 8-, 16-, and 24-bit color monitors, Apple's 8-bit color system, or the Radius Gray Scale Display System. $695. Radius, 408/434-1010.

**Smart Label Printer**
Compact printer that prints letter-quality labels (for envelopes, disks, name tags, and so on) using its own software. Printer weighs just over a pound. $249.95. Seiko, 408/922-5900.

**Adobe Type Manager**
System software designed to produce Adobe PostScript language outline-quality fonts for output to QuickDraw printers (such as the ImageWriter and HP DeskWriter) and to the screen display. 1MB min. memory. $99. Adobe, 415/961-4400.

**SuperScan Plus**
20-inch color monitor that does autoscanning and autosynching, accepts any video signal between 30kHz and 64kHz. Compatible with Mac II and a number of other graphics controllers. $3295. Nissi Sanryo America, 800/441-4832.

**The Algebraic Proposer**
Worksheet program designed for computational problem solving. Includes sample problems in arithmetic, estimation, algebra, physics, chemistry, and economics. Includes tutorial and displays problems graphically. 1MB min. memory. $79.95. True Basic, 800/872-2742.

**Two-Page Monochrome Monitor**
19-inch monochrome monitor that includes controller board and tilt/swivel base. Runs at a resolution of 1152 by 870 pixels, displays at 72 dots per inch, and has vertical refresh rate of 70Hz. $895. Ehman, 307/789-3830.

**Everyday People on CompuServe**

**Invest Wisely.**

One of the smartest investments you can make these days is a membership to CompuServe. Just by going online, you'll have more control of all your vested interests. Like monitoring stocks, bonds, funds, and options, or buying and selling with discount brokers. You can even discuss ideas with members of our Investment Forum.

"One company I invest in merged with another. I didn't receive anything about it in the mail, and wouldn't have until weeks later. I went to S&P Online, and got all the information I needed right away."

— Herb Bethoney, Photographer

If you're interested in past performances, you can chart them with CompuServe's historic pricing statistics. You can also stay ahead of the game with detailed performance information on thousands of publicly held companies. In fact, CompuServe has everything you need to make sound investment decisions. Call 800 848-8199, or see your computer dealer, and join the many investors who have found it pays to be connected.

CompuServe®
$7495; demo disk $40. Linker Systems, 714/552-1904.

**Bomber**
Adventure game that recreates the sights, sounds, and experiences of B-17 crews flying in the skies over Hitler's Europe. Object of the game is to complete 25 successful missions so you can get rotated back to the United States. Written in HyperTalk with scrolling graphics, simultaneous action, and uninterrupted sound. 1MB min. memory. $295, $99.95 for owners of CA-Cricket Draw. Computer Associates International, 516/227-3300.

**CA-Cricket Stylist**

**CD Companion Series**
HyperCard software that works with CD ROM drive and includes audio CD as well. Explores specific musical works using text, graphics, and audio examples. First in series is Ludwig van Beethoven: Symphony No. 9, a five-part HyperCard program. 1MB min. memory. $99.95. The Voyager Company, 213/451-1383.

**Dialoger**
Combination of four HyperCard stacks designed to be an environment for design, creation, and control of any type of dialog box within HyperCard. Supports Dialog Manager, lists, pop-up menus, and styled text. 1MB min. memory. $94.29. The Result Software, 919/294-5034.

**DTPublisher**
Disk series of desktop publishing resources for the Mac that will be released in the form of one new volume each quarter. Includes three PostScript-compatible laser fonts, more than 350K of EPS graphics, two PageMaker-compatible design templates, and a DA for viewing graphics. 1MB min. memory. $29.95. Softdisk Publishing, 318/221-8718.

**ESR**
Electron spin resonance spectral-simulation program that supports all naturally occurring isotopes for the first 103 elements. With user-definable nuclear abundances, spectrometer frequency, line width, spectral width, g, coupling constant, and spectral resolution. Simulates up to 24 nuclear spin sets. 512KE min. memory. $175. Calleco Scientific Software Publishers, 303/493-8573.

(continues)
Executive Management System
HyperCard front-end information-retrieval system that uses Oracle in the background to retrieve information from mainframes or any SQL-based database-management system. 1MB min. memory. $495. Softouch Software, 503/241-1841.

Family Roots
Genealogy program that stores and organizes family tree information. 512K min. memory. $157.50. Quinsept, 617/641-2930, 800/637-7668.

FaxGate
Program for use with BackFax to provide fax service for all the users on a Microsoft Mail or QuickMail network via a single fax modem and phone line. Runs in the background on a mail server. 2MB min. memory. $245 per mail server. Solutions, 802/865-9220.

Hey I Can Print
Application that consists of three stacks: Correspondent, ScriptReports, and Focal Point Menu Installer. Enables HyperCard browsers to collect sorted address information from any stack using one to five levels of selection criteria. 1MB min. memory. $99. R&B Software, 617/787-0728, 800/627-9778.

HP Color PrintKit

IdeaFisher
Lexicon of words, associations, and questions that can be used to help generate new ideas in advertising, writing, or other areas that involve problem solving. 7MB min. memory. $495. Fisher Idea Systems, 714/474-8111.

In/Out
Electronic in/out board for use in an office or group setting. Keeps track of in and out status of group members; provides date and time stamps when user checks in or out; has comments field, automatic alerts that sound when a selected user leaves or returns, and optional screen saver. 512KE min. memory. For 5 users $199; for 10 users $299; for 50 users $995.95. CE Software, 515/224-1995.

Interactive Physics
Software that uses animation to illustrate physics concepts for the beginning college-level physics student. Can be used as a demonstration tool or a problem-solving tool to investigate quantitative and qualitative physics problems. Includes objects such as springs, ropes, dampers, meters, and a variety of mass shapes. 1MB min. memory. $449; volume discounts available. Knowledge Revolution, 415/377-1940.

JMP Software
Statistical program that displays information in chart

Where will your electronic mail sy

Some people see electronic mail as a simple desktop utility for shooting messages down the hall. Period.

Microsoft, however, sees it as a strategic business investment that should dramatically boost communication and productivity five minutes after installing it. And five years after running it.

Introducing Microsoft® Mail version 20—the only company-wide electronic mail system built so you won't outgrow it. Now you can instantly send messages and files Mac® to Mac, Mac to PC, Mac to

Customers inside the 50 United States, call (800) 541-1261, Dept. J8.5. In Canada, call (416) 673-7638. Outside the U.S. and Canada, call (206) 882-8661. © Copyright 1989 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks of Microsoft Corporation.
CA-Cricket Stylist

CD Companion Series
HyperCard software that works with CD ROM drive and includes audio CD as well. Explores specific musical works using text, graphics, and audio examples. First in series is Ludwig van Beethoven: Symphony No. 9, a five-part HyperCard program. 1MB min. memory. $99.95. The Voyager Company, 213/451-1383.

Dialoger
Combination of four HyperCard stacks designed to be an environment for design, creation, and control of any type of dialog box within HyperCard. Supports Dialog Manager, lists, pop-up menus, and styled text. 1MB min. memory. $94.29. The Results Software, 919/294-5034.

DTPublisher
Disk series of desktop publishing resources for the Mac that will be released in the form of one new volume each quarter. Includes three PostScript-compatible laser fonts, more than 350K of EPS graphics, two PageMaker-compatible design templates, and a DA for viewing graphics. 1MB min. memory. $29.95. Softdisk Publishing, 318/221-8718.

ESR
Electron spin resonance spectral-simulation program that supports all naturally occurring isotopes for the first 103 elements. With user-definable nuclear abundances, spectrometer frequency, line width, spectral width, g, coupling constant, and spectral resolution. Simulates up to 24 nuclear spin sets. 512KE min. memory. $175. Calleco Scientific Software Publishers, 303/493-8573.

Everyday People on CompuServe

Get Support.

It doesn’t matter what kind of computer you have, there’s bound to come a time when you could use a little help. Well, you can get it on CompuServe, any time, day or night. Once online, you’ll find industry experts, technical reps, and thousands of other users just like you, all swapping helpful tips and information in one of CompuServe’s Forums.

“I find CompuServe to be a community of users really willing to help each other. I am continually surprised when I ask a question about a program, and find that the author is there online, and helping.”

—Sally Ryce, Finance Director

Browse libraries, use Forum message boards, attend online conferences, share software, and just have fun; it’s all on CompuServe. Call 800/848-8199, or see your computer dealer. But, do it soon, because you never know when you may need a little help from your friends.
IF YOU WANT FREEDOM OF CHOICE,
THERE'S ONLY ONE OPTION:

The Nu Vista card was honored by MacUser Magazine as the Best New Image Processing product for 1989.

THE NuVista® SERIES FROM TRUEVISION.

You won't find many display restrictions with Truevision, because we work with any standard Apple, multi-scanning, or NTSC and PAL-compatible monitor. So you're free to choose the best solution for you. And since the NuVista cards can be easily programmed to display a wide range of resolutions, as your needs change, your hardware won't have to. More freedom for you, and with our three different cards, more choices, too.

NuVista 1M
The Desktop Presenter
The NuVista 1M ($2995) is the ideal multi-media card. It combines overlay, capture and 32-bit display all into one card. With the NuVista 1M and a V/DI/O™ Box, you can videotape any standard Macintosh®II desktop application, such as MacroMind Director™. You can even use our free software to overlay text or graphics from applications onto live video. Or you can capture images from any standard video source like a VCR, laser disk or video camera. And of course any image captured with NuVista can be placed into PageMaker® or other desktop publishing programs, in monochrome, 8-bit color or true color at a full 32-bits. It's your choice.

NuVista 2M and 4M
Professional Power
For the ultimate in multi-media, the NuVista 2M ($4495) and the NuVista 4M ($6495) to provide maximum flexibility and performance. With broadcast-quality NTSC and PAL video output, overlay, capture, zoom and pan, and 32-bit display, these are the choice for professionals in video, publishing, CAD and presentation graphics. The NuVista 2M displays a 32-bit image at 640 x 480 pixels, while the NuVista 4M displays 32-bit images up to 1024 x 768 pixels, interlaced.

More Ways To Save
The NuVista series saves you money and slots. If you already have a multi-scanning monitor, just connect it to the NuVista and you’re ready for multi-media. Or look into the monitors shown here, they’re all less expensive than the special monitors which some manufacturers force you to buy. If you have a Mac IIcx and are short on slots, don’t worry. A NuVista card only occupies one slot, yet it provides you with more functionality than some manufacturers can claim in a three-slot configuration. Best of all, our new lower prices reflect savings up to $1000 on a NuVista card!

Freedom of Choice—it’s what the Macintosh is all about to begin with. And when it comes to videographics, it’s what only Truevision gives you. So no matter which path you choose, you’ll find a NuVista at your destination. To contact us for more information, or to locate your nearest Authorized Reseller, call 800/858-TRUE.

NuVista from Truevision
The Videographics Cards of Choice


Actual unretouched screen displays of the same image at varying resolutions. The Super VHS set was driven by a NuVista 4M through a V/DI/O Box, which encoded the RGB signal into an S-Video signal.

Trademark registration and ownership by the respective companies is hereby acknowledged.
Executive Management System
HyperCard front-end information-retrieval system that uses Oracle in the background to retrieve information from mainframes or any SQL-based database-management system. 1MB min. memory. $495. Softouch Software, 503/241-1841.

Family Roots
Genealogy program that stores and organizes family tree information. 512K min. memory. $157.50. Qunsept, 617/641-2930, 800/637-7668.

FaxGate
Program for use with BackFax to provide fax service for all the users on a Microsoft Mail or QuickMail network via a single fax modem and phone line. Runs in the background on a mail server. 2MB min. memory. $245 per mail server. Solutions, 802/865-9220.

Hey I Can Print
Application that consists of three stacks: Correspondent, ScriptReports, and Focal Point Menu Installer. Enables HyperCard browsers to collect sorted address information from any stack using one to five levels of selection criteria. 1MB min. memory. $99. R&B Software, 617/787-0728, 800/627-9778.

HP Color PrintKit

IdeaFisher
Lexicon of words, associations, and questions that can be used to help generate new ideas in advertising, writing, or other areas that involve problem solving. 7MB min. memory. $495. Fisher Idea Systems, 714/474-8111.

In/Out
Electronic in/out board for use in an office or group setting. Keeps track of in and out status of group members; provides date and time stamps when user checks in or out; has comments field, automatic alerts that sound when a selected user leaves or returns, and optional screen saver. 512KE min. memory. For 5 users $199; for 10 users $299; for 50 users $995. CE Software, 515/224-1995.

Interactive Physics
Software that uses animation to illustrate physics concepts for the beginning college-level physics student. Can be used as a demonstration tool or a problem-solving tool to investigate quantitative and qualitative physics problems. Includes objects such as springs, ropes, dampers, meters, and a variety of mass shapes. 1MB min. memory. $449; volume discounts available. Knowledge Revolution, 415/377-1940.

JMP Software
Statistical program that displays information in chart or tables. Some people see electronic mail as a simple desktop utility for shooting messages down the hall. Period. Microsoft, however, sees it as a strategic business investment that should dramatically boost communication and productivity five minutes after installing it. And five years after running it. Introducing Microsoft® Mail version 2.0—the only company-wide electronic mail system built so you won't outgrow it. Now you can instantly send messages and files Mac® to Mac, Mac to PC, Mac to
form. Does rotation and spinning and has 3-D effects. 1MB min. memory. $695. SAS Institute, 919/467-8000.

**King Frog**
Early reading program. Interactive, illustrated storybook that lets children move from frame to frame. Optional digitized voice reads the story. Child can click on any word to have it repeated or click on frame to keep the story moving forward. 1MB min. memory. $29.95. Actreo Software, 612/546-3456.

**MacPhotography**

**MitemView**
Software-development tool that helps create graphical user interfaces for Mac-to-mainframe applications without host system modification. Uses HyperCard. 1MB min. memory. $995. Mitem, 408/449-8801.

**NeuroSmarts**
Simulates a neural network, allowing for automatic identification of patterns in applications such as financial forecasting and medical diagnosis, and extracting decision rules from business and engineering data. 1MB min. memory. $800. Cognition Technology, 617/492-0246, 800/622-2829.

**PicturePak**

**Politics**

---

VAX, potentially Mac to whatever. And, for the first time ever, you can send and receive mail directly from Macintosh programs like Microsoft Excel and Microsoft Word—it's never been this convenient.

Call (800) 541-1261, Dept. J85 for an eye-opening Mail 2.0 Handbook or see your dealer for a demo.

Either that, or get a less sophisticated mail system. And risk buyer's remorse.
Rodime Introduces the Standard for Hard Disk Technology.

COBRA DRIVES SET THE STANDARD. Cobra high performance internal and external hard drives are the finest drives available for your Mac. With capacities of 45MB, 70MB, 100MB, and 210MB, Cobra is the answer to all your storage needs. External Cobra drives come in a new, sleek low profile cabinet that fits neatly beneath your Mac Plus, Mac SE or Mac SE/30. Internal Cobra drives come with two mounting brackets. One, for installation in the Mac II or Mac IIx, and one for mounting in the Mac SE/30 or Mac SE which allows you to keep both floppy ports active.

FAST 18ms ACCESS TIME. Nothing is faster! With an average access time of 18 ms Cobra is the fastest drive available on the market for the Macintosh line of computers. Cobra drives also come with a 16K Caching Buffer which allows even faster access to your data, (sub 18 ms), by storing frequently used data in "instant access" RAM.

CONVENIENT SINGLE POWER SOURCE. With the external Cobra, the flip of one switch on the drive activates your CPU, printer and other peripherals, eliminating cumbersome cables.

LED'S THAT PUT YOU IN CONTROL. Now you can be aware of the status of the drive at all times, with power-on, drive activity and fault warning lights.

ONE YEAR WARRANTY. Rodime Systems offers the level of reliability, innovation and support only an original equipment manufacturer can provide.

FREE BACK-UP AND UTILITY SOFTWARE. Cobra drives come with a FREE copy of FASTBACK™ back-up software, a $99.00 value, as well as Rodime's Utility Software which allows partitioning (including A/UX), media verification, formatting and driver installation.

RODIME'S COMMITMENT TO QUALITY. At Rodime Systems, the craftsmanship built into every drive is our commitment to produce the finest, most reliable drives available. When you buy a Rodime Systems product, you are buying years of manufacturing experience, state of the art engineering and peace of mind that comes from knowing that more Mac users have chosen Rodime drives than any other.
memory-management unit.
1MB min. memory. $139.
Consulair, 208/726-5846.

SuperMOM/Home Business
Version
Database-management program for sales, invoicing, and mail order that can handle up to 5000 customers.
1MB min. memory. $2 49.
National Tele-Press, 707 /937-2848 inside California, 800/448-0988 outside California.

Tablecloth
Screen utility for tidying the screen under MultiFinder. Covers all background windows and icons leaving only the foreground application visible. Contains a screensaver. Optional password protection. 1MB min. memory. $49.95. User-Tek, 800/888-7640.

Tempo II
Macro-generation program records a series of keystrokes and mouse actions and plays them back as a single command. Macros can repeat or branch to other macros as needed. 1MB min. memory. $149.95. Affinity Microsystems, 303/442-4840, 800/367-6771.

TrueForm
Forms-processing software designed to automate creation of users' existing forms. Allows changeover from paper to computerized forms without having to change the form itself. 1MB min.

Where in Europe Is Carmen Sandiego?

ACCESSORIES

Computer/Lit Calendar
Desktop calendar designed to help computer users enlarge their computer vocabulary. Each day's calendar page defines a different computer term. $9.95; volume discounts available. Computer Expressions, 215/222-4400.

Covergear
Series of nylon dust covers for Macintosh computers, keyboards, monitors, and printers. Water-resistant, stain-resistant, and anti-static. $12.95 to $28.95. JTB Communications, 312/263-3063.

Erase-A-Label

UPGRADE ANNOUNCEMENT

DiskTop
Version 4.0 from CE Software

“The new DiskTop 4.0 package is the ultimate finding device. If you can’t find it with DiskTop or Gofer, it’s not there.”

- Bob LeVitus, Author, Dr. Macintosh

If you’ve ever wished the Macintosh Finder was ... well, better at finding ... we have great news for you! The new version of DiskTop, the multipurpose disk management toolkit from CE Software, makes finding files and information within files so much faster and easier that you'll wonder how you ever lived without it.

Here’s an example of DiskTop 4.0’s power: You want to find all the files over 300K that haven’t changed in three weeks. Quickly. You need to make room on your hard disk, so you save the files to a floppy and delete them. DiskTop 4.0 retains the list of files you found so you can copy, move or delete the files you found.

Also new in version 4.0: You can teach DiskTop to automatically launch the programs you use most often, even attach files to the launch. You save keystrokes, mousestrokes, and most important, your time! And this power is instantly accessible, within DiskTop. Either from your Apple menu or a quick “hot key” away.

And DiskTop 4.0 includes Gofer, a $79.95 value, at no extra cost! Now you have the power to search the contents of files. It’s very handy when you’re looking for a phrase, fact or note, but can’t remember which file it’s in.

We’ve listed but a few of the new features that make DiskTop 4.0 the most capable and essential tool for finding, launching and working with information on a Mac. We’ve enhanced every corner of the product, adding the features you, our users, told us you wanted.

Current registered DiskTop users can upgrade to version 4.0 for $30. If you’re still waiting to discover the power of DiskTop, call 1-800-5-CESOFT today for the name of the nearest CE Software retailer or direct supplier.

CE SOFTWARE INC

1854 Fuller Road, PO Box 65580, West Des Moines, Iowa; 1-800-5-CESOFT. Suggested retail price for DiskTop is $99.95. DiskTop is a trademark of CE Software, Inc. Other names may be trademarks or registered trademarks.

MACWORLD • JANUARY 1990 241

Circle 130 on reader service card.
**MIDI Poster**
Computer-generated color poster that answers common questions about the MIDI (musical instrument digital interface) standard. Includes diagrams that show how to hook up an instrument using MIDI cables, a flow chart for daisy-chaining, and a glossary of MIDI terms. Nonlaminated $6.95; laminated $14.95. Castalia Publications, 707/778-7635.

**Portable Pack**
Set of hardware and software products providing all the tools necessary to connect to networks from remote locations. Includes two PhoneNet StarConnectors, two RJ-11 2-meter modular extension cables, a PhoneNet-to-LocalTalk adapter cable, screwdriver, cable extenders, and other equipment necessary for remote computer operation. $495. Farallon Computing, 415/849-5770.

**Zero Halliburton Mac Portable Attache Case**
Don't Choke Your Macintosh With a 3.5" Hard Drive!

An 18 ms Imprimis Half-Height MacWren Hard Drive is 66% Faster Than a 19 ms Quantum 3.5" Hard Drive.

MicroNet Offers Imprimis 5.25" Half-Height Hard Drives That Are Power Matched For The Ilcx and Ilci.

105, 173, 303 and 404 MB

Don't be fooled by access time alone. The difference between 19 ms and 18 ms is only a 1000th of a second. The ability of a hard drive to sustain high data transfer rates is far more important than access time. MacWren drives are industry known for their performance!

The MicroNet series of internal half-height hard drives are the fastest storage systems available for the Macintosh Ilcx and Ilci. Excellent for network servers, virtual memory, graphics, sound and with color separation systems. Our internal systems are shipped with easy to install brackets, cables and powerful SCSI utilities. Each system is fully tested and includes a one year warranty and is rated at 40,000 hours MTBF.

MicroNet's SCSI software is maintained by our own engineering department to be fully compatible with the latest system releases from Apple Computer. It supports up to 36 MacOS or A/UX partitions on the same drive, as well as, password protection, bad block spare, media verify and our unique overlapped seek algorithm that cuts access time in half on twin Wren drive subsystems. External systems available.

"QUALITY YOU CAN COUNT ON"

Call for data sheets and the name of your nearest dealer. Dealer inquiries invited.

MicroNet Technology, Inc.

20 Mason • Irvine, California 92718 • Telephone: (714) 837-6033
FAX: (714) 837-1164 • Connect: Micronet • AppleLink: D1656 • CompuServe: 76004,1611

Circle 398 on reader service card
"FOR KILLER PRESENTATION GRAPHICS, GET THE PUBLISHER. ITS AWESOME SPEED AND CRISP, CLEAR IMAGES MAKE IT THE PRINTER OF CHOICE."

Dean Tanji, President
Abracadabra Slide Production, Inc.
Award-winning creator and producer of presentation graphics for Fortune 500 companies

CALL 1-800-223-2479 TODAY FOR THE DEALER NEAREST YOU.
Circle 353 on reader service card
some time back (February 1988, to be exact) a tip suggested putting fonts in HyperCard stacks so that those fonts would always be available, even if they weren't installed in the System file. Apple now advises against putting fonts in any document—including HyperCard stacks. Installing fonts in documents is known to cause memory problems, which may lead to the application quitting unexpectedly and even to system crashes. Macintosh Technical Note 245 (first published in August 1989) advises, "If you feel that your stack loses all its artistic merit without a certain font, you should license it for distribution in a suitcase file and let the users install it in their systems."

TOO MUCH TO PASTE

Upgrading my Mac SE to 4MB last year really made a big difference—especially for heavy-duty jobs, but the Clipboard seems unable to use the improved elbow room. For example, trying to paste a SuperPaint picture larger than about 32K into WriteNow 2.0 results in a message saying the picture is too large. My slow and dirty solution has been to print the WriteNow text with gaps where the too-large pictures are supposed to be and then print those directly from SuperPaint in a separate pass. But even with a LaserWriter, such steam-driven tactics tend to cause serious bouts of nail biting when deadlines are tight, not to mention the paper wasted to get the results to come out right. What's the solution?

RESTRICTED HYPERCARD FINDS

The Find button in HyperCard searches all fields for chosen text. Is there a way to search only selected fields?

CAPS LOCK DEAD IN QUICKKEYS

Why is it that Caps Lock is disabled when I enable QuicKeys?

A HyperCard's Find command (press ⌘-F or choose Find from the Go menu) searches background fields and card fields for text you specify. You can't restrict the search to one card field, but you can restrict it to one background field by adding to the end of the Find command the word in and the name, number, or ID of a background field. Here is an example:

find "mad world" in bg fld "title"

A Find command like the one above goes to the next card that contains each word in the text you want found. (Words are separated by spaces.) The found words can be in any order, but they must all be in the specified background field. The found words must start with, but can be longer than, the words they match in the Find command.

You can further modify your search criteria by adding one of these words—Chars, Words, String, or Whole—to the Find command (see "Find Control").

A It's WriteNow 2.0 that restricts the amount you can paste to 32K. The system limit, which equals half the memory available to the application, would allow pasting a much larger selection. The next version of WriteNow, which T/Maker is now working on, may let you paste bigger pictures. Otherwise, your only recourse is to switch word processors or use a page-layout application. I have successfully pasted a 57K color picture from SuperPaint into MacWrite II, Word 4.0, Works 2.0, PageMaker 3.01, ReadySetGo 4.5, QuarkXPress 2.11, and WordPerfect 1.0.2. The image also went into FullWrite Professional 1.0 but was converted to black and white.
NOW, MACLINK® PLUS TRANSLATES EVERYTHING UNDER THE SUN

The award-winning software package that transfers and translates files between Macintosh and DOS or OS/2 programs now does the same for Sun worshippers. And for the NeXT world.

With MacLinkPlus/PC, you can now send files in either direction between Macintosh and virtually any other desktop environment. Files arrive in the new environment with the correct styles and formats in place—just as if they had been created there.

MacLinkPlus/Wang OIS and MacLinkPlus/Wang VS provide the same bi-directional connectivity between Macintosh and Wang.

TRANSFERNS AND TRANSLATEs

The MacLinkPlus/PC package arrives with everything you need—software, manual, a direct connect cable (a Hayes modem or compatible also works), and our full library of over 100 translators.*

If you don’t need file transfer capabilities (maybe your Macs and PCs already share a network or server), then simply order MacLinkPlus/Translators. It’s the same package without the cable and communications capabilities. And, it’s the ideal software purchase for anyone with a Macintosh FDHD SuperDrive or external drive that reads DOS disks.

INSTANT PASSPORT TO EVERYWHERE

Make incompatibility a thing of the past with the MacLinkPlus family of Databridge products. For the name of your nearest DataViz dealer, call 203-268-0030 today.

*takes advantage of special connections built into MacWrite™ II from Claris™

All product names are trademarks of their manufacturers.

Circle 281 on reader service card
versions, Caps Lock can be used only for typing capital letters. If you upgrade key sets from version 1.0 using Quick Access, keystrokes that include the Caps Lock key will no longer work. Also, Caps Lock does not work if you use QuicKeys aliases to reconfigure the Mac keyboard to another layout, such as Dvorak or VT100.

**IMAGEWRITER'S BEST**

Q When I print Microsoft Word 3.01 documents in 12-point New York on an ImageWriter II using Best quality, I’m very pleased with the results. But when I print PageMaker 2.0 documents using the same font and print quality, I’m disappointed because the results look like Faster quality. The 24-point size is installed in PageMaker. How can I improve the look of my PageMaker documents?

Dan McKinney
Anderson, South Carolina

A I have no trouble printing Best quality on an ImageWriter II from PageMaker 2.0 or PageMaker 3.01. Perhaps you have 12-point New York installed in the System file and 24-point New York installed only in PageMaker itself. If the System file contains one or more sizes of a particular font, the Mac won’t look in any other files for additional sizes of that font. Use Font/DA Mover to make sure all the sizes you need of a single font are in one file—normally the System file.

If you use a utility such as Suitcase II, Font/Juggler, or MasterJuggler to keep some of your fonts in files other than the System file, make sure the System file doesn’t contain any sizes of those fonts. New York and other basic fonts can sneak back into the System file when you upgrade or replace system software.

**REORGANIZING WORD 4.0 TABLES**

**Tip:** To easily reorder the rows of a table in Word 4.0, choose Outlining from the Document menu. In outline view, you can move any row up or down by dragging it with the mouse. In contrast, cut-and-paste when you’re not in outline view is much more work. The Cut command leaves an empty row behind, which you must later delete. The Paste command can’t insert a row above an existing row but must always replace a row, so you must insert a blank row before pasting.

Leland McArthy
Mountain View, California

**UNTAPPED DISK POTENTIAL**

**Tip:** Your Apple hard disk may have a megabyte or more of concealed disk space. Free space usually exists on an Apple hard disk unless HD SC Setup has been used to create a custom partition. Simply initializing an Apple hard disk creates a standard-size partition regardless of the disk’s actual capacity. An Apple HD40SC hard disk, for example, always initializes at 40,000K. The Quantum 40 disk mechanism used in many HD40SC drives has an actual capacity of over 41,000K. Mechanisms made by Sony and others, which Apple also uses in many HD40SC drives, may have different capacities.

To find out if your disk has extra space, start the HD SC Setup utility (it’s on the System Tools disk that comes with the Mac). Click the Partition button. If you then see a dialog box listing several pre- (continues)
How to avoid making backups.

Make Irwin® do it.
An Irwin tape backup system, that is. So go home early. Because an Irwin system will back up your data, your programs, your breakthrough ideas—all automatically.

No complicated commands.

No sloppy floppies.
Our EzTape® software makes it easy to store whatever data you want. Whenever you want.

It doesn't matter whether you're backing up a Macintosh® or a PC.

An Irwin backup system works with them all. Along with all the popular local area networks. Providing up to 150 megabytes of reliable storage.

In fact, with its patented AccuTrak® precision tracking technology, you can transfer data from a Mac to a PS/2® to a PC and back again. Something that would throw a floppy right off its track.

All in all, that's why more people rely on Irwin minicartridge systems to do their backup than all others combined.

Just call 1-800-BACKUP1 for the dealer nearest you. Because the best way to make backups is to avoid it.

A Cipher Products Group

Circle 471 on reader service card
See these colors? They're bright. Brilliant. Vibrant. Because these colors are being projected just as they appear on your computer screen. By the true-color LCD projection panel from In Focus Systems. The 480C PC Viewer™. What's more, its 640 x 480 high-resolution display works with IBM, compatibles, and the Macintosh family.

So call In Focus today. And make your presentations look truly brilliant.

1-800-327-7231

IN FOCUS SYSTEMS INC

See it. Believe it.

Circle 63 on reader service card
7649 Southwest Mohawk Street, Tualatin, Oregon 97062. 1-800-327-7231. In Oregon, 503-692-4968.
---This handler lets the user change the text font, size, style, and alignment using the text style dialog.---CAUTION: The selected button is brought to the front of its layer (card or background) even if you cancel the text style dialog.--on doMenuItem if menuitem is not "Button Info..." or the optionKey is up then pass doMenu

set the cursor to watch lock screen--save user’s preferences

put the textFont into prefTextFont

put the textSize into prefTextSize

put the textAlign into prefTextAlign
do "put" & &quote & the textStyle & &quote B.B. "into prefTextStyle"

put the edlBgnd into prefEdlBgnd

--determine which button was selected and paste at the top--of its layer (background or card)

put the number of bgnd buttons into bldBtms
doMenu "Cut Button"--cut the selected button

set the edlBgnd to (bldBtms + the number of background buttons)
doMenu "Paste Button" if the edlBgnd is true
then put "last bgnd button" into selectedBt
else put "last card button" into selectedBt

--use the button’s current text attributes as defaults

set the textFont to the textFont of selectedBt
set the textSize to the textSize of selectedBt
set the textAlign to the textAlign of selectedBt
do "set the textStyle to" & &quote B.B. the textStyle of selectedBt

choose text tool--use text tool to doMenu "Text Style..." --get text attributes

--change the button’s text attributes

set the textFont of selectedBt to the textFont
set the textSize of selectedBt to the textSize
set the textAlign of selectedBt to the textAlign
do "set the textStyle of selectedBt to" & &quote B.B. the textStyle

--restore preferred settings

set the textFont to prefTextFont
set the textSize to prefTextSize
set the textAlign to prefTextAlign
do "set the textStyle to" & &quote B.B. prefTextStyle

set the edlBgnd to prefEdlBgnd

select selectedBt
unlock screen
doMenu "Button Info..."
end doMenu

Button Font
Put these script lines in the stack script of your HyperCard Home stack and you can select a button’s text font, size, style, and alignment using the standard text-style dialog.

TEXT ATTRIBUTES OF BUTTONS
TIP: Ideally, HyperCard should provide a dialog box for changing the text font, size, style, and alignment of a button the same way it does for a field. In versions 1.2.2 and earlier, however, you must write a script or type lengthy commands in the message box. The script lines in “Button Font” let you use the standard HyperCard text-style dialog box to select a button’s text attributes. After putting the script lines in the Home stack’s script, you can change any button’s text style by selecting the button with the Button tool and pressing the Option key while choosing Button Info from the Objects menu. (Note that a button with an icon always uses plain Geneva 9; you can change only its justification.) When you dismiss the text-style dialog box, the normal Button Info dialog box appears.

Robi Khan
Saskatoon, Canada

The script has a sly side effect: it gives the button you select the highest number and renames all other buttons below it, which puts it in front of all other buttons and fields in the same layer (card or background)—even if you cancel the text-style dialog. If your scripts refer to buttons by number (instead of by name or by ID), they may no longer work. As long as you keep these limitations in mind, the script is very useful.

We pay from $25 to $100 for tips published here. Send tips or questions (include your address and phone number) to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to CompuServe (70370,702) or MCI Mail (addressed to Macworld). All published submissions become the property of Macworld.

Lon Poole answers readers’ questions and Selects their tips for this monthly column. His many personal computer books include the quick reference HyperTalk (Microsoft Press, 1988) and a new book of Mac tips (soon to be published by Microsoft Press), Amazing Mac Facts.
A Complete Family of Monochrome, Gray Scale and Color Display Systems.

Find out where to buy an E-Machines Display System. Call us today at 503-646-6699. Or, write to us at 9305 SW Gemini Drive, Beaverton, OR 97005.
How to avoid making backups.

Make Irwin® do it.
An Irwin tape backup system, that is. So go home early. Because an Irwin system will back up your data, your programs, your breakthrough ideas—all automatically.

No complicated commands.
No sloppy floppies.
Our EzTape® software makes it easy to store whatever data you want. Whenever you want.

It doesn’t matter whether you’re backing up a Macintosh® or a PC.

An Irwin backup system works with them all. Along with all the popular local area networks. Providing up to 150 megabytes of reliable storage.

In fact, with its patented AccuTrak® precision tracking technology, you can transfer data from a Mac to a PS/2® to a PC and back again. Something that would throw a floppy right off its track.

All in all, that’s why more people rely on Irwin minicartridge systems to do their backup than all others combined.

Just call 1-800-BACKUP1 for the dealer nearest you. Because the best way to make backups is to avoid it.
Getting Started with Buying a Mac

How to assemble a system that meets your needs—and budget

by Jim Heid

Today's Macintosh shopper faces more decisions than the president on a bad clay. Apple currently offers eight Macs, ranging in price from $1799 for a bare-bones Plus to roughly $10,000 for a maxed-out Mac IIx. Hundreds of independent, or third-party, manufacturers supply thousands of programs and hardware add-ons. You can outfit a system using only Apple hardware, or combine components from different firms. You can shop at a local dealer, or through the mail. Buy the right system, and you'll wonder how you got along without it. Buy the wrong one, and you'll feel betrayed by technology as you watch it depreciate and collect dust.

This month, we make our way through the maze of issues you need to consider when assembling a Mac system, with the goal of helping you decide what combination of hardware is best for you.

MONEY IS EVERYTHING

Many consultants and experienced users will suggest that you answer the following questions to determine what to buy:

1. What tasks do I want to use the Mac for?
2. Which programs can perform them?
3. What kinds of hardware are required?

A valid approach, I'd preface it with a more pragmatic question: How much can you spend? The fact is, what you want a Mac to do and what an affordable system can do are often two different things.

Thus, you can't accurately answer the first question until you determine your budget.

Addressing your finances is especially important in the Mac world, where "bargain" often means "less than a new car." I'm exaggerating, but it is true that Macs generally cost more than the other major microcomputing standard, the IBM PC and its work-alikes, or clones. But the Mac is also easier to learn. If your time is worth money, the system's higher cost may easily be offset by the time you save learning it, especially if you or someone else will be training employees.

HARDWARE DECISIONS

You've thought about what you want to do with the Mac and you've determined which programs you want to use. You're ready to start shopping for hardware. That means addressing the seven basic areas that differentiate each Mac model.

- **Size** If portability is important, you'll want to consider the new Mac Portable or one of the members of Apple's compact Mac line: the Plus, SE, and SE/30. (The members of the Mac II family form the modular Mac line.) Of these, the Portable is the only one that runs on batteries.

- **Speed** The Mac SE/30 and the II family are faster than the Plus, SE, and Portable, and therefore are better able to handle applications that demand fast processing speed. Even the lowly Mac Plus can handle such tasks as simple word processing and filing, monochrome drawing, telecommunications, and file serving to a small network. Other duties are better handled by an SE, including light-duty desktop publishing and spreadsheet work, and creating and using HyperCard stacks. You'll want a fast Mac for working with large databases or spreadsheets, large word processor documents with indexes and tables of contents, color illustrations or containing color.

- **Expandability** The SE and II families contain internal expansion slots into which you can plug circuit boards that add to the machine's capabilities. Accelerator boards boost performance, video boards control (continues)
specialized monitors, and communications boards let you connect to other computers over the phone or to high-speed office networks. (For more on the virtues of expansion slots, see “Getting Started with Expansion Slots,” Macworld, April 1989.) Expansion slots are also an excellent defense against obsolescence. For example, an accelerator board such as the Radius Accelerator 25 can make a lowly SE roughly as fast as a Mac IIci (for more information on the IIci, see Macworld News, November 1989).

* Video features The Macintosh Portable, Plus, and SE can display only black screen dots and white screen dots, or pixels. If you want to work with color or true shades of gray (like those displayed by televisions), you'll want an SE/30 or a member of the II family equipped with color or gray-scale video hardware. If your applications demand speed and if you're content to work with 256 simultaneous colors or gray shades, consider the Mac IIci, the only modular Mac that contains built-in video hardware. For business graphics, presentations, black-and-white scanned images, and many desktop publishing applications, 256 colors are more than enough, but they may not be adequate for working with scanned color photographs or illustrations. For those tasks, you may want a 24-bit color board such as SuperMac's Spectrum/24 or RasterOps's ColorBoard 264. For desktop publishing, drafting, and word processing applications, consider a large-screen monitor such as Apple's Portrait Display or Two-Page Monochrome Monitor, which show one or two letter-size pages, respectively. Or you might consider one of the large-screen color monitors offered by firms such as SuperMac, Radius, and RasterOps. (For more on color monitors, see “Screen Tests,” August 1989; for more on noncolor monitors, see “Getting Down to Black & White,” May 1989.)

* Memory capacity If your applications demand speed, chances are they'll devour memory and disk space, too. All Macs come standard with 1 megabyte of RAM. That's barely enough. (These days, it's rarely enough.) A 2MB machine will let you run two or three programs simultaneously under MultiFinder and switch between them with a mouse click. If you plan to work extensively with digital sounds and color images, you'll probably want (if not need) 4MB. If you want to be able to run several memory-devouring applications at once, consider an SE/30 or a modular Mac. They can accommodate up to 8MB using 1MB memory boards called SIMMs, short for Single Inline Memory Module.

* Disk-storage capacity Today's complex programs require the speed and capacity of a hard disk, and any Mac can accommodate one (or more). Simply put, a hard disk is the most important add-on you can buy. Without one, you'll endure slow performance and frequent disk-swapping. With one, the Mac will start programs and open documents swiftly, and you'll be able to switch between programs and documents without shuffling floppies (see “Getting Started with Mass Storage,” December 1988, for more details on hard

---

### COMPARING MACS

<table>
<thead>
<tr>
<th>Portability</th>
<th>Plus</th>
<th>SE</th>
<th>SE/30</th>
<th>II</th>
<th>IIx</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>poor</td>
<td>poor</td>
</tr>
<tr>
<td></td>
<td>( weighs about 16 lbs., has built-in screen, but requires power source)</td>
<td>( weighs about 20 lbs., has built-in screen, but requires power source)</td>
<td>( weighs about 20 lbs., has built-in screen, but requires power source)</td>
<td>( large system unit and external monitor make transporting difficult)</td>
<td>( large system unit and external monitor make transporting difficult)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speed (1 = slowest, 6 = fastest)</th>
<th>1</th>
<th>1.3</th>
<th>4</th>
<th>3</th>
<th>3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Expandability</td>
<td>poor</td>
<td>good</td>
<td>good</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Video flexibility</td>
<td>poor</td>
<td>very good</td>
<td>very good</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Memory capacity</td>
<td>very good</td>
<td>very good</td>
<td>excellent</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Floppy-disk storage capacity</td>
<td>fair</td>
<td>good-excellent</td>
<td>very good</td>
<td>very good</td>
<td>very good</td>
</tr>
<tr>
<td>Virtual memory support</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes (with upgrade)</td>
<td>yes</td>
</tr>
</tbody>
</table>

1 These values represent each machine’s floppy storage capacity when equipped with the maximum possible number of floppy drives that each machine can accommodate; capacity is less when fewer drives are used. Also, two sets of values are listed for the SE because machines manufactured after August 1, 1989 are equipped with the IAMB high-density floppy drive. A floppy news, the Radius Accelerator 25 can make a

two-letter size pages, respectively. Or you might consider one of the large-screen color monitors offered by firms such as SuperMac, Radius, and RasterOps. (For more on color monitors, see “Screen Tests,” August 1989; for more on noncolor monitors, see “Getting Down to Black & White,” May 1989.)

* Memory capacity If your applications demand speed, chances are they'll devour memory and disk space, too. All Macs come standard with 1 megabyte of RAM. That's barely enough. (These days, it's rarely enough.) A 2MB machine will let you run two or three programs simultaneously under MultiFinder and switch between them with a mouse click. If you plan to work extensively with digital sounds and color images, you'll probably want (if not need) 4MB. If you want to be able to run several memory-devouring applications at once, consider an SE/30 or a modular Mac. They can accommodate up to 8MB using 1MB memory boards called SIMMs, short for Single Inline Memory Module.

* Disk-storage capacity Today's complex programs require the speed and capacity of a hard disk, and any Mac can accommodate one (or more). Simply put, a hard disk is the most important add-on you can buy. Without one, you'll endure slow performance and frequent disk-swapping. With one, the Mac will start programs and open documents swiftly, and you'll be able to switch between programs and documents without shuffling floppies (see “Getting Started with Mass Storage,” December 1988, for more details on hard

---

### GETTING STARTED

### HOW TO

<table>
<thead>
<tr>
<th>Portability</th>
<th>Plus</th>
<th>SE</th>
<th>SE/30</th>
<th>II</th>
<th>IIx</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>good</td>
<td>good</td>
<td>good</td>
<td>poor</td>
<td>poor</td>
</tr>
<tr>
<td></td>
<td>( weighs about 16 lbs., has built-in screen, but requires power source)</td>
<td>( weighs about 20 lbs., has built-in screen, but requires power source)</td>
<td>( weighs about 20 lbs., has built-in screen, but requires power source)</td>
<td>( large system unit and external monitor make transporting difficult)</td>
<td>( large system unit and external monitor make transporting difficult)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speed (1 = slowest, 6 = fastest)</th>
<th>1</th>
<th>1.3</th>
<th>4</th>
<th>3</th>
<th>3.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal Expandability</td>
<td>poor</td>
<td>good</td>
<td>good</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Video flexibility</td>
<td>poor</td>
<td>very good</td>
<td>very good</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Memory capacity</td>
<td>very good</td>
<td>very good</td>
<td>excellent</td>
<td>excellent</td>
<td>excellent</td>
</tr>
<tr>
<td>Floppy-disk storage capacity</td>
<td>fair</td>
<td>good-excellent</td>
<td>very good</td>
<td>very good</td>
<td>very good</td>
</tr>
<tr>
<td>Virtual memory support</td>
<td>no</td>
<td>no</td>
<td>yes</td>
<td>yes (with upgrade)</td>
<td>yes</td>
</tr>
</tbody>
</table>

1 These values represent each machine’s floppy storage capacity when equipped with the maximum possible number of floppy drives that each machine can accommodate; capacity is less when fewer drives are used. Also, two sets of values are listed for the SE because machines manufactured after August 1, 1989 are equipped with the IAMB high-density floppy drive. A floppy drive upgrade for older SEs is available.

2 Maximum memory values reflect the use of 1MB SIMMs, currently the most widely available. The only exception is the Mac Portable, which currently uses 256K static RAM chips. Also, NuBus-equipped Macs can accommodate additional RAM on expansion boards; however, the Mac's current system software can access only 8MB of RAM. System 7.0 will be able to access additional RAM.
disks and other high-capacity storage media).

By shopping from mail-order firms such as MacConnection, you can buy a 20MB or 30MB drive for just a little more than what Apple charges for an external floppy drive. You won’t need one if you’re buying a hard disk. But without a hard disk, a second floppy drive is essential.

**Virtual memory support** Last May, Apple announced plans for a major upgrade to the Mac’s system software, System 7.0, which it expects to release before the summer of 1990. System 7.0 will provide a virtual memory feature that lets the Mac treat a hard disk as an extension of RAM, thus allowing you to run several large programs simultaneously. System 7.0 will require a minimum of 2MB of RAM, and Apple recommends that you buy enough memory to accommodate the largest program you plan to run, so you may need more than 2MB.

All Macs from the Plus on will be able to run System 7.0, but the Plus, SE, and Portable won’t support the virtual memory features. (The II won’t either, unless you add a $400 chip.) So, if you want to be completely ready for System 7.0, consider an SE/30, IIx, IIcx, or IIci. But don’t base a purchase on this factor alone. Add a few megabytes of memory, and any Mac can run several large programs at once.

“Comparing Macs” shows how each Mac model fares in these categories.

**START THE PRESSES**

Chances are you’ll want to commit your work to paper. If your budget is tight, consider a dot matrix printer such as Apple’s ImageWriter II or ImageWriter LQ—both print by striking a cloth ribbon with a series of fine wires. ImageWriter output looks good, but it has that computer-printer look. However, because ImageWriters are impact printers and can accept continuous-feed paper stock, they’re the scribes of choice for printing on multipart business forms and mailing labels. Both the ImageWriter II and the LQ accept optional boards that let you share the printer with Macs interconnected by LocalTalk network cables.

If you plan to do desktop publishing, you’ll want a laser printer. These use photocopier-like mechanisms to produce sharp output that looks similar to the output of a typesetting machine, with print resolution of 300 dots per inch versus an (continues)
COPY II®
for Apple Macintosh

Copy II for the Macintosh is a collection of three utility programs and a new desk accessory, Locate. Copy II combines powerful utilities which enable you to: maintain and repair your floppy and hard disks, create archival backups and allow you to install applications directly onto your hard disk.

Here is what the experts say: "It's a well-rounded collection of useful disk utilities that no Macintosh user should be without."

John Gillett
Macworld 5/89

"It's a well-rounded collection of useful disk utilities that no Macintosh user should be without."

Jake Paden
MacUser 3/89

To Order: see your local dealer.

$39.95
Central Point Software
INCORPORATED
- Founded in 1981 -
15220 NW. Greenbrier Pkwy., 9200
Beaverton, OR 97006 USA
503/690-8090

SEARCH AND FIND
Locate is a fast information finder in a desk accessory. You can search for full or partial file names, up to three key words, or both. Once found, Locate displays the information and under Multifinder will launch the application.

Requirements: Mac512e, MacPlus, Mac SE, Mac II. Supports H.F.S., M.F.S., 400K and 800K disks, 1 or 2 drives, hard disks and all available memory.

Prevent Macintosh Theft!

MacKablit System

Heavy duty 10' steel cable (7 x 19) secures and locks computer, printer, other equipment, up to 4 components. The unique Mac-Kablit system includes 2 brackets that snap into existing slots on the Macintosh keyboard and computer. Additional hardware included for other Mac peripherals (disk drives, printers). The unique Mac-Kablit system utilizes existing security slots on the keyboard and computer and existing screws in other peripheral equipment. The system includes 2 brackets for the security slots plus unique Kablit fasteners for peripherals. Cable passes through Kablit fasteners, preventing removal of screws.

EXCLUSIVE!
Proprietary components (Pat. Pend.) permit only your key to release Mac-Kablit. When ordering multiple units, specify locks to be keyed differently or alike. Specify Mac, Mac Plus SE, or Mac II.

Other Kablit systems for IBM, Apple, others.

$39.95 + $3.00 shipping/handling

Money back if returned in 30 days.
Phone or send check.

Secure-It, Inc.
18 Maple Court
East Longmeadow, MA 01028
800-451-7592 413-525-7033
Dealer Inquiries Invited

$39.95 + $3.00 shipping/handling
Quantity pricing also available for multiple purchases from schools, institutions, businesses, industries, etc. Send P.O.

GETTING STARTED
HOW TO

ImageWriter II’s 140 dpi and an LQ’s 216 dpi. A laser printer’s resolution is still short of a typesetter’s (1270 dpi and up), but it’s sharp enough to render the subtle line strokes and serifs of most typefaces.

The least expensive laser printer is the $2099 GCC Personal LaserPrinter (PLP). The PLP produces first-rate output, but it can be slow, and it requires that you designate a portion of your hard disk for font storage. And, if you want to share a PLP with other Macs, you’ll need a $500 add-on called PLP Share.

If you’re serious about publishing, you’ll want a printer that uses Adobe Systems’ PostScript page-description language. PostScript printers such as Apple’s LaserWriter IIINT and NTX contain powerful computers that can produce remarkable graphic and type effects. They also contain software and built-in network connectors that let you share a printer with other Macs and with IBM PCs.

Alas, PostScript printers aren’t cheap. The NEC SilentWriter LC 890 is often discounted to about $3000 by mail-order houses, but such printers generally go for between $4000 and $6000. PostScript clones—printers that act like PostScript printers but don’t use Adobe’s version of the language—such as Qume’s CrystalPrint Publisher, Jasmine’s DirectPrint, the La Cie Panther PDX, and the Abaton QuickStep, all of which are identical except for their labels and list prices—often sell for less, but I’ve had mixed results with them. I recommend buying the real thing. (For more details on laser printers, see “Getting Started with Laser Printers” and “Paging All Printers,” in October 1989."

You can get PostScript output without buying a printer: take completed documents to a desktop publishing service bureau for printing. Many printing companies and college libraries also rent time on Macs and PostScript printers. These alternatives aren’t as convenient as having a printer in your home or office, but saving several thousand dollars can make a little inconvenience palatable.

OTHER ADD-ONS
With a modem and communications software, you can send electronic mail on (continues)
Wherever your Apple LaserWriter II is now perched, we offer this attractive alternative: The Organizer," from CoStar.

You may have a hard time determining where one ends and the other begins (as some Macintosh experts did), but that's not so surprising. The Organizer was created by a member of the design team responsible for the LaserWriter. It is the exact same color. And has the exact same finish.

It is Apple to the core. In form. And function.

Take those shelves for instance. Think of the reams of paper you could store there. The extra paper trays. And toner cartridges.

There's even a special place in back for a hard disk drive. And a wire management system that keeps everything nice and neat.

And those hefty wheels. They make it easy to move the whole operation down the hall. Or to park it in a closet overnight for safekeeping.

The Organizer from CoStar. We think it could do wonders for your organization.

The Organizer comes with a lifetime warranty.

To order one, or to find out the dealer nearest you, call 1-800-426-7827. (In Connecticut, call 661-9700.)
services such as MCI Mail, Connect, and CompuServe. You can also tap into a vast network of computer users to exchange ideas and obtain freeware and shareware.

If you’re doing desktop publishing or computer illustration, you might consider a scanner, which lets you turn artwork and photographs into digital images that you can alter, or trace over and include in publications. Combine a scanner with optical character recognition (OCR) software such as Caere’s OmniPage, Olduvai’s Read-It, or CTA’s TextPert, and you can scan pages of text and edit the resulting files using your word processor. (For more details, see “Getting Started with Scanners,” November 1988, for a detailed look at OCR software, see “The Reading Edge” in February 1989.)

**WHICH ROUTE FOR YOU?**

Before you buy a Mac, you need to weigh the differentiating factors and determine which ones are most important to you. This will help you get the machine best suited to your present and future situation.

Aside from actually writing out the check, this is one of the hardest steps in the purchasing process. It’s at this juncture that you’ll realize just how many ways exist for you to reach your hardware goals. For example, say you’ve determined that you need a fast Mac with a hard disk and 4MB of memory. Should you buy an SE/30 or a member of the II family? Or should you get an SE and install an accelerator board? Should you buy a stripped-down Mac and buy a mail-order memory upgrade and hard disk? Or should you spring for a system in which those components are factory installed?

“Sample Systems” shows four routes you might take. And there are a few buying tips I can pass along to steer you in the right direction.

• Buy the fastest Mac you can afford, even if your present needs are simple. You’ll enjoy top-notch performance, and your hardware will be ready to accommodate System 7.0 and the larger, more complex programs that will undoubtedly be developed to exploit its talents. At the very least, your system will retain its value better should you decide to sell it.

• Avoid the Plus if your budget allows it. This nearly four-year-old Mac runs virtually all of today’s software, and it will be able to run System 7.0 (although it won’t support virtual memory). But its weakling power supply and lack of an expansion slot make obsolescence-shattering upgrades such as accelerator boards impractical and risky. If you can, buy an SE instead. Its single expansion slot gives it a brighter future, it can reliably handle an internal hard disk, and it’s a bit faster than the Plus.

• Don’t be afraid to mix and match components. You can save money by buying non-Apple hard disks, printers, modems, etc.

### Sample Systems

**Low-Cost System**

- Macintosh Plus ($1799)
- External floppy drive ($429)
- ImageWriter II ($5995)
- Future additions: External SCSI hard disk, 2400-baud modem, memory upgrades (to maximum of 4MB).

**Economical Business/Professional System**

- Macintosh SE ($2999)
- Apple Standard Keyboard ($129) or Apple Extended Keyboard ($229)
- 40MB hard disk ($3299 for Apple HD 405C; many alternatives available for under $1000)
- GCC Personal LaserPrinter ($2099)
- Memory upgrade to 2.5MB ($999 for Apple’s)
- Future additions: Accelerator board, upgrade to PostScript-based GCC Business LaserPrinter;
- large-screen monitor, 2400-baud modem, memory upgrades.

**Performance-Oriented Business/Professional System**

- Macintosh IIc with 40MB hard disk ($5269) or with BOMB hard disk ($7069)
- Apple Standard Keyboard ($129) or Apple Extended Keyboard ($229)
- PostScript laser printer ($4999 for Apple’s LaserWriter II NT; many comparable printers available for less)
- Memory upgrade to 5MB ($1999 for Apple’s)
- Video card ($499–5499 for Apple’s)
- Monitor ($999 for AppleColor High-Resolution RGB monitor; $399 for Apple High-Resolution Monochrome Monitor)
- Future additions:
  - More memory, additional monitors, 9600-baud modem, additional disk storage.

### Future Additions:

- GCC's WriteMave printer ($5579)
- GCC's WriteMave printer ($6579–56499)
- Macintosh SE (52869)
- Macintosh IIcx with 40MB hard disk (55369) or with BOMB hard disk (57069)
- Macintosh Portable (5379–56499)
- GCC's WriteMave printer ($5379)
- Future additions: Apple video adapters, monitor for office use.

Listed here are four ways to assemble a Mac system, each geared to different needs and price ranges. The prices listed after each item are Apple’s suggested retail prices as of October 1, 1989; you may find dealers offering discounts of 20 percent or more, especially if you shop in urban areas. With items whose prices are listed as “$000 for Apple’s,” you’re likely to find less-expensive alternatives from third-party manufacturers.

When you buy a member of the SE or II family, you purchase the keyboard separately. The Apple Extended Keyboard costs more than the Apple Standard Keyboard but provides additional keys, including cursor control keys, which make it easier to navigate large word processing documents, and function keys, which many programs let you use as an alternative to choosing commands with the mouse.
How To Save Money On Hard Drives and Other Macintosh Products!

Would you like to save money? A lot of money?

If so, before you go through the pain and expense of buying a hard disk drive for your Macintosh, there's something you should know. It's a trade secret that Apple and others would rather you didn't know.

Just listen to this. Apple only offers three hard drive choices. But, when you know how, you can have an almost unlimited selection.

You can select a 20 megabyte or 600 megabyte - or more - all from major brand name drive manufacturers. You can even purchase the same drive that Apple sells!

What's the secret? Everything that you need to know is explained fully on a diskette titled “BYOM.”

“BYOM” is published by UniMac. And, it’s yours for just seven bucks! A small price to pay for inside trade information. Wouldn't you agree?

But, that's not all. Included is information on hundreds of products you can buy from other companies that will enhance the value and performance of your Macintosh!

Now, here's the best news of all. We guarantee that this $7 investment will save you money or we'll double your money back! No kidding. If “BYOM” doesn't show you how to save money on your next hard drive using any of our internal or external kits, we will cheerfully refund you $14.00!

So why wait? All you have to do is send us your request along with your $7. Send in your order today - and learn the trade secrets that we've dared to share!

Universal MacProducts, Inc.
942 Calle Amanecer, Bldg. A
San Clemente, CA 92672

Oh, by the way, a full-size poster of this illustration is available from our dealers. Details included with your order. Thank you.
1-800-248-0800

Our savings are huge. Our advice is free.

Software

TGS Systems

Very high level, pictorial, object-oriented programming environment for software development. Completely visual programming language, and an Application Builder for WYSIWYG creation of user interfaces. Supports complete software development from design to debugging.

Addison Wesley

Programmers On Line Companion 2.0

Adobe

ATM Plus Pack... 119.
Illustrator 88... 278.
Streamline... 238.
True Form... 225.
Type Manager... 57.

Adobe Postscript Fonts

1 Palatino... 123.
2 ITC Bookman... 123.
3 ITC Zapf Dingbats & ITC Zapf Chancery Med. Ital... 123.
4 ITC Avant Garde Gothic... 123.
5 NewCen. Schoolbook... 123.
6 Optima... 123.
7 ITC Suzanne... 123.
8 ITC Lubalin Graphik... 123.
9 ITC Garamond... 123.
10 ITC American Typewriter & ITC Machiner... 93.
11 ITC Benguiat & Frz Quartz... 123.
12 Obey®... 123.
13 Heilevita LT & Blk... 123.
14 Heilevita Condensed... 123.
15 Trump Medieval... 123.
16 Meritor... 123.
17 ITC Galliard... 123.
18 ITC New Baskerville... 123.
19 ITC Korina... 123.
20 Goody Old Style... 123.
21 Sonatina... 61.
22 Century Old Style... 93.
23 ITC Franklin Gothic... 180.
24 ITC Cheltenham... 123.
25 Park Avenue... 61.
26 Bodoni... 123.
27 Letter Gothic... 123.
28 Prestige Elite... 123.
29 Optima... 93.
30 News Gothic... 123.
31 ITC Tiffany... 180.
32 Copper Black... 123.
33 Stencil, Hobo & Brush... 93.

At Once! ............... $269.

Layered

High-speed small business accounting software. Easy to learn, fast & flexible professional accounting bookkeeping for the Mac.

88 Sabon... 123.
89 Hirohira... 243.
90 A. Stockin F. Fraktur, Press... 123.
91 Dom Casual... 93.
92 Post Antiqua... 93.
93 Folsor... 123.
94 Limescript & Linotype... 123.
95 Vay Round... 123.
96 Akzidenz Grotesk... 123.
97 Impressor... 123.
98 Bauer Bodoni... 123.
99 New Astar... 243.
100 Adobe Garamond... 180.
101 Adobe Garamond Expert Collect... 123.
102 Candidata... 123.
103 Gerber... 123.
104 Typo... 123.

105 Utopia Exp Collect... 123.
106 ITC Berkeley Oldstyle... 243.

Latest 16 new Adobe fonts in stock. Call for prices.

MacPrint ........... $75.

Insight Development

Print Mac applications on LaserJet, DeskJet, & other Hewlett Packard printers. Completely transparent in operation.

Advanced Software

DocuComp... 87.
AEC Management Systems

AEC Information Mgr... 409.
FastTrack Schedule... 115.

Atys

Fontastic Plus... 51.
Fontographer 3.0... 278.

Atys

dBASE III... 294.
Full Impact... 248.
FullWrite Professional... 255.

Berkeley System Design

After Dark... 24.
Stepping Out 2.01... 51.

Blith Software

Omnis 5 Single User... 355.

Bootware Software

Resume Writer

Professional Version... 58.
Student Version... 16.

Borland International

Reflex Plus... 188.
SideKick 2.0... 67.
Turbo Pascal 1.1... 67.
Turbo Pascal Tutor 1.0... 46.

Bright Star Technology

Hyper Animator 1.5... 98.

Bruderbrand

PosterMaker Plus... 34.
Print ST... 35.

Caere

OmniPage 2.0... 549.

Casy& Greene

AME Single User... 179.
AME 1-5 Users... 584.
AME 1-10 Users... 978.
QuickDEX... 31.

CE Software

CalendarMaker 3.0... 31.
DiskTop... 31.
In/Out 1-5 Users... 145.
In/Out 1-10 Users... 209.
MockPackage + Utilities... 31.
Quakeys 1.2... 64.
QuickMail 1-5 Users... 169.
QuickMail 10 Users... 255.

Central Point Software

Copy II Mac... 20.
PCTools Deluxe... 46.
We'll help with your holiday shopping.

Don't quite know what gifts to order? Know what you want and want to get it without a lot of hassles? Have questions about a product?

Then you've come to the right ad. The MacZone experts are standing by to help you this holiday season with product information, unparalleled Macintosh expertise, and a dash of Yule cheerfulness.

A quick phone call to the Zone can take care of all your Mac shopping—we carry everything from mouse pads to hard drives. All at prices that would make Scrooge smile.

If you order by the 22nd, you'll have your goodies in time for Christmas. And you can order any time from 8 a.m. to 1 a.m. Eastern Standard Time (5 a.m. to 10 p.m. Pacific Standard Time).

So if you're overwhelmed by holiday shopping, just sit down with your list and call the Zone.

And we ho-ho-hope you have a great Christmas and a very Mac New Year.

---

Adobe Type Manager .......... $57
Adobe Illustrator 88/Type Manager Bundle .......... $278

Decided you just gotta have Adobe Type Manager, but you'd like a little PostScript bonus thrown in? Fine with us...

Kiwi Envelopes ........... $38
Retire your typewriter for good!
Kiwi Envelopes is a simple, easy, and fast solution for printing one envelope at a time; a useful desk accessory, always accessible under the Apple menu. Frequently used addresses can be saved, recalled easily, and printed at the click of a mouse!

---

Product Guarantees:
If you are not completely satisfied with a purchase, many of the products we sell come with a 30 to 60 day money back guarantee. Ask for details when you place your order.

1-800-248-0800

Int'l: (206) 883-1975 Canada: 800-248-0344 FAX (206) 881-3421

Our savings are huge. Our advice is free.
P.O.s accepted here.

Universities, colleges, school districts, government agencies, corporations—if your organization issues purchase orders, we'll gladly accept them (some corporate P.O.s require credit approval). Just fax or mail your P.O. for cheerful, speedy service.

Dolphin Systems
Our best line of data storage devices, including integerexternal hard disk drives (available in capacities from 20 to 330 megabytes), Flipper 150mb tape backup, Flipper-4mb removable cartridge drives, Sonar 800 removable optical read-write disk drive, and many more.

Dolphin Hard Disks .......... see listings

DataDesk
For those who use your Macintosh keyboard for more than just typing, DataDesk gives you a power users keyboard with one hundred and one keys at your fingertips. Throw in the 101 Keys keyboard macro program included, and leap beyond the limits like never before.

Mac 101 Keyboard .................. $135.

Insignia Solutions
Need a communications program. Easy to use communica­tions program.

Soft PC ........................... $245.

Farallon
To capture, manipulate, bend, twist, echo, or just generally-play with sound resources, MacRecorder does it all. Electronic Acts Studio/1 is a unique combination of black & white graphics combined with powerful and EASY on screen animation.

Mac Recorder & Studio/1 ............. $210.

Design Your Own Drive

Let the Zone put together your perfect drive. Pick a drive. Pick a platinum or black case, or internal kit. We'll put it together, test it and guarantee it with the Zone Loaner Program, and a 1 or 2 year drive warranty and send it out to you today for delivery tomorrow!

External Enclosure Kits
Half Height .................. 195.
Full Height .................. 250.
With Key Lock add ......... 30.
Internal Kit -All Macs ......... 39.

Internal Hard Disks
CDC 3.5” Drive
CDC 135mb .................. 1795.
CDC 172mb .................. 1995.

Connor 3.5” Drive
100mb Cp-3100 .............. 788.
Quantum 3.5” Drive
Quantum 105mb .............. 898.
Quantum 40mb .............. 419.
Quantum 80mb .............. 790.

Seagate 3.5” Drive
20mb St-125n-1 .............. 325.
30mb St-138n-1 .............. 365.

Pro Plus Software
Wall Street Investor ........ 395.

Prometheus
MacKNOWLEDGE ........ 124.

ProVUE
Panorama 1.1 .............. 204.

Quark
QuarkStyle .............. 189.
XPress 2.11 .............. 485.

Sabastian Software
Image Grabber .............. 24.

Select Micro Systems
Extratex 1.2 .............. 214.
MapMaker 3.0 .............. 214.

Silicon Beach Software
Digital Darkroom .............. 248.
Super 30.2 (Color) ........ 315.
Super Card .............. 128.
Super Paint 2.0 .............. 124.

SmethersBarnes
Prototype 2.1 .............. 198.

Smith Micro Software
Quicklink .............. 48.
Software Ventures
Microphone 1.5 .......... 109.
Microphone II .............. 215.

Solutions
backFax .................. 124.
Curator .................. 72.
SmartScrap & Clipper .... 45.
Super Gue 2.0 .............. 61.

SuperMac Software
Disk R 1.5 .............. 58.
Network Disk File ........ 225.
PixelPaint Pro .............. 398.
Sentinel 2.0 .............. 88.
Super Spool 5.0 .............. 58.
SuperUser/Spool 2.0 Multi User (1 to 5) ........ 298.
Single User .............. 85.

Survivor Software
Invoice II .............. 52.
MacMoney 3.02 .............. 59.

Symantec
Just Enough Pascal ............ 49.
Lightspeed Pascal 2.0 .... 92.

Syncex
Synergy Software
Kaledisograph 2.0 ........ 148.
Versa Term 4.0 ........ 88.
Versa Term Pro 2.20 ........ 174.

Synergy Software
Kaledisograph 2.0 ........ 148.
Versa Term 4.0 ........ 88.
Versa Term Pro 2.20 ........ 174.

Synex
MacEnvelope Plus ............ 179.
MacPhone Book ............ CALL.
MacInvoice ............ CALL.
MacEnvelope ............ CALL.

Zoner
Invoice II .............. 52.
MacMoney 3.02 .............. 59.

Overnight Delivery $3 Dollars
### Business Hours
Our phone lines are open for orders:

**Monday - Friday:**
- 8 am to 5 pm Pacific Time

**Saturday:**
- 9 am to 1 pm Pacific Time

### Ordering Information
We accept VISA, MASTERCARD, AMERICAN EXPRESS, and checks.

**International Orders:**
- We accept VISA, MASTERCARD, AMERICAN EXPRESS.
- We ship anywhere in the world using the quickest and least expensive methods possible.
- Payment by check in U.S. dollars.
- All orders subject to availability and shipping charges.
- We will refund you the difference.
- All returns must have authorization.
- Products we sell come with a 30 to 60 day money-back guarantee.

### Warranties & Guarantees
All products are covered by a 120 day limited warranty. Defective software replaced immediately. Hardware replaced or repaired at our discretion after 30 days. Mac Zone has a 30 day money-back guarantee on hardware.

### Electronic Orders
- E-mail us your orders or questions to us via CompuServe (73667.3636) or GEnie (MACZONE).
- MacZone uses CE Software's QuickMail to check our mail hourly.

### International Orders
- We accept VISA, MASTERCARD, AMERICAN EXPRESS.
- We ship anywhere in the world using the quickest and least expensive methods possible.
- Payment by check in U.S. dollars.
- All orders subject to availability and shipping charges.
- We will refund you the difference.
- All returns must have authorization.
- Products we sell come with a 30 to 60 day money-back guarantee.

### Shipping Information USA
- All orders over $50.00 are shipped via First Class Mail.
- All orders under $50.00 are shipped via UPS Ground.
- Orders are shipped to the customer within 48 hours (Monday through Friday, excluding holidays).
- Orders placed before 3:00 pm EST will be shipped the same day.
- Orders placed after 3:00 pm EST will be shipped the following day.
- UPS rates are based on weight and distance.

### Customer Service
- MacZone is a trademark of Multiple Zones International.
- We ship anywhere in the world, using the quickest and least expensive methods possible.
- Payment by check in U.S. dollars.
- All orders subject to availability and shipping charges. We will refund you the difference.
- All returns must have authorization.
- Products we sell come with a 30 to 60 day money-back guarantee.

---

**Contact Information**
- **Phone:** (206) 883-1975
- **Fax:** (206) 881-248
- **Email:** maczone@ce.com
- **Address:** 1001 NE 66th Street, Suite A110, Redmond, WA 98052

---

**Related Links**
- [MacZone's Home Page](https://www.maczone.com)
- [MacZone's Customer Service](https://www.maczone.com/support)
- [MacZone's Shipping Information](https://www.maczone.com/shipping)
- [MacZone's Warranty Information](https://www.maczone.com/warranty)

---

**Support Information**
- **Phone:** 1-800-248-0800
- **Fax:** 1-800-248-0300
- **Email:** support@maczone.com
- **Address:** 1001 NE 66th Street, Suite A110, Redmond, WA 98052

---

**Important Notes**
- All returns must have an authorization number.
- Products are covered by a 120 day limited warranty.
- Defective software replaced immediately. Hardware replaced or repaired at our discretion after 30 days.
- Mac Zone has a 30 day money-back guarantee on hardware.
- If you are not completely satisfied with a purchase, many of the products we sell come with a 30 day money-back guarantee. Ask for details when you place your order.
- All returns must have an authorization number.

---

**Disclaimer**
- MacZone is a trademark of Multiple Zones International.
- We ship anywhere in the world, using the quickest and least expensive methods possible.
Get what you want this holiday season.

Sure you can. Just call the Mac experts at the MacZone. We have expertise and knowledge to make sure you get what you really want. And no one carries a wider selection of Mac products.

T/Maker
Writeflow 2.0 ................. 108.
Tactic Software
ArtClip 1st Ed ................ 52.
ArtClip 2nd Ed ................. 68.
ArtFonts 1/2/3 ................ 52.
ArtFonts Pack ................ 129.
FontShare ...................... 129.
Icon-It ......................... 42.
Sound Clips 1 .................. 59.
Sound Clips 2 .................. 52.
Timeworks
HyperWorks Organizer ........ 59.
Publish III ..................... 247.
TML Systems
TML Pascal I 3.0 .............. 56.
TML Pascal II 3.0 w/MIPW3.0 108.
TML Source Code Lib. ....... 39.
TOPS
Index 2 1 Starter Kit ........ 148.
Index 4: Personal Comm. ... 44.
TOPS (DOS Version) ......... 114.
TOPS (Mac Version) ......... 139.
TOPS Netfront II .............. 117.
Traveling Software
Lap-Link Mac 2.0 ............. 81.
Trendware
XCAL ......................... 77.
True Basic
True Basic 2.02 .............. 56.
3-D Graphics ................. 43.
Scientific Graphics .......... 43.
U.S. Micro Labs
FontShare ..................... 69.
Versacad
Versacad Draftr .............. 419.
WordPerfect Corp.
WordPerfect 1.02 ............. 189.

CanOpener .................... $64.
Abbott Systems
Can open any type of text, EPSF, PICT, or paint file without requiring conversion even if it's contained within another file type.

Xerox (Datacopy)
AcuText ....................... 545.
Zedcor Inc.
DeskPaint/DeskDraw 2.0 .... 64.
2Basic 5.0 .................... 95.

ALTRA
A completely new design in pointing devices. Designed to be used with the fingers, using the same motion as writing with a pen. The optical measurement system combined with the on-board micro processor enables Felix to provide unmatched ease of use and pointing control.

Felix ......................... $129.

Hardware
SCANNERS
Abaton
Scanner 300/S ................ 1198.
Scanner 300/3G ............... 1495.
Logicel
Scan Men ...................... 339.
RasterOps
TrueCapture 324 ............. 1995.
TrueCapture 324 w/ColorBoard 264 - Mac II ........ 2395.
TrueCapture 324 w/Composite Video Option .......... 2398.

ScheduleMaker 3.01 .......... $298.

Tactic Software
ArtClip 1st Ed ................ 52.
ArtClip 2nd Ed ................. 68.
ArtFonts 1/2/3 ................ 52.
ArtFonts Pack ................ 129.
FontShare ...................... 129.
Icon-It ......................... 42.
Sound Clips 1 .................. 59.
Sound Clips 2 .................. 52.

Timeworks
HyperWorks Organizer ........ 59.
Publish III ..................... 247.

TML Systems
TML Pascal I 3.0 .............. 56.
TML Pascal II 3.0 w/MIPW3.0 108.
TML Source Code Lib. ....... 39.

TOPS
Index 2 1 Starter Kit ........ 148.
Index 4: Personal Comm. ... 44.
TOPS (DOS Version) ......... 114.
TOPS (Mac Version) ......... 139.
TOPS Netfront II .............. 117.

Traveling Software
Lap-Link Mac 2.0 ............. 81.

Trendware
XCAL ......................... 77.

True Basic
True Basic 2.02 .............. 56.
3-D Graphics ................. 43.
Scientific Graphics .......... 43.

U.S. Micro Labs
FontShare ..................... 69.

Versacad
Versacad Draftr .............. 419.

WordPerfect Corp.
WordPerfect 1.02 ............. 189.

CanOpener .................... $64.

Abbott Systems
Can open any type of text, EPSF, PICT, or paint file without requiring conversion even if it's contained within another file type.

Xerox (Datacopy)
AcuText ....................... 545.

Zedcor Inc.
DeskPaint/DeskDraw 2.0 .... 64.
2Basic 5.0 .................... 95.

ALTRA
A completely new design in pointing devices. Designed to be used with the fingers, using the same motion as writing with a pen. The optical measurement system combined with the on-board micro processor enables Felix to provide unmatched ease of use and pointing control.

Felix ......................... $129.

Hardware
SCANNERS
Abaton
Scanner 300/S ................ 1198.
Scanner 300/3G ............... 1495.
Logicel
Scan Men ...................... 339.
RasterOps
TrueCapture 324 ............. 1995.
TrueCapture 324 w/ColorBoard 264 - Mac II ........ 2395.
TrueCapture 324 w/Composite Video Option .......... 2398.

ScheduleMaker 3.01 .......... $298.

Our savings are huge. Our advice is free.

1-800-248-0800

Shiva Corporation
NetBridge ..................... 359.
NetRouter V2400 ............. 439.
NetSerial ..................... 289.
NetBridge ..................... 348.

Supra Corp.
Supra Modem 2400 ........... 129.

Telebit
T-1000 9600 BPS ............. 699.
T-2000 19,000 BPS .......... 1254.
T-2560 V32 19,000 ...... 1254.

U.S. Robotics
2400 baud .................. 347.
9600 baud HST .............. 685.

MONITORS, GRAPHICS
CARDS & COLORBOARDS

Micron Colorboards
NB-10-78 (8 Bit) Mac IIs (for 19" monitors) .......... 598.
NB-6-48 (8 Bit) Mac IIs (for 14-17 monitor) .......... 385.

NEC - Color Monitors
MacSync 14" ................ 598.
NEC MultiSync XI 20" .... 2695.

RasterOps
ClearView 19" SE Monitor w/60MB (with W4W) ....... 1595.
ColorBoard
106+ ......................... 1249.
106+ SE/30 .................. 1439.
2432 (32 Bit) Color ........ 3995.
264 Mac II (24 Bit) ......... 785.
264 SE/30 (24 Bit) .......... 938.
Trintron 19" .......... 3398.

Sony - Color Monitors
14" 1204i Hu Multisync .... 795.
16i HG Multisync .......... 2498.
19i HG Multisync .......... 3198.

Tanzan
Crystal View - Mac SE, II, llx, ICx, SE/30 .......... 1395.

ACCELERATORS & UPGRADES

Daystar Digital - Accelerators
Mac SE - 030 16MHz .......... 975.
Mac SE - 020 25MHz .......... 1595.
Mac SE - 030 33MHz .......... 2395.
Mac II & llx Accelerators
68030 25MHz .......... 1798.
68030 33MHz .............. 3096.
68030 40MHz .............. 3748.
68030 50MHz .............. 4496.
Fast Cache Iici .............. 576.

Leprechaun .................. $29.

Shodan
Arcade/puzzle game with digital sound and full 256 color graphics (also works in black & white). A challenge for everyone.

Daxe
MacSnap Upgrades
524 (512K to 1MB) .......... 192.
524e (512K to 1MB) .......... 185.
524s (512K to 1MB) with SCSI port .......... 235.
548 (512K to 2MB) .......... 415.
548e (512K to 2MB) with SCSI port .......... 475.

SCSI Port Adapter .......... 109.
Marathon 2025-SE Accelerators
MSE1 (Board Only) .......... 419.
MSEZ (w/SCSI) .......... 715.
Order by the 22nd and we'll be home for Christmas.

Good news for last minute shoppers—if you call us with your holiday order by December 22, we'll rush it to you overnight for just $3. So it can be under the tree by Christmas.

1-800-248-0800

Product Guarantee:
If you are not completely satisfied with your purchase, many of the products we sell come with a 30 to 60 day money back guarantee. Ask for details when you place your order.
What is a Zoner Loaner?

We stand behind our hard drives. If a drive you buy from us goes down during its warranty period and we can't fix it over the phone, we'll ship a Zoner Loaner drive to you overnight. Now you know why we say our service is as good as our savings.

MacSync...$598./ColorBoard 264...$785.

 Silicon Beach
 Award winning Super Paint combines Paint and Draw in one easy to use power graphics program. Includes features like Auto Trace automatically convert Paint graphics into Draw objects, customizable Airbrush, and a Freeware tool to easily sketch editable Bezier curves.

 ML Baseball II...$26
 Micro League Sports
 For fantasy league fanatics, yesterday's legends, today's stars, and tomorrow's greats all take the diamond under your control!

 Premier Software
 Net Trek..34
 Strategic Conquest 2.0...34
 Shodan..29

 Silicon Beach Software
 Apache Strike..24
 Beyond Dark Castle..24
 Dark Castle..22

 Software Toolworks
 Cribbage King/Sim King..38
 Hunt For Red October..31
 Life And Death..31

 Sphere
 Falcon 2.0..30
 Gato 1.4..26
 Pi-109..26
 Solitaire Royale (Color)..19
 Tetris (Black & White)..19
 Tetris (Color)..22

 Spinnaker
 Sargon IV..26
 Strategic Simulations, Inc.
 Adv. Dungeons & Dragons: Pool of Radiance..32

 Three Sixty
 San Diego?..26
 Sandiego?..26

 Education
 Bible Research Systems
 The Word (KJV)..164
 The Word (NKJV)..164
 The Word (RSV)..164

 Puzzle Gallery...$31
 Miles Computing
 Welcome to Hazard Park, a carnival of conundrums, a midway of mystery, a new game from the author of ever popular Fool's Errand.

 Borland International
 Eureka: The Solver..127
 Bright Star Technology
 Alphabet Blocks..29
 Talking Ties..25

 Braderbund
 Calculus..58
 Geometry..58
 Physics..58
 Type!..18

 Davidson & Associates
 Math Blaster..26
 Great Wave Software
 KidsMath..26
 KidsTime..25
 Number Maze..26

 Learning Company
 Math Rabbit..31
 Reader Rabbit 2.1..31

 Pipe Dream..$28
 Lucas/Im
 Lay pipe like a madman and keep the flooz flowing! Brand new, highly original arcade style game comes complete with DA version.

 Nordic
 Alphabetizer..27
 BodyWorks..27
 Clockworks..27
 CornerWorks..27
 EarthWorks..27
 FistWorks..27
 Lemonade Stand..27
 Naval Battle..27
 Preschool Disk 1..27
 Preschool Disk 2..27
 Turbo Math Facts..27
 Word Search..27

 Penton Overseas
 Ventobal,ear/ce French..30
 Ventobal/ear/ce German..30
 Venture/de/ce Italian..36
 Venture/de/ce Spanish..30

 Simon & Schuster
 Typing Tutor IV..29

 Software Toolworks
 Magic Beacon
 Teaches Typing..32
 Spinnaker
 Typing Made Easy..25

 True Basic
 Algebra..33
 Arithmetic..33
 Calculus..33
 Discrete Mathematics..33
 Pre-Cal/Trigonometry..33
 Probability Theory..33
 TrueSTAT..33

 Music
 Ars Nova
 Pratica Musica 2.19..72

 Boga Productions
 Super Studio Session..65
 Studio Session 1.4..46
 Country..13
 Heavy Metal..13
 Sound Effects..13
 String Quartet..13

 Braderbund
 Jam Session..28

 Coda
 Female 1.26..399
 Mac Drums..31
 Perceive..49

 Electronic Arts
 Digital Music Construction Set 2.0..82
 Deluxe Recorder..99

 Farallon
 MacRecorder 2.0..164

 Great Wave Software
 ConcertWare Plus..38
 ConcertWare Plus MIDI..78

 Mark Of The Unicorn
 Professional Composer..389
 Professional Performer..393

 NEC & RasterOps
 The RasterOps ColorBoard 264, now available for any Mac II, as well as the SE/30, makes incredible 32-bit color yours, with all the colors of the rainbow and a few others besides. compatibility with most 13" & 14" color monitors—we recommend the outstanding NEC 14" color monitor.

 Super Paint
 $124.

 Mosaic
 Spectacular full color PostScript clip art available in 12 different volumes (consisting of assortments of 96 images from popular subjects), or by single subject, including Birds, Fish, Insects, Wild Animals, Domestic Animals, Flowers, Food, Holidays, Nautical, Sports, Tools & Hardware.

 Totem Graphics
 CALL

 Portfolio Systems
 The Instant Address Book is a fast on-line personal database that elegantly prints double-sided address pages for Flexfax and most organizer systems. Includes "red-line" tape paper and powerful database functions like find, sort, select, delete, insert, export, merge, and much more.

 Dynadex
 $98.

 1-800-248-0800
 Our savings are huge. Our advice is free.
MouseStick...$64./MouseStick AOB...$79.

Targus Bags .......................see listings

Intersect CD-ROM Player ...........$498.

Targus A well padded bag with plenty of room for your Mac, keyboard, mouse, hard disk, cords and cables. Nylon material and extra heavy duty construction makes the Targus bag the ideal way to safely transport your Macintosh or ImageWriter to wherever your business takes you.

Macintosh SIMM Upgrades ..........CALL

SIMM Chip Upgrades Does your computer just nibble at it's work? Put some teeth in your mother board. One megabyte SIMMs (for Mac Plus, SE, SE/20, II, IIx, IIcx & IIci) are easy to install, especially since we include complete installation instructions. It's time to give your Mac the RAM it needs to take a bigger bite.

MacZone page 8 of 8

Order 8 a.m.-1 a.m., E.S.T.

Those are our exceptionally convenient phone hours (that's 5 a.m. to 10 p.m. Pacific time). And if they're still not convenient enough, you can always fax your order to us 24 hours a day at (206) 881-3421.

Mac Zone 7 Outlet & Surf Spcl. ........24.
Mouse Pads (6" x 9") ........89.
Black, Blue, Gray or Red .6.
SCSI Tester .......................39.
Mac Tool Kit .....................15.
Mazeli 150mb Backup Tape ....24.
60 mb Backup Tape ........19.
Microlytics Personal Organizer w/Mac Advantage .............98.
Microsoft Print Excel In Business ........20.
Mobius Fanny Mac ..............59.
MGC Technologies A+ series (512k & Plus) ....59.
+ A+ Mouse AOB ...........79.
Orange Micro Grapper Spooler ..........38.
Grapper CMac/GS ..........78.
Grappler Mac LG or LS ........102.
Somak Script Edit ...............49.
Sony Discs 8mm Tape Cartridge ....26.
DC 2000 mb Tape ..............19.
DS- 10 Pack ...................14.
DS-Bulk (Units of 50) ........29.
Hi Density - 10 pk (1.44mb) ...27.
Hi Density - Bulk (Min. 50) ....1.20

Summagraphics Bil. Pad Plus ....324.
(12 x 12 Tablet - ADB).

Targus Dlx SE Extended Bag - Black, Gray, Navy, or Wine .... 72.
ImageWriter Bag Black ........56.
Mac/SE Bag Black ..............56.
Williams & Macias myDiskLabeler .......33.
Labels, 2 1/2 (Laser/Writer) .... 18.
ImageWriter) ....... 28.
Labels, 2 1/2 (LaserWriter) .... 15.
Sticky Business ............89.

MacZone Colby Giveaway

1805 NE 86th St. Suite A 110
Redmond, WA 98052

When you order by phone, fax or mail, you are automatically entered in the drawing. You can also enter by mailing us this coupon.

Name ____________________________
Address __________________________
City __________________ State ______ Zip ______ APT ______

Order 8 a.m.-1 a.m., E.S.T.

Those are our exceptionally convenient phone hours (that's 5 a.m. to 10 p.m. Pacific time). And if they're still not convenient enough, you can always fax your order to us 24 hours a day at (206) 881-3421.

Gemini 020/030 Accelerators-see listings

MacZone page 8 of 8

Circle 70 on reader service card
If your spreadsheet is spreading you too thin, pinpoint your prospects with GeoQuery.

A spreadsheet can tell you where your customers are. But it can't show you. So you lose precious hours just locating your prospects, instead of selling them.

If only you had GeoQuery? It turns your names and addresses into push pins on a map. Using the data in most any spreadsheet or database, from a Macintosh, PC, VAX™ or mainframe.

Don't know the client in Fresno? No problem. Click on the Fresno pushpin, and GeoQuery will tell you all about him.

Will that new territory support a field office? Ask GeoQuery. Draw a circle anywhere, and get a report on every prospect inside.

To see how GeoQuery addresses these and other pointed questions, call the toll-free number below.

Call 1-800-323-5423. In IL, 1-312-498-5615.

GOOD BUY FOR NOW
One more piece of advice: don't put off a purchase in the hopes that next year's Mac family will offer dramatic new features at half the price. If you really need a machine now, buy a machine now. It may be supplanted by faster machines with new features, but if you buy a Mac with expansion slots, chances are you'll be able to buy boards that boost performance or add new features to your existing machine.

More to the point, if you wait to buy a Mac, you'll miss out on the productivity-boosting benefits one can provide. It's like waiting to buy a car in the hopes that next year's model will be cheaper or get better gas mileage. Maybe it will, maybe it won't, but one thing is certain: you'll do a lot of walking in the meantime.

See Where to Buy for contact information.

Jim Heid is a Macworld contributing editor who each month focuses on a different aspect of Mac fundamentals. His latest book is Inside the Apple Macintosh, an advanced user's guide (Brady Books).
Big-league stats for the serious player.

When you want more data analysis power from your Macintosh, the only game in town is SPSS.

When you've got to know the score, you need more than an ordinary statistics package. You need the most powerful data analysis software ever created for the Macintosh: SPSS.

Only SPSS for the Macintosh gives you all the same analytical capabilities as our legendary SPSS mainframe and workstation software.

So you get more ways to turn data into knowledge.

Our Macintosh user interface puts you in control of data and file management. Basic and advanced statistical procedures like time series analysis and forecasting, nonlinear regression, discriminant analysis and more. Plus award-winning presentation graphics and tables to let you display your results.

In short, you get more statistical methods and features with SPSS than with any other Mac software.

And SPSS also gives you one other vital feature: the SPSS support team that's come through for over a million users in the last 20 years.

So if you're serious about winning, don't settle for anything less than the power you need. Find out more about SPSS by calling [312] 329-3323.

And get the knowledge to be first in your field.

Best in the final analysis.

444 North Michigan Avenue, Chicago, Illinois 60611
SPSS International BV: Avelingen West 80,
P.O. Box 115, 4200 AC Gorinchem, The Netherlands

Circle 210 on reader service card
Two out of three serious writers recommend WordPerfect word processing software.

And that's no joke. Because from one-liners to technical guidelines, writing is serious business.

That's why so many serious writers recommend WordPerfect. And with good reason.

Take the powerful WordPerfect Columns, for example.

Whether you're writing a play, the ten o'clock news, or tomorrow's daily schedule, you'll find WordPerfect parallel columns unparalleled.

And WordPerfect newspaper columns turn annual reports and company newsletters into mouseplay.

Then take a serious look at the WordPerfect Speller. Not only will it snag your typos, it can help you spell proboscis, rhinoplasty, or any of 115,000 other words.

And speaking of other words, the WordPerfect Thesaurus can put a screenful right under your nose.

Meanwhile, WordPerfect macros reduce long tedious tasks to the click of a mouse.

Add the reassurance of toll-free support and you've got one serious word processor.

If that's not as plain as the nose on your face, call us toll-free at 1-800-526-5034. We'll send you Ten Reasons Why Serious Writers Recommend WordPerfect for the Mac.
By adding more than 300 features to 4th Dimension (commonly referred to as 4D), ACIUS has created a rich environment for database users at all levels. Report and label generators, object scripts, automatic bidirectional file relationships, automatic button actions, and many other new features make 4th Dimension 2.0 a powerful tool for users and developers alike.

STRUCTURING YOUR DATABASE
Whenever you create a new 4th Dimension database, you see a Structure window, which is where you set up and modify your database structure. Here are a few tips for streamlining the process ("Navigating Your Structure" shows some of them in action).

Double-click on a file name to see a list of all existing layouts for that file or to create a new layout for that file. To add new fields to the file, double-click on the area below the file name and below any existing fields in the file. You can also double-click on an existing field to modify its attributes or change its name.

Use the Show Page icon in the lower-left corner of the Structure window to navigate complex structures. Click on this icon to display a sized-to-fit view of your entire structure. Then to scroll to a different area of the structure quickly, move a gray box over the area you wish to view and click the OK button (a feature also available in 4D’s Layout editor).

TRUE OR FALSE
One of 4D’s new field types is Boolean, which stores logical values of true or false. The default setting is a pair of radio buttons labeled Yes and No, but a Boolean field can also be displayed as a single check box. To select a value for a Boolean field, you can click on one of the radio buttons or on the check box, or type Y or N. You can change the default to other values—for example, Married or Single. You can select your choice by typing the first character, in this case, M or S (typing Y or N will also still work).

SETTING UP LAYOUTS
If you use one of 4D’s standard layout forms and you don’t select any fields to be in the layout, 4D automatically creates a layout with all the fields in the file. Even if you don’t want all fields included, it’s often easier to modify these generated layouts than to build one from scratch.

When adding a new field to a layout you usually want to match the visual formatting characteristics of the fields already in the layout. 4D’s object-oriented approach makes this a snap. Select one of the fields that is already in the layout—along with its label—and click the Duplicate icon in the tool palette (or press Alt-D). Once the duplicate is created, drag it into position and adjust its size if necessary. Then double-click on the field from the scroll box of field names in the Field Definition dialog box.

If you’ve added several fields to a file’s structure and need to modify the layout to reflect the changes, use the Add to Layout command from the Layout menu (this menu appears only when you are using the Layout editor). This will allow you to either quickly create an entire new setup for the current layout or just add a group of fields to the layout without having to create them one by one.

THE FIRST FIELD
The entry order of fields you set in the layout determines the order in which the cursor moves from field to field as the user enters data and tabs through the database. An often confusing aspect of this process is how to change the first enterable object (a field or variable) in the layout.

After you’ve opened the layout, select Entry Order from the Layout menu. A line appears connecting all the enterable objects on your layout. Use the Entry Order pointer to click and drag from the current first object in the layout to the desired first object.
Crystal Quest: $49.95
Crystal Quest & CritterEditor: $79.95

Casady & Greene Inc.
POB 223779, Carmel, CA 93922
Information: (408) 624-8716
Orders: (800) 331-4321
In CA: (800) 851-1986

INSIGHTS
HOW TO

LAYOUT EDITOR SHORTCUTS

- Click (with any tool but text tool)
  Returns you to the arrow tool

- Click-drag
  Creates a new object with the last-selected tool

- Shift-click on an object
  Places a 1-pixel border around the object

- Option-click on an object
  Opens the object's script

- Control-double-click on an object
  Opens the object's Position dialog box

Control select
Holding down the Control key while selecting an object selects only the objects completely enclosed by the selection rectangle.

Shift-drag a control marker
Moves the selected control marker and all markers below it

Other Shift key options
Pressing the Shift key while creating or modifying an object constrains movement so that lines will be only vertical or horizontal; rectangles will always be square; and ovals will be circles.

SELECTING RECORDS
In addition to letting you select records via a search, 4D lets you select records manually. You select multiple records by either Shift-clicking to select contiguous records or Clicking to create a discontiguous selection. Once you've highlighted the records you want, select Show Subset from the Select menu. 4D then lists only the selected records. You can use those records for a report, graph, labels, or any other 4D operation that works on a selection of records.

IMPORTING
If you've worked with other database programs, you probably have data you want to import into 4D. It turns out that the fastest method of doing this is also the easiest. If the data you wish to import is saved as Text, DIF, or SYLK, you can use the Import Data command in the File menu of the User environment.

If the fields in the data file you're importing are in the same order as the fields in your 4D database, you can just click Open and 4D automatically places the fields from the data file in the corresponding 4D fields. Even if the fields in both files are in the same order, the process goes much faster if you use the import list at the bottom of the Import Data dialog box, which tells 4D where to place the data as it is imported. The difference in speed is dramatic. This feature also enables you to map the fields in a data file to any field in your 4D database.

SEARCHING
The Save and Load feature of the Search editor saves time by allowing you to store, modify, and reuse searches. After performing a Search by Layout in the User environment, 4D displays the search criteria in the Search editor and gives you the option of saving. Next time you want to perform the search, just use the Load button in the Search editor to retrieve the search criteria.
MiniCad+ TM
Computer-Aided Design and Analysis comes of Age

MiniCad+ rises on the foundations of a groundbreaking Macintosh CAD program, MiniCad 2D/3D. Universal in aim, MiniCad Plus is a total design and analysis solution, the answer to time-consuming transfers between applications. This professional CAD system offers the following easy-to-use components:

- High precision 2D drafting environment which includes complex duplication with arrays, hierarchical symbol editing with both external and internal libraries, fillets, beziers & cubic splines, auto-join, auto-dimensioning, continuously variable zoom up to 1000x, double-line tools with auto-clean up, 256 user-definable attributes, 8 line types, unlimited layers, full use of Mac II, and more...
- Active spreadsheet inside drafting area which can be hot linked with objects to perform area calculations, parts schedules, cost estimation and more. As easy-to-use as the spreadsheet you’re using now.
- All new integrated 3D that is so powerful and user-friendly we may change your mind about micro 3D.
- MiniPascal, a programmable macro language, will allow advanced users and 3rd party vendors to create reports, macros, and powerful extensions to MiniCad Plus's capabilities.

Graphsoft • 8370 Court Ave. Suite 101 • Ellicott City, MD • 21043
MiniCad+ $695 • Demo Available for only $19.00
MiniCad Plotter Drivers: Prof. $300 Stand. $150
U.S.: 1 (301) 461-9488 • Canada: 1 (604) 384-2151 • Australia: 61-7-369-1204
Visa & MasterCard Welcome

Circle 177 on reader service card
Insurance For Fried Apples?

When your surge protector fails will your insurance save you? SAFEWARE® computer insurance covers power surges, lightning, theft, fire, accidental damage and more! Full replacement of hardware, media and purchased software for as little as $39 per year.

<table>
<thead>
<tr>
<th>Total Value, Hardware, Media &amp; Purchased Software</th>
<th>Annual Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>up to $2,000</td>
<td>$39</td>
</tr>
<tr>
<td>$2,001- $5,000</td>
<td>$69</td>
</tr>
<tr>
<td>$5,001- $8,000</td>
<td>$89</td>
</tr>
<tr>
<td>$8,001- $11,000</td>
<td>$109</td>
</tr>
<tr>
<td>$11,001- $14,000</td>
<td>$129</td>
</tr>
</tbody>
</table>

For immediate coverage, information and rates on higher coverages, call 1-800-848-3469
Locally 614-262-0559
On Compuserve, GO SAFEWARE, The Insurance Agency Inc.
2929 N. High St., P.O. Box 02211, Columbus, OH 43202

Circle 293 on reader service card

How To Make The Dollar Stronger Overseas.

Give to CARE. 95% of every dollar we receive goes to help impoverished people in the third world.

Small wonder that we're the best run, best managed charity in America.

CARE
We're Helping People Learn To Live Without Us
1-800-242-GIVE

ANNOUNCING THE BIGGEST RIP-OFF IN THE HISTORY OF THIS MAGAZINE.

Two months ago we at AGFA Compugraphic and Adobe ran an informative, 12-page advertising insert on PostScript® and the future of electronic publishing.

Many of you wanted to rip it out, but couldn't. Many of you also called for extra copies. So here's your chance to get a permanent copy of the insert for free. Just call 1-800-227-2780, AGFA, extension 2400 (in Canada, 1-800-387-9533), or send in the attached coupon.

Mail to: AGFA Compugraphic, P.O. Box N1098
New Bedford, MA 02746-9961

Name ________________
Title/Company ________________
Address ____________________________________________________________
City/State/Zip ________________
Phone _______________________

AGFA
AGFA COMPUGRAPHIC DIVISION

POSTSCRIPT is a trademark of Adobe Systems Inc.

Circle 460 on reader service card

Color Support
4D's color submenu lets you select both a foreground and a background color for each 4D object. You can copy custom palettes into the database structure to replace 4D's default palette.

INSIGHTS
HOW TO

search criteria. Saved searches are a boon for less experienced users who need to access your database. They don't need to figure out how to set up a complex search; they merely retrieve one you've already created. 4D also performs relational searches via the Search editor; for example, you can search the Invoice file for all Invoice records belonging to customers with balances higher than $10,000. 4D's automatic relations make this possible even though the balance is stored only in the Customer file.

SORTING
4D 2.0 performs relational sorts. For example, if you set up an automatic relation between the Employees and the Companies files, users can easily sort employee records based on the zip codes stored in the Companies file without having to store those zip codes in the Employees file.

In 4D 2.0 you can sort by formula, for example, based on the length of the data stored in a field, or on a particular character in the field. The latter is useful for creating directory-style reports that have a break between names starting with different letters of the alphabet (see the Contacts II example that comes with 4D).

BY DEFAULT
4D 2.0 provides codes for setting default values, which can be used in layouts and in the Quick Report editor. These include #D, the date from the Macintosh clock; #H, the time from the Macintosh clock; and #P, the current printing page (for use in re-
双击文件名可以创建新的布局。

双击此区域可以创建一个新的字段。

单击Show Page box可以将整个文件结构显示出来。使用此功能可以浏览复杂文件结构。

**EXPORTING QUICK REPORTS**

Quick Report editor允许你将报告打印到磁盘，使其成为一个强大的工具来导出数据到字处理器和页面布局程序。Quick Report editor导出计算字段、子总数和总和。它甚至允许你选择特定部分的报告（选择Hide Line from the Edit menu）。因此，你可以创建格式化的文本文件，这些文件将需要数小时的编程。4D。

要将报告打印到磁盘，选择File menu中的Print To命令。在出现的对话框中选择Disk File选项。

**FILTERS**

Filters是4D 2.0中最有趣的功能之一。你可以在Field Definition对话框中添加字段的过滤器，或者通过4th Dimension语言程序性地设置。过滤器可以帮助数据输入者理解字段的期望值，并防止输入错误的类型。

例如，这个过滤器

```
Enter phone number: (###) #___#
```

将显示以下消息，只在用户输入电话号码时。

```
Enter phone number: (____) _____-
```

```
Make the field large enough on the layout for the message to be displayed.
```

**STYLES**

使用风格来保存复杂的显示格式和输入过滤器可以大大简化重用或修改格式或过滤器。你可以在Edit Styles对话框中更改风格（该对话框隐藏在Design environment的Preferences对话框中）。该风格会自动更新你引用的任何地方。

**PROCEDURE/SCRIPT EDITOR**

虽然你可以使用4D而无需编写任何程序或脚本，但是你将发现4D内置语言的强大功能。4D提供两种方式来创建和编辑程序：流程图编辑器和列表编辑器。程序和脚本无法相互打开。
Use the Listing editor. The Listing editor is by far the most popular editor for creating 4D scripts and procedures. All of 4D’s documentation and examples revolve around the use of the Listing editor. If you use the Flowchart editor you’ll find that you’re largely on your own.

You may think it’s a good idea to choose Listing as the default in the Preferences dialog box in the Design environment. Don’t do it.

The best setting for the Procedure Default is No Default. If you Option-click on a field or variable in the Layout editor, that object’s script opens automatically. However, if no script exists for that object, 4D creates a new script of the default type. This can be a problem if you didn’t intend to use the object script, since there is no way to delete the script without deleting the object. With a No-Default setting, 4D still opens existing scripts immediately. But if a script doesn’t already exist, you’ll get a dialog box asking which type of procedure to create. This gives you a chance to cancel creation of a new script.

LISTING EDITOR SHORTCUTS
A Fields list, at the bottom-middle of each Procedure window, displays the names of the fields and layouts in your database. Clicking on an item in this list—or on the file name itself—automatically inserts the item into your procedure. You can access the fields and layouts of any file in your database from the Fields list.

In a database with many files, it may be tedious to click on the left and right arrows to find the file you’re looking for. If you click on a file name and hold the mouse button down for about a second, a pop-up list of all the files in the database appears. Use this pop-up to go directly to the file you want. This shortcut is also available in the Search editor, the Sort editor, Quick Report, and Apply/Search by formula.

In the bottom-right portion of Procedure windows, 4D presents a list of all available built-in, user-defined, and external routines. If you press the $ and Shift keys while typing the first couple of letters of a built-in routine, the listing of routines automatically scrolls to the correct entry. You then simply click on it to enter it into your procedure.

A similar shortcut is available in the Procedure dialog box (which you see when you select Procedures from the Design menu in the Design environment). Once you expand the list of global procedures, type $-Shift and the first couple of letters of a global procedure name, and 4D scrolls to it. Don’t forget to use the Sort button as you add new global procedures to keep them in alphabetical order.

FAST CLEANUP
To quickly close all the open windows in the Design environment, click the close box of the front window while holding down the Option key.

GETTING THE BUGS OUT
One of the most powerful programming features of 4D is its built-in debugger. Whenever one of your procedures or scripts is running, you can access 4D’s Debugger by Option-clicking. The Debugger lets you step through the code in the upper half of the window and check the current values of fields and variables in the window’s lower half.

The Debug window has no zoom box in the title bar, but double-clicking on the size box in the lower-right corner makes the window zoom in and out.

You can change the amount of space allotted to each part of the window by Option-dragging the line that separates the top and bottom halves of the window.

You can enter any valid 4D expression in the lower half of the Debug window (called the expression evaluation area). 4D evaluates the expression and shows its current value.

A pair of pop-up menus in the Debugger make it easier to enter a field name or an expression that uses a 4D routine. To access the menus, click in the expression evaluation area to set an insertion point. Then, to get a complete listing of your file structure, hold down the $ key and click at the insertion point. For a complete list of built-in 4D routines, hold down the $ key and click at the insertion point.

These pop-ups may take a few moments to appear, so be sure to hold down the mouse button long enough. Any item you select from the pop-up menu is entered at the insertion point in the Debug window.

CONVERTING FROM 1.0 TO 2.0
Before you run the Converter program on your 1.0 database, run the Repair Database option of 4D Tools 1.04. This cleans up the data and provides a smoother conversion.

After conversion you may want to optimize some layouts. In many cases, layout procedures will no longer be nec-
500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.

500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.

500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.

500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.

500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.

500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.

500 EPS/PICT Images
Volume 1.2 & 3 Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

80 EPS Images
Volume 1. Your new illustrations of business, entertainment, people, business and special occasions.

Great for ads, posters, presentations, marketing, entertainment, sports, transportation, with art, borders and ornaments.

100 EPS Images
Volume 2. Headlines, borders, montages and other elements for design, business and entertainment.

20 Sets of Hot Type letters in Illustrator format.
Volume 3. The desktop publisher can change, stretch, modify & color using Adobe Illustrator or Aldus FreeHand to create perfect headlines and legs.

80 EPS Images
Volume 4. A selection of exciting images depicting food and fun.

80 EPS Images
Volume 5. Image Club makes impressive graphic design a special occasion with quality graphics for Christmas, Birthdays and more.
The new layout will execute a little faster
old layout along with its layout procedure.

If you've used any arrays in your 1.0
application, be sure to read the section on
arrays in 4th Dimension Language Refer­
ence. It tells you how to convert 1.0 array
structures to 2.0 arrays. You'll see real
ture versions of 4D.

Examine the new programming struc­
tures available in 4D 2.0. Wherever pos­
sible use For loops, since they're at least
twice as fast as While loops. One easily
overlooked feature of For loops is the
ability to modify the counter from within
the loop, allowing you to conditionally
exit the loop.

4D ADD-ON PRODUCTS AND
SERVICES

There are quite a few third-party products
and services to enhance your use of 4D,
ranging from regular users of the ACIUS forum, drop me
a note to say hi (Tony Oppenheim, a
note about any 4D-related topic here and you'll most
likely have an answer within a few hours.

One of the best features of 4th Dimension
is ACIUS Technical Support. Fortunately,
it doesn't end at 5 p.m. on Friday. If you
have a modem (and CompuServe Naviga­
tor), log on to the ACIUS forum on Com­
uServe (in Appendix A Subtopic 2), a very
active forum populated by both ACIUS
tech support and 4D developers from
around the country. Post a question about
any 4D-related topic here and you'll most
likely have an answer within a few hours.

Many of the tips for this article came
from regular users of the ACIUS forum.
Some notable contributors include Bob
Shurtleff, Peter Schwitz, Alan Schlingen­
baum, Richard Taylor, and Paul Lambert.
We received many more contributions
than we could possibly use.

SHARE THE WEALTH
If you've found a tip or shortcut not
mentioned here, spread the word to other
Macworld readers by sending it to Quick
Tips, Macworld, 501 Second St., San Fran­
cisco, CA 94107. See Where To Buy for contact information.

Tony Oppenheim is an ACIUS certified de­
veloper based in New York City. His firm,
Options Computer Consulting, creates 4th
Dimension database systems for a wide
variety of clients in the New York Metro­
politan area.

FREE Introductory Offer!

The definitive
design tool
for the Macintosh
is NOW SHIPPING!

FREE Architecture Library disk ($29.95 value), including 4 dozen plans, with every
Design Your Own Home: Architecture ordered by Jan. 31, 1990 that mentions
this ad!

Design Your Own Home: Architecture
Computer software that allows for quick and efficient design work. Draw floor
plans, side views and structural details.

Features:
• architectural shapes and symbols
• custom shape creation
• icon drawing tools
• standard scales
• grids, ruler, measurements
• overlays
• stud/beam repeater

To Order Call: 1-800-451-4871
Or send check or VISA/MasterCard number. Add $5.00 shipping and handling.

Capture Video Images: $249.95!

Capture real-world images on your Mac II/SE, Mac Plus, SE, or
Mac II from any standard video source (video camera, VCR)
On the screen . . .
ComputerEyes includes several options for images display, and
ead and edit options such as shrink, expand, scroll, and more.
Behind the scenes . . .
ComputerEyes acquires larger-than-screen images with 256 gray levels
for desktop publishing and image processing
On paper . . .
ComputerEyes saves images on disk in several file formats
including TIFF, MacPaint, PICT, RIFF, and EPS for use with
PageMaker, Hypercard, MacPaint—virtually all the popular
graphics programs.

ComputerEyes is backed by a one year warranty and the success of
over 20,000 systems sold. See your dealer or order direct.
For more information, example images, or Demo Disk ($3), call (617) 329-5400.

To order call 800-346-0090
VISA, M/C, COD accepted.
Digital Vision Inc.
270 Bridge Street
Dedham, MA 02026

Abracht data
the source of plan making software
PO. Box 2440, Dept. MW
EUGENE, OR 97402
(503) 342-2030

 backgrounds, bedroors, dining rooms, etc.

278
Circle 68 on reader service card.
MACWORLD • JANUARY 1990

H 242 on reader service card
Make Your LocalTalk Network Work As Hard As You Do.

Whether you work hard, fast or just plain smart, Dayna has a tool to help you work better.

It's called DaynaTALK™. A LocalTalk® enhancement that gets the best possible performance out of your network. And everybody working on it.

DaynaTALK boosts LocalTalk transmission rates from the standard 230 Kbps up to 850 Kbps Macintosh® to Macintosh and 1.7 Mbps PC to PC. That means your network cable carries more data per second than ever before.

That's important because on a busy network, every second counts. A unique Collision Avoidance System keeps other 230 Kbps devices on the network from interfering with DaynaTALK's high speed transmissions.

And that means your network can work both fast and error free.

DaynaTALK costs only $139 per Macintosh node, $549 for a 5 Pack or $999 for a 10 Pack. A DaynaTALK PC card is only $299 for a single card or $1099 for a 4 Pack.

So get your LocalTalk network working hard, fast and error free. For sales and dealer information call 801-531-0203.
We couldn’t claim that **NEW FASTBACK II** is the most powerful backup system on the market ...

...unless we had some powerful data to back it up.

<table>
<thead>
<tr>
<th>Feature</th>
<th>FASTBACK II</th>
<th>DiskFit 1.5</th>
<th>Redux 1.5</th>
<th>HD Backup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back up to any HFS device</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Data compression</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Auto-formats without time lapse</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Restores backups from PC</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Built-in macro</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Scheduled macros</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Multiple setup files</td>
<td>YES</td>
<td>NO</td>
<td>#</td>
<td>NO</td>
</tr>
<tr>
<td>Prints labels (ImageWriter &amp; LaserWriter)</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Speed: Kbyte/Min (Mac SE)</td>
<td>1000</td>
<td>273</td>
<td>267</td>
<td>200</td>
</tr>
</tbody>
</table>

# Allowed to save preferences, not multiple setup files.

And these are merely a few of the many exclusive features that make **NEW FASTBACK II** the fastest, easiest and most powerful backup software for the Mac you can buy. Only **FASTBACK II** gives you data compression and compatibility with virtually any HFS device. And you’ll have data security features that assure the safest backup you can make. You’ll have maximum file selection flexibility with powerful backup and restore options so you can easily tailor the process to your own particular needs. In short, you’ll finally have a system that ensures regular backup. **FASTBACK II**. Specifically created for the Mac, and designed to fit smoothly into your corporate computing environment.

**And a powerful $40 exchange offer.**

Save about $149! Just send in this coupon and the original title page of all your current backup manuals with payment of $40* per copy, and we’ll send you new **FASTBACK II**. Current users of **Fastback** can upgrade for only $35.* This limited offer is subject to change and expires Jan. 31, 1996.

---

Call about our $40 exchange offer. 1-800-873-4384

FIFTH GENERATION SYSTEMS

11200 Industrilplex Blvd. • Baton Rouge, LA 70809

504-291-7221

DiskFit is a trademark of SuperMac Technologies.

Redux is a trademark of Microseeds Publishing.

Macintosh, Mac, HD Backup, ImageWriter and LaserWriter are trademarks of Apple Computer, Inc.

This product is in no way associated with or has originated in Fisher Scientific or Allied Corporation.

Dealers circle 364 on reader service card
End Users circle 250 on reader service card
UPDATES

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Construction Set version 2.0 allows you to create an unlimited number of parts such as buttons and LEDs; "paper tape" graphic can hold up to 32K; includes financial functions, bit-operation functions, and functions that affect the calculator itself. Dubl-Click, 9316 Deer- ing Ave., Chatsworth, CA 91311; 818/700-9525. $25; $89.95 new.

Excellerate for Microsoft Excel 2.2 adds two new modules: What's New for 2.2 and Macros for 2.2. Macros for 2.2 covers the new macro features in Excel 2.2, and What's New for 2.2 covers other features such as creating borders, using multiple fonts, assigning colors, adding notes to cells, protecting and auditing spreadsheets, using data forms, and using internal and external macros. Personal Training Systems, 828 S. Bascom, #10 0, San Jose, CA 95128; 408/559-8635. $25 per module; $49.95 per module (nine-module set) new.

Gofer version 2.0 performs searches for any Mac hard disk or file server and supports a variety of additional programs, such as FullWrite, MacWrite II, Word 4.0, and Microsoft Works. Includes wildcard function and Search-Set feature to make it easier for users to locate hard-to-find information, and to let users retrieve lost data using a minimal amount of information. The Search-Set feature allows users to retrieve information from a variety of sources by saving predefined searches as a separate file. Move to Desktop feature lets the user load the file into any desktop application on the Mac. Microlytics, One Tobey Village Office Park, Pittsford, NY 14534; 716/248-9150. $25; $79.95 new.

Hard Disk Partition version 3.0 adds expandable partitions, on-the-fly encryption, and multiuser access control. FWB, 2040 Polk St., #215, San Francisco, CA 94109; 415/474-8055. $30; $79.95 new.

HyperDA version 1.2 lets users modify existing text fields, acts as an interactive HyperCard stack tool, and lets users designate a default stack to automatically open when HyperDA is accessed. Symmetry Corporation, 761 E. University, Mesa, AZ 85203; 800/624-2485. $15; $89 new.

Macintosh Pascal version 3.0 adds support for System 6.03 and networks. Runs on all Mac models and is compatible with MultiFinder. Improved network file support lets users print the program's output to a networked printer and launch the program from a server. Simplifies installation and allows users to print and save text or drawing windows. Symantec, 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600. $49 for educational users; $69 for noneducational users; $62.50 per unit new.

MacSmarts Professional version 3.0 and MacSmarts version 3.3 are compatible with SuperCard. MacSmarts Professional 3.0 can handle up to 4000 rules per knowledge (continues)
100 Classic PostScript Display Typefaces

One Hundred complete — upper case, lower case [if in original design], numbers and punctuation — PostScript Display typefaces. Supplied with 18, 24 and 48 point Screen Fonts, PostScript Printer files, and AFM files. Special offer expires Dec 30, '89. Linotronics' 2,540 DPI output shown below.

```
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
0123456789
ABCDEFGHIJKLMNOPQRSTUVWXYZ
```

MapMaker version 4.0 contains a tool palette with object-oriented color drawing tools for lines, arrows, rectangles, ovals, and editable polygons. Also includes interactive distance and latitude/longitude functions, is capable of drawing map sizes of up to 10 by 10 pages, and allows placement of map boundaries into individual layers, which can be displayed or hidden independently. Includes PostScript hairline line widths, and has expanded import/export capabilities for graphics and data. Select Micro Systems, 322 Underhill Ave., Yorktown Heights, NY 10598; 914/245-4670. Free if originally purchased after July 1, 1989; $75 if purchased before that date; $395 new.

Mathematica version 1.2 supports linear programming, differential equations, statistics, and concurrent processing. Also has a feature to select interactive 3-D viewpoint and supports Adobe Illustrator format. Wolfram Research, P.O. Box 6059, Champaign, IL 61821; 217/398-0700. $45; $495 new.

Minimum Requirements version 2.0 records financial transactions, generates reports, produces invoices, and tracks fixed assets. Includes cash-requirements scheduling feature. Spreadsheets, P.O. Box 4574, Hayward, CA 94540-4574; 415/794-4388. $7.95; $59 new.

PrintBar version 2.0 adds three volumes. Volume 1 includes Codebase and 1000 examples per rule for creating expert systems. Includes a report generator for expanded advice in both text and graphics format and session reporting. Cognition Technology, 55 Wheeler St., Cambridge, MA 02138; 617/492-0246. MacSmarts Professional free; $100 to upgrade from MacSmarts; $495 new. MacSmarts $50; $195 new.

QuickPie version 2.0 has the ability to place clip art graphics into pie charts created with QuickPie. Comes with a custom clip art sampler, which contains an 8-bit color pizza, copper penny, and other images suitable for creation of pie charts. Has variable line thicknesses, three label-placement styles, independent font and style control over individual pie wedges, and horizontal or vertical 3-D effects in either tube or drop-shadow modes. Prophecy Software, 3650 Silverside Rd., #3, Wilmington, DE 19810; 302/994-1502. Free; $79.95 new.

Think C version 4.0 supports classes, methods, inheritance, and polymorphism. Class library provides the building blocks to implement a standard Macintosh interface. Compiles up to 48,000 lines per minute on a Mac II and has integrated language-sensitive text editor. Symantec Corporation, 10201 Torre Ave., Cupertino, CA 95014; 408/253-9600. Free if originally purchased after July 1, 1989; $69 plus $5/s/h if purchased before; $249 new.

To have products listed in this section, send upgraded software, an outline of major changes since the previous release, upgrade price, suggested retail price, company name, mailing address, and phone number to Updates, Macworld, 501 Second St., San Francisco, CA 94107.
Ain't nothing like the real thing.

Quality speaks for itself.
Optical and Removable drives by Microtech.

Microtech OR650 Optical Disk Drive.
650MB capacity. Rewritable. Erasable.
Two year warranty.
Additional cartridges available. Preformatted.
One year warranty.

$4795
$249

Microtech R45 Removable Cartridge Drive.
45MB capacity.
Two year warranty.
Additional cartridges available.
One year warranty.

$1099
$99

All drives bundled with MacTREE Plus, DS Backup,
and demos of MICROSOFT EXCEL and 4TH DIMENSION.

1-800-325-1895  In CT (203) 468-6223

©1989 Microtech International, Inc. All product names and logos are trademarks or registered trademarks of their respective owners. Prices and specifications subject to change without notice. MasterCard and Visa accepted at no extra charge.

Circle 458 on reader service card
REAL CADD FOR YOUR MAC... JUST $149.95!

Affordable CADD. And it's only the beginning.
The CADD stands for Computer Aided Design and Drafting. With a suggested retail price of just $149.95, Generic CADD Level 1 makes the power of real CADD affordable. And it's just part of a family of Generic CADD products that will make you more productive than ever before.

Standard Mac interface for ease of use.
Now you can produce accurate drawings with real work scale on the Mac Plus, Mac SE, or Mac II. You can edit multiple drawings in separate windows and cut and paste between them. CADD Level is also multifinder compatible.

Symbol Libraries boost productivity.
From office furniture to specialized electronics symbols, our Symbol Libraries save you the time of redrawing repetitive elements every time you need them.

Add the power of real CADD to your Mac.
Move your Macintosh drawings into the real world. Call us at 1-800-228-3601 for your free CADDalog or the name of your Generic dealer. And find out why we say the only thing generic about us is the price.

1989 Generic Software, Inc. Generic CADD Level 1 is not copy protected and comes with a 60-day money back guarantee. Registered user get free technical support from Generic Level 1 and Generic CADD are trademarks of Generic Software, Inc. Macintosh is a trademark of Apple Computer, Inc.

Circle 157 on reader service card.

New version includes snap, additional drawing tools, DOS/Mac translator and more!
Call 1-800-228-3601 for details
1989 Annual Index

by Erfert Fenton

This index covers the 12 issues of Macworld published during 1989. It lists most products alphabetically as well as under appropriate subject headings. Boldface page numbers indicate a major reference, for example, an item that is being reviewed or featured.

Aardvark, Oct 160
Aask, Oct 160, Oct 192
Aatrix TimeCard, Jun 243
Abaton Quickstep PostScript-compatible printer, Sep 220
Abaton's 300 S scanner, May 124
Access Control Environment, Aug 16
Accounting, Nov 170
Andrew Tobias Managing Your Money, May 196
DAC Easy Light, Jun 161
financial-management programs, Feb 206
for architects, Dec 136
MacMoney, Jun 30, Nov 17, Dec 309
Series Six Plus/Mac, Feb 14
Service Industry Accounting, Dec 239
Accutext, Dec 319
ACE, Aug 16
Acknowledgement, Jan 166
Acta, Feb 188
Active Eye, Dec 109
ADC-1 data-acquisition board, Jan 172
Adobe Collectors' Edition 2, Mar 13
Adobe Illustrator 88, Feb 180, Jun 116, Jul 16, Aug 140
books on, Dec 111
color separations, Mar 128
tuning tip, Jul 200
Adobe Separator, Mar 128
Adobe Streamline, Sep 224, Mar 13
Adobe Type Manager, Aug 15, Dec 105
AdWriter, Aug 249
AEC Information Manager, Dec 136
e4, Nov 170
Agfa Focus 800Gs scanner, Oct 190
Agfa Matrix PostScript RIP, Jul 16
Agfa P3400PS PostScript printer, Oct 120
AI. See Artificial Intelligence
Alchemy, Jan 180, Mar 249, Apr 124, Nov 299

Aldus FreeHand, Feb 133, Feb 180, Apr 249, Jun 27, Jun 150, Jul 28, Aug 140, Sep 38
centering curved text, Dec 288
color separations, Mar 128
Insights on, Sep 311
spaces around files, Dec 292
Aldus PageMaker, Feb 294, Apr 108, Sep 35
centering objects, Jun 216
Color Extension, May 13, Jul 83, Dec 185
exchanging Macintosh and IBM PC files, Apr 118
placing Word 4.0 documents, Sep 17
printing double-sided pages, Feb 98
retrieving wraparound text when removing graphic, Sept 296
text inside graphic, Oct 240
treatment of graphic, Feb 99
Aldus Persuasion, May 166, Jun 156, Jul 209, Aug 73
importing PowerPoint files, Dec 18
LearnPersuasion tutorial, Sep 268
Aldus' Open Pre-press Interface, Aug 15
Alias, Nov 187
AldaShare, Feb 245
Alphabet Blocks, Feb 249, Aug 36
Amanda Stories, Mar 190
AmPack Plus, Oct 261
Amygdala newsletter, Jul 89
Analog Connection WorkBench, Sep 321
Anatool, Jan 37, Jul 157
Ancient Art of War at Sea, Nov 240
Andrew Tobias Managing Your Money, May 196
Animation, Jun 108, Jun 116, Sep 208, Sep 299
Animation Help, Nov 187
Dimensions Presenter, Jun 108, Oct 35
Dynaperspective, Jun 108
HyperAnimator, Apr 93, Jun 108, Jun 156, Sep 299
HyperCard, Feb 79, Jun 108, Sep 299
interFACE, Dec 176
Macromind Director, Jun 108, Sep 221, Sep 299
Renderman, Jun 108
Sculpt-Animate 40, Jan 99
SpaceEdit, Jun 108
Studio/1, June 108, Nov 197
Super 30, Jun 108, Oct 181
SuperAnimator, Jun 16
SuperCard, Jun 108
Swivel 30, Jan 156, Jun 108, Nov 116
TapeOp, Jun 108

three-dimensional, Sep 299
VideoWorks, Jun 108
VideoWorks CD ROM, Feb 145
VideoWorks II, Sep 299
Animation Help, Nov 187
Annotator, Nov 152
AntiToxin, Aug 249, Oct 160
Anti-Virus Kit, Sep 17
APDA, Apple assumes control of, Apr 93
Aperture, Dec 123
APL-800WD WORM drive, May 191
A+ Mouse ADB, Dec 212
Apple Coax/Twinax board, Sep 145
AppleColor High-Resolution color monitor, Aug 148
Apple Computer
customer support issues, Apr 67
Engineering Forum, Aug 101
hard disk repair policy, Nov 71
hardware and software trials, Dec 105
security at, Nov 61
warranty issues, Jul 57, Jul 99, Dec 69
AppleFax Modem, Jan 158, Mar 138, Mar 181, May 14, Jul 227
Apple File Exchange, Jan 204, Apr 118
Apple 40MB hard disk, Apple's repair policy, Nov 71
Apple Hard Disk 40SC, Sep 17, Sep 172
Apple HD20SC fan, Jan 206
Apple High-Resolution Monochrome Monitor, May 142
AppleLine, Jun 138
AppleLink, Sep 18
Apple PC 5.25 drive, Apr 118
Apple Professional Information Exchange, Apr 67
Apple Scanner, Feb 220, May 124
AppleShare, Jan 118, Jan 221
Insights on, Jul 221
Apple Software Update Program, Sep 18
AppleTalk, Sep 149, Nov 152. See also Networks
time out network, Jan 93
speeding up network, Dec 168
Apple Tape Backup 40SC, Dec 144
Apple TokenTalk NB Board, Sep 135, Sep 145
Apple TV, Dec 121
Apple's 160MB hard disk, May 14
Apple's Serial NB Card, Sep 145
Apple II programs, running on Macintosh, Jan 46,
(continues)
1989 ANNUAL INDEX

AppleWorks files, transferring to Macintosh, Jan 204
Applied HyperCard, Feb 147
AppMaker, Dec 237
ArchAccount, Dec 136
Archer, Dave, Oct 107
ArchCAD, Dec 136
Architect's Budget Estimator, Dec 136
Architect's Office, Dec 136
Architecture, Dec 136
Architect's Budget Estimator, Dec 136
Architect's Office, Dec 136
ArchText, Jul 166
Architext, Jul 166
Arctext, Apr 40
Ark Electronic Products' DL432 modem, Jul 128
Arlan/TeleNode, Jun 87
ArtExpress, Feb 160
ArtImport, Aug 103
Art Impoter, Aug 105, Aug 172
ArtRoom, Jun 243
Ashlon: Tale, commentary, Dec 59
AST-ICP I/O board, Jul 123
AST-RM4 I/O board, Jul 123
Atelier Interiors and Atelier Structures, Dec 136
Atelier Management and Atelier Finance, Dec 136
Axe Design Software, Oct 130
Atkinson, Bill, Feb 160
Atlas Explorer, Nov 217
atOnce, Nov 170, Dec 208
Aussie Joker Poker, May 213
AutoCAD, Dec 136
AutoMac II, Feb 188
AutoSave II, Sep 268, Oct 160
AUX, Mar 224
BackFax, Mar 138, Mar 181, Jun 34
BackPack hard disk, Apr 91, Sep 172, Dec 125
Back to Basics Professional, Nov 170
Backup programs, Mar 234
Fastback II, Dec 190
Retrospect, Dec 190
Rex, Oct 103
Ball & Stick, Oct 261
Bar codes, printing with MacEnvelope, Sep 202
Barneyscan color scanner, Jul 134
Barneyscan XP, Mar 13
Barneyscan XP, Mar 13
Bay Microsystems' 44 Repack removable-cartridge drive, Jul 116
BellSouth Media Technologies Microcomputer Training Center, Feb 129
Bening Totem II Bernoulli drive, Jul 116
Bernoulli Box series, Jul 16, Jul 116, Nov 238
Biblical databases, Feb 188, Feb 261
BigBin 1000 paper tray, Apr 13
The Big Picture monitors, May 142
Bigthesaurus, Jul 173, Oct 160
Bill-It, Sep 321
Birss, Edward, interview, Sep 91
BlueMail clone, May 13
BLUE/60, Jan 37
Boards, Apr 227, Jul 123
ADC-1 data-acquisition, Jan 172
Apple Coax/Twinax, Sep 145
Apple TokenTalk NB, Sep 135, Sep 145
Apple's Serial NB Card, Sep 145

GOOD HELP LOW RATES.
Willing to do the shopping, banking, get the news, play with the kids, check the weather, order airline tickets and more for just $9.95 a month.
The little yellow box brings you hundreds of features for just $9.95 a month.

Who says good help is hard to find?
The PRODIGY® Service Start-up Kit is your key to a world of helpful services at a price that won't eat you out of house and home.

After you purchase your Start-up Kit, all it takes is a flat $9.95 a month, with no on-line charges, to bring you and your family hundreds of features!* Now, shopping is easy, banking is a breeze, plus you can get the latest news, send messages, book your own flight, play games that are fun and educational, and that's just the beginning.

Up to six family members can choose their own personal password and then customize the PRODIGY service to fit the way they want to use it. Weather forecasts, member clubs, stock quotes, plus the features you like are all waiting for you.

The PRODIGY Service Start-up Kit comes complete with everything you need to get on-line easily. There is also a Start-up Kit with a Hayes® Personal Modem 2400 at a great price.

Call 1-800-822-6922, ext. 594, for a dealer near you.

---

*The PRODIGY service is available in selected cities through a local phone call. Additional fees apply for banking. PRODIGY is a registered service mark and trademark of Prodigy Services Company. Hayes is a registered trademark of Hayes Microcomputer Products, Inc. IBM is a registered trademark of IBM Corporation. Macintosh is a registered trademark of Apple Computer, Inc.
Introducing The Gravis MouseStick™
Here's the digital controller
that towers above joysticks,
mice and trackballs. For speed.
For precision. For versatility.
For technology. For durability.
And just for fun!

For versatility, the MouseStick features three programmable microswitch buttons which can emulate any eight keyboard commands.

For technology, there's the Gravis MouseStick Processing Unit (GMPU). With 16K of ROM and powerful Control Panel Software, your programming options are virtually limitless, and can be upgraded to include new features!

So for large-screen monitor CAD and DTP applications, or serious computer games, get a grip on the future with the incredible Gravis MouseStick.

You'll discover that for serious work or serious play, the Gravis MouseStick really handles it!

Advanced The Art

Advanced Gravis Computer Technology Ltd.
7533 Antrim Drive, Burnaby
B.C. Canada V5J 2Y5
(604) 431-2724
U.S.A.
1962 Carolina St., #312,
Bellingham, WA 98225

Circle 401 on reader service card

MAC WORLD • JANUARY 1990

288
GET THE WHOLE PICTURE!

PCPC IHD Series
Internal Drives for Mac II
MacBottom quality in an internal hard disk drive, with mounting hardware and MacBottom Utilities.

MacBottom Hard Disk Drives

PCPC HD-20 WSI™ (SCSI upgrade)
Turns your Apple HD-20 into a SCSI drive! Easy installation boosts speed 5-8 times!

PCPC II™ 8 Bit and 32 Bit Color Graphic Systems
High-resolution, flicker-free 19” Trinitron color monitor and video card, bundled with cable, tilt/swivel base, and Stepping Out™ II virtual screen software. 32-bit Color QuickDraw™ compatible. 16” Executive Trinitron colors also available.

If you’re hungry for the best,
check the new items on our menu!
No one offers you a better selection of the highest rated peripherals than we do.
When you require the best, acquire the best!

QuickDraw is a registered trademark of Apple Computer Inc.

Personal Computer Peripherals Corporation
4710 Eisenhower Blvd., Building A-4
Tampa, FL 33634
800-622-2888
813-884-3092

Circle 223 on reader service card
Great Slides.

Free Film.

Whether you use 20 slides a month or a thousand, a Mirus FilmPrinter™ Plus will let you do the job in-house with greater control, convenience and economy than any outside service can supply.

Our FilmPrinter Plus will make great slides from all your favorite graphics applications no matter what they run on—PC, PS/2, or Macintosh—without any extra hardware.

Order your FilmPrinter Plus before February 28, 1990 and we'll give you 1 year's worth of free film. So call 1-800-654-0808 today.

Great slides and a year's worth of film are just a phone call away.

*Mirus* FilmPrinter Plus are trademarks of Mirus Corporation. All other trademarks or registered trademarks are the property of their respective holders.

Circle 228 on reader service card.
The soaring prices of video cards can keep you from getting the highest graphics performance from your Macintosh™.

That's why at Micron, we've brought the high price of brilliant color and outstanding resolution down to earth with our Xceed™ video cards. Now you can exceed the graphics limits of your Macintosh II, IIx, IICX or SE/30 without exceeding your budget.

Xceed video cards give you all the performance features you expect such as 1, 2, 4 and 8 bits per pixel, 256 simultaneous colors from a palette of more than 16 million, 640 × 480 or 1024 × 768 resolutions and full Macintosh software compatibility. Plus we include 8/24-bit MacroPaint™ software and a gamma color correction desk accessory — a package worth $149.00 — absolutely free!

In fact, the only feature we don’t offer is the high price tag.

And like all Micron memory products, Xceed video cards are supported by our comprehensive customer service program and toll-free hotline.

So call us today at 1-800-642-7661 for the name of your nearest Micron dealer. And enjoy brilliant color graphics without the high flying price.

Micron. Working to improve your memory.

Xceed and MacroPaint are trademarks of Micron Technology, Inc. Macintosh is a registered trademark of Apple Computer, Inc.
ColorSpace II video board, Sep 208
ColorView 5612 printer, Jan 134
Delphi character, typing, Jul 195
CommCard 1/0 board, Jul 123
Comment, Feb 188, Feb 266
Communications. See also AppleTalk; IBM PC-Macintosh connectivity; Modems; Networks; Terminal emulation
Acknowledgment, Jan 166
AppleLink, Sep 18
Executive Server, Oct 195
IBM mainframe-Macintosh, Jun 138, Sep 145
IBM minicomputer-Macintosh, Feb 13
IBM 3278 and 3279 terminal emulation, Feb 263
Kermit, Jun 138
MacBlasp, Sep 255
Macintosh-mainframe, Mar 93
Macintosh-VAX connectivity, Jan 93
Smartroom 3.1.1, Mar 97
TextTerm+Graphics, Apr 37
TGRAF-07/Mac, Sep 253
VINES Mac Mail Gateway, Apr 85
Campbell, Jun 124, Oct 261
Complete HyperCard Handbook, Aug 103
Complete Undelete, Oct 18
Components General Ledger, Nov 170
Compuserve Insights on, Jan 75
Navigator, Nov 123
tips, Jan 75
Computer-aided design. See CAD
ComputerEyes video digitizer, Jul 155
Computerized Classic Bookkeeping, Nov 170
Computer Professionals for Social Responsibility, Jun 64
Computers and You project, Aug 43
ComputeServer, Jun 83
ConcertWare+, Apr 124
ConcertWare-MIDI, Sep 17
Concord Data Systems’ 296 Trellis modem, Jul 128
Connect Professional Information Network, Apr 97
Conservation Biology Questions, Nov 187
Consulair 68020/030 Assembler, Dec 18
Control, Nov 319
ConvertUnits, May 213, Oct 206
Coonen, Jerome, Feb 160
Copyrighted material, use of, Sep 287
Copy II Mac, May 195
Cosmic Osmo, Oct 105, Nov 215, Dec 176
Cosmos 600 erasable optical drive, Jul 116
Country Christmas, Dec 176
Courier series modems, Jul 128
C++, Apr 91
Crashes, avoiding, Mar 146, Aug 233
Cricket ColorPaint, Jul 15
Cricket Draw, Aug 140
filling complex shapes, Jun 212
reflecting bound text, Feb 99

Cricket DrawMaster, Jul 15
Cricket Graph, curve fit tip, Aug 229
Cricket Paint, Jan 93, Apr 156, Dec 154
Cricket Presents, May 166, Jun 243, Jul 209, Aug 73
Crow, George, Feb 160
Crystal Ball, Jan 186
CrystalPrint Publisher PostScript-compatible printer, Oct 120
Crystal Quest CritterEditor, Jan 89
Cue, Mar 249
Curran, Kevin, interview, Nov 97
Cursor INIT, Oct 160
Custom Menu Tutorial, Apr 196
Custom Trackballs, Dec 176
Cutting Edge’s XL45+ hard disk, Sep 172
CXR Telecom’s 9651-1 modem, Jul 128
CyberChrome, Oct 139

D

DAC-Easy Light, Jun 161
Dartmouth XCMD’s, Nov 187
DAs. See Desk accessories
Dash 030, Jul 87
Data acquisition, Feb 227
DAtabase, Jun 128, Jun 177
Databases, Jun 128, Jun 133
Business FileVision, Jun 128, Aug 249
Clear Access, Jul 93
CL/1 support, Jul 93
DAtabase, Jun 128, Jun 177
Double Helix II, Aug 15
exchanging IBM PC and Macintosh files, Apr 118
Fastmap, Jul 93
FileMaker II, Apr 241, Jun 128, Jun 133,
Aug 157, Aug 230, Oct 242
Filevision II, Aug 15
FaxBase, Apr 118
FaxBase-Mac, Mac 249, Oct 261
FaxBase-Mac Multi-User, Feb 13
GeoQuery, Jul 93
GQL database query language, Jul 93
Hyper SQL, Jan 87
McxMax, Aug 179
Microsoft File, Mar 250, Apr 154, Jun 128, Jun 133
Natural Language query system, Jan 99
NextStep Object, Jul 93
Omnis, Aug 15
Oracle for the Macintosh, Jun 124, Sep 244
Panorama, May 182, Jun 128, Jun 133, Aug 15,
Oct 238
problems with TOPS, Jul 15
Record Holder Plus, Jun 128
Reflex Plus, Jun 128
VAX database access, Jul 93
Datashell 90 hard disk, May 158
Datapcopy 830 scanner, Jan 176
(continues)
Those beautiful ideas in your head need to go on the overhead just as beautifully, but your artistic ability or the guy in graphics just won't cooperate.

But the 4693DX Color Image Printer will. It uses a 300-dpi thermal-wax process in 16.7 million colors so images and type are bright, glossy, and very impressive.

And it prints on paper or transparencies for presentations, overheads and comps, with infinitely more fiscal responsibility than pricey outside services.

The Tektronix 4693DX. It's the perfect printer to have up your sleeve. Call for more information, 1-800-835-6100 Dept. 1C, or fax to (503) 682-3408.

Magic without the markers.
Three NEW ways to keep your data from getting into the wrong hands.

QuickLock™
Automatic Password Screen Protection

QuickLock password-protects your screen and your network connections with the touch of a key or stroke of the mouse. It prevents others from viewing or altering your work, but allows background processing. QuickLock darkens the screen, protecting your screen from phosphor "burn-in;" and remains active even if the system is restarted. QuickLock's automatic lock-out feature makes your work private after a preselected period of inactivity.

The NightWatch™ (v 1.03)
Password Protection for Hard Disks

The NightWatch securely shuts down your hard disk with a password. NightWatch stands guard, preventing unauthorized access or erasure of your hard disk, or even the introduction of a virus. The authorized user enters their name and password to unlock the hard disk, and every attempt to unlock is recorded. The Administrator application includes an override function in case a user has forgotten their password or lost their User disk. It even has the ability to dynamically update itself when it encounters new systems or machines.

MacSafe® II
Security for Files and Networks

MacSafe II password protects your files inside a safe on the Macintosh desktop. It's great for networks or Macs that are shared. You can restrict access to documents, applications, or whole folders of information by moving your files into a safe with your password. New features give you Administrator override of safe passwords, easy Control Panel access, “Project Sets,” the ability to move multiple files in simultaneously, and our new LightningCrypt™ encryption - the fastest in the industry.

Kent Marsh Ltd.
1200 Post Oak Blvd. • Suite 210
Houston • Texas • 77056
713-623-8618

You can count on these three products to work independently or hand-in-hand to give you peace of mind that your important work is secure; you determine what level of security you need. Call 1-800-325-3587 today for all the facts, to locate the dealer nearest you, or to order.
E-mail. See E-mail
Electronic Map Cabinet, Nov 226
Electronic Whole Earth Catalog, Nov 187, Dec 197
E-Machines’ C20 color monitor, Aug 148
E-Machines’ T16 and T19 color monitors, Aug 148
E-Machines’ TX color monitor, Aug 148
E-Machines’ TX SE/30 color display subsystem, Oct 107
E-mail, Feb 105, Jul 19, Sep 188
cc:Mail, Sep 188
cc:MailFaxlinx, Jul 85
DynamoMail, Sep 188
InBox, Sep 188
Microsoft Mail, Sep 188, Nov 127
QuickMail, Sep 188
RetinMail, Nov 117
+Mail, Sep 188
VINES MacMail Gateway, Apr 85
Empower, Jun 185, Aug 249
Encryption. See Security
EndLink, Sep 321
EndNote, Feb 188, Feb 261, Jun 243, Sep 321, Oct 261
Engineering, Dec 136. See also Architecture; CAD
Annot, Jan 37
Apple Computer Engineering Forum, Aug 101
BLUE/60, Jan 37
CASE tools, Jan 37
DynaPerspective, Feb 127
Foundation Vista, Jan 37
MacDesigner, Jan 37
PowerTools, Jan 37
Snap, Sep 260
Entertainment. See Games
Envelope, Sep 202
Envelopes, printing, Sep 202
Epson LO-950 dot-matrix printer, Oct 199
Equation editors, Nov 211
Erasable optical drives, Jul 116, Dec 119
Cirrus 600 Magneto Optical Drive, Nov 202
Cosmos 600, Jul 116
DataFrame RS Optical, Dec 119
DataFrame XP600 and XP600i, Dec 119
DirectOptical, Jul 116
Genesis 6000, Nov 202
hammerDisk600, Jul 116
Infinity Optical, Oct 17, Dec 119
Jasmine DirectOptical, Nov 202
LaserStar, Mar 103, Dec 119
MacDiscus, Dec 119
Maxcess 600L, Dec 119
Microtech OR650, Dec 119
PCPC OER600, Jul 116
Pinnacle Micro REO-650, Jul 116, Nov 202
Sony’s REO-650, Apr 14
Sumo Systems Optical Disk Drive RSSM 600B, Nov 202
Sumo Systems RSSM-6000, Jul 116
XYX’s XXY600BW, Oct 17
Ergonomics, Oct 63
Espinosa, Chris, Feb 160
Etiquette of the Undercaste, Feb 145
EtherLink NB communications board, Jul 123
EtherPort series communications boards, Jul 123
EtherTalk communications board, Jul 123
Eye copy-protection system, Feb 14
Excel. See Microsoft Excel
ExcelDrive series hard disks, Feb 14
Accelerator XL 20 and XL 25 accelerator boards, Mar 118
ExecutivePads, Dec 176
Executive Server, Oct 95
eXodus, May 109
ExpandAC race removable-cartridge drive, Jul 116
Expand II series I/O boards, Jul 123
Expansion slots, introduction to, Apr 227
Expert Advisor: Adobe Illustrator, Dec 111
Exploreroid, use of Macintoshes by, Feb 137
Exploring HyperCard, Aug 103
ExpressDrive series hard disks, Feb 14
Expressionist, Feb 188, Nov 211
ExpressWrite, Oct 201
Existhat, Apr 138, May 189
Extend, Aug 249
Extender GraPhak, Sep 321
EZ-Menu, Oct 160
EZTax series, Feb 206, Mar 237
F
Facilities, Dec 136
Falcon, Jan 221
Family Care, Jul 177
Family Life Education Stock, Nov 187
Family Matters, Nov 249
Fan
Macintosh II, Apr 217
replacing, Jan 206
Fastest, Aug 185
Fastback II, Dec 190
FastComm Communications’ F2496, F2496T, and F9600 modems, Jul 128
FastComm Communications’ FDX9624 and FDX9696 modems, Jul 128
FastLabel, Jun 185, Sep 202
FastMap, Jul 93
FastNet series communications boards, Jul 123
FastPath 4, Mar 179
FastTrack Schedule, Oct 205
Faxes, sending over Novell NetWare network, Jul 85
Fax modems. See Modems
FaxPlus modem, Mar 138
FAxStf modem, Mar 138, Nov 319
Fee Simple, Dec 136
Fellowship of the Ring, May 209
Ferrari Grand Prix, Aug 249
FiberTalk communications board, Jul 123
File managers, Oct 160
File servers, Jan 118, Jul 221
FilterShare, Feb 245
AppleShare, Jan 118
NetFrame, Jan 118
PacerShare, Feb 245
Perplex, Jan 118
Share, Jan 118
TOPS, Jan 118
File. See Microsoft File
FileGuard, Oct 18
FileMagic, Oct 160
FileMaker II, Jun 128, Jun 133
complex lookups, Oct 242
fractions, Aug 230
Insights on, Apr 241
transferring data to PageMaker for table, Aug 157
File-transfer programs, Apr 118
Filevision IV, Aug 15
FilmPrinter film recorder, Jan 134, Jul 108
Film recorders, Jul 108
Agfa Matrix PostScript RIP, Jul 16
FilmPrinter, Jan 134, Jul 108
Lasergraphics’ LFR, Jan 134, Jul 108
MacHarmony, Jul 16
Mirror FilmPrinter, Dec 43
Montage FRI, Jan 134, Jul 108
PhotoMetric SlideMaker, Jul 108
ProColor, Jan 134, Jul 108
SlideWriter, Jan 134, Jul 108
Still Light, Jul 108
Finale, Feb 222, Jul 227, Nov 319
Financial Analysis, Feb 291
Financial Decisions, Feb 206
Financial-management programs, Feb 206
Finder,
arranging numbered files in order, Apr 222
changes to, Jul 19
eliminating warning messages in, Mar 227
error messages, Aug 233
version 7.0, Aug 124
Find File tip, Aug 230
Findwell, Mar 163, Oct 160
FirePower I/O board, Jul 123
1st Aid HFS, Jan 145
Fish, Oct 160, Dec 176
Fishcamp Engineering’s NBS-GPIB data-acquisition board, Jul 123
F-keys, Jan 203
F-key utilities, Mar 146
FlashBox, Jan 13
Flashcard coprocessor board, Jul 123
Flex, Oct 160
Flexible, Dec 136
Flexware, Nov 170
Flipper tape drive, Dec 144
Flipper 20 high-density floppy drive, Jul 116
(continues)
NOW JUST WHEN THE HECK DID I INTEGRATE THAT INTO THE SYSTEM?

Get three FREE issues of COMPUTERWORLD, the total systems journal

If you're involved with more than PC's, if you need to know about networks and minis and the integration of systems, then you should accept this special offer for three free issues of COMPUTERWORLD.

COMPUTERWORLD is the only weekly newspaper that gives you complete coverage of every aspect of the information system. Every week COMPUTERWORLD covers hardware, software, new products and services, technology trends, new techniques, industry news, things you may want and things you may want to avoid. That's why it is the best read publication among industry executives.

Your subscription to COMPUTERWORLD will bring you 51 weekly issues plus special bonus sections of COMPUTERWORLD Integration. Each section gives you in-depth coverage of the hottest issue facing information professionals today: integration of the corporate computing system.

New Subscribers Only. If you've never subscribed to COMPUTERWORLD before, we'd like you to give us a try. So we're making this special offer to new subscribers — send us your order and pay nothing now. We'll start your subscription and send you an invoice for only $29.57* — that's more than half off our newsstand price and 38% lower than our regular subscription rate of $48. And, if you choose to subscribe, we'll send you the COMPUTERWORLD desktop calculator — FREE with your paid subscription.

If you're satisfied with COMPUTERWORLD, if it delivers what you need, simply pay the invoice. If you decide it's not what you want, mark “cancel” on the invoice and send it back. You get to keep the three free issues. You owe us nothing. So order today because there is nothing to lose and everything to gain.

* U.S. Only. Canada $110, Central/South America $130, Europe $195, all other countries $295. Foreign orders must be prepaid in U.S. dollars.
My favorite all-around accounting program is CheckMark Software's MultiLedger/Payroll set. It was the simplest and most logical I examined that provided a reasonably full set of capabilities. Its price/performance ratio represents an excellent bargain.**

Macworld / September 1988

"MultiLedger is ideal for the small business. It's easy to set up and use and has an amazing set of accounting features when compared to other programs that cost more and don't offer much more power."  

MACazine / March 1989

"I don't know of any other Mac accounting software which contains so many features and modules for the price."  

Computers in Accounting / January 1989

"A welcome and impressive bonus is the Payroll program which can be linked to MultiLedger. ... MultiLedger and Payroll are a bargain for companies that don't need a networked system."  

MacUser / April 1989

"Our favorite package was MultiLedger.... It's the most elegant, usable and Mac-like of all the packages we reviewed.... CheckMark offers unlimited free telephone support to all users. This policy would lead to bankruptcy if the program were as confusing as others."  

The Macintosh Buyer's Guide / Spring 1989

Easy. Powerful. If you thought they didn't go together, consider what the Macintosh did to redefine personal computing.

It let users concentrate on what they were trying to achieve or produce, while other systems forced them to focus on the operation of the computer itself. The amazing success of the Macintosh shows that when thinking people are given a choice between simplicity and power, they'll take both!

Those who created the Macintosh realized that it takes more time, more work, and more creative thinking to make something simple than it does to make something complicated. Their success has enabled us to create easy-to-use, affordable accounting programs for small and medium-sized businesses of all kinds.

To see if one or more of our programs can work for you, just give us a call. We'll send you a free demo disk of all three programs, reprints of recent reviews, and dealer names in your area.

You'll see for yourself just how easy and painless accounting on the Macintosh has become.

CheckMark Software Inc.
1520 East Mulberry / Suite 220
Ft. Collins, Colorado 80524
Phone: 970-494-3547  FAX: 970-494-0429

Full-functioning demo disk available
1-800-444-9922
Dealer inquiries welcome.

Macintosh, ImageWriter, and LaserWriter are trademarks of Apple Computer, Inc.
MultiLedger is a trademark of Checkmark Software, Inc.
Presentations
Adobe Streamline, Mar 13
artists’ workshops, Mar 101
black-and-white paint programs, Dec 154
Canvas, Jan 221, Feb 291, Apr 176, Aug 140, Dec 154
clip art, Oct 138
color paint programs, May 151
color QuickDraw, Jun 15
color separations, Feb 198, Mar 128, May 85, Aug 113, Dec 185
Cricket ColorPaint, Jul 15
Cricket Draw, Aug 140
Cricket DrawMaster, Jul 15
Cricket Paint, Jan 92, Apr 156, Dec 154
Crystal 3D, Jun 95
DeskDraw, Aug 140
DeskPaint, Dec 154
DeskPaint/DeskDraw, Jan 162
drawing parallel lines, Apr 224
drawing Table, Aug 140, Sep 251
Dynaperspective, Jan 127
embroidery, Feb 133
ekodak, May 109
FullPaint, Dec 154
GraphistPaint, Jan 93
GraphistPaint II, May 151
how Macintosh generates, Apr 71
image processing, Jan 91
Lumena, May 151, Jun 95
Macintosh Masters Art Contest winners, Aug 133
MacPaint, Jun 211, Oct 107, Dec 154
ModaCAD, Jun 91
Modern Artist, May 151
newspaper graphics via satellite, Feb 129
NuPaint, May 198, Sep 322, Dec 154
opening IBM PC graphics with Macintosh, Apr 118
PhotoMac, May 176
PhotoPaint, May 151, May 178
PhotoShop, Jun 116
PixelPaint, May 151
PixelPaint Professional, Sep 133, Dec 184
Presentation Toolkit, Jan 97
RenderMan, Mar 14
Reyes, Mar 14
Smart Art, Aug 105, Dec 188
Studio/1, Nov 197, Dec 154
Studio/8, Jan 85, Mar 156, May 151
Super 3D, Oct 181
Swivel 3D, Jan 156, Jun 108, Jun 116
TCL-Image, Jan 91
Ultimage, Jan 91
Wolff Olins design firm, Mar 87
GraphistPaint, Jan 92, Sep 17
GraphistPaint II, May 151
Graphs. See Charts
Grappert LQ printer, Apr 42
Gravis ADB MouseStick, Dec 212
Great Plains Accounting Series, Nov 170
Grolier Academic American Encyclopedia CD ROM, Sep 17
Groupware, Nov 152
Guardian, Oct 160
Guide, Jul 166
GunShy, Apr 91

Hackers Conference, Feb 147
Halls of Montezuma, Dec 162
hammerDAT tape drive, Dec 144
hammerDisk44 removable-cartridge drive, Jul 116
hammerDisk600 erasable optical drive, Jul 116
Hammer 80 and Hammer 91 hard disks, May 158
hammerS300 hard disk, Nov 160
hammerTape tape drive, Dec 144
Hard Disk Deadbolt, Aug 229
Hard disks, May 158, Sep 172, Nov 160
See also Backup programs: removable-media drives
Apple Hard Disk 40SC, Sep 17, Sep 172
Apple H020SC fan, Jan 206
Apple’s 160MB, May 14
BackPac, Apr 91
BackPac 40, Sep 172
BackPac 130MB, Dec 125
Cirrus 42, Sep 172
Cirrus 613, Nov 160
Cirrus series, May 158
Cobra 45, Sep 172
Cutting Edge’s XLS+, Sep 172
Datacell 90, May 158
Dataframe, Aug 81
Dataframe XP 330, Nov 160
Delcaft Systems’ Server 300, Nov 160
DirectDrive 40, Sep 172
DirectDrive 100, May 158
DirectDrive 130, Dec 125
DirectDrive 300, Nov 160
DiskExpress, Jun 185
Dolphin IL-46, Sep 172
Elman Engineering 45 Hard Disk, Sep 172
Elman Engineering HD302, Mar 103
ExcelDrive series, Feb 14
ExpressDrive series, Feb 14
GCC Technologies’ FL/40 and FX/40 hard disks, Sep 172
GCC Technologies’ FL/80 Internal and FX/80 External hard disks, May 158
hammer 80 and hammer 91, May 158
hammerS300, Nov 160
Hardpac Max 40, Sep 172
Hard 300 Plus, Nov 160
high-capacity, Nov 160
HiPerformance, Sep 172
HiPerformance 320, Nov 160
HyperDrive trade-in policy, Nov 71
Impact 80, May 158
Impact 40 Plus, Sep 172
Imprimis’s series Wren, Mar 103
InnerCrate internal, Feb 14, Apr 13
InnerDrive 100, May 158
InnerDrive 130MB, Dec 125
Integra 40, Sep 172
Integra 80, May 158
Integra 300, Nov 160
Liberty 40, Sep 172
Liberty 80 and Liberty 100, May 158
MacBottom 45, Sep 172
MacBottom HD84, Apr 13
MacCrace, Apr 13
MacDrive 40, Sep 172
MacDrive 80, May 158
MacDrive 300, Nov 160
MacDisk EM100, May 158
MacDisk EM330, Nov 160
MacinStor 45-ZF, Sep 172
MacinStor 90 ZF, May 158
MacinStor 345, Nov 160
MacinStor series, Mar 103
Macintosh Hard Disk 80SC, May 158
MacStack 45, Sep 172
MacStack SD810, May 158
Magic 300, Nov 160
MagicDrive 46, Sep 172
MagicDrive 91, May 158
Maxcess’s E Series, Sep 172
Maxcess’s M Series 300, Nov 160
Maxcess’s V Series 40, Sep 172
medium-capacity, Sep 172
Memorybank SS400, Jul 168
Micro/Max 5B-330, Nov 160
Micro/Max series, May 14
MicroNet Technology’s MS-91, May 158
Micro/Stack 40, Sep 172
Mirror Technologies’ M40 and M40+, Sep 172
MultiDisk, Jun 185
Nova 40, Sep 172
Nova 80, May 158
Nova 320, Nov 160
Nova 650, Sep 18
Open Mac Enterprises’ OME100X, May 158
Peripheral Land’s PLI 100 External Turbo, May 158
Platinum 100, May 158
Platinum 300, Nov 160
PLI Turbo 50 External, Sep 172
Preferit Hard Disk AP, Sep 172
preventing file removal, Aug 229
Quantum 40MB Raw Drive, Oct 237
recovering data, Jan 145

(continues)
Swivel 3D™ is the best-selling, three-dimensional Macintosh program for anyone who needs high-quality graphics for product design, scientific visualization, animation, and graphics for desktop publishing and multimedia presentations.

Easy to learn and use, Swivel 3D comes with an extensive library of 3D art including alphabets, human figures, robots and additional shapes and figures.

By instantly changing the lighting, casting a shadow, or placing 2D art over a 3D surface, Swivel 3D gives you the freedom to explore all kinds of dramatic possibilities. Quickly and easily.

What’s more Swivel 3D works with your other graphic programs because it supports all the popular formats: Encapsulated PostScript® for Adobe Illustrator; PICT2 for Studio8; PixelPaint and PageMaker; PICT for MacDraw II; and the animation format — PICS — for MacroMind Director.

Express yourself. Call (415) 543-3848 today. Demo disks are available for $10.

PARACOMP

Paracomp, Inc.
123 Townsend Street, Suite 310
San Francisco, Ca 94107, 415-543-3848
A TRUE STORY

The phones at San Francisco's Suicide Prevention Center ring every seven minutes.

And every call is a crisis.

But until one of our expert volunteers put the center's database in order, counselors were forced to put callers on hold and scramble through card files bursting with vital emergency information.

To get answers that, despite everyone's best efforts, might be six months out-of-date.

Now the files are updated daily. Soon they'll be available on screen while counselors stay in comforting contact.

Our volunteers (we call them computer mentors) have made that kind of difference at more than 200 Bay Area non-profit organizations in the last two years.

Matched up with resourceful groups battling tough problems like hunger, homelessness and environmental decay, computer mentors solve straightforward problems like spread-sheet wrinkles and telecommunications tangles.

So the people doing the most good can do more good, faster and better, for more people than ever.

Now it's possible for you to replicate this miracle in your own area. The rewards?

"They're immediate," says mentor Hank Roberts. "You make something work and their faces light up. And then they turn right around and teach the person next to them how to use it."

A suicide center counselor puts it simply. "Our computer mentor not only rescued our system. he saved lives."

For your free CompuMentor start-up kit, please write or call our director, Daniel Ben-Horin.

Together, we can make sure computers keep their promise.
HyperDraft, HyperComposer, HyperTMON, HyperMac Subjects, HyperCom, Jul Feb 13
HyperDrive trade-in policy, Hyper SOL, HyperScan, HyperSource, HyperSound, Mar 11 8
HyperCard and History, Nov 187
HyperCard CD Audio Toolkit, Jun 124, Aug 111
HyperCard Made Easy, Aug 103
HyperCard Script Language Guide, Feb 147
HyperCard UNIX in a Nutshell, Sep 145
HyperCard VideoDisc Toolkit, Jun 124
HyperCharger 020 accelerator board, Mar 118
HyperCom, Jun 124
HyperComposer, Nov 187, Dec 203
HyperDraft, Feb 268
HyperDrive trade-in policy, Nov 71
HyperEngine, May 14, Jun 124
HyperText on HyperText, Jan 14
HyperTMON, Jun 124
HyperTutor, May 211
HyperWorks Organizer, Jul 161
Hyper-XCall, Jan 13

IBM mainframe—Macintosh communications, Jan 138, Sep 145
IBM minicomputer—Macintosh communications, Feb 13
IBM PC—Macintosh connectivity, Apr 118, May 37, Jul 221

Apple TokenTalk NB board, Sep 135
coprocessor boards, Jul 123
DaynaNet, May 105
E-mail, Feb 105
MacLink Plus PC, Dec 210
NetWare for the Mac, Aug 188
Network-OS Mac-PC Connection, Feb 14
NuLink System tape backup, Mar 97
opening IBM PC graphics with Macintosh, Apr 118
PC as file server, Jun 91
PC MacTerm/Network, Nov 247
printers, Jun 89
Rapport, May 111
SoftPC, Sep 233
VINES Mac Mail Gateway, Apr 85

Icon Factory, Mar 195
Iconia, Dec 319
Icon-iT, Jul 227, Oct 160
making invisible, Aug 229
meaning of shading, Mar 227
solid-colored, Mar 146
IDAC/1000, Feb 227
Ideacon Mac communications board, Feb 13
If Monks Had Macs, Nov 187
Illustrator 88. See Adobe Illustrator 88
Image Capture II board, Mar 14
Image processing, Jan 91
Barneyscan XP, Mar 13
ImageStudio, Feb 291
PhotoMac, May 176
PhotoShop, Jun 116
ImageStudio, Feb 291
ImageWriter. See also ImageWriter LQ; ImageWriter II
color printing problem fix, Mar 222
matching LaserWriter margins, Feb 97
out-of-paper warning, Dec 292
paper jam fix, Apr 217
printing sharper graphics, Feb 100
universal power supply, Aug 227
ImageWriter LQ, Jan 134
Apple's repair policy for, Nov 71
fonts, Apr 218
Print Driver, Jul 227
quieter version, Jun 16
ImageWriter II, Jan 134
avoiding paper jams, Mar 227
label printing tip, Jun 211
printing overhead transparencies, Oct 237
scrunch-line problem fix, Mar 227, Sep 287

ImageWriter LSC fonts, Apr 218
Impact 80 hard disk, May 158
Impact 40 Plus hard disk, Sep 172
Impact 60/150 tape drive, Dec 144
InBox, Sep 188
In-CAD, Apr 13
Infinity 40 Turbo removable-cartridge drive, Jul 116
Infinity Optical erasable optical drive, Oct 17, Dec 119
Infinity 10 high-density floppy drive, Apr 118, Jul 116
Info42R removable-cartridge drive, Jul 116
InfoLogic Envelope, Mar 249, Sep 202
Informed Designer, Aug 16
INITPicker, Oct 160, Oct 192
INITs, Jan 211, Oct 192
Chime, Nov 299
INIT managers, Oct 160, Oct 192
MultiClip, Jul 99
QuickFolder, Dec 176
SoundMaster, Nov 299
UserInfo, Dec 115

Inix, Oct 160, Oct 192
InnerCrate internal hard disk, Feb 14, Apr 13
InnerDrive 100 hard disk, May 158
InnerDrive 130MB hard disk, Dec 125

In/Out, Nov 18
Input devices
A+ Mouse ADB, Dec 212
Calcomp Drawing Board digitizer, Jul 148
Custom Trackballs, Dec 176
Gestures, Aug 105
Gravis ADB MouseStick, Dec 212
Nestor Learning System, Jul 87
Paper Keyboard, Sep 149
Personal Writer 15SL, Jan 164
Turbo Mouse ADB, Dec 212
U-Force, Jul 95
Voice Navigator, Oct 95

Insight Expert Accounting, Nov 170
Insight Expert Accounts Receivable, Sep 321
Insight OneWrite, Nov 170
Insiration, Feb 188, Dec 319
Instant Expert Plus, Mar 249
Insurance, Jul 57
Integra 40 hard disk, Sep 172
Integra 60 hard disk, May 158
Integra 300 hard disk, Nov 160
Interactive Multimedia, Feb 131
interface, Dec 176
InterfacR, Aug 30
Interfaced modem, Mar 138, Jun 166
Interleaf Publisher, Jan 13, Mar 249
price reduction, Oct 17

Intersect CDR-77 CD ROM reader, Aug 174
Investment programs, Feb 206
Investor, Feb 206
Invisible files, Aug 228
Invoice, Nov 17
IOtech's MacI488 data acquisition board, Jul 123
Irwin Backup 5080 Tape Drive, May 207
Irwin Magnetics' series accelerator boards, Feb 13
Irwin Magnetics' 5040 and 5080 tape drives, Dec 144

J

Jam Factory, Apr 124
Jam Session, Apr 124
Japanese Garden Design, Jul 95
Jasmine Direct Optical erasable optical drive, Nov 202
Jasmine Direct Print PostScript-compatible printer, Sep 220
JetLink Express, Dec 319
Jetstream tape drive, Dec 144
JMP, Aug 113
Jobs, Steve, Feb 160
Julian Systems' NTSC Converter, Sep 208
Just Enough Pascal, Jul 152

KanjiCards, Nov 187
Kapor, Mitch, Feb 160
Kane, Susan, Feb 160
Kawasaki, Guy, Jun 19
KCS Level II, Apr 124, Sep 194
Kensington Apple Security System, Dec 176
Kenyon, Larry, Feb 160
Kenyon, Patti, Feb 160
Keyboard
   Hellenic Keyboard, Feb 291
   temporary fix for broken key, Feb 98
KeyPlan, Aug 16
Kiwi Address stack, Sep 202
Kiwi Envelopes, Feb 38, Sep 202
Klondike, Feb 259
Kodak Datashow 480 Projection Pad, Dec 201
Kodak Datashow Presentation Remote, Aug 103, Sep 237
Kolar, Mar 146
Kroy ColorPlus, Jan 134

Label Manager, Sep 202, Dec 43
Label1Once, Dec 176
Labels, Sep 202
   FastLabel, Jun 185
   ImageWriter II printing tip, Jun 211
   Label Manager, Dec 43
   LabelOnce, Dec 176
   Labels and Envelopes, Sep 202
   Lightning Labels, Dec 45
Labels and Envelopes, Sep 202
Lab Master II series data-acquisition boards, Jul 123
   Lab-NB data-acquisition board, Jul 123
   La Ge Panther PDX PostScript-compatible printer, Sep 220
   Language Systems Fortran Compiler, Mar 167, Apr 249
   LANstar Interface Board, Jul 123
   LapLink Mac, Apr 118, May 257
   Laptop. See Portable Macintosh
   Large Screen Anti-Glare Filter, Dec 176
   Laser FX, May 134, Aug 105
   Lasergraphics' LCR film recorder, Jan 134, Jul 108
   LaserJet IIP printer, Dec 17
   LaserMax 1000, Nov 18
   LaserMax Systems' MX6 series printer controllers, Nov 18
   LaserOptics, Aug 105
   LaserPoint Color II color separations, Mar 128
      scanner driver, Jul 134
   Laser printers, introduction to, Oct 247 See also Printers/printing
   LaserStar erasable optical drive, Mar 103, Dec 119
   LaserStar WORM drive, Jul 116
   LaserWriter disabling test page, Jun 211
      PostScript version number, Apr 217
LaserWriter II, Oct 120
   LaserWriter IIc, Oct 120
      printing sharper graphics on, Feb 100
LearningPersuasion, Sep 268
LetrStudia, May 134, Jul 146
   LetrTuck, May 134
   LetrTuck+, Sep 321
   Letter Learner, Nov 187
   LexLink communications board, Jul 123
   Liaison, Aug 176
   Liberty 40 hard disk, Sep 172
   Liberty 80 and Liberty 100 hard disks, May 158
   Liberty Spell II, Feb 188
   Lightning Labels, Dec 45
   LightningScan scanner, Mar 97, May 124, Jul 37
   Lightspeed, Jan 174
   Lightspeed Pascal, Jun 181, Oct 38
   Linotronic imagesetters, Oct 154
   Listen, Apr 124
   The Little Kingdom: The Private Story of Apple Computer, Feb 61
   LocalTalk, Nov 152
   Logical Connection print buffer/spooler, Jul 16
   Looking Good in Print, Jan 95
   Lookup, Feb 188
   Low-cost Macintosh, commentary, Sep 23
   LP Text, May 134
   Lumena, May 151, Jun 95
   L View monitor, May 142
M, Apr 124
   MacAds II SE data-acquisition board, Feb 227
   MacADIOS II series data-acquisition boards, Jul 123
   MacApp, Apr 91
   MacA8PC, Jun 138, Sep 145
   MacArchition, Apr 249
   MacBlit, Jun 138, Sep 255
   MacBottom 45 hard disk, Sep 172
   MacBottom HD84 hard disk, Apr 13
   MacBra, Mar 87
   MacBra Electronics Designer, Oct 103
   MacBra Facilities, Oct 103
   MacRISC coprocessor board, Nov 18
   MacCD, Apr 91
   Maccele late I/O board, Jul 123
   MacClint, Aug 249
   MacClock II I/O board, Jul 123
   MacCone communications board, Jul 123
   Mac Cosy, Dec 176
   MacCreate 40 hard disk, Sep 172
   MacCreate 80 hard disk, May 158
   MacCreate 300 hard disk, Nov 160
   Maccreate hard disks, Apr 13
   Mac Data Display, Feb 277
   MacDesigner, Jan 37
   MacDiscuss erasable optical drive, Dec 119
   MacDisk EM110 hard disk, May 158
   MacDisk EM330 hard disk, Nov 160
   Mac/DOS II coprocessor board, Jul 123
   MacDot printer, Apr 14
   MacDraw, Show Size command, Mar 232
   MacDraw II, Apr 99, Jun 244, Aug 140
      as presentation tool, Aug 73
      filling shapes, Jan 207
      keystroke command shortcuts, Dec 45
      rotated text printing problem, Jun 30
      selecting all objects of same type, Dec 292
      thin lines in, Jul 195
   MacDSP digital signal processor board, Jan 95, Mar 95, Jul 123
   MacEnvelope, Feb 291, Aug 250, Sep 202
   MacEyn, Feb 188
   MacFax modem, Jul 128, Aug 115
   MacFlow, Oct 262
   MacFontware, Oct 183
   MacFartran, Jan 13, Mar 167, May 257
   MacFartran for MPW, Oct 262
   MacFartran/020, Mar 167, May 257
   MacHerbory, Jul 16
   MacHex, Mar 249, Aug 250
   MacHotel, May 258
   Maciris, Nov 18
   MacinStor 45-ZFP hard disk, Sep 172
   MacinStor 90 ZFP hard disk, May 158
   MacinStor 345 hard disk, Nov 160
   MacinStor Installer, Dec 320
   MacinStor series drives, Mar 103
   MacinTox, Feb 206
   MacinText, Feb 170
   Macintosh, myriad versions of, Jul 43
   Macintosh clones, Apr 55, May 13, Jul 15, Aug 15
   Macintosh Communications Package, Sep 260
   Macintosh development team, Feb 160
   Macintosh 512K, starting from hard disk, Feb 97
   Macintosh 512KE, color display, May 13
      The Macintosh Font Book, Jun 99
   Macintosh Hard Disk BOSC, May 158
   Macintosh Information Service, Oct 262
   Macintosh Masters Art Contest winners, Aug 133
   Macintosh News Service, Nov 71
   Macintosh Plus, startup problem, Sep 288
      upgrading, Oct 77
   Macintosh Portable, Nov 144
   Macintosh SE accelerator boards, Feb 256, Mar 118, Aug 15
      boards, Apr 227
      screen jitter repair policy, Apr 44
      upgrading, Oct 77
   Macintosh SE/30, Mar 112
      E-Machines' TX SE/30 color display subsystem, Oct 107 (continues)
Macintosh II
accelerator boards, Mar 118
boards, Apr 227
capturing screen image on, Mar 146
commentary, Mar 61
8-bit Video Card, Sep 208
fans, Apr 217
ruggedized version, May 95
utility programs, Mar 146
Macintosh IIx, Nov 114
Macintosh IIx, Apr 131
Macintosh IIIx, Jul 144
The Macintosh Way, Jun 19
Macinware SE Extended Carrying Case, May 138
Madel, Jul 14
MacLife, Jul 221
MacMainframe II communications board, Jul 123
MacMainframe SE, Jun 138
MacMainframe TLMP, Mar 93
Macintosh coprocessor board, Jan 95, Jul 123
Macintosh Model II symbolic processor board, Oct 99
MacJet, Apr 13
MacKern, May 134
MacLab, Feb 227
MacLAN Connect, Jul 221
MacLink Plus, Apr 118
MacLink Plus PC, Dec 210
MacLinkPlus/Wang VS, Sep 322
MacLite portable, Oct 172
MacMainframe series, Jun 138
MacMainframe terminal-emulation board, Feb 263
MacMainframe 3270/CUT, Aug 250
MacMainframe II communications board, Jul 123
MacMainframe II/DFT, Mar 93
MacMaster Templates, Jul 148
MacMoney, Feb 206, Jun 30, Nov 17
Insights on, Dec 309
MacMusicFest, May 109
MacOCR, Feb 170
MacPacq data-acquisition board, Jan 172
MacPaint, Oct 107, Dec 154
centering drawing in version 2.0, Jun 211
MacPerspective, Apr 40, Dec 136
MacPrint, Jun 89, Oct 262
MacProject II, May 13, Jun 244, Aug 203
MacProof, Feb 188, Jun 30, Aug 250
MacProto NuBus prototyping board, Jan 168
MacRecorder, Jun 124, Nov 299, Nov 319, Dec 176, Dec 199
MacRing communications board, Sep 139
MacColor video board, Jun 89
MacroMaker, Jun 211, Feb 188, Mar 146, Jul 200
MacroMind Director, Jun 108, Sep 221, Sep 299
MacroPlus, Feb 188, Mar 146, Oct 160
MacroMaker, Jan 211, Feb 188, Mar 146, Jul 200
QuickKeys, Dec 221
Tempo II, Dec 221
MacroScope Ecology Laserdisc, Oct 95
MacSaver, Nov 131
MacScan and MacScan Pro scanners, May 124
MacScriba, Dec 217
MacScriba Technologies’ GS6000 erasable optical drive, Jun 16
MacSnap price reduction, Jun 16
MacSprint II, Oct 262
MacStack 45 hard disk, Sep 172
MacStack 581U hard disk, May 158
MacSync monitor, Feb 13
MacTape/SCSI-4, SCSI-5, and SCSI-8 tape drives, Dec 144
MacTCP, Jan 14
MacTell, Apr 249
MacTemp, Feb 139
MacX270, May 258, Jun 138
MacTilt, Dec 176
MacTran Plus, Mar 167
MacTransfer, Jan 46
Mac2400E communications board, Jul 123
Mac 20MX-16 and 20MX-25 accelerator boards, Mar 118
Mac II Workstation, Jan 87
Mac286 coprocessor board, Jul 123
MacVision video digitizer, Mar 249, Jun 116, Jul 155
Macworld Expo, commentary, Apr 19
MacWrite
flush-left text with indents, Mar 232
Print macro, Jul 200
MacWrite II, Apr 99, Sep 61, Sep 180, Oct 130
Insights on, Nov 311
Max, Sep 149
Magic 45 removable-cartridge drive, Jul 116
Magic 300 hard disk, Nov 160
MagicDrive 46 hard disk, Sep 172
MagicDrive 91 hard disk, May 158
MagicTape 60/150 tape drive, Dec 144
Magnavox’s CM9080 monitor, Feb 13
Mail Dex, Jul 178, Sep 202
Mailing Labels, Sep 202
Mail order, May 73, Sep 40
Mainframe-Macintosh communications, Jun 138, Sep 145, Sep 233, Sep 255
Maintenance tips, Jul 69
ManagerSpot, Nov 187
Managing Your Money, Feb 206, Mar 249
The Manhole, Mar 190, Dec 162, Dec 176
Manock, Jerry, Feb 160
Map CDEV, Jan 211, Mar 230
MapGrafik, Jul 227
Maps. See Geography
Marathon 020 and Marathon 030 accelerator boards, Mar 118
Market Analyzer, Feb 206
Market Manager Plus, Feb 206
MarketMaster, Apr 249
MarkUp, Nov 152
MARS, Feb 13
Master Outline Spec, Dec 136
Master Tracks Pro, Apr 124, Sep 194
Mastering Adobe Illustrator 88, Dec 111
Mastering HyperTalk, Feb 147
MasterJuggler, Oct 160
MasterSpec AIA, Dec 136
MathCAD, Jun 16
Mathematica, May 59
Mathematics
equation editors, Feb 188, Nov 211
MathCAD, Jun 16
Mathematica, May 59
MathType, Feb 188, Aug 250, Sep 322, Nov 211
Milo, Mar 89, Jul 164
NumberMaze, Aug 181
SPAM, May 14
MathType, Feb 188, Aug 250, Sep 322, Nov 211
Matrix TT200 color thermal printer, Jun 152
Matrox’s NG-1281 graphics board, Feb 14, Mar 14
Mavis Beacon Teaches Typing, Mar 195
Maxxess’s 600L erasable optical drive, Dec 119
Maxxess’s E Series hard disk, Sep 172
Maxxess’s M-Series 300 hard disk, Nov 160
Maxxess’s V Series 40 hard disk, Sep 172
Maxxess’s 1501 tape drive, Dec 144
Max-15 monitor, May 142
MaxPage, Jul 228
MaxStream 60 and MaxStream 150 tape drives, Dec 144
MaynStream 60, 150, and 2200HS tape drives, Oct 17, Dec 144
MaynStream 60 and MaynStream 150 tape drives, Dec 144
McCray coprocessor board, Jul 123
McMax, Jun 244, Aug 179
McSink, Feb 188
Mean 18 Ultimate Golf, Jun 168
Medicine
Cardiac Imaging, Nov 187
Family Care, Jul 177
HyperCard/videodisk surgical-training programs, Jul 89
Report and Image Management System, Apr 87
MegaDrive 20 high-density floppy drive, Jul 116
MegaROM 1.1, virus on, Feb 14
MegaScreen monitor, May 142
MegaScreen 2008 color monitor, Aug 148
Memory expansion, Jan 73
Clearpoint Research 4M8 SIMMS, Mar 13
MacSnap, Jun 16
Multi-Inline Memory Module, Oct 97
Memorybank SS400 hard disk, Jul 168
Memorybank tape backup, Jul 168
MenuFonts, Mar 195
MenuFonts 2, Oct 160
Mercury’s MC32000NU coprocessor board, Jul 123
Nova 320 hard disk, OCRs, Feb 170
Objectworks for Smalltalk-SO, Aug 190

NuBus

NuBus Multibus I Adaptor board, Jul 123
NuBus prototyping board, Jan 168
NuBus Q22 Bus Adaptor board, Jul 123
NuBus VME Adaptor board, Jul 123
NuControl/0 board, Jul 123
NuLink System tape backup, Mar 97
NumberMaze, Jan 168
NuPaint, May 198, Sep 322, Dec 154
NuPrometheus League, Aug 15, Nov 61
Nutmeg 19 monitor, Mar 192, May 142
Nutmeg/Xerox Full Page Display, May 142
Nutrition Stock, Oct 262
NuView video board, Jan 97
NuVision coprocessor board, Jul 123
NuVista video board, Jan 97, Sep 208

Neurotour, Jul 175

Omnis 3 Plus/Express, Feb 188
Omnis, Feb 170

OmniPage, Feb 170, Mar 158, Oct 262

Omnipage, Sep 18

OmniLaser 2106 PostScript printer, Oct 120

OmniPage, Feb 170, Mar 158, Sep 18

Omnis, Aug 15

Omnis 3 Plus/Express, Feb 294

Omniz's 96325D modem, Jul 128

On Cue, Oct 160

101 Buttons and Scripts, Oct 53

Online services

ComputServe, Jan 75, Nov 123

Connect Professional Information Network, Apr 97

OOPSLA, Feb 131

Open It, Jul 175

Open Mac Enterprises' OME 100X hard disk, May 158

Open Systems Interconnect, Mar 101

Opinion poll, Macs used in, Mar 93

Optical drives, Jun 85. See also Erasable optical drives

Macrosystems' GS6000 EO, Jun 16

Optical WORM drive, Jul 116

Options 80A Advanced Stock Option Analyzer, Feb 206

Oracle for the Macintosh, Jun 124, Sep 244

Orange Micro's NTSC Converter, Sep 208

Orion Accelerator board, Mar 118

Outliners, Feb 188. See also More; More II Acta Advantage, Nov 251

OvalTune, Aug 199

Overhead transparencies, Feb 97, Oct 237

Overlays A.M.S., Dec 136

Over 030 accelerator board, Mar 118

PacerShare, Feb 245

Page-layout programs, Apr 108. See also Aldus

PageMaker; QuarkXPress

DesignStudio, Dec 18

Interleaf Publisher, Jan 13

Multi-Ad Creator, Dec 228

Publish It, Nov 117

Silicon Beach Software's program, Nov 117

spacing guides, Oct 238

Springboard Publisher, Mar 165

PageJet. See Aldus PageJet

PageView monitor, May 142

PaintJet color ink-jet printer, Jan 134, Apr 13, Jun 85

MacPrint compatibility, Jun 89

Palm Top Link for the Macintosh, Dec 176

PanChroma CHC-345 and CHC-645 printers, Jan 134

Panorama, May 182, Jun 128, Aug 15, Oct 238, Nov 319

Paper Keyboard, Sep 149

Parameter Manager Plus, Mar 250

Parameter RAM, resetting, Oct 206

PC MacTerm/Network, Nov 247

PCOX/Coax-M, Jun 138

PCOX/Multi-M, Jun 138

PCPCE OER/600 erasable optical drive, Jul 116

PCPC II color monitor, Aug 148

PC Scan series scanners, May 124

PC Tools Deluxe, Jun 165

PEGASYS II, Jun 248, Dec 136

Perfectstudy, Feb 294, Apr 187

Perfect Timing, Nov 152

Performer, Apr 124, Sep 194

Peripheral Land's 1.44MB floppy drive, May 14

Peripheral Land's PLI 100 external Turbo hard disk, May 158

Personal Accountant, Feb 206

Personal Ancestral File, Sep 242

Personal Golf Stats, Nov 319

Personal/home software. See also Games

Andrew Tobias Managing Your Money, May 196

Family Care, Jul 177

Family Matters, Nov 249

For the Record, Nov 249

Personal Ancestral File, Sep 242

ResumeExpert, Oct 205

SpeedReader II, Apr 194

Synchronicity, Dec 226

Two-Minute Nutrition Manager, Aug 204

Personal LaserPrinter QuickDraw printer, Oct 120

Personal Page Printer PostScript printer, Oct 120

Personal Vision video board, Sep 208

Personal Writer 15SL, Sep 208

Perspective for Architects, Dec 136

Persuasion. See Aldus Persuasion

PS1 Mustang Flight Simulator, Apr 192, Aug 250

Phaser CPS color thermal-transfer printer, Jan 85

Phaser PrintStation, Mar 85

Photolink infrared cabling system, Sep 141

PhotoMac, May 176

color separations, Mar 128

Photomac, Jul 108

Photon Paint, May 151, May 178

PhotoShop, Jun 116

PICT, Jan 204

PictureBook, Oct 206

Pinnacle Micro's REO-650 erasable optical drive, Jul 116, Nov 202

Pirates, Dec 162

Pixelmaster, Aug 28

Pixelmaster ink-jet printer, Jun 85

PixelPaint, Jan 221, May 151

PixelPaint Professional, Sep 132, Dec 184

color separations, Mar 128

Plains & Simple One-Write, Nov 170

Platinum 100 hard disk, May 158

Platinum 300 hard disk, Nov 160

Playing to Win project, Aug 43

PLI Turbo 50 external hard disk, Sep 172

PlotMaster printer, Jan 134

Plus, Apr 81, Jun 124, Aug 16

PMMU, Jun 73

P.O.E.M., Feb 133

Police Quest: In Pursuit of the Death Angel, Mar 183

Portable Macintosh

Macintosh Portable, Nov 144

Travel Mac, Oct 107

Walkmac SE, Jan 14, Jun 83

Wallaby Laptop System, Sep 147

Portable Packs, Dec 176

Portrait, Sep 194

PostScript file, creating, Jan 207, Oct 237

PowerDraw, Dec 136

Powermenus, Sep 267, Oct 160

PowerPoint, Apr 82, May 166, Jul 209, Aug 73

sending files to Aldus Persuasion, Dec 18

(continues)
### QMS ColorScript 100 color PostScript printer
- Apr 158, Oct 93

### QMS-PS 810 PostScript printer, Apr 158

### Quad 56000 DSP Card coprocessor board, Jul 123
- QMS-PS 810 PostScript printer,
- Pyro,
- Puzzle Gallery: At the Carnival, Dec 162
- Publish or Perish, Feb 188,
- Quantum 40MB Raw Drive,
- Quantum hard disks, failure of,
- QuickMap,
- QuickMail,
- Quickletter, Oct 201,
- QuickXpress, Jan 154, Apr 108, Sep 35, Sep 322, Nov 320

#### Color separations, Mar 128
- creating table, Aug 157
- Insights on, Mar 75
- QuarkStyle, Feb 141, Apr 181
- QuarkXtras, Dec 18

### QuickCapture frame-grabber board, Feb 236, Sep 35

### QuickDex, Dec 176

### QuickDraw, Apr 71
- color, Jun 15
- 32-bit, Aug 99

### Quick, Feb 206, Nov 320

### QuickKeys, Feb 188, Mar 146, Oct 160, Dec 221

### QuickFolder, Oct 160, Dec 176

### QuickLetter, Oct 201, Nov 320

### QuickMail, Mar 250, Apr 85, Jul 228, Sep 188

### QuickMap, Nov 226
- QuickShare data-transfer board, Mar 250, Apr 118

### QuickWord II, Feb 188
- Qume CrystalPrint Publisher PostScript-compatible printer, Sep 220

### R

<table>
<thead>
<tr>
<th>Racial-Milgo's RM/9632 and RM/9632/2 modems, Jul 128</th>
</tr>
</thead>
<tbody>
<tr>
<td>Racial-Vodic's 9600VP modem, Jul 128</td>
</tr>
<tr>
<td>Race OCS modem, Jul 128</td>
</tr>
<tr>
<td>Racet Comutes' SA series tape drives, Dec 144</td>
</tr>
<tr>
<td>Radius Accelerator 16 and Accelerator 25 boards, Mar 118</td>
</tr>
<tr>
<td>Radius Full Page Display monitor, May 142</td>
</tr>
<tr>
<td>Radius QuickColor Graphics Accelerator, Oct 99</td>
</tr>
<tr>
<td>Rags to Riches, Nov 170</td>
</tr>
<tr>
<td>RamTime, Dec 107</td>
</tr>
<tr>
<td>RAM cache, Apr 144</td>
</tr>
<tr>
<td>chip shortage, Jan 57</td>
</tr>
<tr>
<td>expanding, Jun 73</td>
</tr>
<tr>
<td>RAM disk, Apr 144</td>
</tr>
<tr>
<td>RamTest, Aug 57</td>
</tr>
<tr>
<td>Rapport, May 111</td>
</tr>
<tr>
<td>RasterOps' 1948H and 1948S color monitors, Aug 148</td>
</tr>
<tr>
<td>Reader Rabbit, Feb 249</td>
</tr>
<tr>
<td>Read-It OCR, Jan 222, Feb 170, Apr 250, Dec 320</td>
</tr>
<tr>
<td>ReadStar II Plus, Feb 170</td>
</tr>
<tr>
<td>ReadySetGo, Apr 108, Sep 35</td>
</tr>
<tr>
<td>Insights on, Aug 241</td>
</tr>
<tr>
<td>Real Estate Investment Analysis, Feb 206</td>
</tr>
<tr>
<td>Rebound, Oct 160</td>
</tr>
<tr>
<td>Record Holder Plus, Jan 128</td>
</tr>
<tr>
<td>Reflex Plus, Jun 128</td>
</tr>
<tr>
<td>Relax 80 Plus and Relax 90 Plus hard disks, May 158</td>
</tr>
<tr>
<td>Relax Technology's 60 and 150 Tape Plus tape drive, Dec 144</td>
</tr>
<tr>
<td>Relax Technology's Hard 46 Plus hard disk, Sep 172</td>
</tr>
<tr>
<td>Relisys's RE1475 monitor, Feb 13</td>
</tr>
<tr>
<td>Removable-media drives, Jul 116</td>
</tr>
<tr>
<td>Bay Microsystems' 44 Repack, Jul 116</td>
</tr>
<tr>
<td>Bernoulli Box II 44, Nov 238</td>
</tr>
<tr>
<td>Cirrus 45, Jul 116</td>
</tr>
<tr>
<td>DotoPak, Jul 116</td>
</tr>
<tr>
<td>Disk Pack series, Jul 116</td>
</tr>
<tr>
<td>DFI 44, Jul 116</td>
</tr>
<tr>
<td>ExponaCrate, Jul 116</td>
</tr>
<tr>
<td>Flipper 44, Jul 116</td>
</tr>
<tr>
<td>h البحرDisk44, Jul 116</td>
</tr>
<tr>
<td>Infinity 40 Turbo, Jul 116</td>
</tr>
<tr>
<td>Info2R, Jul 116</td>
</tr>
<tr>
<td>Magic 45, Jul 116</td>
</tr>
<tr>
<td>Micro/Removable 45, Jul 116</td>
</tr>
<tr>
<td>Mobile 42 Plus, Jul 116</td>
</tr>
<tr>
<td>ToteCrate, Apr 12</td>
</tr>
</tbody>
</table>

### TransPac series, Jul 116
- RenderMan, Mar 14, Jun 108
- Report and Image Management System, Apr 87
- ResEdit, removing corrupted fonts with, Mar 227
- ResumeExpert, Oct 205

### Rex, Oct 103

### Reyes, Mar 14

### RGB Decoder, Sep 208

### RGB/VideoLink Plus, Jan 14

### Ricoh's DX1 fax modem, Aug 115

### Rodime 45 Plus, Sep 172

### Rodime's hard disk interleave ratio, Jan 40

### Rodime's RX series hard disks, May 13

### Rodime's 100 Plus hard disk, May 158

### Rodime's 1000 RX hard disk, May 158

### Rossman, Alain, Feb 160

### RoundUp, Feb 188

### Running HyperCard with HyperTalk, Feb 147

### S

| Sad Mac error codes, Jul 69 |
| Safire Shopper, Feb 129 |
| Sales Associate, Apr 290 |
| SAM, Jun 15, Oct 160 |
| SANE, Jul 28 |
| SBT Mac Series Six Plus, Nov 170 |
| ScanJet and ScanJet Plus scanners, May 124, Sep 228 |
| ScanMan scanner, Jan 13, May 124 |
| Scammaster scanner, Apr 174, Aug 28 |
| Scammaster series color scanners, Jul 134 |
| Scanners, Feb 170, May 124, Jul 134. See also |
| Video digitizers |
| Abaton's 300 S, May 124 |
| Agfa Focus 5800GCs, Oct 190 |
| Apple Scanner, Feb 220, May 124 |
| Barneyscan, Jul 134 |
| Barneyscan XP, Mar 13 |
| color, Jul 134 |
| Datocopy 830, Jan 176 |
| Datocopy series, May 124 |
| Delf, Jun 116 |
| HighScan series, May 124 |
| HyperScan, Jun 124 |
| LightningScan, Mar 97, May 124, Jul 37 |
| MacScan/MacScan Pro, May 124 |
| MacVision, Jun 116 |
| Microtek Lab's MSF series, May 124 |
| OmniPage, Mar 158 |
| PC Scan series, May 124 |
| ScanJet and ScanJet Plus, May 124, Sep 228 |
| ScanMan, Jan 13, May 124 |
| Scammaster, Apr 174, Aug 28 |
| Scammaster series color scanners, Jul 134 |
| Sharp JX-450, Apr 174 |

(continues)
Screen savers, Screens.

Series Six Plus/Mac, SCSI, connection tips, Scriptwriter, ScriptView.

Service modem, Jul 128

Sequences, Service bureaus, typesetting, Service Industry Accounting, Service modems, Stackware.

Sector Collector, Rony, Feb 160

Sector Collector, Mar 146

Sector Collector, Oct 18

Security, Jul 57

Access Control Environment, Aug 16

encryption utilities, Jun 185

FileGuard, Oct 18

Hard Disk DeadBolt, Aug 229

Kensington Apple Security System, Dec 176

making icons invisible, Aug 229

Seiko's QD-5500 series QuickDraw printers, Oct 17

Sepial, Feb 160

Sebok, Feb 160

Sector Collector, Oct 18

Security, Jul 57

Screen Gems, Scion Image Capture Board, ScriptMaster, ScriptExpert, ScriptMast er.

Screen savers, Screens.

Screen Gems, Mar 146

Screen Gems, Screenshot, Screen savers, Oct 160

ScriptExpert, Mar 195

ScriptMaster, Oct 130

Scriptor, Apr 37

Script Report, Feb 137

ScriptView, Feb 137

Script-writing programs, Apr 37

Scriptwriter, Apr 37

SCSI, connection tips, Aug 233

SCSI Dart RAM disk, Nov 18

SCSI Evaluator, Aug 57

SCSI Tools, Oct 53

Sculpt-Animate 4D, Jan 99

ScuzzyGraph video board, May 13, Dec 45

Sekor, Feb 160

Sector Collector, Oct 18

Security, Jul 57

Access Control Environment, Aug 16

encryption utilities, Jun 185

FileGuard, Oct 18

Hard Disk DeadBolt, Aug 229

Kensington Apple Security System, Dec 176

making icons invisible, Aug 229

Seiko's QD-5500 series QuickDraw printers, Oct 17

Separable Grammar, Feb 188

Separator, Mar 128

Sequence, Apr 126

Series Six Plus/Mac, Feb 14

Service bureaus, typesetting, Oct 154

Service Industry Accounting, Nov 170, Dec 239

Service modem, Jul 128

SFScrollINIT, Oct 160

SFViewINIT, Oct 160

Shadow 80 hard disk, May 158

Shadowgraph monitor, Feb 13

Shadows of Mordor, May 209

Shanghai, Dec 162

Shareware, Oct 53. See also Public domain/ shareware

Sharp JX-450 scanner, Apr 174

Sharp JX series color scanners, Jul 134

Sharp's JX-730 printer, Jan 134

Shogun, Dec 232

Showcase F/X, Nov 237

ShowNet, Jun 91

Shufflepuck Cafe, May 202

Silicon 3333 accelerator board, Jan 13

SideKick for the Mac, Feb 188

Signal: Communications Tools for the Information Age, May 103

Signs of Type, Nov 187

SilentPartner, Aug 103

SilentWriter LC 890XL printer, Apr 14

SilverView S8 monitor, May 142

SimCity, Nov 231, Dec 162

SIMMs, 4MB, Jun 73

SimpleSpan and BackSpan, Dec 136

Simply Accounting, Nov 170

Simulations

SimCity, Nov 231

SIMMStack, Nov 251

Sky Travel, Jan 186

Slides, Jul 209. See also Film recorders;

Presentations

croft interface, Nov 18

Showcase F/X, Nov 237

SlideWriter film recorder, Jan 134, Jul 108

Slides, Sep 79

Smalltalk/V Mac, Feb 131, Aug 190

Smart Alarms, Apr 250

Smart Art, Aug 105, Dec 188

Smartcraft II V3.1, Mar 97

SmartPak's 9600 Plus modem, Jul 128

SmartForm Assistant, Apr 99, Dec 320

SmartForm Designer, Apr 99, Jul 145, Dec 320

SmartModem 2400M, Mar 97

SmartModem 9600, Jul 128

SmartModemM communications board, Jul 123

SmartScrap & The Cipper, Apr 250, Aug 197

Smith, Burrell, Feb 160

Snap, Sep 260, Nov 320, Dec 136

SnapShot, Mar 146

SniffEr, Mar 250, Aug 251

SoIPC, Sep 233

SoIPC Mac, Jul 228

Solitaire Desk Accessory, Feb 259

Solitaire Royale, Feb 259

Sonar, Feb 188, Jun 29

Sonar Professional, Feb 188

Sony's REO-50 optical drive, Apr 14

Sound. See also Music

Alchemy, Jan 180, Mar 249, Apr 124, Nov 299

altering beep sound, Nov 287

Chime, Nov 299

Gorillas in the Mist, Dec 176

introduction to digital sound, Nov 299

MacRecorder, Jun 124, Nov 299, Nov 299, Dec 176, Dec 199

Sound Accelerator board, May 109

Sound Designer, Apr 124

Sound Designer II, Nov 299

SoundMaster, Oct 160, Nov 299

Sound Accelerator coprocessor board, Mar 95, May 109, Jul 123

Sound Designer, Apr 124

Sound Designer II, Nov 299

SoundMaster, Oct 160, Nov 299

Sound Resource Libraries, Mar 195

SpaceEdit, Jun 116, animation in, Jun 108

SpaceMaker, Dec 136

Space Quest II: Vohaul's Revenge, Mar 183

SPAM, May 14

SPAMM, Oct 160

Specifications, Dec 136

Spectrum/8 Grayscale monitor, May 142

Spectrum/8 Series II color video board, Apr 99, Sep 208

Spectrum 9600 modem, Jul 128

Speedlink communications board, Jul 123

Speedometer, Aug 57

Speed Reader II, Apr 194

Spell Coach Professional, Feb 188

Spelling Champion 3, Feb 188

Spelling checkers, Feb 188

Spellswell, Feb 188, Nov 320

Spreadsheets Nov 180. See also Microsoft Excel

exchanging IBM PC and Macintosh files, Apr 118

Full Impact, Nov 180

indentation, Nov 294

Trapeze, Sep 18

Wings, Mar 13, Jun 148, Nov 17, Nov 180, Dec 18

SpringBoard coprocessor board, May 95

SpringBoard data-acquisition board, Jul 123

SpringBoard Publisher, Mar 165

Stack Starter, Mar 32, Oct 53

Stackware. See HyperCard

Staircase, Oct 160

StandOut, Mar 172, May 166, Jul 209, Aug 73

Stanford University ballot-counting program, Sep 141

StarController, Jun 91

StarDrive 40 and StarDrive 45 hard disks, Sep 172

StarDrive 90 hard disk, May 158

StarDrive 60TX hard disk, Apr 169

StarDrive 60TX tape drive, Sep 40

StarDrive 60TX and 150TX tape drives, Dec 144

Startape tape backup, Apr 169

Startup problems, Aug 233, Sep 288

Statistical Package for the Social Sciences, Dec 119

Statistics, Apr 138

Crystal Ball, Jan 186

Data Desk Professional, Apr 138, Sep 139

Exstatix, Apr 138, May 189

Fastal, Aug 185

JMP, Aug 113

Statistical Package for the Social Sciences, Dec 119

StatView 512+, Apr 138

StatView SE+Graphics, Feb 252

StatView SE+Graphics/II, Apr 138
SurfBoard I/O board, Jul 123
Switch-a-roo, Mar 146
Swivel 3D, Jan 156, Jun 116
animation in, Jun 108
SX Envelope Cassette Tray, Apr 13
Syphon, gomless, Mar 36
Symantec AntiVirus for Macintosh, Sep 17
Symantec Utilities for the Macintosh, Jan 145, Jun 185, Oct 18
Synchronicity, Nov 320, Dec 226
Systat, Feb 252, Apr 138, Jul 116
System 6.0, introduction to, Jan 211
System 7.0, Aug 124, Nov 79

(continues)
TopFlight data-acquisition board, Jul 123
TOPS, Jan 118, Jun 15
problems with databases, Jul 15
TOPS/Mac, May 258
ToteCrate removable hard disk, Apr 13
Touch OSI, Mar 101
TPM-Mac coprocessor board, Jul 123
TraiBlazer Plus modem, Jul 128
Training, BellSouth Media Technologies Microcomputer Training Center, Feb 129
TransFax modem, Mar 138
TransPac series removable hard disks, Jul 116
Trapeze, Sep 18
Travel Mac portable, Oct 107
Tri-Data Systems' OZ 9600 and OZ 9600E modems, Jul 128
Tribble, Bud, Feb 160
Tricks of the HyperCard Masters: The Stacks, Dec 76
Troubleshooting tips, Aug 233
TrueForm, Aug 16
Truvel's Tz series scanners, May 124
Truvel's TZ-3BW and Tz-35BW color scanners, Jul 134
T-Shirt Factory, Feb 38
TurboBridge, Dec 223
TurboMac, Jul 85
Turbo Mouse ADB, Dec 212
Turbo SE accelerator board, Feb 256, Mar 118
TurboSynth, Jan 184, Apr 124, Dec 320
Turbo 300 hard disk, Nov 160
TV Producer Pro video board, Sep 208
Twins, Oct 18
Two-Minute Nutrition Manager, Aug 204
Two+Two I/O board, Jul 123
2001 Quotes, Jan 186
Tycho, Aug 157
Tyler, Dec 176
Type Designer I, Aug 105
Typefaces. See Fonts
TypeStyler, May 134
Typing Tutors, Mavis Beacon Teaches Typing, Mar 195
UpBeat, Apr 124
Upgrades, commentary, Oct 77
Used Macintosh, buying, Aug 57
User groups, Apr 67, Sep 69
Apple discount for, Aug 57
Apple Library Users Group, Dec 69
Apple Professional Information Exchange, Apr 67
BMUG, Jan 53
Boston Computer Society, Apr 67
directory, Sep 325
directory additions, Nov 71, Dec 69
Gold Coast Macintosh Users Group, Apr 91
Macintosh News Service, Nov 71
National Apple User Group Conference, Apr 67
NYMUG, Apr 67
Seattle's Macintosh Downtown Business Users Group, Jul 57
User Group Connection, Aug 57
Washington Apple Pi, Jan 57
UserInfo, Dec 115
Using HyperCard, Feb 147
Utilities, Oct 160
Aardvark, Oct 160
Aask, Oct 160, Oct 192
AntiToxin, Oct 160
Apple File Exchange, Apr 118
AutoSave II, Sep 268, Oct 160
backup applications, Mar 214, Oct 18, Dec 190
BigThesaurus, Jul 173, Oct 160
BWIC, Mar 146
CacheKey INIT, Mar 146
Capture, Jan 203, Mar 146, Sep 321, Oct 160, Oct 261
CEVs, Oct 160
ClipShare, Jul 99
Color CICNs, Mar 146
Color Cursor, Mar 146
ColorDesk, Oct 160
Colorizer, Mar 146
Color Map, Mar 146
Complete Undelete, Oct 18
Copy II Mac, May 195
Cursur INIT, Oct 160
Dimmer, Oct 160
Directory, Jul 178
DiskExpress, Jan 185
disk recovery, Jan 145
DiskTop, Aug 229, Nov 18
DocoCamp, Sep 135, Oct 176
Earth, Oct 160
Empower, Jun 185
encryption, Jun 185
file transfer, Apr 118
FileMagic, Oct 160
Findswell, Mar 163, Oct 160
1st Aid HFS, Jan 145
Fish, Oct 160, Dec 176
Flex, Oct 160
FIFY, Feb 188, Mar 146, Jun 29, Oct 160
Front & Center, Mar 146, Oct 160
Gopher, Apr 171
Guardian, Oct 160
HFS Backup, Aug 204
HierDA, Oct 160
Icon-H, Oct 160
INITPicker, Oct 160, Oct 192
INITs, Oct 160
Inix, Oct 160, Oct 192
In/Out, Nov 18
Kolor, Mar 146
Macintosh II, Mar 146
MacroMaker, Jan 211, Mar 146
MasterJuggler, Oct 160
MenuFonts, Mar 195
MenuFonts 2, Oct 160
MFDetective, Aug 203
MFLauncher II, Aug 203
MultiClip, Jul 99, Oct 160
MultiDisk, Jun 185, Oct 160
On Cue, Oct 160
OpenIt, Jul 175
PC Tools Deluxe, Jun 165
PictureBook, Oct 206
Powermenus, Sep 267, Oct 160
Pyro, Oct 160
QuickKeys, Mar 146, Oct 160, Dec 221
QuickFolder, Oct 160
RamDisk+, Jul 200
Ram Test, Aug 57
Rebound, Oct 160
SAM, Jun 15, Oct 160
Screen Dump II, Jan 203, Mar 146
Screener, Mar 146
Screen Gems, Mar 146
SCSI Evaluator, Aug 57
SCSI Tools, Oct 53
Sector Collector, Oct 18
SFScrollINIT, Oct 160
SDSImul, Oct 160
SmartScrap & The Clipper, Apr 250, Aug 197
SnapShot, Mar 146
SoundMaster, Oct 160
SPAM, May 14
SPAM, Oct 160
Speedometer, Aug 57
Staircase, Oct 160
Stepping Out, Oct 42, Oct 160
Stepping Out II, Feb 294, Apr 183, Oct 160
StuffIt, Mar 234, Sep 131
Suitcase II, Oct 160
SuperClock, Oct 160
SuperLasseSpool, Jun 211, Jul 195, Oct 160
Switch-a-roo, Mar 146
Symantec: Utilities for the Macintosh, Jan 145, Jun 185, Oct 18
Talking Moos, Apr 250, Oct 160
Tempo II, Mar 146, Oct 160, Dec 221
Test Pattern Generator, Aug 57
Thunder II, Oct 160
Toggle Cache, Mar 146
TOM/WIT, Oct 160
UserInfo, Dec 115
Vaccine, Oct 160
Virex, Apr 13, May 258, Aug 251, Nov 17, Dec 320
VirexGuard, Oct 160
Wizards, Jun 211
WindowMagic, Oct 160
Windows, Oct 160
word processor add-ons, Feb 188
XTreeMac, Nov 213

Vaccine, Oct 160
Vantage, Jan 170
Varnityper's VT6000 PostScript printer, Oct 120
VAX database access, Jul 93
VAX-Macintosh connectivity, Jan 93
VersaCAD, Jan 222, Dec 138
VersaTerm, May 258
VersaTerm-Pro, May 258
VERS resource, Jan 211
Video, Sep 208
animation, Jun 108
boards, Jun 97, Sep 208
broadcast-quality from Mac, Feb 139, Sep 208
color/SpaceFX board, May 109
EdgeWriter, Jun 116
Edit Worx, Jun 116
Genius, Jun 97
Macintosh as video workstation, Sep 208
Macintosh's role in film industry, Jan 116
MicroTV, Dec 121
Midas character generator, Jun 97
problems grabbing frames from VCR, Jul 37
RGB/VideoLink Plus, Jan 14
Showcase I/X, Nov 237
VideoMaker, May 103
video overlay software, Dec 45
Wax, Jun 97
Video digitizers
ComputerEyes, Jul 155
MacVision, Jul 155
ProViz Color Video Digitizer, Sep 208
VideoLink 400 and 400/Genlock, Sep 208
VideoMaker, May 103
VideoShow Desktop Presentation System, Apr 14
VideoWorks, Jun 108
VideoWorks Accelerator, Jun 116
VideoWorks CD ROM, Feb 145
VideoWorks II, Jun 116, Sep 299
VIDI/O Box, Sep 208
ViewLink Mac, May 97
Viking 2 monitor, Feb 13
Viking 21 color monitor, Aug 148
Viking 2/72 GS monitor, May 142
Viking 2400 monitor, May 142
Vincent van Gogh Laserguide, Nov 187
VINES Mac Mail Gateway, Apr 85
V.I.P., Mar 188
Virex, Apr 13, May 258, Aug 251, Nov 17, Dec 320
VirexGuard, Oct 160
Virtual, Oct 179
Virtual memory, Jun 73, Jul 19, Aug 124, Sep 91, Nov 79
Virus, Oct 179
Viruses, Mar 41, Jul 27
AntiToxin, Aug 249, Oct 160
Anti-Virus Kit, Sep 17
on MegaROM 1.1 CD, Mar 14
SAM utility, Jun 15, Oct 160
Symantec AntiVirus for Macintosh, Sep 17
undetectable on compressed files, Dec 17
Vaccine, Oct 160
Virex, Apr 13, May 258, Aug 251, Nov 17, Dec 320
VirexGuard, Oct 160
Virus Rx tip, Jul 200
Vision, Sep 194, Oct 185
Vision 030A and 030X SE/30 monitor boards, Jul 16
VisionScan series scanners, May 124
Visual Almanac laser disk, Oct 105
Vivo II, Nov 187
Voice Navigator, Oct 95
Voyager, Feb 139, Apr 40, Apr 190
Voyager Videostack, Nov 187

Wait Group's Tricks of the HyperCard Masters: The Stacks, Dec 176
Walkmore SE, Jan 14, Jun 83
Wallaby Laptop System, Sep 147
Wall Street Investor, Feb 206, Jun 248
Washington Apple Pi, Jun 57
Westcom WE40 hard disk, Sep 172
West of Eden, Feb 61
Wet Paint Special Occasions, Dec 176
Where in the USA Is Carmen Sandiego?, Nov 217
Windows, Oct 160
Wingz, Mar 13, Jun 148, Nov 180, Dec 18
CL/1 support, Nov 17
Wizard Electronic Organizer, Dec 176
Wolff Olins, use of Macintosh at, Mar 87
Word. See Microsoft Word
Word Attack, Apr 194
Word Finder, Feb 188
Word 4 Companion, Aug 16
WordMaker, Dec 230
WordPerfect, Aug 251, Sep 180
outliner, Feb 188
WordPerfect Office, Nov 17
Word processors, Sep 61, Sep 180. See also FullWrite
Professional; MacWrite; MacWrite II; Microsoft
Word; WriteNow
add-on products for, Feb 188
exchanging IBM PC and Macintosh files, Apr 118
Microsoft Write, Sep 180
MindWrite, Sep 18, Sep 180
Nisus, Sep 16, Sep 180, Sep 246
taste, Aug 101, Sep 18
WordMaker, Dec 230
WordPerfect, Feb 188, Aug 251, Sep 180
Word Processing: the Usable Portable Guide, Mar 195
XyWrite, Feb 141
Zeus, Feb 141
Wordwise, Feb 268
Works. See Microsoft Works
WorksPlus Command, Feb 188
WorksPlus Spell, Feb 188, Jul 228
World Class Leader Board, Jun 168
World Class Macintosh Awards, Sep 165
WORM drives, May 191, Jul 116
A.P.L.-800WD, May 191
Colby WORM, Jul 116
data WORM 800, Jul 116
Laserdrive's Model 820, Jul 116
LaserStar, Jul 116
Optical WORM, Jul 116
Worx, Jun 97
WOS Fund Accounting, Nov 170
Wren hard disks, Mar 103
WristMac, Dec 176
WriteMove ink-jet printer, Apr 152
WriteNow, Apr 14, Apr 250, May 180, Sep 61, Sep 180, Oct 130
format templates, Nov 296
outliner, Feb 188

Xceed series color boards, Nov 123
XCMD's for HyperCard, Aug 103
xfer, Apr 118
XPress. See QuarkXPress
XTreeMac, Nov 213
X Windows-Macintosh connectivity, May 109
XyWrite, Feb 141
Xyxis's XY600RW erasable optical drive, Oct 17

Zeus, Feb 141
Zing, Dec 136

MACWORLD • JANUARY 1990
315
In an effort to make your telephone purchasing a more successful and pleasurable activity, The Microcomputer Marketing Council of the Direct Marketing Association, Inc. offers this advice, “A knowledgeable buyer will be a successful buyer.” These are specific facts you should know about the prospective seller before placing an order:

Ask These Important Questions
- How long has the company been in business?
- Does the company offer technical assistance?
- Is there a service facility?
- Are manufacturer’s warranties handled through the company?
- Does the seller have formal return and refund policies?
- Is there an additional charge for use of credit cards?
- Are credit card charges held until time of shipment?
- What are shipping costs for items ordered?

Reputable computer dealers will answer all these questions to your satisfaction. Don’t settle for less when buying your computer hardware, software, peripherals and supplies.

Purchasing Guidelines
- State as completely and accurately as you can what merchandise you want including brand name, model number, catalog number.
- Establish that the item is in stock and confirm shipping date.
- Confirm that the price is as advertised.
- Obtain an order number and identification of the sales representative.
- Make a record of your order, noting exact price including shipping, date of order, promised shipping date and order number.

If you ever have a problem, remember to deal first with the seller. If you cannot resolve the problem, write to MAIL ORDER ACTION LINE, c/o DMA, 6 E. 43rd St., New York, NY 10017.
Tomorrow’s leaders are being shaped by two of the most powerful forces in America today. Computers and You.

In an unprecedented way, the computer industry is bringing technology and learning to neighborhoods more commonly associated with hardship than hardware. In San Francisco’s Tenderloin, kids have given up graffiti to study PC architecture, graphics and desktop publishing. They work in a learning center equipped with Apple® computers and IBM® PC-compatible systems, as well as an impressive and growing software library, all provided through donations. And they’re learning from volunteer instructors like David Bunnell and Adam Osborne.

The goal of Computers and You is to make a difference through technology. And it’s working. By the end of the first quarter, students had already found jobs. For some, their first ever. And it doesn’t stop with the Tenderloin. Our vision is to fully develop the San Francisco center and then recreate it in cities across the U.S.

A donation of equipment, time and especially money from you or your company can help make this vision a reality. To find out how, call us at (415) 922-7593. Computers and You, 330 Ellis St., 6th Fl., San Francisco, CA 94102.
Power Meeting.

Become part of the Desktop Media revolution. Power up your Mac with the Proxima® Data Display® and make your meetings come alive.

Macintosh changed the possibilities for personal creativity and productivity forever. Now, by adding a Proxima Data Display from Computer Accessories Corporation, you can bring the same creative freedom to on-line, interactive group working sessions, training meetings, and presentations.

And it’s all so easy.

Just plug the Data Display into your Mac. Set it atop any conventional overhead projector. And project precisely the same images shown on your computer screen – in dramatic simulated color or high-contrast monochrome – to give all your Mac graphics maximum visual punch.

With a Data Display, you can focus group attention on exploring what-if scenarios. Perform on-the-spot problem solving. Fine tune ideas in brainstorming sessions. And document spontaneity. All of which can turn a sales or financial discussion, training or education gathering – any data-sharing session – into a more productive and more creative meeting.

Use your existing software exactly as you always have. Data Display works as a perfect enlargement of your Mac’s monitor. For example, use Aldus Persuasion™ and the Data Display for “live delivery,” high-impact presentations. Microsoft Excel™ for group financial analyses or HyperCard® for conducting customized interactive training sessions. The opportunities and the potential to increase creativity and efficiency are limited only by your imagination.

Proxima Data Displays are available in two Macintosh compatible models. The Data Display MultiMode™ MacPac gives you complete Macintosh compatibility (all Mac IIs and compact Macs) and the best representation of color available to show off your Macintosh color graphics.

It comes with its own remote control so you can access both the Data Display and your Macintosh from anywhere in the room.

The Data Display 342, compatible with all compact Macs, sets the monochrome standard for high-contrast and bright, crisp images – even in lighted rooms.

Get the details on how Proxima Data Display power can make your meetings come alive. Call us for your nearest dealer at 800/582-2580, (in California 800/582-0852).

PROXIMA
by Computer Accessories Corp.
WHERE TO BUY

This listing provides company addresses and phone numbers for products mentioned in this issue. Allow several weeks for responses to reader service inquiries. Asterisks indicate vendors who prefer to be contacted directly.

Reader
Service

701 Abaton Quickstep Abaton, a Division of Everex, 48431 Milmont Dr., Fremont, CA 94538; 415/683-2226, 800/444-5321.


704 A.M.E. Casady & Greene, Inc., P.O. Box 223779, Carmel, CA 93922; 408/624-8716, 800/331-4321.


706 AntiToxin Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301; 818/991-6540.

707 Anti-Virus Kit 1st Aid Software, Inc., 42 Radnor Rd., Boston, MA 02135; 617/782-4676, 800/843-3497.


408/996-1010.

713 AppMaker Bowers Development Corp., P.O. Box 9, Lincoln Center, MA 01773; 617/259-8428.

714 Bernoulli Box Iomega Corp., 1821 West 4000 South, Roy, UT 84067; 801/778-1000, 800/456-5522.

715 BulletProof Spectra Micro Development, P.O. Box 4795, Tucson, AZ 85717; 602/884-7402.


718 Cause Maxem Corp., ASU Research Park, 7855 S. River Pkwy., Tempe, AZ 85284; 602/491-2466.

719 ColorBoard 264 RasterOps Corp., 10161 Bubb Rd., Cupertino, CA 95014; 408/562-4200.

720 Compuserve Information Service Compuserve, P.O. Box 20212, Columbus, OH 43220; 614/457-8600, 800/484-8199.


723 CrystalPrint Publisher Qume Corp., 500 Yosemite Dr., Milpitas, CA 90035; 408/942-4000, 800/223-2479.


726 dScience Spectra Blue, 7739 E. Broadway, #248, Tucson, AZ 85710; 602/296-3899.

727 Empower Magna, 2540 N. First St., #302, San Jose, CA 95151; 408/433-5467.

728 Eureka! The Solver Borland International, P.O. Box 660005, Scotts Valley, CA 95066-0005; 408/438-8400, 800/331-0877.

729 ExperAction ExperTelligence, 5638 Hollister Ave., #302, Goleta, CA 93117; 805/967-1797.

730 ExperCommon Lisp ExperTelligence, 5638 Hollister Ave., #302, Goleta, CA 93117; 805/967-1797.


733 4 Dimensional Hypercube Lascaux Graphics, 3220 Steuben Ave., Bronx, NY 10467; 212/654-7429.

734 Ft.KnoX Transfinite Systems Company, Inc., P.O. Box N, MIT Branch, Cambridge, MA 02139; 617/969-9570.

735 f(z) Lascaux Graphics, 3220 Steuben Ave., Bronx, NY 10467; 212/654-7429.

736 GCC Business LaserPrinter, GCC Personal LaserPrinter GCC Technologies, 580 Winter St., Waltham, MA 02154; 617/890-0880, 800/634-9737.

738 Glockenspiel C++ Oasys, 230 Second Ave., Waltham, MA 02154; 617/890-7889.

739 Handwriting Analyst CIASA, 2017 Cedar St., Berkeley, CA 94709; 415/644-2771.

740 Hard Disk DeadBolt FWB, Inc., 2040 Polk St., #215, San Francisco, CA 94109; 415/474-8055.

741 HMSL Frog Peak Music, P.O. Box 9911, Oakland, CA 94613; 415/485-0867.


743 HyperCard Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010. (continues)
744 Igor WaveMetrics, P.O. Box 2088, Lake Oswego, OR 97035; 503/635-8849.

754 Macintosh Allegro
C Yay APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

755 Macintosh Portable
C Yay Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.


756 Macintosh SE
C Yay Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

757 Macintosh IIcx
C Yay Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

758 Macintosh II 4bit Video Card Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

759 Macintosh II 4bit Video Card
Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

760 Macintosh II 4MB Expansion Kit Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; 408/996-1010.

761 Macsound
C Yay Synex, 692 Tenth St., Brooklyn, NY 11215; 718/499-6293, 800/447-9639.

762 Macintosh Programmer's Workshop
C Yay APDA-Apple Computer, Inc., 20525 Mariani Ave., MS: 33G, Cupertino, CA 95014; 800/282-2732.

763 MacWrite Plus
C Yay Dataviz, Inc., 35 Corporate Dr., Trumbull, CT 06611; 203/268-0030.

764 MacLock
C Yay MacProducts, 20231 San Gabriel Valley Dr., Walnut, CA 91789; 714/595-4838.

765 MacLock
C Yay Verge Technologies, 510 Oak Grove Rd., Norfolk, VA 23505; 804/423-2042.

766 MacPaint
C Yay MacPaint, 1150 17th St. NW, #800, Washington, D.C. 20036; 202/293-4255, 800/444-6245.

767 MDA
C Yay Symbiotics, 875 Main St., Cambridge, MA 02139; 703/556-8756.

768 MCA
C Yay Symbiotics, 875 Main St., Cambridge, MA 02139; 703/556-8756.

769 MacLock
C Yay MacLock, 18 Maple St., Brooklyn, NY 11215; 718/499-6293, 800/447-9639.

770 MacSafe
C Yay Kent Marsh Ltd., 1200 Post Oak Blvd., #210, Houston, TX 77056; 713/623-8618, 800/325-3587.

771 MacSaver
C Yay MacSaver, 509 S. Rockford Dr., Tempe, AZ 85281; 602/666-5802, 800/325-7347.

772 MacSpin
C Yay D Software, P.O. Box 50052, Austin, TX 78763; 512/478-2393.

773 MacSticker
C Yay International Computer Services, Inc., 300 Three First National Plaza, Chicago, IL 60602; 312/630-4895.

774 MacII FSS

775 Maple

776 MathCAD
C Yay MathSoft, Inc., One Kendall Square, Cambridge, MA 02139; 617/577-1017, 800/628-4223.

777 Mathematica
C Yay Wolfram Research, Inc., P.O. Box 6059, Champaign, IL 61821-9902; 217/398-0700, 800/441-6284.

778 MathView Professional
C Yay BrainPower, Inc., 9447 Canwood, #201, Agoura Hills, CA 91301; 818/707-1712, 800/345-0519.

779 MATLAB

780 MCI Mail
C Yay MCI Mail, 1150 17th St. NW, #800, Washington, D.C. 20036; 202/293-4255, 800/444-6245.

781 Meta Courier
C Yay Symbiotics, 875 Main St., Cambridge, MA 02139; 703/556-8756.

782 Microsoft Mail
C Yay Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717; 206/882-8080, 800/426-9400.

783 MII Paracomip, Inc., 123 Townsend St., #310, San Francisco, CA 94107; 415/543-3848.

784 Multiple
C Yay ASoft, P.O. Box 613, Spring, TX 77383-0927; 713/353-4090.

785 Mobius
C Yay Mobius Technologies, Inc., 6020 Adeline St., Oakland, CA 94608; 415/654-0556, 800/669-0556.

786 Mums the Word
C Yay Terrace Software, Box 1236, Cambridge, MA 02238; 617/491-4725.

787 The Muzzle
C Yay Ergotron, Inc., 3450 Yankee Dr., #100, Eagan, MN 55420; 612/452-8135, 800/888-8458.

788 NEC SilentWriter LC 890

789 NetDome V2400
C Yay Shiva Corporation, 155 Second St., Cambridge, MA 02141; 617/864-8500, 800/458-3550.

787 Nextstep Object
C Yay Neuron Data, 444 High St., Palo Alto, CA 94301; 415/321-4888.

790 NightWatch
C Yay NightWatch, 1200 Post Oak Blvd., #210, Houston, TX 77056; 713/623-
America is worth fighting for.

From the Atlantic to the Pacific, the Arctic to the Gulf, our land is constantly under attack from the polluters and despisers.

That's why Sierra Club Legal Defense Fund attorneys are pursuing dozens of cases nationwide in defense of wildlife, rare habitats, the air we breathe and the water we drink.

Most of our support comes from individual contributors like you. Please help us win. Because America is worth fighting for.

I enclose my tax-deductible contribution to save what I love most about America. Send me your quarterly newsletters in return.

NAME
ADDRESS
CITY STATE ZIP

Sierra Club Legal Defense Fund
2044 Fillmore, San Francisco, CA 94115
Sharp's new JX-600 brings the capabilities of high-end commercial scanners to the desktop. It scans slides, transparencies and artwork up to 11" x 17", at resolutions from 30 to 600 dpi. The JX-600 uses a range of 1 billion colors for precise color matching.

The JX-450 has become the scanner of choice for professional desktop publishers and computer artists. It scans originals up to 11" x 17" at 300 dpi and offers the option to scan slides and transparencies.

The economical JX-300 offers business users the performance of the acclaimed JX-450 in a space-saving format. It handles artwork up to 8½" x 11", at 300 dpi.

The unique new JX-100 provides color and gray-scale scanning, at up to 200 dpi, for less than $1000. It comes with everything you need, including powerful driver software and interface cable. The JX-100 is the ideal personal scanner.

Sharp is the premier source for desktop color scanners. With four different models, there's one that's compatible with your computer and your needs. Of course, they all work with SSCL (Sharp Scanner Control Language), the defacto industry standard for software support of color scanners. And they not only capture precise color detail, they yield exceptional gray-scale and monochrome results as well. To find out more, call the color scanning experts at 1-800-BE-SHARP.

WHERE TO BUY

Picture yourself at MACWORLD Expo

There are good reasons why you should attend the MACWORLD Expo nearest you. First, attending MACWORLD Expo means you don't have to spend lots of and trying to find the best solutions to your computing problems. Second, you can and the latest Macintosh products... demo hundreds of hardware, software and peripheral exhibits representing the future of computing. Third, whether you use your in the, at or at you'll learn how to use it better. Fourth, if you develop, produce or sell products, you'll have a unique opportunity to spot upcoming. And fifth, you'll be able to your skills, using one of the many available, to practice what you've learned. So the coupon below, and it for more information. And this is the original Macintosh-exclusive show. Choose from these upcoming shows:

SAN FRANCISCO '90
April 11-13, 1990
Moscone Center
Brooks Hall/Civic Auditorium

BOSTON '90
August 9-11, 1990
Bayside Expo Center
World Trade Center

Just fill in below, clip and mail to: MACWORLD Expo, Mitch Hall Associates, 260 Milton St., Dedham, MA 02026. You'll receive complete information on each show as soon as it's available. No obligation of course.

I want to get the big picture.

I am interested in: [ ] Attending [ ] Exhibiting

Please send me details about the following MACWORLD Expos:

[ ] San Francisco April 11-13, 1990 [ ] Boston August 9-11, 1990

Name ___________________________ Title ___________________________
Company ___________________________ Street ___________________________
City/State/Zip ___________________________ Phone ___________________________

MACWORLD Expo is sponsored by MACWORLD, the Macintosh Magazine, an IDG Communications publication. MACWORLD Expo is an independent trade show produced by IDG World Expo Corp. and managed by Mitch Hall Associates and not affiliated with Apple Computer, Inc. MACINTOSH and MACWORLD are trademarks of Apple Computer, Inc. IDG World Expo Corp. is a company of International Data Group.
<table>
<thead>
<tr>
<th>PRODUCT INDEX</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOFTWARE</strong></td>
<td><strong>BUSINESS</strong></td>
</tr>
<tr>
<td>474</td>
<td>Absolute Solutions, 187</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>475</td>
<td>Ashton-Tate, 207</td>
</tr>
<tr>
<td>476</td>
<td>Checkmark Software, 299</td>
</tr>
<tr>
<td>10</td>
<td>Computer Associates, 126</td>
</tr>
<tr>
<td>165</td>
<td>DesignScience, 43</td>
</tr>
<tr>
<td>152</td>
<td>Fox Software, 202</td>
</tr>
<tr>
<td>157</td>
<td>Generic Software, 284</td>
</tr>
<tr>
<td>390</td>
<td>Informix, 194-195</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>37</td>
<td>MeCa, 97</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>162</td>
<td>Microsoft, IFC-1, 212-213, 238-239</td>
</tr>
<tr>
<td>213</td>
<td>Odesta, 268</td>
</tr>
<tr>
<td>214</td>
<td>Paracomp, 26</td>
</tr>
<tr>
<td>29</td>
<td>Personal Training Systems, 27</td>
</tr>
<tr>
<td>29</td>
<td>Prescience, 36</td>
</tr>
<tr>
<td>342</td>
<td>SAS Institute, 209</td>
</tr>
<tr>
<td>297</td>
<td>Serken, 132-133</td>
</tr>
<tr>
<td>297</td>
<td>Shana Corporation, 205</td>
</tr>
<tr>
<td>419</td>
<td>Sofview, 122</td>
</tr>
<tr>
<td>210</td>
<td>SPSS, 269</td>
</tr>
<tr>
<td>215</td>
<td>Symantec, 9</td>
</tr>
<tr>
<td>491</td>
<td>Sytast, 32</td>
</tr>
<tr>
<td>492</td>
<td>Sytast, 32</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>134</td>
<td>Thinking, 33</td>
</tr>
<tr>
<td>134</td>
<td>Personal Business/Home</td>
</tr>
<tr>
<td>232</td>
<td>AT&amp;T, 278</td>
</tr>
<tr>
<td>233</td>
<td>Dayna Communications, 279</td>
</tr>
<tr>
<td>239</td>
<td>Insignia Solutions, 38</td>
</tr>
<tr>
<td>245</td>
<td>ATLAS, 136</td>
</tr>
<tr>
<td>93</td>
<td>Wollongong Group, Inc., 193</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>43</td>
<td>Maxwell Corporation, 211</td>
</tr>
<tr>
<td>423</td>
<td>Series 132-133</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>202</td>
<td>Aloft, 4</td>
</tr>
<tr>
<td>381</td>
<td>Berkeley Systems Design, 102</td>
</tr>
<tr>
<td>187</td>
<td>Berkeley Systems Design, 102</td>
</tr>
<tr>
<td>300</td>
<td>CE Software, 241</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>250</td>
<td>Central Pure Software, 256</td>
</tr>
<tr>
<td>250</td>
<td>Fifth Generation, 280</td>
</tr>
<tr>
<td>364</td>
<td>Fifth Generation, 280</td>
</tr>
<tr>
<td>272</td>
<td>Franklin Software, 50</td>
</tr>
<tr>
<td>439</td>
<td>GDT Software, 48</td>
</tr>
<tr>
<td>13</td>
<td>IJC Software, 54</td>
</tr>
<tr>
<td>261</td>
<td>Ken Marsh, 295</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>439</td>
<td>Checkmark Software, 299</td>
</tr>
<tr>
<td>439</td>
<td>GDT Software, 48</td>
</tr>
<tr>
<td>285</td>
<td>Macromind, 14-15</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>464</td>
<td>Micron Corporation, 250</td>
</tr>
<tr>
<td>354</td>
<td>MacFriends, 247</td>
</tr>
<tr>
<td>86</td>
<td>MacFriends, 255</td>
</tr>
<tr>
<td>58</td>
<td>MacFriends, 275</td>
</tr>
<tr>
<td>109</td>
<td>MacFriends, 281</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>61</td>
<td>Computer Friends, 328</td>
</tr>
<tr>
<td>119</td>
<td>GCC Technologies, 35</td>
</tr>
<tr>
<td>31</td>
<td>GCC Technologies, 37</td>
</tr>
<tr>
<td>442</td>
<td>GCC Technologies, 39</td>
</tr>
<tr>
<td>343</td>
<td>Hewlett Packard, 51-53</td>
</tr>
<tr>
<td>102</td>
<td>Jasmine, 44-45</td>
</tr>
<tr>
<td>145</td>
<td>Li Cie, 24-25</td>
</tr>
<tr>
<td>52</td>
<td>Mitsubishi, 95</td>
</tr>
<tr>
<td>353</td>
<td>Quake, 244</td>
</tr>
<tr>
<td>327</td>
<td>Sharp, 322</td>
</tr>
<tr>
<td>433</td>
<td>Teftronix, 203</td>
</tr>
<tr>
<td>93</td>
<td>Varniop, 220</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>403</td>
<td>American Micro Distributors, 43</td>
</tr>
<tr>
<td>404</td>
<td>Daystar Digital, 134</td>
</tr>
<tr>
<td>478</td>
<td>Daystar Digital, 134</td>
</tr>
<tr>
<td>161</td>
<td>Micron Technology, 291</td>
</tr>
<tr>
<td>196</td>
<td>National Semiconductor, 130</td>
</tr>
<tr>
<td>265</td>
<td>Orange Micro, 16</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>445</td>
<td>Raster Ops, 124-125</td>
</tr>
<tr>
<td>217</td>
<td>Tsunami, 236-237</td>
</tr>
<tr>
<td>289</td>
<td>DISPLAY</td>
</tr>
<tr>
<td>289</td>
<td>F-Machines, 251</td>
</tr>
<tr>
<td>154</td>
<td>Ellison, Inc., 118</td>
</tr>
<tr>
<td>63</td>
<td>In-Focus, 249</td>
</tr>
<tr>
<td>466</td>
<td>Megacolor, 49</td>
</tr>
<tr>
<td>52</td>
<td>Microsoft, 95</td>
</tr>
<tr>
<td>257</td>
<td>NEC, 40-41</td>
</tr>
<tr>
<td>257</td>
<td>Radisys, 6-7</td>
</tr>
<tr>
<td>293</td>
<td>IBM, 6-7</td>
</tr>
<tr>
<td>293</td>
<td>IBM, 6-7</td>
</tr>
<tr>
<td>61</td>
<td>Computer Friends, 328</td>
</tr>
<tr>
<td>145</td>
<td>La Cie, 24-25</td>
</tr>
<tr>
<td>184</td>
<td>Prometheus, 252</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>135</td>
<td>Slava, 5</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>403</td>
<td>American Micro Distributors, 43</td>
</tr>
<tr>
<td>3</td>
<td>Archive, 55</td>
</tr>
<tr>
<td>41</td>
<td>Boseman Corp, 242</td>
</tr>
<tr>
<td>217</td>
<td>Bramur Corp, 242</td>
</tr>
<tr>
<td>452</td>
<td>Ellison, Inc., 19</td>
</tr>
<tr>
<td>500</td>
<td>Ellison, Inc., 232</td>
</tr>
<tr>
<td>260</td>
<td>Jemage, 182-183</td>
</tr>
<tr>
<td>471</td>
<td>Irwin Magnetic Systems, 252</td>
</tr>
<tr>
<td>102</td>
<td>Jasmine, 44-45</td>
</tr>
<tr>
<td>135</td>
<td>LG Cie, 24-25</td>
</tr>
<tr>
<td>465</td>
<td>MacProducts USA, 332-333</td>
</tr>
<tr>
<td>207</td>
<td>Maxi Micro Systems, 30</td>
</tr>
<tr>
<td>398</td>
<td>MicroNet, 243</td>
</tr>
<tr>
<td>116</td>
<td>MicroNet, 22</td>
</tr>
<tr>
<td>90</td>
<td>Microsoft Corporation, 223</td>
</tr>
<tr>
<td>458</td>
<td>Microtoll International, 283</td>
</tr>
<tr>
<td>424</td>
<td>Microtoll Technologies, 28-29</td>
</tr>
<tr>
<td>149</td>
<td>Hitona, 240</td>
</tr>
<tr>
<td>414</td>
<td>Storage Dimensions, 196</td>
</tr>
<tr>
<td>127</td>
<td>Storage Dimensions, 196</td>
</tr>
<tr>
<td>321</td>
<td>Tecum, 214</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>465</td>
<td>MacProducts USA, 332-333</td>
</tr>
<tr>
<td>161</td>
<td>MicroToll Corporation, 291</td>
</tr>
<tr>
<td>275</td>
<td>MicroToll Corporation, 291</td>
</tr>
<tr>
<td>228</td>
<td>Rainbow Technologies, 13</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>401</td>
<td>Advanced Gravis, 288</td>
</tr>
<tr>
<td>403</td>
<td>American Micro Distributors, 43</td>
</tr>
<tr>
<td>171</td>
<td>Computer Accessories, 318</td>
</tr>
<tr>
<td>61</td>
<td>Computer Friends, 328</td>
</tr>
<tr>
<td>63</td>
<td>In-Focus, 249</td>
</tr>
<tr>
<td>118</td>
<td>Zenica, 237</td>
</tr>
<tr>
<td>267</td>
<td>Zenica, 237</td>
</tr>
</tbody>
</table>
The next discovery could be yours... on an EARTHWATCH expedition

Working with volunteers of all ages, help monitor coral reef in Belize... Help survey Inca architecture and landscaping in mountainous Peru... Help an archaeologist survey a newly discovered Maya ceremonial center.

Dozens of expeditions on six continent

Right now, over 100 Earthwatch expeditions are being mounted in every scientific discipline, bound for points throughout the world. They'll be led by outstanding people, scientists who need your help. As a team member, you'll be helping to fund the expedition you accompany.

You can expect an intense learning experience with a lot of challenges. You'll be taught in the field by professionals. A background in science isn't necessary. You'll learn as you go.

Join Earthwatch as a member

As an Earthwatch member, you'll receive a subscription to Earthwatch Magazine, the colorful chronicle of Earthwatch activities throughout the world. It contains descriptions and photos of all the expeditions. You'll also receive the Expedition News, the quarterly report of the latest findings from the field and news of upcoming expeditions.

You don't have to go on an expedition to be an Earthwatch member. But you do have to be an Earthwatch member to go on an expedition.

Don't delay. Whatever your interest, it all begins with membership.

Your tax-deductible contribution of $25 will make you a member.

EARTHWATCH
(617) 926-8200
Dept. 900 • Box 403 • Watertown, MA 02172
MAIL-ORDER CONSUMERS DO HAVE RIGHTS

The vendors and developers who advertise in the pages of Macworld share with us a common goal—to serve you, the consumer. And as a mail-order consumer, you have certain rights you should know and understand. Mail-order sales must comply with the rules of the Federal Trade Commission (FTC) and various state laws. Here are some guidelines to alert you to your rights and help you shop by mail more effectively.

THE FTC MAIL ORDER RULES STATE:

1. The Seller must ship your order within 30 days of receiving it, unless clearly stated otherwise in the advertisement.
2. If the Seller cannot ship your order when promised, you must be notified in writing prior to the promised date. The notice must specify a new date that is reasonable, and must give you the opportunity to (a) cancel with a refund, (b) agree to a specified delayed shipping date, or (c) agree to an indefinite delay.
3. The Seller's notice must include a postage-paid reply envelope or card so that you may indicate your preference. If you do not respond, the Seller may assume you agree to the delay.
4. Even if you agree to an indefinite delay, you retain the right to cancel at any time before the merchandise has been shipped.
5. If you cancel an order that has been paid for by check or money order, the Seller is obligated to mail your refund within seven business days. If you paid by credit card, the Seller must credit your account within one billing cycle following receipt of your cancellation. Store credits or vouchers are not acceptable in place of a refund.
6. If the item you ordered is unavailable, the Seller may not substitute merchandise without your consent.

DO'S AND DON'TS

By mail:
- Compare prices, including sales tax and shipping fees, before you order. Your purchase may be exempt from sales tax—check your state laws on collection regulations. Handling, packing, and shipping fees are legal and most states tax these services.
- State the precise specifications of the merchandise, such as model, size, component parts, etc.
- Confirm the price and expected delivery date as advertised.
- State on your order whether you will accept substitute merchandise if the item you specified is unavailable. If you won't accept a substitute, state that your payment should be returned.
- Record of payment is essential if a problem arises, with whom should you correspond?
- Note the name of the person who takes your order, and any sales slips and shipping receipts.

By phone:
- Make a record of your order, the price, date, and account number or order number if available. Keep a copy of your letter.
- If you register your complaint by phone, send a follow-up letter to confirm and keep a copy of it.
- If you think the merchandise is defective, review the hardware/software you intend to use it with.
- Can your order be shipped immediately? If not when will it be available for shipping?
- Does the advertised merchandise include all necessary parts and accessories? Are they made by the same manufacturer? Is the version number or model number the same? Is the product compatible with the hardware/software you intend to use it with?
- 2. If you register your complaint by phone, send a follow-up letter to confirm and keep a copy of it.
- 3. If you think the merchandise is defective, review the hardware/software you intend to use it with.
- 4. If you return the merchandise, keep the shipper's receipt or packing slip. Your right to reimbursement of postal costs is determined by store policy.
- 5. Keep copies of your order and all associated correspondence. If a problem arises, so do not send cash.
- 6. Keep copies of your order and all associated correspondence. Your records should include the company's name, address, and phone number, a description of the merchandise, your canceled check or money order carbon, the date you mailed the order and any sales slips and shipping receipts.

PROBLEMS? SOLUTIONS:

1. If you do not receive your order as promised or if the merchandise is defective, write to the Seller immediately. Include a description of your order, the price, date, and account number or order number if available. Keep a copy of your letter.
2. If you register your complaint by phone, send a follow-up letter to confirm and keep a copy of it.
3. If you think the merchandise is defective, review the hardware/software you intend to use it with.
4. If you have discussed your problem thoroughly with the Seller and remain dissatisfied, write to the consumer complaint agency in the Seller's state if you paid for the merchandise by credit card, you may have the right to withhold payment under the Federal Trade Commission's Fair Credit Billing Act.

Macworld believes that the customer has a right to product and service satisfaction. If you continue to experience problems with mail-order purchasing, write to the President of Macworld Communications and the Editor-in-Chief of Macworld and ask to be referred to the President of Macworld Communications. To discuss your situation, our goal is to help you become a satisfied mail-order consumer.
Only Personal Hotline gives you all these features in one program!

- **PDS trading system**, pinpoints entry, exit and stop-loss prices. Precise and accurate.
- **Complete charts**, including Point & Figure, created at the touch of a key.
- **Professional analysis tools** like Stochastics and RSI, many unique to our program.
- **Option pricing and analysis**, take the guesswork out of buying puts and calls.
- **Built-in communications**, with automatic downloading from five major services.

Why settle for less! For only $495 you can have it all and your satisfaction is guaranteed. Call for details on our 30 day trial offer and find out why we say Personal Hotline is... the lowest risk investment available for your Macintosh today!

**PINPOINT YOUR PROSPECTS.**

**Advertisers interested in renting**

**MACWORLD's**

**Subscriber List,**

Please call

**Kevin Normandeau**

**IDG List Services**

1.800.343.6474

for MA 508.879.0700

**New Year Specials**

**PowerMath II**: $108

**ScanMan**: $348

1 yr.; 100-400 dpi; Plug & Play!

**SOFTWARE**

50%-70% OFF!

Previewed but Guaranteed.
Over 350 Titles still in stock!

Join with Our Other Satisfied Customers:

- Lockheed
- General Dynamics
- NASA
- Eastman Kodak
- ABC 20/20
- Procter & Gamble
- Florida Power & Light
- Fingerhut
- Texas A & M
- Northern Telecom
- Trout Creek Architects
- Purdue, Rice, Clemson, Cornell, Penn State, Baylor, Vanderbilt, Harvard, Yale, Notre Dame, Texas, Johns Hopkins, 

& more Universities and Colleges
- Sears Roebuck & Co.
- Peat, Marwick & Mitchell
- Prudential-Bache
- Nordica Intl.
- Telecheck
- AT&T
- Celestial Seasonings
- Rio Grand Transit
- Business Land
- Lunar Radiation
- State of California
- Consolidated Press
- Schlumberger Well Service
- U.S. Sprint
- Welux
- Naval Aviation Supply
- French Trade Comm. 
- Century 21 Admiralty
- Mobil Oil
- AeroFlow Industries
- Amway
- LA Dept. of Water & Power
- NBC
- Olan Mills
- Chevron
- Texas Instruments
- NYMEX Information Resources
- Smith Barney
- Sailspur Design
- Union Texas
- American Express
- Exxon Carribean
- KRON Television
- Kinko's
- Metro Int'l.
- Delta Airlines
- UnoCal
- Westminster
- Holiday Inn
- Alcoa
- Sherason Lehman
- Apollo Computer
- Lyondell Chemical
-Arthur Anderson Co.
- General Mills Inc.
- Digital Equipment Corp.
- Honeywell Inc.
- Com... and Many More.

There's not enough room here to list our vast Product Line of Macintosh Hardware and Software... So Let us Send You Our Catalog...

**Software Library**

For Your FREE Macintosh Business Solutions, CALL:

800 847-5775

Circle 258 on reader service card.
Mac Inker

Mac Inker™, the original, automatic ribbon re-inker. Mac Inker (model 234IM) re-inks Imagewriter I/II black & single color cartridges. The Universal Mac Inker re-inks hundreds of cartridge types (including the Imagewriter LQ, one color and multicolor) with suitable adapters.

Proprietary, extra dark, dot matrix, lubricant ink yields better than new print quality and extends printhead life. New feldes reservoir for precise ink metering. Average number of re-inkings per cartridge is 60-100. With the optional Multicolor Adapter (model M422, $40.00) your Mac Inker re-inks 4-color Imagewriter II cartridges. Full range of accessories available, inks & cartridges, indelible ink, heat transfer etc. Colors: red, green, blue, yellow, purple, brown, orange, silver, gold. Free catalog.

Imagewriter I/II Mac Inker (model 234IM) $42.00
Multicolor Adapter (model M422) $40.00
Universal Mac Inker (model 234U) $68.50
Heat Transfer Adapter 25.00 HT cartridge 9.00
Imagewriter cartridge 3.15 4-color 18.00
Imagewriter LQ cartridge 14.00 4-color LQ 20.00
Extra ink bottle 3.00 pint 18.50
Shipping 4.50

Special Offer: Order for more than $60.00 and say "I saw it in MacWorld" and get a free mousepad. Order for more than $100.00 and get a free key-beeper with flashlight combined, or get an accurate LCD electronic pedometer and calculator for only $15.00.

Order Toll Free 800-547-3303 In Oregon (503) 626-2291
fax (503) 643-5379 - telex 4949559
Computer Friends, Inc. 14250 NW Science Park Drive Portland OR 97229

FREE Facts on Faxes bulletin available.

LightFax 9624

9600 BPS FAX and 2400 BPS MODEM

High speed Fax and 2400 baud modem in one compact unit. 9600 baud fax (fully Group 3 compatible) for fast transmission and lower telephone bills. Fax directly from your application or from text / graphics editor.

Software features include Scheduled Sending, Broadcasting, NameCard Data Management, File Queuing, Choice of Standard or Fine Mode and many more.

Full front panel control lights display precisely the status of the communication and whether you are in fax or modem mode. Superb quality of transmitted fax, superior to conventional fax machines. Modem (100% Hayes compatible) available via software toggle switch, 2400/1200/300 baud speeds. Cable and software included for fax and modem.

Free "Facts on Faxes" bulletin available.

LightFax 9624 (includes Fax & Modem Software) $499.00
Remote Power Center 199.00
9600 baud V.32 9600/2400/1200 modem (NEW PRODUCT) 799.00

USA FLEX

135 N. Brandon Drive, Glen Ellyn, IL 60139

©Copyrighted 1989 Epson America, Inc. Epson is a registered trademark of Seiko Epson Corporation. Macintosh is a registered trademark of Apple Computer, Inc.
PRINTERS & MONITORS

Dot Matrix
Seikosha .......................................$215
Imagewriter/Mac Compatible

EPSON Letter Quality Printers
LQ-510* .......................................$339
LQ-950, LQ-1050, LQ-2550 .............Call
EPSON LQ Printer Software .............$59
(*Requires Serial Card)

Hewlett Packard
H.P. DeskWriter
300 d.p.i .......................................$849

CMS Externals
MacStack 20 .................................$398
MacStack 30 .................................$498
MacStack 45 ..................................$548
MacStack 60 ..................................$648
MacStack 80 ..................................$748
PD 100 ..........................................$898
PD 170 ..........................................$1498
44 Megabyte Removable ..............$848

CMS Internals
(SE, II, IIcx)
40 Megabyte .........................$478
100 Megabyte .........................$778
200 Megabyte .........................$1498

Everex Hard Drives
External/Internal .....................Call
Cutting Edge 800K .................$149

44 Megabyte Removable ..............$848

E-Machines
Big Picture Z21 .................$1798
Big Picture Z21 IQ .................$2598
Big Picture T-16 color ............$2598
Big Picture T-19 color ............$4498

Tape Back-up Systems
CMS TS-60 ....................................$696
Cache 150mg .........................$798

Everex Hard Drives
External/Internal .....................Call
Cutting Edge 800K .................$149

GCC Technologies
Write Move Portable Ink-Jet .......$519

GCC Business Laser ...............$2998

GCC PLP Laser .....................$1595
PLP Plus Laser .....................$1695

Call for Systems/Simms Pricing

Computer professionals
since 1975.

1-800-426-8166

From Beverly Hills
Fax Machine
279 South Beverly Drive, Suite 1200, Beverly Hills, California 90212
(213)273-3710 (213)675-2522

SHIPPING
All items in stock will ship in 24 hours. We offer daily service from Federal Express, UPS, U.S. Postal Service. Call for handling and shipping fees. Minimum shipping charge $4.00.

Circle 5 on reader service card
<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Illustrator</td>
<td>$275</td>
</tr>
<tr>
<td>Adobe Type Manager</td>
<td>$57</td>
</tr>
<tr>
<td>Streamline</td>
<td>$225</td>
</tr>
<tr>
<td>Fonts</td>
<td>Please Call</td>
</tr>
<tr>
<td>AEC Info Manager</td>
<td>$409</td>
</tr>
<tr>
<td>FastTrack Schedule</td>
<td>$113</td>
</tr>
<tr>
<td>Fonts</td>
<td>Please Call</td>
</tr>
<tr>
<td>AEC Info Manager</td>
<td>$409</td>
</tr>
<tr>
<td>Adobe Type Manager</td>
<td>$275</td>
</tr>
<tr>
<td>Streamline</td>
<td>$225</td>
</tr>
<tr>
<td>Fonts</td>
<td>Please Call</td>
</tr>
<tr>
<td>Simply Accounting</td>
<td>$218</td>
</tr>
<tr>
<td>Pro/TimeBilling</td>
<td>$229</td>
</tr>
<tr>
<td>OmniPage 2.0</td>
<td>$539</td>
</tr>
<tr>
<td>FastTrack Schedule</td>
<td>$243</td>
</tr>
<tr>
<td>Fonts</td>
<td>Please Call</td>
</tr>
<tr>
<td>AEC Info Manager</td>
<td>$409</td>
</tr>
<tr>
<td>Quickmail 1</td>
<td>$169</td>
</tr>
<tr>
<td>Quickmail 2</td>
<td>$168</td>
</tr>
<tr>
<td>QuickKey 1.2</td>
<td>$64</td>
</tr>
<tr>
<td>In/Out 5 User</td>
<td>$126</td>
</tr>
<tr>
<td>In/Out 10 User</td>
<td>$186</td>
</tr>
<tr>
<td>DiscoTop 4.0</td>
<td>$64</td>
</tr>
<tr>
<td>Casino Master Color</td>
<td>$45</td>
</tr>
<tr>
<td>Casino Master</td>
<td>$38</td>
</tr>
<tr>
<td>Quickmail 5 User</td>
<td>$169</td>
</tr>
<tr>
<td>Quickmail 10 User</td>
<td>$249</td>
</tr>
<tr>
<td>QuickKeys 1.2</td>
<td>$64</td>
</tr>
<tr>
<td>In/Out 5 User</td>
<td>$126</td>
</tr>
<tr>
<td>In/Out 10 User</td>
<td>$186</td>
</tr>
<tr>
<td>DiscoTop 4.0</td>
<td>$64</td>
</tr>
<tr>
<td>Canvas</td>
<td>$185</td>
</tr>
<tr>
<td>Chroma 32</td>
<td>$419</td>
</tr>
<tr>
<td>QuarkXpress</td>
<td>$459</td>
</tr>
<tr>
<td>QuarkXpress is the top-of-the-line professional layout software that contains word processing and graphics handling with sophisticated page design, layout &amp; color tools.</td>
<td>$459</td>
</tr>
<tr>
<td>Data Desk Professional</td>
<td>$279</td>
</tr>
<tr>
<td>Data Desk Professional</td>
<td>$279</td>
</tr>
<tr>
<td>Swivel 3D</td>
<td>$245</td>
</tr>
<tr>
<td>Model Shop</td>
<td>$369</td>
</tr>
<tr>
<td>Milco</td>
<td>$159</td>
</tr>
<tr>
<td>PARACOMP</td>
<td>$245</td>
</tr>
<tr>
<td>Swivel 3D</td>
<td>$245</td>
</tr>
<tr>
<td>PORTFOLIO SYSTEMS</td>
<td>$99</td>
</tr>
<tr>
<td>Dyndex</td>
<td>$99</td>
</tr>
<tr>
<td>Quark</td>
<td>$211</td>
</tr>
<tr>
<td>XPress 2.11</td>
<td>$459</td>
</tr>
<tr>
<td>Style</td>
<td>$169</td>
</tr>
<tr>
<td>Silcon Beach Software</td>
<td>$125</td>
</tr>
<tr>
<td>Super Paint 20</td>
<td>$125</td>
</tr>
<tr>
<td>Digital Darkroom</td>
<td>$249</td>
</tr>
<tr>
<td>Supercard</td>
<td>$125</td>
</tr>
<tr>
<td>SoftView</td>
<td>$257</td>
</tr>
<tr>
<td>MacInTax</td>
<td>$68</td>
</tr>
<tr>
<td>MacInTax</td>
<td>$68</td>
</tr>
<tr>
<td>TaxView Pro Planner</td>
<td>$257</td>
</tr>
<tr>
<td>TaxView Pro Planner</td>
<td>$257</td>
</tr>
<tr>
<td>Solutions International</td>
<td>$69</td>
</tr>
<tr>
<td>SmartScrap &amp; The Clipper</td>
<td>$46</td>
</tr>
<tr>
<td>SuperGlue II</td>
<td>$59</td>
</tr>
<tr>
<td>The Curator</td>
<td>$69</td>
</tr>
</tbody>
</table>

**Software Ventures**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microphone II</td>
<td>$199</td>
</tr>
<tr>
<td>Microphone II</td>
<td>$199</td>
</tr>
<tr>
<td>Superprint Professional</td>
<td>$395</td>
</tr>
<tr>
<td>Superspool</td>
<td>$29</td>
</tr>
<tr>
<td>Superlaser Spool</td>
<td>$88</td>
</tr>
<tr>
<td>Think C 4.0</td>
<td>$152</td>
</tr>
<tr>
<td>LightSpeed P</td>
<td>$94</td>
</tr>
<tr>
<td>SAM</td>
<td>$59</td>
</tr>
<tr>
<td>SUM II</td>
<td>$99</td>
</tr>
<tr>
<td>More II</td>
<td>$256</td>
</tr>
<tr>
<td>Symmetry</td>
<td>$65</td>
</tr>
<tr>
<td>Acta Advantage</td>
<td>$47</td>
</tr>
<tr>
<td>HyperDA</td>
<td>$234</td>
</tr>
<tr>
<td>KeyPlan</td>
<td>$234</td>
</tr>
<tr>
<td>Kalexigraph</td>
<td>$257</td>
</tr>
<tr>
<td>VersaTerm-Pro</td>
<td>$257</td>
</tr>
<tr>
<td>HyperWorks Organizer</td>
<td>$59</td>
</tr>
<tr>
<td>Publish It Mac</td>
<td>$228</td>
</tr>
<tr>
<td>HyperWorks Organizer</td>
<td>$59</td>
</tr>
<tr>
<td>TOPS</td>
<td>$135</td>
</tr>
<tr>
<td>TOPS for Mac</td>
<td>$135</td>
</tr>
<tr>
<td>TOPS for DOS</td>
<td>$109</td>
</tr>
<tr>
<td>TOPS Flashcard</td>
<td>$156</td>
</tr>
<tr>
<td>TOPS Flashbox</td>
<td>$115</td>
</tr>
<tr>
<td>Telcom Connectors</td>
<td>$26</td>
</tr>
<tr>
<td>Inbox</td>
<td>$179</td>
</tr>
<tr>
<td>Netprint</td>
<td>$114</td>
</tr>
<tr>
<td>ClickArt</td>
<td>From 33</td>
</tr>
<tr>
<td>VersaCAD</td>
<td>$575</td>
</tr>
<tr>
<td>VersaCAD Drafter</td>
<td>$575</td>
</tr>
<tr>
<td>WOLFram</td>
<td>$398</td>
</tr>
<tr>
<td>Mathematica for Mac</td>
<td>$787</td>
</tr>
<tr>
<td>WordPerfect Corp</td>
<td>$179</td>
</tr>
</tbody>
</table>

**Hardware**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>MacInteirors</td>
<td>$189</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$243</td>
</tr>
<tr>
<td>Excel</td>
<td>$247</td>
</tr>
<tr>
<td>Power Point</td>
<td>$247</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>$545</td>
</tr>
<tr>
<td>SmallTalk/YY Mac</td>
<td>$119</td>
</tr>
</tbody>
</table>

**Data Management Systems**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acta Advantage</td>
<td>$47</td>
</tr>
<tr>
<td>KeyPlan</td>
<td>$234</td>
</tr>
<tr>
<td>Kalexigraph</td>
<td>$257</td>
</tr>
<tr>
<td>VersaTerm-Pro</td>
<td>$257</td>
</tr>
<tr>
<td>HyperWorks Organizer</td>
<td>$59</td>
</tr>
<tr>
<td>Publish It Mac</td>
<td>$228</td>
</tr>
<tr>
<td>HyperWorks Organizer</td>
<td>$59</td>
</tr>
<tr>
<td>TOPS</td>
<td>$135</td>
</tr>
<tr>
<td>TOPS for Mac</td>
<td>$135</td>
</tr>
<tr>
<td>TOPS for DOS</td>
<td>$109</td>
</tr>
<tr>
<td>TOPS Flashcard</td>
<td>$156</td>
</tr>
<tr>
<td>TOPS Flashbox</td>
<td>$115</td>
</tr>
<tr>
<td>Telcom Connectors</td>
<td>$26</td>
</tr>
<tr>
<td>Inbox</td>
<td>$179</td>
</tr>
<tr>
<td>Netprint</td>
<td>$114</td>
</tr>
<tr>
<td>ClickArt</td>
<td>From 33</td>
</tr>
<tr>
<td>VersaCAD</td>
<td>$575</td>
</tr>
<tr>
<td>VersaCAD Drafter</td>
<td>$575</td>
</tr>
<tr>
<td>WOLFram</td>
<td>$398</td>
</tr>
<tr>
<td>Mathematica for Mac</td>
<td>$787</td>
</tr>
<tr>
<td>WordPerfect Corp</td>
<td>$179</td>
</tr>
</tbody>
</table>

**Computer Associates**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simply Accounting</td>
<td>$218</td>
</tr>
<tr>
<td>MacLink Plus PC</td>
<td>$123</td>
</tr>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$243</td>
</tr>
<tr>
<td>Excel</td>
<td>$247</td>
</tr>
<tr>
<td>Power Point</td>
<td>$247</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>$545</td>
</tr>
<tr>
<td>SmallTalk/YY Mac</td>
<td>$119</td>
</tr>
</tbody>
</table>

**Hardware**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$243</td>
</tr>
<tr>
<td>Excel</td>
<td>$247</td>
</tr>
<tr>
<td>Power Point</td>
<td>$247</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>$545</td>
</tr>
<tr>
<td>SmallTalk/YY Mac</td>
<td>$119</td>
</tr>
</tbody>
</table>

**Data Management Systems**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acta Advantage</td>
<td>$47</td>
</tr>
<tr>
<td>KeyPlan</td>
<td>$234</td>
</tr>
<tr>
<td>Kalexigraph</td>
<td>$257</td>
</tr>
<tr>
<td>VersaTerm-Pro</td>
<td>$257</td>
</tr>
<tr>
<td>HyperWorks Organizer</td>
<td>$59</td>
</tr>
<tr>
<td>Publish It Mac</td>
<td>$228</td>
</tr>
<tr>
<td>HyperWorks Organizer</td>
<td>$59</td>
</tr>
<tr>
<td>TOPS</td>
<td>$135</td>
</tr>
<tr>
<td>TOPS for Mac</td>
<td>$135</td>
</tr>
<tr>
<td>TOPS for DOS</td>
<td>$109</td>
</tr>
<tr>
<td>TOPS Flashcard</td>
<td>$156</td>
</tr>
<tr>
<td>TOPS Flashbox</td>
<td>$115</td>
</tr>
<tr>
<td>Telcom Connectors</td>
<td>$26</td>
</tr>
<tr>
<td>Inbox</td>
<td>$179</td>
</tr>
<tr>
<td>Netprint</td>
<td>$114</td>
</tr>
<tr>
<td>ClickArt</td>
<td>From 33</td>
</tr>
<tr>
<td>VersaCAD</td>
<td>$575</td>
</tr>
<tr>
<td>VersaCAD Drafter</td>
<td>$575</td>
</tr>
<tr>
<td>WOLFram</td>
<td>$398</td>
</tr>
<tr>
<td>Mathematica for Mac</td>
<td>$787</td>
</tr>
<tr>
<td>WordPerfect Corp</td>
<td>$179</td>
</tr>
</tbody>
</table>

**Hardware**

<table>
<thead>
<tr>
<th>Software Name</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Macintosh</td>
<td>$189</td>
</tr>
<tr>
<td>Microsoft</td>
<td>$243</td>
</tr>
<tr>
<td>Excel</td>
<td>$247</td>
</tr>
<tr>
<td>Power Point</td>
<td>$247</td>
</tr>
<tr>
<td>Microsoft Office</td>
<td>$545</td>
</tr>
<tr>
<td>SmallTalk/YY Mac</td>
<td>$119</td>
</tr>
</tbody>
</table>

**Data Management Systems**
**FARALLON COMPUTING**

**GENERAL COMPUTER**

**E MACHINES**

**D V O**

**DOVE**

**DATASEEK**

**MACINTAX**

---

**HARDWARE**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hewlett Packard Desk Writer</td>
<td>$828</td>
</tr>
<tr>
<td>ScanJet Plus</td>
<td>$1688</td>
</tr>
<tr>
<td>Iomega Benoulli II 44 Meg</td>
<td>$1385</td>
</tr>
<tr>
<td>Benoulli II Dual 44 Meg</td>
<td>$2185</td>
</tr>
<tr>
<td><strong>KENNEX TECHNOLOGY</strong></td>
<td></td>
</tr>
<tr>
<td>Rapport</td>
<td>$215</td>
</tr>
<tr>
<td>Drive 2.4</td>
<td>$359</td>
</tr>
<tr>
<td><strong>KENSINGTON</strong></td>
<td></td>
</tr>
<tr>
<td>Turbo Mouse</td>
<td>$107</td>
</tr>
<tr>
<td>System Saver</td>
<td>$64</td>
</tr>
<tr>
<td>Mac II Stand &amp; Cables</td>
<td>$82</td>
</tr>
<tr>
<td>Masterpiece Mac II</td>
<td>$101</td>
</tr>
<tr>
<td><strong>KEYTRONICS</strong></td>
<td></td>
</tr>
<tr>
<td>Keytronic, Inc. Tempo II</td>
<td>$125</td>
</tr>
<tr>
<td><strong>KINETICS</strong></td>
<td></td>
</tr>
<tr>
<td>Ether Port II</td>
<td>$517</td>
</tr>
<tr>
<td>Fast Path 4</td>
<td>$2084</td>
</tr>
<tr>
<td><strong>L A C I E</strong></td>
<td></td>
</tr>
<tr>
<td>Cirrus 40 Meg</td>
<td>$579</td>
</tr>
<tr>
<td>Cirrus 80 Meg</td>
<td>$995</td>
</tr>
<tr>
<td><strong>BEST DATA</strong></td>
<td></td>
</tr>
<tr>
<td>Smart One 2400</td>
<td>$143</td>
</tr>
</tbody>
</table>

---

**SPECIAL R**

**REMovable HARD DRIVE**

The Cutting Edge removable offers unlimited data storage & security. It is based on the same award winning $190 Queso mechanism that other leading makers offer at twice the price.

---

**MACINTAX**

**POLICIES**

- Visa, Mastercard & AMEX accepted.
- Credit card is not charged until order is shipped.
- California residents add 6.5% sales tax
- Hours: Mon - Fri, 10 - 11 EST.

**Shipment**

- $3. UPS Standard Air/Blue. Hardware over 10 lbs will be shipped ground.
- Same day shipping on orders placed by 9:30 pm EST, if items are on hand.

**Returns**

- Defective software will be replaced immediately by the same item. Call (818) 501-0861 for R.A. number before return.

**Money Back Guarantee**

- Most products have a 30-day money back guarantee. Please inquire when you order.

---

**Special Offer**

Merry Christmas & Happy Hannuka From Dr. Mac

Dr. Mac Season's Greetings MAGIC COFFEE MUG Free With Orders Before December 25th

**Circle 368 on reader service card**
### AMERICA’S SOURCE

#### UPGRades

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1MB SIMM’s</td>
<td>$98</td>
</tr>
<tr>
<td>4MB SIMM’s</td>
<td>$499</td>
</tr>
<tr>
<td>Magic SCSI</td>
<td>$69</td>
</tr>
<tr>
<td>128K–512K Upgrade</td>
<td>$149</td>
</tr>
<tr>
<td>128K–1024K Upgrade</td>
<td>$295</td>
</tr>
<tr>
<td>512K–1024K Upgrade</td>
<td>$149</td>
</tr>
<tr>
<td>800K Drive and ROM’s</td>
<td>$299</td>
</tr>
</tbody>
</table>

### MAGICNets

100% Flash Box, Phone Net, Local Talk compatible

**SALE** $19.00

STAR Controller $149.00

### MAGIC MODEms

100% Hayes Compatible - Auto Dial/Auto Answer

2400/1200/300 Baud - 2 Year Warranty $99

Red Ryder $54

### Magic DRives

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 megabyte</td>
<td>$389</td>
<td>$449</td>
</tr>
<tr>
<td>30 megabyte</td>
<td>$399</td>
<td>$599</td>
</tr>
<tr>
<td>45 megabyte</td>
<td>$519</td>
<td>$649</td>
</tr>
<tr>
<td>60 megabyte</td>
<td>$599</td>
<td>$799</td>
</tr>
<tr>
<td>80 megabyte</td>
<td>$699</td>
<td>$799</td>
</tr>
</tbody>
</table>

### Display Solutions

19" B&W Monitor - 2 Page Display, 72 dpi, 78 hz.
Includes card for +, SE, SE/30, II, IIX, IICX $999

13" & 14" 100% Apple Compatible 8 bit color card $399

19" 8 bit color card $799

19" 32 bit color card $2995

### SmartCACHE

$99

- SCSI Disk Cache
- Tracks your history and optimizes using 64 caching algorithms
- Cuts 30-50% off the access time of any SCSI hard drive
- Write through cache for maximum data integrity

### ACCELERATORS

<table>
<thead>
<tr>
<th>Processor Speed</th>
<th>Capacity</th>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 mhz 68030 +, SE</td>
<td>100 mb CDC</td>
<td>$999</td>
<td></td>
</tr>
<tr>
<td>25 mhz 68030 +, SE</td>
<td>150 mb CDC</td>
<td>$1995</td>
<td></td>
</tr>
<tr>
<td>16 mhz 68020 +, SE</td>
<td>300 mb CDC</td>
<td>$1995</td>
<td></td>
</tr>
<tr>
<td>25 mhz 68020 +, SE</td>
<td>600 mb CDC</td>
<td>$2800</td>
<td></td>
</tr>
<tr>
<td>68881, 68882</td>
<td>60 mb Tape Backup</td>
<td>$695</td>
<td></td>
</tr>
<tr>
<td>68881, 68882</td>
<td>15mb Tape Backup</td>
<td>$895</td>
<td></td>
</tr>
<tr>
<td>45 megabyte</td>
<td>600 mb Read/Write</td>
<td>$999</td>
<td></td>
</tr>
<tr>
<td>45 mb Removable</td>
<td>Optical Drive</td>
<td>$3750</td>
<td></td>
</tr>
<tr>
<td>45 mb Cartridges, ea</td>
<td>1.2 gig Tape Backup</td>
<td>$2995</td>
<td></td>
</tr>
<tr>
<td>60 megabyte</td>
<td>2-3 gig Tape Backup</td>
<td>$3995</td>
<td></td>
</tr>
</tbody>
</table>

**020/030**

Available Now Call For More Info Run System 7 on 512, Mac+

### MacProducts USA

8303 Mopac Expressway • Suite 218 • Austin, Texas 78759 • USA • 1-800-622-3475

1-800-MAC-DISK
### Externals

#### Prices good through January 1990

<table>
<thead>
<tr>
<th>Price</th>
<th>Reg. Price</th>
<th>Sale Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 Megabyte</td>
<td>$549.00</td>
<td>$429.99.</td>
</tr>
<tr>
<td>30 Megabyte</td>
<td>$559.00</td>
<td>$489.99.</td>
</tr>
<tr>
<td>60 Megabyte</td>
<td>$729.00</td>
<td>$579.99.</td>
</tr>
<tr>
<td>80 Megabyte</td>
<td>$849.00</td>
<td>$679.99.</td>
</tr>
<tr>
<td>100-180 Megabyte</td>
<td>$1,499.00</td>
<td>$1,299.99.</td>
</tr>
<tr>
<td>40 Megabyte</td>
<td>$629.00</td>
<td>$499.99.</td>
</tr>
<tr>
<td>60 Megabyte</td>
<td>$649.00</td>
<td>$489.99.</td>
</tr>
<tr>
<td>80 Megabyte</td>
<td>$729.00</td>
<td>$579.99.</td>
</tr>
<tr>
<td>100 Megabyte</td>
<td>$749.00</td>
<td>$599.99.</td>
</tr>
<tr>
<td>Quantum Drives Have a Two Year Warranty!</td>
<td>$999.99</td>
<td>$799.99</td>
</tr>
</tbody>
</table>

### Mac II & IIX Internals

<table>
<thead>
<tr>
<th>Price</th>
<th>Reg. Price</th>
<th>Sale Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 Megabyte</td>
<td>$499.99</td>
<td>$449.99</td>
</tr>
<tr>
<td>60 Megabyte</td>
<td>$639.00</td>
<td>$579.99</td>
</tr>
<tr>
<td>80 Megabyte</td>
<td>$729.00</td>
<td>$679.99</td>
</tr>
<tr>
<td>100-170 Megabyte</td>
<td>$1,149.00</td>
<td>$1,199.99.</td>
</tr>
<tr>
<td>Quantum Drives Have a Two Year Warranty!</td>
<td>$999.99</td>
<td>$799.99</td>
</tr>
</tbody>
</table>

### CMS Hard Disk Drives

- Hard disk drives, tape back ups, removable hard drives, high capacity drives, CMS has them all and we carry their full line.

**Quantum Hard Disk Drives**

Industry leading Quantum quality, dependability and fast access speeds at affordable prices. Backed by our Two Year Warranty, all Quantum drives come complete with cables and software.

#### Prices

- **30-600 Megabyte**
  - Imprimis - MacWren 300 16ms... $2,499.99
  - Imprimis - MacWren Runner 320 10.7ms... $2,649.99
  - Imprimis - MacWren 600 16ms... $3,799.99
  - CMS Enhancements PD 300 16ms... $2,549.99
  - CMS Enhancements PD 600 16ms... $3,699.99

**SE, SE30 & IICX, IIC Internals**

- **30 Megabyte**
  - Caché Systems 30 28ms... $425.99
  - Caché Systems 30 30ms... $479.99

- **40 Megabyte**
  - Caché Systems 45 28ms... $499.99
  - Caché Systems 45 32ms... $529.99
  - Caché Systems 45 38ms... $559.99
  - Quantum 40 19ms (2 Yr. Warranty)... $599.99

- **80 Megabyte**
  - Quantum 80 19ms (2 Yr. Warranty)... $889.99
  - Quantum 100 19ms (2 Yr. Warranty)... $999.99

- **100-170 Megabyte**
  - Quantum Drives Have a Two Year Warranty! $1,149.99

**Imprimis (CDC-Scagte)**

MacWren carries the Imprimis MacWren high capacity disk drives. MacWren's high capacity drives have won more performance awards than any other brand of 51/4" drives. With data transfer rates as high as 25 megabits per second, and seek times as fast as 10.7 milliseconds there is certain to be a model to satisfy your growing storage needs.

### Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional $5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express:

Standard Air which is 1 to 2 day service. COD's Shipped by UPS 2 day air. Call for shipping costs. Products purchased in error are subject to a 20% restocking fee. All prices subject to change without notice. All products subject to availability.
### The Reasons You Should Buy From MacLand...

1. **Price**—Because of our multi-million dollar buying power, we purchase large volumes of quality hardware at low prices and pass the savings on to our customers.

2. **Delivery**—We offer Same Day Shipping on all in stock items if we receive your order by 3 pm Mountain Standard Time. ALL credit card orders are shipped by FEDERAL EXPRESS STANDARD AIR service which means you get your merchandise fast!

3. **Technical Support**—MacLand, Inc. has the best technical support period. We provide you with technical support BEFORE AND AFTER your purchase. Best of all to assure you the highest quality, our trained technicians test ALL hard disk drives for quality and viruses before we ship them to you.

---

### Removables Tape Back-Ups

<table>
<thead>
<tr>
<th>Reg. Price</th>
<th>Sale Price</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS Enhancements 44 25ms</td>
<td>$1,299</td>
<td>$849.</td>
</tr>
<tr>
<td>Cutting Edge 44 25ms</td>
<td>$1,149</td>
<td>$849.</td>
</tr>
<tr>
<td>40-150 Megabyte Tape Back-Ups</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Irwin 40 Meg Tape</td>
<td>$1,100</td>
<td>$949.</td>
</tr>
<tr>
<td>Irwin 80 Meg Tape</td>
<td>$1,499</td>
<td>$1,149.</td>
</tr>
<tr>
<td>Caché 150 Tape</td>
<td>$1,199</td>
<td>$799.</td>
</tr>
<tr>
<td>CMS Enhancements 60</td>
<td>$749</td>
<td>$649.</td>
</tr>
<tr>
<td>CMS Enhancements 150</td>
<td>$999</td>
<td>$849.</td>
</tr>
<tr>
<td>SyQuest Removable Cartridges (Will fit any 44 removable drive)</td>
<td>$119</td>
<td>$94.</td>
</tr>
</tbody>
</table>

---

### Printers

- **CrystalPrint Publisher**
  - The 1989 MacUser Editor’s Choice Award Winner is lightning fast! If you are looking for a quality laser printer at an affordable price look no more.
  - Qume’s Crystal Print Publisher is the answer.

---

### Monitors

- **E-Machines Big Picture**
  - Plus/SE: $1,999.00, $1,299.00
  - E-Machines Z-21 SE: $1,199.00, $1,789.00
  - E-Machines Z-21 SE30/II: $2,099.00, $1,679.00
  - E-Machines Z-21 IQ Grayscale: $2,799.00, $2,589.00
  - E-Machines T-16 Color: $2,999.00, $2,829.00
  - E-Machines T-19 Color: $4,679.00, $4,489.00

- **Hewlett Packard (HP)**
  - ScanJet: $1,699.00

---

### Accelerator Boards

- **MacSprint II CacheBoard**: $299.00
- **MaraThon 020 M2E 1 (1 Meg)**: $779.00
- **MaraThon 020 M2E 2 (1 Meg)**: $999.00
- **MaraThon 020 M2E 3 (Math Chip)**: $649.00
- **MaraThon 020 M2E 4 (1 Meg/Math Chip)**: $999.00
- **MaraThon O30 Accelerator**: $1,099.00

---

### Memory Upgrades

- **MacSnap 524**: $225.00
- **MacSnap 524E**: $219.00
- **MacSnap 524S**: $279.00
- **MacSnap 548**: $489.00
- **MacSnap 548E**: $479.00
- **MacSnap 548S**: $529.00

---

### Scanners

- **Hewlett Packard ScanJet**: $1,699.00
- **Microtek MS II Sheet Feed**: $1,159.00
- **Microtek MSF 5000**: $1,699.00
- **Microtek MSF 5000 II**: $3,299.00
- **Microtek MSF 5002 - Color**: $2,495.00

---

### For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)

5006 South Ash Avenue, Suite 101 Tempe AZ 85282 (602) 820-5802

Circle 264 on reader service card
# Hard Drives International

**POWERDrive**

Hard Drives International is proud to carry the

<table>
<thead>
<tr>
<th>Model</th>
<th>Seagate</th>
<th>Quantum</th>
<th>Conner</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/I</td>
<td>40ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
<tr>
<td>30/I</td>
<td>40ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
<tr>
<td>45/I</td>
<td>40ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
<tr>
<td>60/I</td>
<td>28ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
<tr>
<td>80/I</td>
<td>28ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
<tr>
<td>105/I</td>
<td>16ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
<tr>
<td>200/I</td>
<td>19ms</td>
<td>9ms</td>
<td>19ms</td>
</tr>
</tbody>
</table>

- **POWERDrive 45/I**: Quantum 9ms $449
- **POWERDrive 105/I**: Quantum 19ms $799

**POWERDrive 200/I**: Conner 19ms $996

Comes complete with a pre-formatted, pre-tested hard drive, formatting & partitioning software, mounting hardware, cabling & How-To manual.

**EXTERNAL DRIVES FOR MAC Plus, SE & II**

<table>
<thead>
<tr>
<th>Model</th>
<th>Seagate</th>
<th>Quantum</th>
<th>Conner</th>
</tr>
</thead>
<tbody>
<tr>
<td>45Mb</td>
<td>40ms</td>
<td>19ms</td>
<td>19ms</td>
</tr>
<tr>
<td>40Mb</td>
<td>40ms</td>
<td>19ms</td>
<td>19ms</td>
</tr>
<tr>
<td>80Mb</td>
<td>19ms</td>
<td>19ms</td>
<td>19ms</td>
</tr>
<tr>
<td>105Mb</td>
<td>19ms</td>
<td>19ms</td>
<td>19ms</td>
</tr>
</tbody>
</table>

- **POWERDrive 45**: Seagate 40ms $399
- **POWERDrive 105**: Quantum 19ms $449
- **POWERDrive 200**: Conner 19ms $799

**POWERDrive 600**: 16ms $2796

All units are factory-tested and pre-formatted for hassle-free setup. Each steel external case comes complete with power supply, cabling, Ontrack's "Disk Manager Mac" software and a comprehensive reference manual. High Quality Seagate, Micropolis, Quantum, Imprimis, MiniScribe or Conner hard drives available. Auto-parking heads - Low Power - Low Heat. No assembly required.

**45Mb Removable Hard Drive**

- **Compare with E>lman and Mass MicroSystems!**
- *Uses SyQuest™ mechanism*
- *Unlimited Capacity*
- *Super Fast - 25ms!*
- *Includes One cartridge*
- *Uses SyQuest’s™ mechanism*
- *Unlimited Capacity*
- *Super Fast - 25ms!*
- *Includes One cartridge*

Factory-trained Technicians are on hand to answer your questions!

- **Price and availability subject to change.**
- **All items are new with manufacturer’s warranty.**
- **5% surcharge for American Express and COD orders.**
- **25% surcharge for Diner’s Club orders.**
- **Shipping & handling charges for non-returnable product must be prepaid.**
- **Add $1 for shipping to Alaska, Hawaii, APO/FPO.**
- **Express delivery.**

**Never a Surcharge for Visa & MC!**

- **In U.S. & Canada**
  - Corporate Sales: (800) 729-3472
  - 24 hr. Order Status: (800) 776-3472

**International orders**: (602) 967-7435

**All products come with a 30 Day "Worry-Free" Guarantee and Replacement Policy.**

---

**HARD DRIVES International**

1912 W. Fourth Street
Tempe, AZ 85281
(602) 967-5128
FAX: (602) 929-9193

**In U.S. & Canada**

(800)-765-DISC

Corporate Sales: (800) 729-3472
24 hr. Order Status: (800) 776-3472
International orders: (602) 967-7435

---

**EDITORS' CHOICE**

June 27, 1989

Mass Storage Market

---

**Price and availability subject to change.**

---

**All items are new with manufacturer’s warranty.**

**5% surcharge for American Express and COD orders.**

**25% surcharge for Diner’s Club orders.**

**Shipping & handling charges for non-returnable product must be prepaid.**

**Add $1 for shipping to Alaska, Hawaii, APO/FPO.**

**Express delivery.**

**Never a Surcharge for Visa & MC!**

---

**In U.S. & Canada**

(800)-765-DISC

Corporate Sales: (800) 729-3472
24 hr. Order Status: (800) 776-3472
International orders: (602) 967-7435

---

**All products come with a 30 Day "Worry-Free" Guarantee and Replacement Policy.**

---

**HARD DRIVES International**

1912 W. Fourth Street
Tempe, AZ 85281
(602) 967-5128
FAX: (602) 929-9193

**In U.S. & Canada**

(800)-765-DISC

Corporate Sales: (800) 729-3472
24 hr. Order Status: (800) 776-3472
International orders: (602) 967-7435

---

**All products come with a 30 Day "Worry-Free" Guarantee and Replacement Policy.**

---

**HARD DRIVES International**

1912 W. Fourth Street
Tempe, AZ 85281
(602) 967-5128
FAX: (602) 929-9193

**In U.S. & Canada**

(800)-765-DISC

Corporate Sales: (800) 729-3472
24 hr. Order Status: (800) 776-3472
International orders: (602) 967-7435

---

**All products come with a 30 Day "Worry-Free" Guarantee and Replacement Policy.**
The Macworld Catalog

Now *Macworld* connects you with the world of Macintosh products instantly. And cost-effectively. *The Macworld Catalog* is your immediate access to hundreds of Macintosh products, manufacturers, and services. Each month, this special direct response section brings you detailed product information arranged by category—so you can quickly compare prices and capabilities. Then pick up the phone and order!

For the best Macintosh buys, scroll through *The Macworld Catalog*. 
### Accessories
- Furniture ................................ 339
- Gifts ..................................... 339
- Hardware .................................. 339
- Mouse Pads ................................ 339
- Supplies ................................... 339

### Hardware
- Bar Code .................................. 340
- Computer Systems ......................... 340
- Data Acquisition ............................ 341
- Desktop Publishing ........................... 342
- Emulators .................................. 342
- Memory Upgrade ............................. 342
- Miscellaneous ............................... 344
- Peripherals ................................. 344
- Printers .................................... 344

### Software
- Accounting .................................. 347
- Astrology .................................... 347
- Bar Code .................................... 347
- Business ..................................... 347
- CAD/CAM ..................................... 348
- Communications ............................. 348
- Data Base .................................... 349
- Desktop Publishing ........................... 349
- Educational ................................... 349
- Engineering .................................. 350
- Entertainment ............................... 351
- Fonts ......................................... 351
- Genealogy ..................................... 352
- Graphics ....................................... 352
- Health ......................................... 352
- Languages ..................................... 352
- Medical ........................................ 353
- Mental Arts .................................... 353
- Music/MIDI .................................... 353
- Programming Tools ............................ 353
- Public Domain ............................... 353
- Real Estate .................................... 354
- Religion ....................................... 354
- Sales/Marketing ............................... 354
- Scientific ..................................... 355
- Statistics ...................................... 355
- Utilities ....................................... 355

### Miscellaneous
- Business Oppor. ............................. 355
- Mailing Lists ................................. 355

### HyperCard Stacks
- ............................................... 344

### Services
- Computer Insurance .......................... 345
- Consulting ..................................... 345
- Data Conversion .............................. 345
- Desktop Publishing ........................... 346
- Laser Recharge ................................ 346
- Training ....................................... 347

## Advertising Rates & Information
**The Macworld Catalog**

The Macworld Catalog section is a monthly link-up for advertisers and volume purchasers of Macintosh-related products and services. The Catalog offers advertisers a low-cost marketing opportunity and provides readers with a timely, easy-to-use menu for product buying.

Display ads are sold by column inches (2' minimum). Standard red is available as a second color. Text-only listings are available for a minimum of three issues at $399 per issue $1997 total).

For more information, space closings, and material deadlines, please call toll-free 800/888-8622.

### Instant Link:
- Macintosh Products, Manufacturers, Services
- The Macworld Catalog
- Account Managers
  - Niki Stranz, Western U.S.
  - Carol Felder, Eastern U.S.

---

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
The Macworld Catalog

Mouse Pads

Company Logo Specialist

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Canvas</th>
<th>Hard Surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>$8.50w/logo</td>
<td>N/A</td>
</tr>
<tr>
<td>72</td>
<td>5.90w/logo</td>
<td>7.15w/logo</td>
</tr>
<tr>
<td>144</td>
<td>3.96w/logo</td>
<td>5.21w/logo</td>
</tr>
<tr>
<td>500</td>
<td>3.40w/logo</td>
<td>4.65w/logo</td>
</tr>
<tr>
<td>1000</td>
<td>3.28w/logo</td>
<td>4.53w/logo</td>
</tr>
</tbody>
</table>

Canvas: Grey, Red, Gold, Blue, Tan

Dust Covers for a Clean Machine

- Protect your equipment from dust, spills, and aggro-
- With the original rain-
- Attractive, water-
- extends of dust covers for over 50 models, incl:

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM</td>
<td>$3.50</td>
</tr>
<tr>
<td>Apple II</td>
<td>$4.00</td>
</tr>
<tr>
<td>Macintosh</td>
<td>$4.50</td>
</tr>
</tbody>
</table>

Furniture for the Macintosh

National ad furniture line Oak furniture

Save up to 40% factory direct!

- CAD/CAM WORKSTATIONS
- LASERWRITER CARTS
- PRINTER STANDS
- AND MORE...

For Free Catalog

1-800-333-8095

The Walker Company
Petaluma, CA

Hardware

KODAK DATASHOW
+Apollo, Chisolm and others.
Prices start at $1097

Solutions for SE, Plus, 512, &
Mac II, Apple IIc, & all PCs
M/C, VISA, AMEX & COD

BOXLIGHT CORPORATION
(415) 892-4744

Computer-Based Presentation Systems Since 1984

To Order 1-800-942-4008

Premium Quality! Lowest Prices!

5.25" Disk Sets

Premium Quality! Lowest Prices!

5.25" Bulk Disks

High Quality! Lowest Prices!

5.25" Disk Cases

Lifet ime Qu e re

5.25" User Labels - In Assorted Colors

$2.97 each (for 2 or more)

Apple ImageWriter I & II Ribbon

$1.57 each (in Packs of 6)

4-Color Apple ImageWriter II Ribbon

$5.97 each (in Packs of 2)

3.5" User Labels - In Assorted Colors

($1.50 per click of 50 labels)

A disk shipping $4.25 for 5.25" disks, $10 per

disk case: $1.25 per pack of ribbons

User Labels - No Shipping Charge

AcD Order Processing, Packaging & Handling -

$100 Per Order

100% Guaranteed

ComputerWear

MACH, SE, II, & PRINTERS
Beige w/Gray Trim, Breathable Style-Free

NEW Seal-Skins
For Keyboards

1-800-826-5761

For a dealer near you

call toll free

Pack your Mac in seconds!

Cordura case has internal padded pockets for mouse, keyboard and drive. Available in six colors. Extended Keyboard version also available. For a dealer near you call toll free 1-800-548-0053

West Ridge Designs
1236 N.W. Flanders Portland, OR 97203
### Macintosh Discount

**Mac Plus** $1295  
**Mac SE 2 drive** $1995  
**Mac SE 40mb** $2395  
**Mac Portable 40mb** $4995  
**Mac SE/30 20/40mb** $3995  
**Mac SE/30 80/4mb** $4395  
**Mac IIx 40/2mb** $3795  
**Mac SE 80/4mb** $4995  
**Mac IIcx 40/mb** $4995  
**Mac IIcx 80/4mb** $5895  
**Apple color monitor** $725  
**Apple 8 bit video card** $480  
**Apple keyboard** $100  
**Apple ext keyboard** $175  
**Imagewriter II** $450  
**Imagewriter LQ** $495  
**Laserwriter NT** $3545  
**H.P. Desktopwriter** $875  
**All items new, 90 day warranty**

**Free catalog: 200+ items. Visa and Mastercard added 2%.**

---

### Mac Parts-in-Stock!

**We Buy, Sell, Trade & Upgrade!**

318-635-1121

We BUY Mac's

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Build Your Own Mac
from catalog parts & save $$$

Your 'Mac' Specialists
Mac•In•Stock™

CX Color Systems:
Apple Color Monitor, 8-Bit Board, Imagent II & Cable, Keyboard, 10 Disks, Paper, & Mouse Mat. w/ Apple 40MB, 1MB RAM Retal $795 - ONLY $5,795 w/ Apple 80MB, 4MB RAM Retail $959 - ONLY $6,799 SE/30 Systems:
Imagent II & Cable, Keyboard, 10 Disks, Paper, & Mouse Mat. w/ Apple 40MB, 1MB RAM Retail $757 - ONLY $4,069 w/ Apple 80MB, 4MB RAM Retail $922 - ONLY $5,579 SE Systems:
Imagent II & Cable, Keyboard, 10 Disks, Paper, & Mouse Mat. w/ 2 Superdrives, 1MB RAM Save $105 - ONLY $2,649 w/ Apple 20 MB, 1 MB RAM Save $133 - ONLY $3,069


Computers:
Mac Plus: $1,295
SE Dual I 44MB: $2,069
SE/30I 44MB: $2,495
SE/30I 144 MB: $3,149
SE/30I 4MB: $3,499
ICX/6 - 4MB: $3,795
ICX/144 MB: $4,369
ICX/6 - 144 MB: $5,069
ICX/6 - 144 MB: $5,299
ICX/6 - 144 MB: $6,499
Portable Macs: Call!

Monitors:
Apple 12" Mono: $289
1-Bit Mono Board: $140
Apple 12" Color: $799
6 Bit Color Board: $469
Apple 15" Portrait: $799
Porat Board: $429
Apple 19" 2-Pg Mono: $1,549
2-Pg Mono Board: $429
Radius 15" Color: $3,249
Radius Board: $1,379

Memory Upgrades:
Kensington BOMB (00x): 2-Year Warranty
1MB 100ns - $100
1MB 60ns - $129
256K 100ns: $35
256K 60ns - $30
(Laserwriter II NTX memory upgrades...Call)

Warranty Service:
Same as Apple® (although we are not an authorized dealer). Within the warranty period, we’ll repair or replace the unit at our expense.

Terms:
Personal or business checks. Leasing plans available for qualified businesses. COD·Cashiers made via UPS or FedEx FOB authorized dealer). Within the warranty period, we’ll repair or replace the unit at our expense. Win A Mac
Order now from Mac-In-Stock (or complete and return the reader service card, or just phone in your name, address, and telephone number) and you’re automatically entered to win!

Limit one entry per person. You must be 18 or older to win. Void where prohibited. Drawing held Jan 19, 90. Winner notified by telephone.

MacPacq
The MacPacq transforms the Macintosh into a digital oscilloscope, chart recorder & waveform generator. A complete data acquisition & control system. 8 channel A/D, 8 digital I/O, programmable gain, 64K RAM. Optically isolated, line or nical powered. Runs remote and/or connected to Mac. Comprehensive software interface provides for powerful & flexible system. $1195 complete. Biopac Systems, 5960 Mandarin Dr., #5, Goleta, CA 93117, 805/697-6615

Data Acquisition

MS Windows Catalog
The Macworld Catalog

Desktop Publishing

In a Mac

An Apple //e computer ... all in software!

Run Apple II software on your Macintosh.

Convert Apple II files to Macintosh files.

$149.95

COMPUTER:applications, Inc.
12813 Lindley Drive Raleigh, NC 27614
(919) 846-1411

MEMORY UPGRADE

LOWEST PRICE !!!

- 1 Meg SIMMs
- Lifetime Warranty
- 30 Day Money Back Guarantee
- Credit Cards & Personal Checks

FREE Installation Kits

(800) 622-2210

PO FAX#: (512) 794-8520

Same day shipping

TechnologyWORKS
4030 Braker Lane West Suite 350
Austin, Texas 78759

Memory Upgrade

DON'T LET THIS HAPPEN TO YOU!

COLOR? IT'S MULTIFINDER?

MEMORY UPGRADES FOR THE MAC" PLUS, SE, II

SINGLE IN-LINE MEMORY MODULES

CDC ENTERPRISE (714) 630-4633
2992 E. LA PALMA, ANAHEIM, CA 92806

Call Up Your Ad On Our Screen.
The Macworld Catalog
800.888.8622

UPGRADES!

512Ke - Plus $295
512K - Plus $625
128K - Plus $695

We do new and used equipment/ parts!

1 Meg SIMMs $99

Peripheral Outlet
314 S. Broadway • Ada, OK 74820
(800) 332-6581

More Muscle for your Mac!...

MEMORY SIMMS

1 Meg &
256K
120n
100n

We carry only quality new parts from the same manufacturers who supply Apple® OEM memory boards

SECOND SOURCE
(602) 464-4720
1832 W. Broadway Rd. • 102, Mesa, AZ 85202
Fax: (602) 464-4729

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Don't be fooled. Get the truth about SIMMS. PSI manufactures all the RAM you need to upgrade your Mac Plus and higher (including the new Laptop) and LaserWriter IINX.

(800) 622-1722 or (408) 559-8544

Call today to get the facts on memory upgrades

PSI - The Best Modules in Memory
2005 Hamilton Avenue • Suite 220 • San Jose, CA • 95125 • AppleLink: PSI

Mac Rescue™
for the Classic Mac

Some "experts" are telling us to trash out the 128K and 512K Macs. Don't do it! Classic Macs are far from moribund. Computer Care developed Mac Rescue, a daughter board that snaps on the enhanced Classic Mac motherboard. No need to fold, spindle or mutilate. Installs in minutes to get Mac Plus functionality.

Mac Rescue has 6 SIMM slots so you can upgrade the Classics to 1 meg, 2 meg, 2.5 megs or 4 megs of RAM.

It also has a SCSI port to breathe even more life into your faithful servant.

Limited time offer: We'll buy back your old fashioned expansion boards when you order Mac Rescue, call for exact price quote.

Ford Centre, Suite 1180, 420 North Fifth St.
Minneapolis, MN 55401
(612) 371-0061 (800) 950-CARE (2273)

Upgrade w/Accu-Simms
Upgrade your Mac Plus, SE or Mac II with our low profile one MEG SIMM modules. We assemble, test, and have strict quality control, and can give a lifetime warranty. $99 per meg. (Qty. discounts.) Full instructions come with order. (All SIMMS are 120NS or faster.)

Prices may be lower by the time this ad comes out.
Call for quote & info.
1-800/662-SIMM.
Data Memory Systems Co., 15 Union St., Lawrence, MA 01840
Tel: 508/683-2325
Fax: 508/975-5232

SIMM (Memory Modules)
Diamond-Pac™, Top Quality American made memory modules offer easy and economical expansion of Mac Plus, SE, II. DRAM by 1,2,4 or 8 megarbies. MC/VISA/AMEX

See display ad this issue!

SOUTH COAST ELECTRONICS
10920 Wilshire Blvd. Suite 1100
Los Angeles, CA 90024
213 208-3260 Fax 213 208-3282

800-289-8801

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Apple Daisywheel Printer
TRUE letter quality on all Mac's & Apple II's. Proport. spacing, boldface, 198 columns. Fast 40cps speed and full 130 character printwheel. NEW $449, RECONDITIONED $349 includes easy MAC point & click driver software & cable. New bi-di tractor $99, sheeeteeder $49. All heavy duty with 90-day guarantee.
Quality Discount Computers, Inc., 135 Artist View Dr., Wellington, NV 89444, 702/465-2473, 415/487-8148

Hypercard Stacks

ScriptEdit®
A powerful new desk accessory script editor for HyperCard®
- Edit multiple scripts simultaneously
- Global Find-and-Replace command
- Compare any two scripts instantly
- Move to other stacks while editing
- Window listing of all stack objects
- Quick comment & uncomment
- XCMD for easy custom access
- HyperTalk pop-ups and info bar

Available now! Retail price $79
See your dealer or call us today!

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Learn French Russian German Spanish!
MacFlash Cards: powerful, yet easy to use vocabulary stacks. 2000 words & up to 1000 synonyms. Save word sets to disk. Test noun gender. Use "Look Up" to find just the right word. Extensive user control. German 1/1, French 1/1, Russian 1. Spanish 1/$25 each. S&H $3, CA Res add 7% tax. Ask for free brochure. Call 8 AM-8PM PT or send check/MO. Available only from: The Language Quest Software Co. 101 First Street, Suite 428, Los Altos, CA 94022 VISA/Mastercard/COD /info: 1-800-283-4080 X850

Trendware Corporation
PO Box 2285 Huntington, CT 06484 (203)926-1116

Japanese Language Instruction
Kanji Exercises No. 1
Using HyperCard

Next Page
Imagesetting & Color PS!
from Mac/PC, disk or modem.
Superior imaging from
Varityper's 4500 & Adobe's
latest RIP. 1200/2400 dpi, negs
or paper. Low Prices/Fast
Services!
• Adobe Font Library
• Color PostScript® Printing
• 24-bit Color Separations
• 32-bit Photo-Enhancing
• OCR Scanning
• Full Service Type/Graphics
• Electronic Pre Press
• Visa/MC, Try Us!
ImageSet® Service Bureaus,
111 W. Kingsley #200
Ann Arbor, MI 48103
Call 313/668-7330, 24 br.
9600 bps BBS, 313/668-6319

Laser Recharge

LONG-LIFE RECHARGED
TONER CARTRIDGES

$44
Return Shipping Included

30% More Printing • Your Cartridge
• Blacker Blacks • Colors Available
• 24-hr Turnaround • 100% Guaranteed
1-800-234-3383

Toner Cartridges, black
$40.00

Laser Toner Cartridges

$40.00

Card stock back your cartridges
Every cartridge is pretested
Volume Discounts Call
We also buy empty cartridges

CIRCLE 68 ON READER SERVICE CARD
CIRCLE 699 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
BSc & MS in COMP SCI
The American Institute for Computer Sciences offers an in depth correspondence program to earn your BSc & MS degrees in Computer Science at home. BSc subjects include: MS/DOS, BASIC, PASCAL, C, Data File Process, Data Structures & Operating systems. MS program includes Software Engineering and AI.

AMERICAN INSTITUTE for COMPUTER SCIENCES, 1704-MW 11th Avenue, South Birmingham, AL 35205 TOLL FREE 1-800-767-AICS

Bar Code

PrintBar Fonts for Macintosh
UPC-A, UPC-E, EAN PostScript fonts for LaserWriters and high-resolution printers such as the L-300, Code 39 and 1 of 2 for ImageWriters and LaserWriters.
Use PrintBar with database managers, label, DTP and drawing programs. Print bar codes as easily as printing text.
Complete Line of Mac-Compatible Bar Code Readers.
FREE BROCHURES CALL (916) 622-4640 • FAX (916) 622-4775

Mail Order Manager
SuperMOM—a complete database solution for catalog mail order businesses. • Easy order entry • Unlimited ship-to addresses • Inventory with multiple pricing • A/R • UPS • Credits & returns • Customer tracking by Group, Market, Promo & Salesman • Thorough reporting on sales, inquiries, & advertising response • Demo $15
National Tele-Press, P.O. Box 79 Mendocino, CA 95460, 707/937-2848 800/448-0988

The Macworld Catalog

The most readers. The least cost. Immediate access. Just call The Macworld Catalog at 800.888.8622 and place your ad—today!

800.888.8622

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
Instant Link: Macintosh Products, Manufacturers, Services

The Macworld Catalog

LOAN & LEASE PROCESSING
Amortization -$49.95-$89.95 Balloons, ARM's, GPMs, Biweekly, Extra principal, Skippen, APRs. Analysis, Custom Reports & more.
Tracking -$49.95-$79.95 Tracks loan, lease, & rental payments for entire portfolios or single accounts. Generates detailed schedules, summary & delinquency reports, & more.
Comparison -$39.95-$129.95 Compare 5 loan scenarios at once. Handles any loan. Full mortgage loan, balloon, GPM.
Custom Programming
We will customize our products to your exact specifications. Call or write for FREE Sample Reports & Brochures.
SoftFlair, Inc.
8753 Parkview-Milwaukee, WI 53226
(414) 797-4490
Add S.5 SH/MC/Visa.
CIRCLE 649 ON READER SERVICE CARD

MacPhonebook
MANAGE YOUR NAMES AND NUMBERS THE EASY WAY...
2.0 prints names, addresses and phone numbers in three convenient sizes. Also prints labels! Import/Export lists from other sources. Keeps a database of 1,600 names by categories you define. Even dials the telephone!
$79.95 + $3 S/H (NY add tax)
Call Toll Free 800-447-9639
Check, VISA, MC, AMEX
692 10th St Rkly NY 11215
CIRCLE 659 ON READER SERVICE CARD

MacPhonebook Format
Labels
Packetbook
Checkbook
Format
CIRCLE 650 ON READER SERVICE CARD

Instant Business Tools
WIN/PlantBuilder™ is a powerful & logical business & marketing plan template on diskette for raising capital, launching new products or services, 90+ pages of outlines, heavy duty, written tests & ideas, formatted into 3 MacWrite/MSWord files. Sales & marketing oriented—follow materials, fill-in-the-blanks, edit as a finished plan. Linked financials in Excel (SYLK). Proven successful. $99+shipping
**"We applied for a loan in early November and by Christmas we had $420,000."
"My CPA highly recommends it."
**
*Companion software packages:
- Employee Policies Handbook $99
- Sales Quota/Cost Mgmt. mgmt/ops $149
- Production Financial Model $169
- Private Stock Offering raise up to $1M! $149
- Limited Partnership Agreement $149
- DealMaker™ Business Valuation $395
- 800/442-7371 415/941-9191 CA VISA-MC/Am
Leverage time & technology—save $.
CIRCLE 560 ON READER SERVICE CARD

CAD/CAM

Professional
CAD Symbol Library
Over 2,700 Symbols in One All-Inclusive Package
For All of Your CAD Needs:
- Mechanical Electronics
- Architectural Hardware
- General Drawing Aids
- And Much More, All for $119.95!
- Compatible with ClassCAD™ and MacDraw I/M
- (303) 674-2222 to Order
- Specify ClassCAD or MacDraw I/M Version
Advanced System Design, Inc.
1010 Stagecoach Blvd., PO. Box 3131
Evergreen, Colorado 80439
FREE Sample Reports & Brochures
For FREE brochure please call or write:
800-334-4291
MacWorld Software, Inc. Box 171, Campbell, CA 95008
CIRCLE 562 ON READER SERVICE CARD

CARTOONS

ORDER NOW, GET YOUR FREE PAGE & TYPE DESIGN GUIDE
HiRes $59 LoRes $49 S/H $3
SEND C/O TO:
MAXXI 900 WARREN N. #200
SEATTLE WA 1-800-842-3927
CIRCLE 652 ON READER SERVICE CARD

Communications

Pix!
New! International design elements in EPSF for Mac or IBM. Art you will use everyday! ONLY $69 California for FREE brochure.
817-737-7941
CIRCLE 653 ON READER SERVICE CARD

Clip Art Maps!
From 579
World, Continents, USA & states by county!
Ideal for publications and presentations.
For FREE brochure please call or write:
800-334-4291
CIRCLE 654 ON READER SERVICE CARD

Clip Art

Clip Art

Archives Arts
Old Fashioned Christmas
Over 40 holiday images from an historic publishing archive. Ready for use in PageMaker (TIP) or QuarkXPress. Scanned at 300 DPI. (415) 797-4490
CIRCLE 563 ON READER SERVICE CARD

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
The Macworld Catalog

Data Base

Reference Manager
Find your references, notes, ideas, when you need them • organize by topic • search by keyword/topic/key fields (output to screen, printer, file IWP compat.) • file import/export • Bibliographic output flexible format • cross reference • bookmark facility • save time • HyperCard incl. • Personal Reference Catalog V2.0 • $79 +$3 s/h, edu. disc. avail.

Delphinus Inc., POB 458, Groton MA 01940 508/448-2836

Japanese Desktop Publishing

Kanji PageMaker ™

- Supports varied multi-column formats
- Supports Kanji JIS level I and II
- Compatible with Kanji Talk 2.0
- Compatible with EGWord 3.0

ALDUS

List Price $995
Req. 2MB RAM

Qualitas Trading Co.
6907 Norfolk Rd., Berkeley, CA 94705
Order: 415-848-8080
Fax: 415-848-8009

Developed by Aldus Corporation

HELP!

With 4th Dimension
- Pre-written procedures and applications that you can use as templates or as examples to learn from.
- A desk accessory that enables you to copy and paste our procedures directly into your applications.
- 100 Page Manual.
- Applications include Statistics, Communications, Invoicing, Graphics and much more.
- $129.00.

Ducsoft

Desktop Publishing

POSTSCRIPT* LASER FONTS
ARABIC $99*
Cyrillic 149*
GREEK 99*
HEBREW 119*
PA 99*
KOREAN 119*
TECH 99*
THAI 79*
VIETNAMESE 99*
Mackanji 6.0 99*
MacChinese mandarin/cantonese 99*
GreeK nTL&XK or HEBREW BIBLE $99*
LINGUIST’S SOFTWARE
200 LANGUAGES (206) 775-1130

dei.g.w., PO Box 585, EDMONDS, WA 98020

Perfectstudy 3.05
- Multiple-choice flashcard study system • Create your own study files • 100% recall format
- Randomized question order • Bi-directional learning • Can link multiple files for large-scale memorization • Artificial intelligence review interface
- On screen & hard-copy test generator • 512K, 512KE, Plus, SE, II, SE30, IICx $59 + $5 s/h

Visa/MC/AX

Powerware Systems, 755 North 100 West, Orem, UT 84057 800/36-6644

Educational

An all new edition of the Macintosh Educational Software Collection
- Hard-to-Find & Best Sellers
- HyperCard / Shareware
- Over 150 Titles
- All Subject Areas
- Teachers, Students, Parents

Send for Free Catalog!

CHARIOT • 3659 India St. • San Diego, CA 92103 (619)298-0202

KidsCard ™

Are your children just learning about maps, clocks, calendars and boojies?

KidsCard is an easy-to-use HyperCard application for children. Features include: A talking calendar, three different clocks, an atlas, activity charts, talking books, scrapbooks and more.

Send a check or money order for $34.95 to Kids Concepts P.O. Box 9112, Portland Oregon 97281-9112. For information call (503) 288-8290

Teacher’s Rollbook
A complete classroom management tool! Grade averaging and reporting • New quick grade entry • Full attendance records and totals • Records disciplinary actions • Class size reports • Up to 315 students per file • Remember birthdays & checked out items • Letters to parents • Min.

req. Mac 512KE, 2 drives • $99 • Demo $10.

Current Class Productions, 22824 Berendo Ave., Torrance, CA 90502, 213/326-4246

Continued...

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
TEST GENERATION & SCORING!

LXR-TEST™ 4.0 is the most advanced testing system available. Full character styling (tabs, leading), exact graphic placement, database selection, scoring, mastery reporting, item analysis, and much more! Certified question banks available from major exam publishers.

For free presentation disk, call, write, or fax:

Logic eXtension Resources
9651-C Business Center Drive
Rancho Cucamonga, CA 91730
(714) 980-0046 Fax: (714) 987-8706

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.

IEEE 488 Interfaces

Call or send for your FREE Technical Guide

(216) 439-4091

Electronic CAD

The powerful, easy-to-use Douglas CAD/CAM Professional System takes you from the schematic drawing to the final routed board with:

• Color support on Mac II
• Unlimited multilayers
• SMT capability
• 1 mm resolution
• Layout w/ parts-placement facility
• Schematic w/ digital simulation
• Flexible, multi-pass router

Take your first step into the new age of electronic CAD by ordering a full-feature demo with all 3 programs included. Call or write to us today.

Douglas
Pro Layout: $1500
Schematic: $700
AutoRouting: $700
Demo: $25

E(E)PROM, MICRO & MEMORY CARD PROGRAMMERS WITH INTEGRATED MAC USER INTERFACE

Road Design

MacRoad is a fully interactive road design program that allows you to:

• Design cross sections using a palette of edge & surface types
• Design vertical gradings graphically
• Produce a schedule of quantities
• Adjust the grading & immediately see the effect on the cross sections & quantities
• Produce drawings on a range of printers or pen plotters

Creative Engineering, 6 Antill St, Wilston Queensland 4051, Australia, +61 73566271

Call Up Your Ad On Our Screen.
The Macworld Catalog
800.888.8622

Call or send for your FREE Technical Guide

Capilano Computing
5475-86 NE. Tier B
Bellevue, WA 98004
(425) 669-6343

E(E)PROM, MICRO & MEMORY CARD PROGRAMMERS

Capilano Computing
5475-86 NE. Tier B
Bellevue, WA 98004
(425) 669-6343

Call or send for your FREE Technical Guide

Capilano Computing
5475-86 NE. Tier B
Bellevue, WA 98004
(425) 669-6343

Call or send for your FREE Technical Guide

Capilano Computing
5475-86 NE. Tier B
Bellevue, WA 98004
(425) 669-6343
### Fonts

**Fonts**

**DISPLAY FONTS**

**You need'em cuz they'll read'em.**

Need proof? You just read'em! We have the fonts you need available in an EPS™ or Adobe® PS™ file format ready to ship for $12.95 ea. You can bend'em, stretch'em, fold'em—anything, but best of all they'll read'em. So send your font request to Prism. We will send you all your requested fonts within 48 hours for $12.95 each plus $3.50 postage. All orders shipped flat rate COD.

PO Box 496, Haymarket, VA 22069

Call The Prism showroom and see why.

**Call The Macworld Catalog and see why.**

**800.888.8622**

**YOUR AD GETS MORE FOR LESS.**

**CALL THE MACWORLD CATALOG AND SEE WHY.**

### The Macworld Catalog

**Your Ad Gets More For Less.**

**Call The Macworld Catalog and see why.**

**800.888.8622**

**Entertainment**

**Orbital Mech**

A Spaceflight Simulation

- Suitable for the Macintosh, IBM PC, or IBM PC/XT
- Built-in prices updated annually
- Built-in prices for all major world locations
- Low display with a pop-up window when computer is turned on
- Tasteful off-screen graphics
- Simple keyboard controls

For Macintosh or IBM PCs and compatibles with 3K RAM.

**COMIC RELIEF AT ANY TIME WITH THE PUSH OF A BUTTON.**

**THE COMPUTER COMIC**

The Computer Comic brings hilarious new jokes from Hollywood's funniest writers to your computer screen.

**Credit card sales:** 1-800-289-8773 7 days a week, 24 hours a day

**30-day money back guarantee**

**$24.95** Plus $4.95 shipping and handling

Specify Macintosh, IBM 5 1/4, or IBM 3 1/2 disk

**PAY BY CHECK AND SAVE $1.00**

Send to:

Keyboard Comedy, PO. Box 13192, La Jolla, CA 92038

CA residents add 7% sales tax. (Pay $26.70)

**Tired of Arcade Games?**

Try them all on Abladon Carrier Wartime Simulations™.$39.95 each

**Million Lottery Dollars Have Been Won!**

Over $8 Million Lottery Dollars Have Been Won! Using Odds Improvement Multiplication™

U.S. Patent Number #4,712,796

Now and in the future, this powerful wagering process has been licensed as a professional application for the Mac!

Harvard University consultant confirms that the MacLotto™ process dramatically improves your odds of winning each and every time you use the system. There is a way to beat the odds in your state lottery. The lottery commissions will not give you the information or the system. MacLotto can & MacLotto will!!

Special BONUS!! How to increase your lottery payoff by as much as a factor of TEN! over random selection! This simple technique works directly with MacLotto to further enhance its odds improving abilities. Its the result of years of international lottery paylit research.

MacLotto™ - A highly interactive program which works with every possible lottery configuration. Now and in the future. An advanced graphical interface makes it fast and easy to compute, place your bets! $39 Complete MC & Visa call toll free 1-800-289-8773

PO Box 246 McHenry IL 60050

**CIRCLE 647 ON READER SERVICE CARD**

**STAMP, COIN & BASEBALL CARD COLLECTORS!**

Three powerful, easy-to-use collectible inventory programs.

- Built-in prices & descriptions.
- Prices updated annually.
- Demo $15, Call for FREE catalog.

COMPUT-QUOTE

6914 Berquist Ave. Dept. CM
Camarillo, CA 93010

805-783-5775 ext. 39

In CA 818-348-3662 ext. 39

**CIRCLE 578 ON READER SERVICE CARD**

**FOREIGN FONTS EDITION™**

22 foreign language fonts on one disk $69.90

Customized Fonts & Logos Available

All Orders add $3.00 CA res. add 5% tax

(714) 621-0973

Devonian International Software Company

P.O. Box 2351
Montclair, CA 91763

**CIRCLE 698 ON READER SERVICE CARD**
Family Heritage File™
Most powerful genealogy program on the Mac. Rated “Best” by Macworld. Lisc. ver. of Personal Ancestral File™ by LDS Church. Enhancements for non-LDS. •Mac interface •All Macs & hard disks except 128K •Exports data to WP/databases/modems •Pedigree, Family Group, Individuals, Marriages, Surnames, w/Doc. $149 + $5 s/h Demo $7.

StartCom Microsystems, Windsor Park East, 25 West, 1480 North, Orem, UT 84057, 801/225-1480

Call The Macworld Catalog and see why.
800.888.8622

Genealogy

REUNION™
the family tree software

REUNION is the only software that quickly records and graphically displays information about your entire family. genealogy facts, digitized photos, and up to 5000 words of notes per person. Point and click to navigate through generations of your ancestors. Create, display and print large, graphic pedigree and descendant charts.

Also... family group sheets • family lines • family and personal histories • mailing lists • birthday calendars • index • life expectancies • user defined fields. $99 plus $4 s/h. Visa/MC welcome. Call or write for free brochure and sample printouts.

LEISTER PRODUCTIONS
14 Hill Blvd., Manhasset, NY 11030
717-971-1378

CIRCLE 613 ON READER SERVICE CARD

For your ad to appear in The Macworld Catalog, call 800/888-8622.

Easy Color Paint

Finally, a high-quality, affordable color paint program for the Macintosh. Powerful, yet easy for kids, spouses, and friends. Perfect gift. Version 1.0 includes

- 16 or 256 colors, also runs on b/w Macs
- user-defined patterns and options
- cut and paste, adjustable fonts and brushes
- reads PICT and b/w MacPaint™ files, writes PICT files
- on-line help, detailed documentation

Tools include brush, rectangle, round rectangle, oval, line, bucket, polygon, text, pencil, fatbits, markee, lasso, triangle, diamond, eyedropper, spray paint, and more.

Send $39 or call 1-800-367-6899. MC/Visa accepted.

Creative Software
55 Clinton Avenue • New Providence, NJ 07974

CIRCLE 358 ON READER SERVICE CARD

Languages

Fortran on Your Desktop
No need to wait for time on the “big” computer any longer. Language Systems Fortran lets you run the same high performance Fortran programs at your desk. VAX-compatible extensions, high precision IEEE floating point data types, complete access to Toolkit, direct code generation for the Mac II, and the MPW programming environment make this compiler the most powerful Fortran for the Mac.

Language Systems Corp., 441 Carlisle Drive, Herndon, VA 22070, 703/478-0181

MACTRAN PLUS

DCM DATA Products, 1710 Two Tandy Center, Fort Worth, TX 76102, 817/870-2202

Health

Analyze Diets, Menus...
so much more with the FOOD PROCESSOR II! This TOP-rated software has the best database of any system on the market today! Used by USDA, schools, colleges, hospitals, fitness centers & health programs.
• 4000-3000 foods • 30 nutrients. $295
• CALL OR WRITE TODAY FOR FREE DEMO DISK!

ESHA Research, PO. Box 13028, Dept. D, Salem, OR 97309, 503/585-6242

Your Ad Gets More For Less.

Call The Macworld Catalog and see why.
800.888.8622
Medical Office Mgmt.
TessSystem™ software for insurance and billing. Our $1295 package out-performs software selling at three times that price. Expandable line to grow with your needs. Call for product literature and DEMO software today! New modules include electronic claims and multi-user for Mac networks.
Wabash Medical Resources, Inc.
6865 Parkdale Pl., Suite A,
Indianapolis, IN 46254
317-299-7800

Mood Altering Software
Syncronicity is a mood-altering software experience that turns stress into strategy in a fun & relaxing way. Stimulate your intuition to complement logical decision-making with fresh insight into dilemmas, office politics, negotiations and personal relationships. Eloquent hypertext with beautiful animated art makes it a pleasure to take a creative break. A fantastic gift - only $49.95 Demos $5.
Visionary Software, Inc.
P.O. Box 3225
Manhattan Beach, CA 90266
213/354-2996

Your best PD/Shareware values: only $19.95 per PAK!
ArtPAK 250 (I & II)  $100
GamePAK (I & II)  $100
BusinessPAK 100  $100
DeskPAK 200 (I & II)  $150
FontPAK 200 (I & II)  $150
SoundPAK 150  $150
UtilityPAK 100  $150
HyperPAK 100 (Volumes 1 thru VI)  $100
FREE Smack-a-Mac when you order 5 or more PAKs (59.95 value /1-time offer') Each PAK on 4 OS disks. Save more: 4 PAK's $61.95; 5 PAK's $89.95; 6 PAK's $107.95. Overseas add $40.00 per order over $100.00. No sales tax. Orders over $100.00. Or call 800-445-4866.

Budgetbytes
Order toll free: (800) 250-0551
Customer Serv., (101) 325-2200

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
New from RealData —
Real Estate Investment Analysis, Version 6.0

Real Estate Investment Analysis has been our best-selling product since it was introduced in 1982. Many software products have come and gone over the years, but RealData and our Investment Analysis have stood the test of time. Now Version 6.0 adds new power to this popular program.

What can it do? Real Estate Investment allows you to make ten-year projections of the income, expenses, cash flows, re-sale and tax implications of your property. It performs virtually all of the complex Tax Reform, financing and rate-of-return calculations for you in just seconds. It also includes a lease analysis and annual operating statement.

Real Estate Investment Analysis, Version 6.0 runs with Microsoft Excel or Works on the Mac. $250.

To order, call or write today: MC, VISA, AMEX Welcome or send $2 for our catalog of real estate software for the Mac and PC.

**New from Rea/Data**

Real Estate Investment Analysis, Version 6.0

Real Estate Investment Analysis has been our best-selling product since it was introduced in 1982. Many software products have come and gone over the years, but RealData and our Investment Analysis have stood the test of time. Now Version 6.0 adds new power to this popular program.

What can it do? Real Estate Investment allows you to make ten-year projections of the income, expenses, cash flows, re-sale and tax implications of your property. It performs virtually all of the complex Tax Reform, financing and rate-of-return calculations for you in just seconds. It also includes a lease analysis and annual operating statement.

Real Estate Investment Analysis, Version 6.0 runs with Microsoft Excel or Works on the Mac. $250.

To order, call or write today: MC, VISA, AMEX Welcome or send $2 for our catalog of real estate software for the Mac and PC.
DIGITIZE for the Mac - Ver. 1.0
Digitize points, lines and polygons in any coordinate system • Edit window for viewing and changing points • Area and length calculations • Export routines • For ADB compatible digitizers.

CLR ANOVA
Analysis of variance program that can compute up to a 10-way design with repeated measures and unequal n. Marginal means, plots of interactions, simple effects, range tests, contrasts, and more. Full Mac interface. Can read text files w/entries separated by spaces, commas, or tabs. $100 + $3 s/h.

Unbelievable but True
If you have $25,000 to invest in your own desktop publishing business and must earn $60,000 to $80,000 this year with an established leader in the fine art market and publishing call for complete details! Not A Franchise!
(404) 881-5395

Plotter Utility... with professional fonts for Apple, HP, Houston; A-E sizes. $125
Terminal Utility... fast VT100, Tektronix, file transfer, color, large screens. $195

The most readers. The least cost. Immediate access. Just call The Macworld Catalog at 800.888.8622 and place your ad—today!

800.888.8622

For your ad to appear on The Macworld Catalog screen, call 800/888-8622.
## BUSINESS SOFTWARE

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>1</td>
<td>Microsoft Word</td>
</tr>
<tr>
<td>47</td>
<td>2</td>
<td>Microsoft Excel</td>
</tr>
<tr>
<td>35</td>
<td>3</td>
<td>Microsoft Works</td>
</tr>
<tr>
<td>43</td>
<td>4</td>
<td>Aldus PageMaker</td>
</tr>
<tr>
<td>32</td>
<td>5</td>
<td>MacWrite</td>
</tr>
<tr>
<td>44</td>
<td>6</td>
<td>MacDraw</td>
</tr>
<tr>
<td>16</td>
<td>9</td>
<td>WordPerfect for the Macintosh</td>
</tr>
<tr>
<td>9</td>
<td>7</td>
<td>Aldus FreeHand</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>Wingz</td>
</tr>
<tr>
<td>11</td>
<td>10</td>
<td>QuarkXPress</td>
</tr>
</tbody>
</table>

## EDUCATION SOFTWARE

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2</td>
<td>Where in the World Is Carmen Sandiego?</td>
</tr>
<tr>
<td>39</td>
<td>3</td>
<td>Math Blaster</td>
</tr>
<tr>
<td>23</td>
<td>1</td>
<td>Reader Rabbit</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>Math Rabbit</td>
</tr>
<tr>
<td>35</td>
<td>5</td>
<td>Typing Tutor IV</td>
</tr>
</tbody>
</table>

## ENTERTAINMENT SOFTWARE

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>1</td>
<td>MacGolf</td>
</tr>
<tr>
<td>35</td>
<td>3</td>
<td>Dark Castle</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>SimCity</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>Falcon</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>Crystal Quest</td>
</tr>
</tbody>
</table>

## NETWORK/DATA COMMUNICATIONS

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>1</td>
<td>TOPS</td>
</tr>
<tr>
<td>31</td>
<td>2</td>
<td>AppleShare</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>Netware for the Macintosh</td>
</tr>
<tr>
<td>38</td>
<td>5</td>
<td>LocalTalk</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>Red Ryder</td>
</tr>
</tbody>
</table>

## HARD DISKS*

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1</td>
<td>MacStack SD20</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
<td>Apple Hard Disk 20SC</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>MacStack SD30</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
<td>Rodime 40 Plus External</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
<td>Cutting Edge 20MB</td>
</tr>
</tbody>
</table>

## ADD-IN BOARDS/MEMORY

<table>
<thead>
<tr>
<th>Months on chart</th>
<th>Last month</th>
<th>This month</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>1</td>
<td>Radius Accelerator</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>Radius Interface Display</td>
</tr>
<tr>
<td>25</td>
<td>3</td>
<td>Apple 2MB Memory Expansion Kit</td>
</tr>
<tr>
<td>21</td>
<td>4</td>
<td>Apple 1MB Memory Expansion Kit</td>
</tr>
<tr>
<td>15</td>
<td>5</td>
<td>Macintosh II Video Card</td>
</tr>
</tbody>
</table>

## PRODUCT WATCH

Recent or forthcoming products of particular interest.

**ColorSpace II** Mass Microsystems Full-motion video board for Multisync monitors

**QuickCAD Graphics Engine** Radius RISC-based accelerator

**Spectrum/24 Series III** SuperMac Technology Graphics display board and accelerator

Source: Exclusive InfoCorp survey of more than 125 Macintosh retailers and selected mail-order vendors. Covers sales during September 1989.

*Does not include hard disks installed at the factory.
The Right Choice...  
WriteNow.

“Best New Word Processor”
MacUser Magazine, May 1989

“Readers’ Choice”
MACazine, January 1989

“Golden Gavel Award”

AWARDS & RECOGNITION
WriteNow is the highest-rated word processor in the Macintosh world. MacUser Magazine said it best—"WriteNow wins best new word processor hands down."

EASY-TO-LEARN, EASY-TO-USE
If we were to pick one word that our customers use to describe WriteNow, it's usable. A great word processor is more than just a stockpile of features—it's the usability of those features, how easy they are to learn and use, and how they feel under your fingertips when doing real work. Everyone claims ease-of-use, but WriteNow actually delivers it—and our awards and ratings prove it.

BUSINESS POWER & PERFORMANCE
WriteNow has all the power business users need, including: Mail merge; 100,000 word spelling dictionary; multiple columns; in-line graphics; format accelerators (style sheet equivalents); outline indenting, character and word counting, fixed and flexible line spacing, and much more. As important, WriteNow is the fastest word processor in the Mac world, whether you've got a small Mac 512KE or a loaded Mac Iicx.

<table>
<thead>
<tr>
<th></th>
<th>Copy &amp; paste large area</th>
<th>Search for a word</th>
<th>Spell check document</th>
<th>Change indents &amp; double spacing</th>
<th>Undo ruler changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>WriteNow 2.0</td>
<td>6.7 sec.</td>
<td>2.9 sec.</td>
<td>7.4 sec.</td>
<td>23.3 sec.</td>
<td>1.6 sec.</td>
</tr>
<tr>
<td>MacWrite II</td>
<td>45.9 sec.</td>
<td>40.2 sec.</td>
<td>33.6 sec.</td>
<td>44.7 sec.</td>
<td>24.7 sec.</td>
</tr>
<tr>
<td>MS Works 2.0</td>
<td>1 min. 50.8 sec.</td>
<td>35.7 sec.</td>
<td>5 min. 13.4 sec.</td>
<td>2 min. 24.1 sec.</td>
<td>1 min. 14.5 sec.</td>
</tr>
<tr>
<td>MS Word 4.0</td>
<td>21.6 sec.</td>
<td>11.0 sec.</td>
<td>3 min. 55.1 sec.</td>
<td>39.4 sec.</td>
<td>25.8 sec.</td>
</tr>
</tbody>
</table>

All tests performed using a 12-page word document on a Macintosh Plus with a 30 Megabyte hard disk. All times were measured with accuracy ± 10%. © 1987 T/Maker Company. All rights reserved. The following are registered and unregistered trademarks of the companies listed: WriteNow, licensed to T/Maker Co. MacWrite II, Apple Computer, Inc.; MacWorks, Canon Corp.; Microsoft, Microsoft Corp.

Circle 332 on reader service card
That's right. For the third year running, the readers of Macworld magazine have voted the Kensington Turbo Mouse® "Best Input Device" for Macintosh® computers. Who were the contenders? Every other trackball and mouse on the market. (Not to mention joysticks, keyboards and graphics tablets.) The winning secret? Simple.

Turbo Mouse is quicker, quieter, and easier to use. It delivers the winning combination of speed, precision, two buttons with extra features, and a comfortable, space-saving design—all for just $169.95.

For a free brochure, or a dealer near you, call (800) 535-4242. Outside the U.S. or in New York, call (212) 475-5200.