TAX SOFTWARE: MacInTax and TurboTax help you tackle the IRS

MacUser

SPECIAL BUYER’S GUIDE:

Hard-Drive Price Busters

MacUser Labs rates 32 budget hard drives

- Disk-Recovery Software:
  How to survive your first crash

- Memory Upgrades:
  The cheapest, easiest power boost for your Mac

- Sneak Previews: Kodak’s printer/copier, Pixar’s 3-D Showplace, and new compression tools
You do it by the
When we introduced Microsoft Word six years ago, we weren't planning on making history.

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

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

Which they did.

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

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

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

Then there were those senders of mail, who didn't want to click-click-click-click-click-click. So we built support for Microsoft Mail right into Word. Now, with just a click, everyone stays in the loop. And work in progress stays in progress.

Apparently, listening to what people want is a pretty good way to design software.

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

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

Which we are. In fact, if you've got some input for us, feel free to drop us a line. Or if you'd like to find out more about Word, call us at (800) 541-1261, Dept. N26.

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

After all, we're only making history because we make word processors the way you like 'em.
You don't become the most popular word processor in Mac history by thinking big.
32 budget hard drives took MacUser Labs' torture test. Which came out on top?

89

Life Begins at 40 Megabytes:
Small Hard Drives

BY WINN L. ROSCH AND THE MACUSER LABS STAFF

An external hard drive is one of the most important peripherals you'll ever buy. MacUser Labs tested 32 drives in the 40-to-50-megabyte range. Our evaluations reveal significant differences in speed, physical design, power supply, SCSI connection/termination, software, and service. Check the results to find out which units provide safe, affordable storage for your data. ..Buyer Guide 4

Surviving the Crash:
Hard-Disk Recovery

BY JACKIE TAYLOR, PAUL WOLF, AND THE MACUSER LABS STAFF

Someday your hard disk will go down. Whether your data goes with it depends on how well you've prepared for disaster. MacUser Labs purposely crashed some disks to discover which of five contending programs could best save the day — and your data. .................Buyer Guide 42

Building a Better Network with EtherTalk-to-LocalTalk Routers

BY KURT VANDERSLUIS, PAUL KENT, AND THE MACUSER LABS STAFF

Fast-growing LocalTalk networks gain new life (and speed) when you link work groups via routers to EtherTalk backbones. The MacUser Labs Network Shop tested eight router solutions, both hardware and software, to find the best way around your network bottlenecks. ..........156

Mac to Mailbox

BY OWEN W. LINZMAYER

Whether you mail letters individually or by the thousands, these hardware and software products offer you solutions for everything from mailing-list management to envelope printing. ..................................................174

SIMMple Pleasures

BY OWEN W. LINZMAYER

Memory upgrades are cheaper, easier, and more important than ever before. Here's how to buy the right SIMMs at the right price for the right Mac. .........................194

"Pointers to the future are most easily grasped by the handles of the past." .................................................................229
Sections

VIEW ON THE MENU ..............................................49
It's a printer. It's a copier. It's from Kodak, and it smashes a price barrier. Plus a visit to Pixar's new Showplace, new hardware and software compression tools, news, updates, and more. ..............................................49

DESKTOP PUBLISHING .............................................203
Prepress
Impress your printer. Here's how UCR, GCR, and dot gain help you adjust color density to compensate for differences in inks, paper, and printing presses. 205

Step by Step
You don't need PostScript to do fancy shading. Using MacDraw and some fancy tricks, you can create graduated fills that look as good as the real thing. 211

Networking
Dayna's outstanding EtherPrint lets you print from Macs on Ethernet — and it works about as fast as printing directly via LocalTalk. 217

Trouble Shots
When your AppleShare network suddenly slows down or loses connections, try isolating the problem with InterPoll, Apple's network-diagnostic utility. 221

Power Techniques
Claris' FileMaker Pro adds new capabilities — and also the need for some workarounds. Here are a dozen tricks to help you get the most from this upgrade. 224

Beating the System
Bill Gates has a lot to say about the future of system software. 229

The Expert's Edge
Thom Hogan takes a Pledge break. 235

Power Programming
How to exploit the prospect of System 7.0 239

Tip Sheet
How to rescue deleted files even Norton Utilities' UnErase can't save, encompass words in a box in Word 4.0, do perverse things to After Dark 2.0, and more 245

Help Folder
Generating dialog boxes and collecting data from users in Word, the real difference between the printer port and the modem port, logging Mac use, killing excess INI files, and more 249

Reviews

FilmMaker
Versatile animation software for the pros 52

MacInTax and TurboTax
Now you can choose between two good tax-preparation programs. 54

MiniCad 3.0
How about a fast 2-D/3-D CAD program with lots of features, great analysis tools, and a faithful Mac-like interface? 56

M.Y.O.B.
Great basic all-in-one accounting software, as long as you don't need to handle payroll and multiple departments and have simple inventory needs 58

Intouch
The best name-and-address DA for the Mac 60

DiskDoubler, Compactor, and Diamond
Here's some strong software for archiving and compressing files. 72

Planisoft
Multiuser software for tracking the contacts and appointments of networked Mac users 75

Now Utilities
A great upgrade stars Super Boomerang and features a host of invaluable utilities. 78

FileGuard and MaccessCard Reader
A network-security hardware/software combo with a one-two punch 80

Quick Clicks

Departments

Jon Zilber
I've grown accustomed to your interface. 25

Robert R. Wiggins
Death and taxes, Mac style 41

Guy Kawasaki
Readers, writers, and backbiters 45

John C. Dvorak
Aha! — there is an anticomputer conspiracy 318

Letters
Apple dealers, fax modems, monitors, and more 13

Advertiser Index 284

Marketplace 298
When to buy CANOPENER

You get a file created with a program you don't have, so you can't open it. CanOpener will let you view text and pictures in the file, and copy what you need. So, just because you can't open it, doesn't mean you can't use it.

You try to open an important WP or DTP document, but it's damaged. CanOpener will get you into the document, so you can recover valuable work. Which is probably why many of our users call CanOpener a "lifesaver."

You've misplaced important text or pictures, and you need them now. CanOpener will let you search files, folders or disks and locate text anywhere, even inside pictures. So, a snippet of text is all you need to find a missing drawing.

So buy CanOpener today, we think you'll find it invaluable. And we're not alone. MacUser magazine recently awarded CanOpener "4½ mice" and their famous Editors Choice Award for Best File-Management Utility.

CanOpener is available in all software catalogs, or visit your local dealer. If you need more information, call us at: 800-552-9157 or 914-747-4171.

ABBOTT SYSTEMS

© 1990 Abbott Systems Inc.
CanOpener is a Trademark of Abbott Systems Inc.
Please circle 129 on reader service card.
Introducing the Metro with SCSI Sentry

EMAC has found a way to prevent unnecessary Macintosh hard drive fatalities with SCSI Sentry,™ an engineering breakthrough in disk drive reliability. It protects your disk drive from damaging shorts that can trap data inside your hard disk. Which makes any drive with the SCSI Sentry substantially more reliable.

And only EMAC Metro drives have it.

Metros are zero-footprint disk drives – so they fit perfectly under a Mac Plus or SE. You can also stand Metro on its side next to any Mac II, keeping your desk free for papers, phones, or photographs.

But Metro's engineering goes far beyond pure aesthetics. With some of the most stringent testing in the market – and mean-time-between-failures ratings of 50,000 to 70,000 hours – these drives were built to keep you up and running. And, if your Metro drive ever does have problems, our modular design makes diagnosis and repair quick and easy.

When you add the SCSI Sentry to such reliable disk drives, you know your data's safe with Metro. If you want to own a disk drive with a bulletproof vest, call EMAC at 1-800-821-0806, extension 2222, (In Canada, 1-800-663-5161).

Please circle 154 on reader service card.
THE DIFFERENCE BETWEEN HINDSIGHT AND FORESIGHT IS PERIPHERAL VISION.

When your hard drive fails, hindsight will tell you that you should have gotten it from a company that can replace it fast. But foresight says that it’s best to prepare for the moment of truth. And it’s wise to select a company that replaces its drives in 48 hours or less.

Because every day your storage system is down...is a very long day indeed.

At Peripheral Vision, we counsel our customers on how to save data before and after the inevitable crash. And we consider the service we provide every bit as important as the equipment we sell.

Yet we sell the very best. In fact, our high capacity 350 mb, 650 mb, and 1.2 gb drives are so reliable, they’re warranted for five years.

If you’re looking for an unbeatable combination of high quality technology and service at great prices—including our 45 mb removable, DAT and tape backups—we’re just a toll-free call away. Call Peripheral Vision at 1-800-800-7868.

PERIPHERAL VISION
STORAGE SYSTEMS

We take the long-term view.

CALL 1-800-800-7868
Few Things Bring More People Together Than FastPath.

The Original AppleTalk To Ethernet Router Supports AppleTalk Phase 1 & 2, TCP/IP, DECnet and SNMP. Or any combination of these protocols. Plus AppleTalk encapsulation in UDP (IPTalk), IP forwarding and network device filtering. With full SNMP support, FastPath can be a key part of company-wide network configuration plans. It's been the number one AppleTalk to Ethernet router since 1986, proven in multi-protocol environments worldwide.

FastPath Supports Diverse Network Services. Including terminal emulation (TELNET, CTERM), file transfers (FTP, DEC FAL), file servers (NFS, TOPS, AppleShare), E-mail gateways (such as GatorMail Q), database services to access host-based databases (Oracle for Macintosh, Clear Access) and network print sharing with filtering options.

FastPath Supports Itself With Battery-Backed Up RAM. FastPath won't let you or your network down — even when the power goes down. Battery-Backed-Up RAM ensures uninterrupted operation and saves your network configuration.

We're working to make FastPath even better, with more powerful performance and management features. Call Shiva now to find out how FastPath can solve your network communications problems.

1-800-458-3550. 617-252-6300.
Remember the first day you got your hands on a Mac? Remember how excited you felt when you saw all the things it could do? This may refresh your memory.
Introducing WordPerfect® 2.0.

Every once in a while a new product comes along that sparks the same kind of excitement you may have experienced with your first Macintosh (you stayed up half the night, right?). As we’ve shown new WordPerfect® 2.0 to Macintosh users around the country, we’ve seen a very similar reaction. First eyes open wider. Then heads start to nod. Followed by grins that stretch dimple to dimple. Here are some of the more graphic improvements.

We built a graphics and drawing package right into the program. With WordPerfect 2.0, you don’t have to leave your document to incorporate graphics. Inside your text box, you can create, edit, size, scale and crop graphic figures just by clicking “graphics” or “draw” on the pull-down menu. The palette includes all of the standard drawing tools, plus Bezier curves, polygons and a free rotation tool.

WordPerfect 2.0 also lets you create text boxes. You can change font size and attributes. Then you can drag your text box wherever you want in your document and the rest of your text will wrap around it automatically.

The list of new features could fill a page. Or up to 24 columns.

By clicking and dragging icons on the new WordPerfect ruler, you can create columns (newspaper or parallel) and then adjust the column settings, align text, set tabs, change line spacing, move margins and do a number of other formatting changes to your document.

Want to add a border to text, paragraph, column, or page? Easy. WordPerfect 2.0 gives you 36 different border styles from which to choose.

Like working with Styles? WordPerfect not only lets you use them, you can also share your styles with other people on your network.

We’ve also added new features like a Macro Editor, Tables of Authorities, and Line Numbering.

And we’ve made enhancements to Merge, Search and Replace, and Macros.

Of course, what counts is how you feel.

See WordPerfect 2.0 up and running at your dealer. Better yet, buy a copy of WordPerfect 2.0 and load it onto your Mac. For a limited time, your dealer can give you a great trade-up allowance for your version of Microsoft Word. But when you try WordPerfect 2.0 for the first time, one word of warning. Don’t plan on going to bed early.

For more information, call us at (800) 526-5012.

$125 Trade Up Offer.

If you have any version of Microsoft Word, we’ll make it easy for you to move up to WordPerfect 2.0. Take the registration cover sheet from your Word software manual (or other proof of purchase) to a WordPerfect dealer and get WordPerfect 2.0 for just $125* during this offer.

It’s not just a flowchart, it’s your next promotion...

When your career is on the line, you need help to develop and present better ideas. Your solutions to complex problems! Look good by clarifying complicated situations and move yourself higher on the promotion list.

Use MacFlow, the leading Macintosh flowchart package, to develop, display or document any process without tedious drawing. MacFlow helps you develop an overall view of your work, project or logic flow. Simply drag pre-drawn symbols into place and connect them with flow lines. Move symbols about and lines stay connected. Automatically create right-angled or curved lines. Modifications are just as easy! Export your flowchart to a desktop publishing program for a report or use it in a presentation.

Present your team’s organizational structure. Design and document your manufacturing flow. Or tackle the paper workflow in the office. Explain complicated situations. Eliminate misunderstandings today that could become big problems tomorrow!

Get MacFlow today — because making it perfectly clear could just get you that next promotion.

Give MacFlow a try before you buy. Fax your name and address to (818) 991-4587 for a FREE catalog and MacFlow demo disk.

Mainstay
5311-B Derry Ave, Agoura Hills, CA 91301 (818) 991-6540
71 rue des Alreboles, Brussels, Belgium 322/733.97.91
Please circle 165 on reader service card.

Jacksonville, Oregon. Home to darn good apple pie and Apple’s Sociological Small-Business Experiment. Looking for a small town with businesses that could run solely on Macs, Apple seeded the Applegate Valley town of Jacksonville with Macs last September. Five months later, MacUser went to Jacksonville to see the effect on the town.

Timing was awkward. Some residents were miffed at the February issue, just out then, and in particular at our very own John C. Dvorak. Somehow, they didn’t appreciate being called a podunk burg. And you can’t blame them. Granted, with a population of 2,500, Jacksonville is the kind of small town where everybody knows your name, a place where people get excited over a Christmas-light competition. And granted, the town is visibly little changed from its gold-rush founding in 1851 — most of the town’s 60 small businesses are housed in buildings that are more than 130 years old.

But it was a big deal to this small town when Apple arrived with $300,000 worth of Macs, printers, scanners, and modems and when other companies (including MacUser) chipped in with software and magazine subscriptions. The systems were installed at more than 30 locations, including the Peter Britt music festival, a printing firm, a winery, restaurants, bed-and-breakfast establishments, a medical center, hotels, City Hall, the police and fire departments, the public library, and the elementary school.

It was not the first exposure to computer technology for Jacksonville. Most of the people we interviewed had set aside PC clones or Mac Pluses for the free Mac Classics, LCs, and IIsi’s. One manager we spoke to had subsequently bought a Mac and modem for her home and was in the process of setting up Timbuktu so she could access the office machine from home.

Staying up all night to work on a Mac is common. The library and the school provide public access to Macs, but demand has outstripped supply. Jacksonville’s Mac users troubleshoot problems together. The fact that most have the same machines and software reinforces the sense of community that is a fact of life here. “I don’t worry if I’m not an expert on a certain package,” one person said, “because someone across the street will be.”

What we found most fascinating about the Jacksonville experiment is that Apple has introduced a shared technological base into a real-life community. Most communities with a mutual interest in computer matters are artificial, arbitrary, or ad hoc. Jacksonville’s businesses were a community before the technology arrived, and they have now become a Mac user group as well. What will a real community do when it has an uncommon technology in common? Should be interesting to watch.
Unlocking Corporate Data

ORACLE for Macintosh gives users direct access to PC, mini, and mainframe databases.

We all remember 1984, when Macintosh promised to put the power into the hands of the rest of us.

Well, it's taken six years, but the door to the corporate vault is open. Now, the full power of corporate data is easily accessible to anyone with a Macintosh. More specifically anyone with Macintosh and ORACLE®.

Using ORACLE for Macintosh, Mac users can now point and click their way into, around and out of just about any mainframe, mini, workstation or PC database. That includes any data stored in DEC's RMS, IBM's DB2 and SQL/DS.

They can do it without the limits of Mac-only databases or the masquerade of terminal emulation. In fact, they can do it right from their favorite Mac programs like Microsoft Word and Excel. And they can do all this without compromising the systems administrator's control over access and security.

As for Macintosh developers, ORACLE lets them work in flexible programming environments including HyperCard, SuperCard, PLUS and Acius's 4th Dimension. To name a few.

And all Oracle products are backed by a 30-day money back guarantee. As well as the largest database service and support organization in the world.

Call us at 1-800-633-0516 Ext. 7611 for ORACLE for Macintosh or ORACLE for 4th Dimension.

Or sign up for an Oracle Client/Server Forum in your area. At last, Apple's promise has come to fruition.

Compatibility • Portability • Connectability
You Can’t Buy A Better Surge Protector Than Curtis
Guaranteed Protection—Proven Performance

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

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

Greater Selection—Single or multiple outlets, switched or unswitched, remote control, EMI-RFI filtering, phone line surge protection — choose the surge protector with the combination that best suits your needs.

Guaranteed Protection — Every Curtis surge protector is guaranteed to provide you with the protection you need. And most are backed by the industry’s best warranty coverage — the Curtis Lifetime Warranty.

With all this going for them, no wonder Curtis surge protectors are owned by more computer users than any other brand.

Curtis. You can’t buy a better surge protector.

For the Curtis dealer nearest you call (603) 532-4123 Ext. 43
Eying the LC

I became interested in buying a Mac LC after reading your article “Three Cheers for Three New Macs” (December ’90, page 90), but I wasn’t so impressed with the LC’s color monitor. Does the LC work with other color monitors? If so, are other parts needed to use it?

Victor Gorodinsky
Champaign, IL

Some people don’t like the fact that the LC’s color monitor has only 512-x-384-pixel resolution. Fortunately the LC works with any 640-x-480-pixel monitor that’s Iici-compatible, such as the standard Apple 13-inch color monitor. It also works with monitors for the Mac from Magnavox, NEC, Seiko, and Sony. You need Iici compatibility because both the LC and the Iici have built-in display circuits that automatically determine what monitor you’re using by interpreting the pin configuration of the monitor cable. If pin 4 is grounded to the plug shell, for example, the LC knows you’re using a 640-x-480-pixel color monitor. Most vendors now supply such a cable, but be sure to ask.

You may also want to add video memory. The LC’s 256K video-RAM SIMM supports only 4-bit color on a 640-x-480-pixel monitor (although you get 8-bit color on the 512-x-384-pixel display). However, you can swap in a 512K video-RAM SIMM, but you must discard the 256K SIMM. This costs around $250 and delivers full 8-bit color with a 640-x-480-pixel monitor — or 16-bit color on the 512-x-384-pixel monitor. That’s why I just bought an LC with a 512-x-384-pixel monitor.

One last point — the curved front of the LC makes a poor fit stylistically with some monitors, such as the Apple 640-x-480-pixel color display. See how it looks before you buy.—LT

Loose Chips Sink Ships

The lack of good network-management tools is increasingly felt as AppleTalk networks and internets grow up. As pointed out by Kurt VanderSluis (“The Right Tool,” November ’90, page 229), it is very hard to optimally configure a network without such tools, and his Packet Cruncher stack should be helpful to many network managers.

I think that this situation gives rise to a crucial security problem, however. Good management tools, such as Cayman’s famous Watch program, let anybody with a Mac on an AppleTalk or Ethernet network trap packets and analyze their contents. These packets can be TCP/IP, Telnet, SMTP, and so on.

Even a relatively inexperienced network manager can easily mess up the configuration on a Mac user’s system, allowing a hacker to “see” what the user is doing. Mac users — and Apple — need network-management tools like these urgently.

Ben Hallert of Eugene, Oregon, thinks that the “interesting company politics at Apple” make it all worthwhile. “All the other companies are boring, slow, and unoriginal.”

Wally Parker, also from Eugene, Oregon, which must be an evangelical hotbed, sent us a more Pavlovian reason. The Mac stimulates our “pleasure centers” and he figures, “A computer that’s more pleasurable to work with is demonstrably used more often, more intently, and to better effect. The people who work with it are happier, more confident, and more eager.”

PC users have some 500 laptop models to choose from. Mac users have 3. Some would argue that all that would change if Apple would license its ROMs, which contain the system code that make the Mac a unique computer. Apple could still tightly control who got the ROMs and for what purpose. After all, potential clone makers have been beaten to the market by Apple itself. And maybe we’d get a taste of the incredible variety PC users enjoy.

Speak Up:
Should Apple license its operating system?

Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Dear Mr. Sculley . . .

In January we mentioned that John Sculley’s New Year’s resolution was to regain eroding market share. We asked readers for the one best reason to switch to a Mac. The responses tended to focus on ease of use, as you might expect — but with some wrinkles.

Here’s an example: Wilhelm S. Arnested of Riverside, California, works for an employer that insists that he use an IBM PS/2 at the office. His employer even provides him with an IBM PC/AT to use at home. So, he bought a Macintosh with his own money: “The stark reality is, I take all of my computer work home to do on my Macintosh. The Macintosh gives me superior results faster, easier, and more enjoyably than the PC at work.”

Marc Biayode of Waldorf, Maryland, thinks it is the GUI. “A GUI is much easier to use and learn. Learning quicker means you’re more productive on the job.”

College student Sean M. Joyce of Tiffin, Ohio, proposes a Mac advantage that would have been unthinkable just a short while ago: “Affordability. My IICX only cost the equivalent of one-and-a-half semesters of coursework.” We sure hope he attends a public school. Sean has an even better reason, though: “It gives me a legitimate excuse to subscribe to MacUser.”

Ben Hallert of Eugene, Oregon, thinks that the “interesting company politics at Apple” make it all worthwhile. “All the other companies are boring, slow, and unoriginal.”

Wally Parker, also from Eugene, Oregon, which must be an evangelical hotbed, sent us a more Pavlovian reason. The Mac stimulates our “pleasure centers” and he figures, “A computer that’s more pleasurable to work with is demonstrably used more often, more intently, and to better effect. The people who work with it are happier, more confident, and more eager.”

PC users have some 500 laptop models to choose from. Mac users have 3. Some would argue that all that would change if Apple would license its ROMs, which contain the system code that make the Mac a unique computer. Apple could still tightly control who got the ROMs and for what purpose. After all, potential clone makers have been beaten to the market by Apple itself. And maybe we’d get a taste of the incredible variety PC users enjoy.

Speak Up:
Should Apple license its operating system?

Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.
user can peek at your user-name/password pairs for your favorite AppleShare server or, for a UNIX host, whenever you connect. Further, other users can trap packets that are sent to a LaserWriter and retrieve whole PostScript files on the sly.

Such practices cannot be prevented with this kind of network (any workstation can grab packets and look at their contents). Encrypting user-name/password pairs could make things harder for pirates.

Users should be aware of this possibility because the worst situation is when only hackers know that they can do such things. When you understand that anyone can access your information when your Mac is on the network, you realize that floppy disks are a more secure way to send confidential information.

Jean Thiouloule
Cedex, France

Getting Satisfaxion
I've wanted to buy a modem for the past few months but was unable to decipher the different brands, features, and prices. "Thoroughly Modern Modems" in the January issue (page 100) saved me weeks of indecision. Steven Satchell and the Labs staff did an excellent job of clarifying the different protocols and standards.

But I still have a question that wasn't addressed in the article. I'm interested in modems with fax capabilities. Is there software to make modems operate as a fax? If not, do I need to buy one with fax capability built in to the hardware?

John Zimmerman
Somerville, MA

A few modernise recently developed chips with limited 4,800-bps fax support along with firmware to support fax operations. However, to actually send faxes with such a modem, you also need software such as BackFAX from Solutions (Williston, Vermont; [802] 865-9220). BackFAX comes in different versions for various modems. Some vendors also offer their own fax-software upgrades.

Even without a fax modem, you can still send faxes via on-line services such as CompServe or MCI Mail. You create test mail and then specify a fax telephone number. A forthcoming feature is fax receive — an on-line service takes a fax, runs it through OCR software, and forwards the text to you at your mailbox.

If you plan to send many faxes, get a modem that handles data at 2,400 bps or more and faxes at 9,600 bps. One such modem, the Prometheus 9696 (Prometheus Products, Tigard, Oregon; [503] 624-0571), offers 9,600-bps fax with 9,600-bps, v.32 data capability. — SS

Get Smart Shareware
I'd like to assure John Brosnan ("Letters," December '90, page 18) that there are many good educational shareware programs. You have already mentioned Gravitation Ltd., an excellent program. Others include Scientist's Helper, GraphTools, and Venn. Any good user group should have these — and more — in its library. Mr. Brosnan should contact his local user group or contact us at (215) 895-2573 (voice) or (215) 895-2579 (our BBS).

You can download several of these programs from our file-transfer section.

Scott Brown
President, DUsers
Drexel University's Macintosh Users' Group
Philadelphia, PA

All Those in Favor
MacUser always seems to cover everything I'm interested in, but in particular Guy Kawasaki's column and the Help Folder with Bob and Andy give me more belly laughs (and good info too) than just about anything other than "The Far Side." You make computing entertaining, and isn't that what makes anything fun to learn?

I make most of my hardware and software choices based on your reviews, and I haven't been disappointed. On the contrary, you've saved me a lot of hassles.

Sky Canyon
Aspen, CO

Apple, Schmapple!
I fail to understand why some of your editorial staff (particularly Guy Kawasaki) are so obsessed with the inner workings of Apple Computer.

Does it ever occur to you that the Mac is simply a unique piece of office equipment and that relatively few of the "rest of us" give a hoot about Apple's board of directors, third-quarter sales, and overseas-marketing strategy?

I probably love my favorite breakfast cereal as much as I love my Mac, but I've never felt compelled to write to the CEO of General Mills, nor do I stay up nights worrying about its corporate policies. Who cares?

Marcy Poulos
Sparta, MI

Part of the Macintosh phenomenon is the separation of computer and company:
In all modesty, we've always believed the L-View Multi-Mode display system was a winner — but we're thrilled that the editors at MacUser think so, too. L-View Multi-Mode has plenty of award-winning features, including six user-selectable resolutions (from an ultrahigh 120 dpi to an ultra-large 36 dpi) and a Low-Emission™ monitor design. It lets you select the best view of your work, whether you do publishing, spreadsheets, CAD, programming, presentations or demos. And it runs on the Macintosh II NuBus and SE/30, as well as the new IIci and LC.

So we encourage you to try L-View Multi-Mode. Because we could take a bow for our award-winning work, we'd rather see you take one for yours.

© 1991 Sigma Designs, Inc. L-View is a registered trademark; Multi-Mode and Low-Emission are trademarks of Sigma Designs, Inc. All other brand names, trademarks, and registered trademarks are the property of their respective owners.

Please circle 390 on reader service card.
“I love my Mac. I hate Apple.” I try to help people understand how Apple works and try to force Apple to change its ways. When our attitude becomes “I love my Mac. I love Apple,” more Macs will be sold. People will be happier with them, and the world will be a better place. Apple and Macintosh are inseparable. I care. Many readers care. Can a person love something and not care about the people and company who made it? —GK

Right for Once

It’s a rare day that I agree with John C. Dvorak, but I have to concur with his statement that software piracy is a sales tool (“The Gloom and Doom Boom,” January ’91, page 346). Because I have far-from-unlimited resources, it’s nice to be able to kick the tires and go for a test drive. This practice has saved me money and saved some software companies my animosity. It’s like expensive shareware — buy it if you like it; trash it if you don’t.

Paul G. Gifford
State College, PA

The Ti-tanic

John C. Dvorak’s “The Gloom and Doom Boom,” (January ’91, page 346) pointed out some of the well-known losers in the desktop-computer market. As a Texas Instruments alumus, I felt insulted that none of TI’s failures were mentioned, especially because TI had so many: the Home Computer, the TI PC, the 990 mini, and the Explorer Lisp Machine. In its defense, though, Texas Instruments has recently started to accept the Mac into its culture in the guise of the MicroExplorer.

Mark Johnson
Dallas, TX

MacWait

One way for Apple to regain its eroding market share is to take a long, hard look at its dealer structure.

For me, contending with dealers has been nothing but trouble. I have been trying to purchase a Mac Ilsi since the day it was announced, using my wife’s employee-purchase plan. Businessland is the vendor. It received our order in early November.

Now, a month later, despite constant contact with Businessland, we haven’t received the Ilsi — just a litany of excuses. I think I’ll never buy another Macintosh. If one of the largest Mac dealers can’t deliver 1 machine, how can I expect it to deliver 50 of them to my department at work in a timely manner?

Perhaps I can expect better responsiveness from IBM. My company was considering purchasing new Macs to replace its aging PC/ATs — no longer. If Apple’s retail outlets can’t deal with customers in a timely and forthright manner, I’ll find another company that can. Unfortunately, that company is IBM, because purchases move directly through its corporate channels.

Charles Boyer
Cary, NC

You seem to be biasing your judgment on a single situation in which you were trying to get a brand-new Macintosh model that was in short supply. Apple grossly underestimated the demand for its new machines and has been frantically ramping up. Furthermore, you were unable to shop vendors, because your wife’s company specified a single source.

None of these factors necessarily apply to a group purchase by your company. Dealers are more motivated to give good service when they know you have other purchasing options. Also, Ilsi’s should be plentiful by the time you read this. Moreover, although IBM has a reputation for good service to large corporate customers, that doesn’t make up for the grief you’ll go through trying to get your employees up and running on their PCs. I’m a veteran user in both environments, and I’ve seen what happens after the friendly IBM salesman goes home . . . . —LT

End of an Error

About a year ago, our office converted to a network of seven Macs, a Jasmine DirectServe, and a Jasmine 130-megabyte hard-disk drive. A consultant recommended this setup instead of dedicating an SE/30 as a server. At the same time, we converted our DOS database to Blyth Software’s Omnii and a fund-raising package written by Campaign Associates.

We loaded our database onto the Jasmine, but after a month, Omnii started generating error messages. These messages said that data pointers had been damaged. We then found that all the database’s data pointers were corrupted. Blyth Software, Campaign Associates, and Jasmine looked at the database and concurred that the problem was the DirectServe’s inability to handle Omnii and other multifile databases that link files with data pointers.

Jasmine promised a fix and extended our warranty to cover the time needed to
Four Ways to Recognize a More Productive Mac User

The most obvious sign is the PTS package — usually on top of software manuals that no longer have to be read.

A cassette player is a sure giveaway — because it’s the only accessory you need.

It’s a fact. The better you understand your software, the more productive you’ll be. And with tutorials from Personal Training Systems, you too can be productive in record time.

A private tutor on the audio tape talks you through each new skill, while you listen, practice and learn — whenever and wherever it’s convenient. And since the tutorials can be used over and over again, they’re an ideal way to train an entire group.

Whether you’re a beginner or an expert, there’s a tutorial just right for you. Choose from beginning, intermediate or advanced tutorials for the latest versions of:

- Mac Basics
- QuarkXPress
- FileMaker
- Word
- PageMaker
- Persuasion
- Works
- Excel
- HyperCard
- FreeHand

With our 100% Satisfaction Guarantee and free unlimited Technical Support, it’s no wonder over 250,000 PTS tutorials have been sold.

So if you’re looking for a fast, effective and affordable way to increase your productivity, give us a call at 408-559-8635 or 800-TEACH-99.

Please circle 81 on reader service card.
create and test the fix. So we held on to the DirectServe, but several months later, instead of providing a fix, Jasmine filed for Chapter 11.

The "new" Jasmine sent us a fix last October. We tried it, and Omnis 5 generated the same error messages. Jasmine won't honor the warranty extension, which was the reason we kept the DirectServe. Anyone thinking of buying a Jasmine DirectServe should know that its software is incompatible with Omnis 3 and perhaps with other multifile database programs. We learned a hard lesson and hope others can avoid the same problems.

Charles Gordy
Wiscasset, ME

Gregory M. Lynn, director of hardware engineering at Jasmine, responds: "Ongoing compatibility and development testing is a priority for Jasmine, and any problems discovered with any Jasmine product, including the DirectServe, will be addressed and remedied.

"Jasmine's procedure when it finds a compatibility problem is to contact the hardware or software company in question, to offer a better product, and to work with its engineering department to solve the problem. This procedure is being followed for the Omnis 3.5 incompatibility problem."

The First One's Free
Please include a section in future surveys concerning additional program costs. I believe that purchasers of the atOnce! accounting program have been misled about the program's low cost. The catalog warehouse price is approximately $250, but the annual payroll update costs $100. I purchased atOnce! in November '89 (the first payroll module for '89 was free), but I had to purchase the '90 payroll update and now the one for '91, which totals $200 within 13 months. The five-year price is $750!

Other "low-cost" accounting programs either let users update features or charge a reasonable $25 for their updates. This is not a problem as long as
1. The software's packaging is clearly marked with the extra costs.
2. The documentation is clear. (Nowhere does atOnce! say that the failure to pay $100 per year renders the integrated payroll software useless.)
3. Its advertising states the extra cost.
4. MacUser surveys reflect the extra cost.

Dale S. Zabel
Culver City, CA

You've got a point, but there are some mitigating factors. Payroll programs must be updated annually, for the same reason as tax programs must be — state and federal governments change the ground rules every year.

It takes a lot of work to do 51 separate updates every year, and it's fair to charge for that work. When you evaluate the relative cost of payroll-module updates, be sure to consider the relative depths of the modules, and factor in how much manual labor each module requires before you compare total prices. You should also look at how tightly each module integrates with the rest of the accounting package. — LT

Silent Running
You overlooked one nifty feature of WordMaker in your January '91 review ("Best-Buy Bargain Word Processors," page 156): It can process in the background under MultiFinder. This feature lets you start a mammoth search-and-replace project, for example, and then begin working in another application while WordMaker continues the search/replacement in the background. Microsoft Word lets you switch out during a search/replace, but it suspends activity until you return. WriteNow doesn't even let you switch out.

Scott Harris
Mt. Kisco, NY

SlowScript
In your November '90 article "Affordable, Laser-Quality QuickDraw Printers" (page 134), the printers were described as not being PostScript-compatible. As you are likely aware, a utility named Freedom of Press lets you print PostScript files on certain QuickDraw printers.

I find this software tediously slow, but for users with more time than money, it's a viable alternative to buying a PostScript printer.

Don Peckhan
Berea, KY

Reviews of the latest versions of both Freedom of Press and Freedom of Press Light appeared in our February '91 issue (page 93). — LT

Double Fault
I've yet to read a review of WriteNow — including your January '91 review of low-cost word processors ("Best-Buy Bargain Word Processors," page 156) — that exposes a major problem with its
We designed MacTOPS™ and DosTOPS™ to meet the changing needs of your workgroup. And in the process, we've become the leader in mixed networks. Our reliability has been tested and proven by an installed base of 600,000 users worldwide. Making us the choice of 9 out of 10 Mac-to-PC users.

Like Garry Frenkel of PC Week, who calls MacTOPS and DosTOPS “...a complete networking solution...documentation is superlative...an excellent choice for those who want to get involved in some serious networking.” Plus, Sitka* products have been honored with Network Computing's first-ever Well-Connected Award in December, 1990, the LAN Times Readers' Choice Award 1990, a Publish! Readers' Choice Award and a Macworld Magazine World Class Award.

Our comprehensive network includes true Mac-to-PC two-way filesharing, so files created on either computer can be shared by both. With print spooling that lets you keep working while your document prints. And MacTOPS comes with data file translators to translate files to and from different formats, such as Microsoft Word to Word Perfect or dBASE to Excel. We've also included a free copy of our InBox™ e-mail system—the application network users request most.

What's more, we support our not-so-standard standards with a complete family of networking products. Like our FlashCard™ interface boards for PCs, which allow any PC to participate in the network regardless of its bus interface — EISA, MCA, or Toshiba.

So don't wait for next year's model. Call your local dealer today! Or order from Sitka directly by calling 1-800-445-TOPS, ext. 100. Because your standards can never be too high.

*Formerly TOPS. We've changed our name, but we're still the makers of the same great products.

For distribution outside the U.S., call Sitka International at +415-769-2449; Sitka Europe at +44 276 51446; or Sitka Canada at 415-769-8700, ext. 900.

*Sitka, MacTOPS, DosTOPS, InBox and FlashCard are trademarks of Sitka Corporation. Copyright © 1991, Sitka Corporation.
Whether you write letters, reports, proposals, or novels, you’ll never go wrong with these low-cost writing tools for the Macintosh from Nova Development.

**Improve your writing with an on-line style guide.** The American English Writing Guide is a complete reference to style, punctuation, and better writing. This easy-to-use desk accessory puts hundreds of official writing rules and examples at your fingertips—from capitalization to punctuation, spelling to abbreviations. Even signs and symbols.

Wondering whether to use a comma? Or whether you pay someone a compliment or a compliment? Or how to compile footnotes? The Guide has all the answers.

**Make a real impact with more than 5000 imaginative quotations.** The Instant Library of Quotations gives you fast access to literary, historical, and contemporary quotations on over 600 topics. Each one can provide a solid base for making any point. You can even add your own quotations.

Whether you’re a writer, businessperson, educator, student, or speaker, the Instant Library of Quotations can help you find brand new ways to present an idea.

See your local dealer or call Nova Development at: 1-800-950-NOVA

---

**LETTERS**

spelling checker: WriteNow can’t suggest the correct spelling of a word that has more than one incorrect letter.

For example, WriteNow fails to suggest the correct spelling for these words: upgrade, constell, necerly, impractically, internmental, and riapositive. On the other hand, MacWrite II suggests the correct spelling for all six words, and Word 4.0 gives correct suggestions for four of them.

WriteNow is even stumped by telephone. Poor spellers, beware! If you need a spelling checker that can consistently suggest the correct spelling for your fractured orthography, then WriteNow, despite its otherwise excellent capabilities, might not be the word processor for you.

John E. Price
Palo Alto, CA

**Simple Pleasures**

Your comparison of low-end word processors (January '91, page 156) left out one crucial issue: the frustration factor.

As a Mac consultant and journalist who specializes in word processing, I've tried all the packages you reviewed, as well as MindWrite, MacWrite, and the unalumated Word Juggler. Factoring in the frustration factor, I recommend WordMaker to all my clients who don’t need multiple columns or footnotes.

I have never been able to crash WordMaker, even when I deliberately tried to exceed its capabilities. In contrast, I've lost hours of work when MacWrite II or MindWrite hung while doing something as simple as opening a file or saving it under another name. I've found cuts and paste in those programs to be especially risky.

I've never switched computers or printers with a WordMaker document and found that my page formatting has shifted, which sometimes happens with Word. Worse, when I've changed printers in WriteNow before printing, the program has informed me afterward that perhaps my document had lost some text along the left edge. Users who don't own laser printers and pay for output will not appreciate this “feature.” It's users of WordNow and its low-end ilk who are least likely to have their own laser printer.

WordMaker might be the Volkswagen Beetle of word processors. Although its feature set is limited, it's never made me tear out my hair.

Shel Horowitz
Northampton, MA
We recommended WordMaker "as an excellent choice . . . " and suggested that "if all you want is a little speed and simplicity, WordMaker should suit you just fine." As far as not being able to crash WordMaker, even when you're admittedly trying to exceed its capabilities: That's exactly our point — its capabilities are limited. Although you may have lost hours of work because of MacWrite crashes on your particular system, how much time are you willing to lose trying to work around a program's limitations? Still, we recommend WordMaker as a fast, efficient word processor — if you don’t need the features it lacks, such as multiple columns and footnoting.

About system crashes: We run clean systems during tests, without the INTIs and DAs that frequently cause conflicts with applications. There were no system crashes when we performed the Save tests with any of the programs we reviewed, including MacWrite. You might want to check your System Folder. — KW

**Free Drawing**

I'd like to know if we slackers who didn't buy the September '90 issue can still get a copy of the "MacUser Guide to Graphics Formats" poster for a reasonable (or even exorbitant) sum of money.

Amy V. Ziffer
Burbank, CA

You're in luck, because we still have a few extras. To get one, send a self-addressed, stamped 8.5-x-11 envelope to Nancy Peterson/Graphics Poster, MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404. Or, for a slightly exorbitant price ($7), you can get a copy of the issue, complete with poster, from our Back Issues Department. Call Angela Accetta at (212) 525-5008. — NP

**Fragged**

For at least two years you've recommended the program DiskExpress II. On the basis of that recommendation, I bought the program about a year ago.

I've used DiskExpress II on a Mac SE and a Mac IIfx. I've never seen any improvement in the performance of either machine because of defragmenting or optimization. At best, the program is good at exercising the disk drive, moving hundreds of files around each time it runs.

At worst, after following the instructions exactly, I found that it destroyed my SE's hard-disk-drive contents. It bombed while doing automatic optimization in the background, and no other program was...
Because The World Isn’t Grey

Chinon’s New Color Scanner. Under $1,000!

It’s time to colorize your world! Chinon's new color scanner is an incredible price breakthrough that has made color scanning affordable. Plus you’ll get all the other benefits of our unique scanner.

With OCR software you can input text without retyping it. With a simple add-in card your computer becomes a full-featured fax. And DS-3000 scans almost any graphic image, so it’s perfect for desktop publishing.

Chinon’s unique overhead scanning design and proprietary technology means you can scan books — or even three-dimensional objects (of up to 3/4" in height). No other scanner can claim this capability.

DS-3000 is available for IBM and compatibles or Macintosh computers, so color scanning is now available — and affordable — for everyone. Call Toll-Free for the Chinon Dealer nearest you — and stop scanning a grey world.
Macawi Networks Corporation is dedicated to making your network work MORE for you. Our challenge is to create powerful network communications solutions that are also very affordable! Macawi-Mac meets our corporate objectives in every way. It is compatible with AppleTalk and cabling such as LocalTalk. It works between different systems, in different zones, with unlimited file sizes and user groups, and with minimal memory and existing hardware! Call us today at (613) 596-2802 to discuss a Macawi-Mac solution for your network. Dealer inquiries welcome.

Backdoor Mac

I am fighting the battle in a Mac-illiterate town but am eroding my manager's obstinacy. My advice: Don't demand a Mac initially. Use the PC for a while, and then complain about its inefficiency, user unfriendliness, poor graphics abilities, and so on. Plant the seed that the Mac is the only solution.

Dale Rogers
Sherman, TX
SORRY, CLARIS.
BUT IT'S DEJA VU
ALL OVER AGAIN.

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

And MacDraw® Pro isn't a bad try. In fact, it reminds us of another drawing program we've always had the utmost respect for: Canvas 2.1. Unfortunately for Claris, our new Canvas 3.0 includes enough major enhancements to leave their latest effort idling somewhere back in the dust. Again.

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

MacDraw Pro doesn't.

Canvas 3.0 gives you more technical drawing features. Like custom dynamic hatching. Custom parallel lines & curves. Custom dashed lines, curves & borders. Automatic dimension lines. Area & perimeter calculations. And a Smart Mouse™ drawing aide. MacDraw Pro doesn't.

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

MacDraw Pro doesn't.

MacDraw Pro doesn't.

You are what you drive. Like Canvas 2.1 before it, the new Canvas 3.0 was developed in direct response to the wish lists of thousands of Smart Mouser® drawing professionals. Its heritage of performance is proven. Its price is right. And its ease of use is legendary. Which leaves just one last question. If what you draw is important to you, why settle for Claris's sedate sedan when you can get your hands on a dream machine?

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

Trading up's so easy to do. But only for a limited time. MacDraw users: Trade up now to the new Canvas 3.0 for just $149 US. Just call 1-305-594-6865 and ask for Dept M. (Have your MasterCard, Visa or American Express card number & expiration date ready!) Or mail your MacDraw® program disk to the address below, along with your credit card information or check drawn in US dollars on a US bank. Offer limited to the US and Canada, and ends Aug 1, 1991.
PHYSICALLY FIT

Introducing the only Illsi Ethernet cards that fit without an adapter.

If you're adding Ethernet to a Macintosh® Illsi computer, there is one thing you need to know. The new low profile of the Illsi requires all existing Ethernet cards to use an additional, expensive adapter.

The exceptions however, are the MacCon+® 30i cards from Asanté.® They are the only Ethernet cards designed specifically for the Macintosh Illsi that don't need an adapter.

Eliminating the adapter saves you money. But, if you prefer to use the math coprocessor available on some adapters, you'll be happy to know that the MacCon+ 30i cards are fully compatible with all adapters as well.

To create the MacCon+ 30i, we took the technology that MacUser said, "buried the competition in raw performance tests," and put it in a small, elegantly designed Illsi package. The result is blindingly fast Ethernet performance on the fastest Mac bus.

Along with this performance comes unmatched compatibility and reliability. The MacCon+ 30i cards are register-level compatible with Apple's Ethernet card and both run A/UX. With their lower chip count, the MacCon+ 30i cards run cooler and have fewer parts. That translates to fewer problems. They're even backed by a five-year warranty.

Asanté Technologies is the only company that offers a full line of Ethernet products for all Macintoshes. If you're simply adding a Illsi to an existing network, or creating a complete high-performance Ethernet network from scratch, turn to Asanté for all the right connections.

The MacCon+ 30i comes in thick/thin and 10BaseT versions and is available now from your Asanté reseller. Call them today for full details.

Asanté Technologies, Inc. • 404 Tasman Drive • Sunnyvale, California 94089 • (800) 662-9686

Resellers: Asanté products are available from Ingram/MicroD, Merisel/Macamerica, and Tech Data.

© 1991 Asanté Technologies, Inc. Asanté and MacCon+ are trademarks of Asanté Technologies, Inc. Other product names are trademarks or registered trademarks of their respective holders.

Please circle 37 on reader service card.
Use a Macintosh long enough, and it starts to mess with your mind. First your psyche gets a bit wobbly, and before you know it, you’re playing with a whole new set of rules.

Let’s start with your psyche.

It starts out subtly, but the symptoms are unmistakable. Like remote-control freaks who have to stifle the reflex to brandish an imaginary TV “channel zapper” to click their way out of a boring conversation by switching reality channels, you forget which is reality and which is your Macintosh desktop.

You start expecting the Mac’s metaphors to apply to all aspects of your life. For example, when you need to be sure you’ll remember some important new information, you don’t simply jot it down on a memo pad. Instead, your hand instinctively moves to pull down the File menu and execute a Save command.

As the disorder progresses, the symptoms become more severe. Your fingers navigate an imaginary mouse pad to pull down the Find File DA whenever a tidbit of information is on the tip of your tongue — but you’ve forgotten where your tongue is.

Your new reality is fully able to support you in the style to which you’ve grown accustomed. If you’re stuck in a rut, you move to open a new document. When you need to remind yourself of the big picture, you reach for the grow-window box.

If this kind of thing hasn’t started happening to you, be patient — it will. One of the hallmarks of the human brain is its remarkable capacity for training itself to believe things it knows to be false. Back in high school, we all memorized the laws of physics, the gospel according to Newton and Einstein. But in grade school, we also memorized the laws of cartoon physics, the gospel according to Road Runner. Such as: Whenever Wile E. Coyote runs off the edge of a cliff, he doesn’t fall — not until he looks down and realizes he’s been hovering in midair. Cartoon physics also show up on the big screen more and more these days: In the movie Ghost, Patrick Swayze’s character swooshes through subways, walls, and doors but is stopped dead in his tracks (so to speak) by floors.

And although most of us usually accept that the physical world works according to Isaac’s and Albert’s rules, we can — when it’s convenient — shift gears and adopt Bugs’ and Wile E.’s calculus-free way of thinking. (After all, most of us spent far more time with the Looney Tune crowd in our formative years.)

In fact, we often find it easier to favor the preposterous over the unlikely. Two characters in Douglas Adams’ novel The Long Dark Tea-Time of the Soul argue the point this way: “What was the Sherlock Holmes principle?” “Once you have discounted the impossible, then whatever remains, however improbable, must be the truth.”

“I reject that entirely,” said Dirk sharply. “The impossible often has a kind of integrity to it which the merely improbable lacks. How often have you been presented with an apparently rational explanation of something that works in all respects other than one, which is just that it is hopelessly improbable?”

Technology Rules

Changing the rules is a lot easier than facing up to a set of complex facts. Technology has the awesome power to change all the rules without blinking. So does the human mind. In his book From Beirut to Jerusalem, journalist Thomas L. Friedman gives this example: “The Austrian-born philosopher Ludwig Wittgenstein once remarked that if you ask a man how much is 2 plus 2 and he tells you 5, that is a mistake. But if you ask a man how much is 2 plus 2 and he tells you 97, that is no longer a mistake. The man you are talking with is operating with a wholly different logic from your own.”

Once you get past the minor fact that the basic assumptions are wrong, contradictory, or impossible, it’s easy to admire and even believe the consequent logic of cartoon physics — or of technological empowerment. Technology has the power to change the floor plan. The humans at the helm of the machines have an uncanny knack for accepting any new set of ground rules. The combination has tremendous potential for progress — or catastrophe.

Start trusting technology — especially something as reliable and consistent as the Mac — and you end up being frustrated when the world doesn’t work with a consistent interface.

With the slogan “The Power to Be Your Best” emblazoned on its family crest, the Macintosh has thrived. But the part that Apple left out is that power corrupts — especially when you’re counting on it the most. There’s something about hard disks that makes them refuse to crash until you have a very important presentation to give in 15 minutes.

Technology is never the total solution to anything — whether it’s business problems, international conflicts, or going about your

In Technology We Trust

The Mac’s ‘power to be your best’ has a dark side: the power to cloud your mind — and to invade your privacy.
daily business. It’s fallible, it’s vulnerable, and it’s a piecemeal solution.

Technologies have consequences. Some affect work-group productivity; others affect geopolitics. And others affect your junk mail.

Balk Mail

Usually the march of technology is an unstoppable force. But when consumers take a stand, the juggernaut can be arrested. Which is exactly what happened with MarketPlace versus the marketplace.

One day last January, Lotus Development found itself in the midst of a consumer uproar about a planned Macintosh CD-ROM product called Lotus MarketPlace: Households. The disc was to include demographic data about 120 million U.S. consumers, a follow-up to a previous release containing data on 7 million U.S. businesses.

The names and addresses on the CD-ROM discs were intended for consumer and business-to-business bulk mailers. Most of this data is already a matter of public record; the names and addresses of most businesses and individuals are freely available in the phone book. Still, many advocates of consumer privacy pointed to the potential nuisances or even the dangers that could result once this information became more accessible and more targetable.

The data was provided by Equifax, a billion-dollar company in the business of collecting and selling this kind of information. All the data was already widely available to marketing professionals. The only new element was the way the information was to be distributed: on CD-ROM discs.

Anticipating that the disc might cause a stir, Lotus had built numerous consumer-privacy safeguards into the disc itself (telephone numbers, income data, credit history, and other particularly sensitive items in the Equifax database were excluded) as well as into the way the disc would be distributed (a controlled purchase process was aimed at restricting the disc’s sale to bona fide businesses). Lotus and Equifax also provided consumers with a no-cost way to remove their names from the database (although this, of course, was an option only for the small percentage of consumers who knew of the disc’s existence and could take effect only for update discs).

The MarketPlace product was a real breakthrough for marketing professionals. It provided them with far greater control and economy than the traditional channels for buying and renting lists of names for mailings and market research. Technologically, MarketPlace was a useful and innovative piece of work, with the Business disc having garnered a MacUser Eddy Award nomination. But the concept of concentrating millions of files of private information into a compact, easily accessible form had a dark side. Data about 7 million businesses scared many consumers; data about 120

MS-DOS® and Windows®,
2 PC/AT® Slots, VGA, PC/Novell® EtherNet for
Your Macintosh®

Orange 386
OS/2, MS-DOS Coprocessor

If you need to run “corporate standard” or custom PC software on your Mac, or require superior connectivity to PC dominated networks, you want maximum performance and full AT hardware compatibility. Truly a universal platform, the Orange386 coprocessor board features:

- Intel® 80386sx/16 processor for full MS-DOS or Windows compatibility
- Revolutionary PC/AT bus slots for 2 add-in cards such as Novell EtherNet, VGA, or Token Ring
- Optional 387 math coprocessor
- Interface for IBM® PC compatible serial, parallel, and floppy drive

Call your dealer now to order your Orange386 Coprocessor today!

“11 Years of Innovation and Excellence”
1400 N. Lakeview Ave., Anaheim, CA 92807 (714) 779-2772

©Orange Micro, Inc., 1991

Please circle 58 on reader service card.
Last night, someone stole Dave's car. And the scary part is, he never even knew it was gone. The same thing can happen to you if you're leaving your Mac unlocked. Co-workers can cruise through your files, causing accidents and leaving viruses. Or thieves can take what they want—and trash the rest. All good reasons to get DiskLock.

DiskLock doesn't let anyone into your system without your password. It automatically locks your drive when you shut down, and you can set it to lock when your Mac's been idle for a specified time. Plus, DiskLock lets you choose from three levels of security, including the government standard, DES encryption. That's serious protection.

Just load it and forget everything except your password. DiskLock is the first program to let you lock individual folders or files, as well as your entire drive. You can set different passwords for specific files and give your system a fail-safe master password. DiskLock even alerts you when anyone tries to get into your system. And it automatically checks itself for viruses.

You never know who might have designs on your next project. So protect it with DiskLock. For more information, call 1-800-873-4384. Buy DiskLock, and we'll send you a free locking diskette box. Just write "Dave's car" on the registration card and return it to us. This is a limited-time steal of a deal, so act now.
million individuals outraged even more. As MacUser's Robert Wiggins commented last September, "As with Pandora's box, once the information escapes, there's no way to ever contain it again."

Faced with mounting complaints from consumers — a reported 30,000 irate individuals asked to have their names removed from the database — Lotus canceled the Households disc and also discontinued shipment of the Business disc. Lotus CEO Jim Manzi predicted that "Balancing the advantages of easier access to information with the individual's right to privacy is only the first of many new issues our industry will grapple with in the coming years."

Lotus made the right business decision. By taking a loss on its development-and-marketing investment in MarketPlace — as well as forgoing anticipated profits from the disc — it has managed to keep the lid on a potentially far more expensive Pandora's box of consumer ill will toward the company.

Like information, once a technology gets out of its own Pandora's box, there's no stopping it. Discs like MarketPlace will reach the marketplace — eventually. In the meantime, consumers have bought time and entered into the process of setting the agenda and deciding how best to control what comes out of the box. MarketPlace is neither the first nor the last technological marvel to be squelched by an angry public. There is an endless stream of emerging technologies — such as ISDN, artificial intelligence, and virtual reality — with their own hidden prices of power lurking within. The only sure safeguard is an alert and vigilant public that knows which trade-offs it's ready and willing to embrace.

**Selling Your Wares**

Discware such as MarketPlace is also redefining (or, at least, attempting to redefine) the formats, media, and procedures of software distribution. Like the now-defunct MarketPlace discs, many font and clip-art CD-ROM discs contain more items than most customers can afford to buy in one shot. Several vendors have incorporated access-code schemes whereby, for example, customers might have access to 20 of 100 fonts encrypted on a disc as part of the purchase price. To get more fonts, customers call the vendor, provide a credit-card number for payment, and immediately receive the password for getting access to another 20 fonts. The customers get the convenience of instant delivery while the vendor gets a happy (and captive) customer and cuts down on distribution costs as well.

With these kinds of new software coming into vogue, we'll need some new terminology. You probably know what shareware and freeware are — but that's just the beginning. Here's an excerpt from a new dictionary of computer-industry terms due to be published this month — on April 1, in fact:
Tired Of Being Held Up
By Shady Characters?

Output from LaserWriter II NT, 300 dpi.

Now you don't have to buy a new printer to get ultra-fast, high-resolution output. The Accel-a-Writer™ LaserWriter® Upgrade instantly converts any Apple® LaserWriter to a higher-speed, higher-quality laser printer. It's the next best thing to owning your own typesetter.

Prints up to 20 times faster. With Accel-a-Writer's high-speed RISC technology, you can output text, graphics and complicated halftones up to 20 times faster — without shady edges and jagged lines. Plus our 3-level Advanced Memory Management puts your printer to work preparing a second document while your first one's still printing.

Works well with others. Accel-a-Writer is fully compatible with Adobe's® PostScript® page description language. It comes with 2MB of memory and expands to hold up to 16MB. What's more, our ISI technology lets you print from PCs and Macs simultaneously, without additional hookups or switch-

Accel-a-Writer™

©1991 XANTE Corporation. XANTE Accel-a-Writer is a trademark of XANTE Corporation. Other brands and product names are trademarks or registered trademarks of their respective holders. XANTE Corporation: 23800 Highway 98, Post Office Box 518, Montrose, AL 36559 USA TEL: 205/990-8189.

Please circle 356 on reader service card.
**Shareware:** Software that you use first and then pay for if and when you feel like doing so. Sort of like the overall attitude of the federal government about buying anything.

**Freeware:** Software with no strings attached. Sort of like the federal regulations governing S&Ls.

**Beta ware:** Software that still has some bugs in it. Buyers pay for it now to help fund the final stage of development and get a free upgrade when the bug-free version ships — if it ever does. Small, underfinanced, first-time software publishers give their betaware a version number of 0.9-something. Large, overconfident, veteran software publishers give their betaware a version number of 1.0.

**Vaporware:** Software announced long before it’s ready to ship, designed to prevent customers from jumping ship to a competitor’s cool new upgrade or to goad competitors into releasing betaware.

**Whereware:** Vaporware that’s more than 12 months late.

**Wereware:** Announced software that everyone assumes will be vaporware because the vendor has cried wolf too often.

**Shelfware:** Software nobody uses but everybody buys — mostly just so they can understand Robert Wiggins’ frequent references to these products in his column.

**ELFware:** Hardware designed to reduce extremely-low-frequency radiation, bought by people who want to get John C. Dvorak’s disparaging references to these products in his columns.

**Selfware:** Software that presents a conflict of interest for software-publishers-turned-pundits, which is why you won’t find Guy Kawasaki making reference to certain products in any of his columns.

**Be-ware:** What the buyer should be of unsubstantiated rumors about what’s going to emerge from Jean-Louis Gassée’s Be Labs.

**Look-and-feel-ware:** Software that uses copyrighted metaphors for displaying information.

**Scareware:** The legal documents sent back and forth between look-and-feel lawyers.

**Tupperware:** The airtight case the look-and-feel lawyers think they have.

**Airware:** Sneakers that cost as much as top-notch software used to.

**Heirware:** Software that gets handed down to junior coworkers when you pop for the exorbitantly expensive upgrade.

**Wash’n’ware and Underware:** Software paid for with laundered money.

**Stoneware:** Software even Barney Rubble could understand — it runs under cartoon physics.
He hunts heads with a single piece of software.

Mike Giddings has the power to move the football. His ratings reports are studied by 12 NFL teams several times a year.

Chances are, that hot running back you see inserted into the line-up mid-season came from one of Mike's reports.

More than 5,000 players are rated using dozens of criteria. There are hundreds of thousands of pieces of information in all.

How does Mike handle all this? And publish dozens of reports a year? With a staff of three?

With a single piece of database software called FileMaker® Pro.

With it, he can analyze data to a remarkable degree. FileMaker looks for certain attributes in a player's performance, weighs them, calculates performance, and displays the rankings in 200 different formats that Mike publishes for his clients. And he can do all this without computer expertise. He's a former coach, not a hacker.

Mike's reports give coaches an edge.

With FileMaker Pro, Mike has an edge, too.

Mike Giddings is just one of over a quarter-million people who benefit from FileMaker. You can, too.

To see how, call 1-800-729-2292, ext. 20.
## Our commitment to you:

<table>
<thead>
<tr>
<th>AfterHours Software TouchBASE</th>
<th>Fuji FloppySpecials</th>
</tr>
</thead>
<tbody>
<tr>
<td>TouchBASE ........................ $85</td>
<td></td>
</tr>
</tbody>
</table>

### Word Processing

<table>
<thead>
<tr>
<th>Brand</th>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe 3.0/3.1</td>
<td>Illustrator 3.0/3.1</td>
<td>$348</td>
</tr>
<tr>
<td>BestPage</td>
<td>MacWrite II 1.1</td>
<td>$114</td>
</tr>
<tr>
<td>Claris</td>
<td>MacWrite II 1.1</td>
<td>$114</td>
</tr>
<tr>
<td>Lifetree</td>
<td>Correct Grammar 2.0</td>
<td>$54</td>
</tr>
<tr>
<td>Microsoft</td>
<td>Word 4.0</td>
<td>$244</td>
</tr>
<tr>
<td>Paragon Concepts Inc.</td>
<td>News 3.0</td>
<td>$244</td>
</tr>
<tr>
<td>Desktop Software</td>
<td>MacWrite 2.0</td>
<td>$91</td>
</tr>
<tr>
<td>Big Thesaurus</td>
<td>SmartFrom Designer</td>
<td>$278</td>
</tr>
<tr>
<td>Desktop Software</td>
<td>Canvas 3.0</td>
<td>$124</td>
</tr>
<tr>
<td>Design Science, Inc.</td>
<td>Math Type</td>
<td>$88</td>
</tr>
<tr>
<td>Microtype Paint</td>
<td>Ultra Paint</td>
<td>$58</td>
</tr>
<tr>
<td>Dynaware</td>
<td>Dynamic Perspective</td>
<td>$599</td>
</tr>
<tr>
<td>Electronics Art</td>
<td>Studio 1</td>
<td>$55</td>
</tr>
<tr>
<td>Desktop Software</td>
<td>Studio 8 2.0</td>
<td>$188</td>
</tr>
<tr>
<td>Design Science, Inc.</td>
<td>Studio 2</td>
<td>$448</td>
</tr>
<tr>
<td>Frame Technology</td>
<td>Frame Maker</td>
<td>$795</td>
</tr>
<tr>
<td>Foundation Publishing</td>
<td>Comic Strip Factory</td>
<td>$36</td>
</tr>
<tr>
<td>Graphics &amp; Design</td>
<td>eOffice Days</td>
<td>$20</td>
</tr>
<tr>
<td>ColorStudio</td>
<td>#2 Kid Stuff</td>
<td>$20</td>
</tr>
<tr>
<td>MathType</td>
<td>MicroFrontier</td>
<td>$238</td>
</tr>
<tr>
<td>ColorStudio</td>
<td>LeParticulate</td>
<td>$644</td>
</tr>
<tr>
<td>DesignStudio</td>
<td>FontStudio</td>
<td>$488</td>
</tr>
<tr>
<td>FontStudio</td>
<td>ImageStudio</td>
<td>$368</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>LetraStudio</td>
<td>$138</td>
</tr>
<tr>
<td>LetraStudio</td>
<td>ReadySetWeb 4.5</td>
<td>$144</td>
</tr>
<tr>
<td>Mainstay</td>
<td>PrintCabinet</td>
<td>$97</td>
</tr>
<tr>
<td>ClickPaste</td>
<td>Capture 4.0</td>
<td>$97</td>
</tr>
<tr>
<td>Pantoype</td>
<td>Computer Color Book</td>
<td>$48</td>
</tr>
<tr>
<td>XPress</td>
<td>Quark</td>
<td>$518</td>
</tr>
<tr>
<td>Salient</td>
<td>Partner 1.01</td>
<td>$55</td>
</tr>
<tr>
<td>Parascope</td>
<td>FilmMaker</td>
<td>$438</td>
</tr>
<tr>
<td>ModelShop</td>
<td>Swivel Art</td>
<td>$81</td>
</tr>
<tr>
<td>Swivel Art</td>
<td>Swivel 3D 1.1</td>
<td>$294</td>
</tr>
<tr>
<td>Swivel 3D 1.1</td>
<td>Swivel 3D Professional</td>
<td>$438</td>
</tr>
<tr>
<td>Solutions</td>
<td>Curator</td>
<td>$75</td>
</tr>
<tr>
<td>SmartScraper &amp; Clipper</td>
<td>$55</td>
<td></td>
</tr>
<tr>
<td>SuperMac Technology</td>
<td>PixelPaint 2.0</td>
<td>$224</td>
</tr>
<tr>
<td>#2 Kid Stuff</td>
<td>$20</td>
<td></td>
</tr>
<tr>
<td>SuperPaint 2.0</td>
<td>$134</td>
<td></td>
</tr>
<tr>
<td>Bruderbond</td>
<td>PrintShop</td>
<td>$34</td>
</tr>
<tr>
<td>TypeStyler 1.5</td>
<td>BannerMania</td>
<td>$114</td>
</tr>
<tr>
<td>CE Software</td>
<td>CalendarMaker 3.0</td>
<td>$30</td>
</tr>
<tr>
<td>AmazingPaint</td>
<td>$64</td>
<td></td>
</tr>
</tbody>
</table>

### Graphics and Design

<table>
<thead>
<tr>
<th>Brand</th>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>Illustrator 4.4</td>
<td>$488</td>
</tr>
<tr>
<td>Enhanced Photoshop</td>
<td>FontStudio</td>
<td>$368</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>LetraStudio</td>
<td>$138</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>ReadySetWeb 4.5</td>
<td>$144</td>
</tr>
<tr>
<td>Mainstay</td>
<td>PrintCabinet</td>
<td>$97</td>
</tr>
<tr>
<td>Pantoype</td>
<td>Computer Color Book</td>
<td>$48</td>
</tr>
<tr>
<td>Quark</td>
<td>XPress 3.0</td>
<td>$518</td>
</tr>
<tr>
<td>Salient</td>
<td>Partner 1.01</td>
<td>$55</td>
</tr>
<tr>
<td>Parascope</td>
<td>FilmMaker</td>
<td>$438</td>
</tr>
<tr>
<td>ModelShop</td>
<td>Swivel Art</td>
<td>$81</td>
</tr>
<tr>
<td>Swivel Art</td>
<td>Swivel 3D 1.1</td>
<td>$294</td>
</tr>
<tr>
<td>Swivel 3D Professional</td>
<td>$438</td>
<td></td>
</tr>
<tr>
<td>Solutions</td>
<td>Curator</td>
<td>$75</td>
</tr>
<tr>
<td>SmartScraper &amp; Clipper</td>
<td>$55</td>
<td></td>
</tr>
<tr>
<td>SuperMac Technology</td>
<td>PixelPaint 2.0</td>
<td>$224</td>
</tr>
<tr>
<td>#2 Kid Stuff</td>
<td>$20</td>
<td></td>
</tr>
<tr>
<td>SuperPaint 2.0</td>
<td>$134</td>
<td></td>
</tr>
<tr>
<td>Bruderbond</td>
<td>PrintShop</td>
<td>$34</td>
</tr>
<tr>
<td>TypeStyler 1.5</td>
<td>BannerMania</td>
<td>$114</td>
</tr>
<tr>
<td>CE Software</td>
<td>CalendarMaker 3.0</td>
<td>$30</td>
</tr>
<tr>
<td>AmazingPaint</td>
<td>$64</td>
<td></td>
</tr>
</tbody>
</table>

### Fonts & Clip Art

<table>
<thead>
<tr>
<th>Brand</th>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>Illustrator 4.4</td>
<td>$488</td>
</tr>
<tr>
<td>Enhanced Photoshop</td>
<td>FontStudio</td>
<td>$368</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>LetraStudio</td>
<td>$138</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>ReadySetWeb 4.5</td>
<td>$144</td>
</tr>
<tr>
<td>Mainstay</td>
<td>PrintCabinet</td>
<td>$97</td>
</tr>
<tr>
<td>Pantoype</td>
<td>Computer Color Book</td>
<td>$48</td>
</tr>
<tr>
<td>Quark</td>
<td>XPress 3.0</td>
<td>$518</td>
</tr>
<tr>
<td>Salient</td>
<td>Partner 1.01</td>
<td>$55</td>
</tr>
<tr>
<td>Parascope</td>
<td>FilmMaker</td>
<td>$438</td>
</tr>
<tr>
<td>ModelShop</td>
<td>Swivel Art</td>
<td>$81</td>
</tr>
<tr>
<td>Swivel Art</td>
<td>Swivel 3D 1.1</td>
<td>$294</td>
</tr>
<tr>
<td>Swivel 3D Professional</td>
<td>$438</td>
<td></td>
</tr>
<tr>
<td>solutions</td>
<td>Curator</td>
<td>$75</td>
</tr>
<tr>
<td>SmartScraper &amp; Clipper</td>
<td>$55</td>
<td></td>
</tr>
<tr>
<td>SuperMac Technology</td>
<td>PixelPaint 2.0</td>
<td>$224</td>
</tr>
<tr>
<td>#2 Kid Stuff</td>
<td>$20</td>
<td></td>
</tr>
<tr>
<td>SuperPaint 2.0</td>
<td>$134</td>
<td></td>
</tr>
<tr>
<td>Bruderbond</td>
<td>PrintShop</td>
<td>$34</td>
</tr>
<tr>
<td>TypeStyler 1.5</td>
<td>BannerMania</td>
<td>$114</td>
</tr>
<tr>
<td>CE Software</td>
<td>CalendarMaker 3.0</td>
<td>$30</td>
</tr>
<tr>
<td>AmazingPaint</td>
<td>$64</td>
<td></td>
</tr>
</tbody>
</table>

### DeltaPoint TASTE

<table>
<thead>
<tr>
<th>Brand</th>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>Illustrator 4.4</td>
<td>$488</td>
</tr>
<tr>
<td>Enhanced Photoshop</td>
<td>FontStudio</td>
<td>$368</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>LetraStudio</td>
<td>$138</td>
</tr>
<tr>
<td>ImageStudio</td>
<td>ReadySetWeb 4.5</td>
<td>$144</td>
</tr>
<tr>
<td>Mainstay</td>
<td>PrintCabinet</td>
<td>$97</td>
</tr>
<tr>
<td>Pantoype</td>
<td>Computer Color Book</td>
<td>$48</td>
</tr>
<tr>
<td>Quark</td>
<td>XPress 3.0</td>
<td>$518</td>
</tr>
<tr>
<td>Salient</td>
<td>Partner 1.01</td>
<td>$55</td>
</tr>
<tr>
<td>Parascope</td>
<td>FilmMaker</td>
<td>$438</td>
</tr>
<tr>
<td>ModelShop</td>
<td>Swivel Art</td>
<td>$81</td>
</tr>
<tr>
<td>Swivel Art</td>
<td>Swivel 3D 1.1</td>
<td>$294</td>
</tr>
<tr>
<td>Swivel 3D Professional</td>
<td>$438</td>
<td></td>
</tr>
<tr>
<td>solutions</td>
<td>Curator</td>
<td>$75</td>
</tr>
<tr>
<td>SmartScraper &amp; Clipper</td>
<td>$55</td>
<td></td>
</tr>
<tr>
<td>SuperMac Technology</td>
<td>PixelPaint 2.0</td>
<td>$224</td>
</tr>
<tr>
<td>#2 Kid Stuff</td>
<td>$20</td>
<td></td>
</tr>
<tr>
<td>SuperPaint 2.0</td>
<td>$134</td>
<td></td>
</tr>
<tr>
<td>Bruderbond</td>
<td>PrintShop</td>
<td>$34</td>
</tr>
<tr>
<td>TypeStyler 1.5</td>
<td>BannerMania</td>
<td>$114</td>
</tr>
<tr>
<td>CE Software</td>
<td>CalendarMaker 3.0</td>
<td>$30</td>
</tr>
<tr>
<td>AmazingPaint</td>
<td>$64</td>
<td></td>
</tr>
</tbody>
</table>

### LSI Sales & Marketing Manager

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

Sales & Marketing Manager $295

Call us first for low prices

1-800-248-0800

## Adobe Hotline

1-800-258-1233

Adobe Systems

Type-On-Call

CD-ROM Disk

Type-On-Call offers over 800 Adobe Type 1 fonts on a single CD-ROM in a new accessible format that you can use with any CD-ROM player. Call for details.

Type-On-Call Introductory Price $48

FREE with purchase of select CD-ROM players. Call for details.
Shining stars for the 90's
1990 Eddy Award Winners

BEST SOFTWARE
PACKARCE OF THE YEAR
Adobe Photoshop 1.07
Adobe Photoshop is the affordable Macintosh image-processing program with enough power and versatility to be used as a paint, pre-press, color corrections and darkroom system. And it does all in living 24-bit color. Whether you start with scanned photographs, slides, electronic art works or from scratch, Photoshop's full range of filters, painting, drawing and selection tools give you the artistic control and precision you've been missing.

Photoshop 1.07 .............. $498

BEST PRESENTATION PRODUCT,
BEST DEVELOPMENT TOOL AND BEST
UTILITY
Symantec Products,
MORE 3.0, THINK Pascal 3.0 and Norton Utilities
Symantec has three winners this year. The first is MORE, which is the best presentation-software package around as well as one of the premier outliners. THINK Pascal which has the most advanced and comfortable development environment on the Mac, is the benchmark for today's developmental environments. And Norton Utilities which has redefined the state of the art of data-recovery software. It speeds up disk-related work with an optimizer and a standard file-dialog box extender with high-speed file-finding capability. It can resurrect data from sick disks with its intelligent recovery tools.

More 3.0 ......................... $259
Think Pascal ..................... $160
Norton Utilities .................. $83

BEST CAD SOFTWARE
Graphsoft
MiniCad + 3.0
MiniCad+ is a product that integrates a spreadsheet and a relational database into a drawing so you can keep track of costs as the design evolves. Database information linked to a particular object stays with that object even when it is cut and pasted into another drawing. MiniCad+ also has a built-in programming language and a "smart cursor" to aid in the finer points of drafting.

MiniCad+ 3.0 ................... $585

BEST CONNeCTIVITY SOFTWARE
Farallon
Timbuktu
Timbuktu links all the Macs on a LocalTalk network (with password protection). The Desk Accessory opens and closes files, and actually operates the software on another person's Mac. This makes Timbuktu especially good for training others on how to use an unfamiliar application. With version 3.1 you can now send files to others or let them copy to or from yours. And, you can operate files servers in distant rooms – from the comfort of your own Mac.

Timbuktu ....................... $92

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

WealthBuilder .................... $144

ACCOUNTING & FINANCE
Absolute Solutions
Computerized Classic Accounting ........... 223.0
Check Mark Software
Cash Ledger ........................ 114.
MultiLedger 1.3A ................... 234.
Payroll ......................... 174.
Chipsoft
Turbo Tax Mac 1990 ................ 49.

Computers Associates
Simply Accounting 1.1 ............. 224.

In-House Software
In-House Accountant ................ 135.
InHaut ......................... 35.

Peachtree/Layered
At Once! ........................ 284.

MECA Ventures Inc.
Managing Your Money 4.0 134.

Kobo Press
For the Record 2.0 ................ 31.
Will Maker 4.0 ................... 36.

Reality Technologies WealthBuilder
SelfSync/Bloc
Accountant Inc. Pro 2.0 ............ 335.

Softview
Business, D.D. & GSA
Expense Reports ...................... 49.
Personal Tax Analyst ............. 49.

Softview
MacInTax 1040 1990 ................ 58.
State Supplements ................ 48.
Tax View 1040 Pro ............... 335.
IFX Payroll Tax Assistant ....... 85.
IFX Personal Tax Analyst ......... 47.
IFX Home Loan Assistant ....... 63.

Survivor Software
Dollars & Sense 5.0 ............... 58.

Survivor Software
MacMoney 3.5 ...................... 58.

Teleware
M.Y.O.B ......................... 142.

Timeslips Corp.
Timeslips III 2.0 .................. 194.

Published It! Easy
Publish It! Easy integrates page layout, word processing (with spelling checker and thesaurus) and drawing and painting, so even beginners can produce attractive documents. It includes most of the features of Publish-it, but adds many useful new functions. Dynamic Text Flow reformatst text when you adjust the size of text frames. Zoomable palettes disappear when you need screen space. With Multiple Undo Levels you can remove changes five steps back. Editable Thumbnails let you see and edit the entire page.

Publish It Easy ................... $135
Asante
Cayman Systms
CE SaftwarB
Data Viz
MacCon+ll E& llET ..........340.
MacCon+ll EET 64Kb .....
MacCon SE E
Gator Card E/11 ............ea.458.
Gator Mail aor
Gator Box ...................... 1,955.
Gator Share Software .... 1,350.
In/Out (1-5 user) .............. 127.
In/Out (1-10 user) ............ 186.
QuickMail 2.2
M10 user .......................675.
FIlmMaker is the ultimate answer.
The Eddy Award winning FIlmMaker is the
Paracoc,111 FIlmMaker
LT200PC ....................... 185.
LT200MC ...................... 295.
Dayna Talk for Macintosh
Single .......................... 5.
5 Pack ........................ 380.
10 Pack ........................ 715.
Dave
Ethernet
FastNet SE, SE/30 or
Faranil
LocalTalk
PhoneNET DIN-8 ...........
PhoneNET DIN-8 (10 Pk) ..
Star Connector (single) ....
Star Connector (10 Pk) ..... 125.
Star Controller 300 ......... 819.
Repeaters ..................... 305.
PhoneNET/AppleTalk Adapt. 8.
Ethernet - PhoneNET cards include Timbuktu & RJ45 cable
Faranil
PhoneNET EN Mac II .......
Mac II Card (10 Pk) ...........
PhoneNET EN SE/30 ........
Star Connector EN ...........
Star Controller EN .......... 1,588.
Star Wiring Kits
Star Controller LT/EN ....
Passive Star .................
Harmonica Block LT .......
Timbuktu - One copy is required on every Mac
Timbuktu (single user) ....
Timbuktu (10 user pack) 1284.
Timbuktu Remote ...........
Remotes Access Pack .......
Remote Wakeup Cable ......
Portable Pack ............... 328.
MacRecorder Sound System
Sound System 2.0 ...........
Voice Digitizer ...............
Int'l Business Software
DataClub 3 users ...........
DataClub 10 users .......... 538.

Networking & Connectivity

Best Animation Program
Paracomp FilmMaker
The Coby Award winning FilmMaker is the
masterful animation and multimedia graphics
program. This amazing application allows the
user to create professional quality presentations
and animations quickly and easily! What takes
tours to create in other applications can now be
done in just minutes with FilmMaker. Whether
you're a professional animator who wants to
create stunning effects for video, or just
someone who wants to put their ideas in motion
FilmMaker is the ultimate answer.
FilmMaker ................. $438
### Our MacAdvisors will answer

### ACCELERATORS & UPGRADE Resources

<table>
<thead>
<tr>
<th>Component</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classic 1MB Upgrade</td>
<td>135.00</td>
</tr>
<tr>
<td>QuadraLink</td>
<td>204.00</td>
</tr>
<tr>
<td>Mac Portable 1MB SIMM</td>
<td>365.00</td>
</tr>
<tr>
<td>ZoomCard</td>
<td>329.00</td>
</tr>
</tbody>
</table>

### DayStar Digital

- **PowerCard G303 120:400**
  - 40MHz w/FPU: 1205.00
  - 50MHz w/FPU: 1220.00
  - 50MHz w/FPU: 1250.00
  - FastCache IC: 280.00

- **PowerCard G303 25MHz**
  - 50MHz II: 1115.00
  - 33MHz II: 1145.00
  - 40MHz II: 1250.00
  - 50MHz II: 1250.00

### Symmetry Mariah

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

**Price:** $93

### STORAGE MEDIA

<table>
<thead>
<tr>
<th>Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS/DD 10 pk Rainbow</td>
<td>9.00</td>
</tr>
<tr>
<td>DS/DD 10 pk black</td>
<td>10.00</td>
</tr>
<tr>
<td>HD Rainbow 10 pk</td>
<td>15.00</td>
</tr>
</tbody>
</table>

### Modems & Fax

<table>
<thead>
<tr>
<th>Modem Type</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AppleModem 1200</td>
<td>264.00</td>
</tr>
<tr>
<td>AppleModem 2400</td>
<td>417.00</td>
</tr>
<tr>
<td>AppleModem 2400V</td>
<td>417.00</td>
</tr>
<tr>
<td>Applied Engineering</td>
<td></td>
</tr>
<tr>
<td>DayStar Digital</td>
<td></td>
</tr>
<tr>
<td>SCSI Accelerator w/o SIMM</td>
<td>1.025.00</td>
</tr>
<tr>
<td>RAM Expansion w/o SIMM</td>
<td>2.025.00</td>
</tr>
<tr>
<td>Dove</td>
<td></td>
</tr>
<tr>
<td>MacSnap Simm Upgrades</td>
<td></td>
</tr>
<tr>
<td>50K XE (50K XE to 1MB)</td>
<td>195.00</td>
</tr>
<tr>
<td>50K XE (50K XE w/SCSI)</td>
<td>269.00</td>
</tr>
<tr>
<td>50K XE (120K XE to 1MB)</td>
<td>220.00</td>
</tr>
<tr>
<td>50K XE (50K XE w/SCSI)</td>
<td>455.00</td>
</tr>
<tr>
<td>Marathon G302 Upgrades</td>
<td></td>
</tr>
<tr>
<td>Bundled w/Virtual</td>
<td></td>
</tr>
<tr>
<td>Mac Plus, SE &amp; II</td>
<td>524.00</td>
</tr>
<tr>
<td>SIMM</td>
<td></td>
</tr>
<tr>
<td>4MB SIMM packages come with free software:</td>
<td></td>
</tr>
<tr>
<td>1MB G50S Call for lowest price.</td>
<td></td>
</tr>
<tr>
<td>1MB G50S for NTX</td>
<td>Call.</td>
</tr>
<tr>
<td>2MB Module for G3 &amp; G4</td>
<td>Call.</td>
</tr>
<tr>
<td>3MB Module for G3 &amp; G4</td>
<td>Call.</td>
</tr>
<tr>
<td>4MB G50S for G3, G4 or 50S</td>
<td>Call.</td>
</tr>
<tr>
<td>Mac qty</td>
<td>Call.</td>
</tr>
<tr>
<td>Orange Micro</td>
<td></td>
</tr>
<tr>
<td>Mac 286 v.3.0</td>
<td>1078.00</td>
</tr>
<tr>
<td>Mac 68030 v.3.0</td>
<td>444.00</td>
</tr>
<tr>
<td>Mac 88000</td>
<td>188.00</td>
</tr>
</tbody>
</table>

### Total Systems - Accelerators

- **Macroy 250**
  - 16MHz for Plus | 480.00 |
  - 16MHz for SE | 380.00 |
- **Gemini**
  - 20MHz for 100 | 765.00 |
  - 25MHz for 100 | 950.00 |
- **Gemini II**
  - 33MHz for 100 | 1150.00 |
  - 46MHz for 100 | 1270.00 |
  - QuickCache | 445.00 |
  - QuickCache II | 315.00 |
  - Gemini (required to install Gemini II) | 125.00 |

### Insight Development

Print any Macintosh application on many different printers. MacPrint is a printer-ready program, completely transparent in operation. MacPrint will display all your printer's resident fonts on your screen. If no resident font is found, MacPrint creates a scalable font. MacPrint is available for various Macintosh systems.

**Price:** $88

### Modem & Fax

- **Abatson**
  - InterFax 12/48 | 264.00 |
  - InterFax 24/96 | 417.00 |
- **Applied Engineering**
  - AppleModem 1200 | 264.00 |
  - AppleModem 2400 | 417.00 |
- **Digital**
  - SmallTalk/MAc | 124.00 |
  - Mainstay | 85.00 |
  - MicroCom | 85.00 |
  - Quick BASIC 1.0 | 64.00 |
  - Paragon Courseware | 124.00 |
  - Novell | 85.00 |
  - SmallTalk/MAc | 124.00 |
  - Think Pascal 3.0 | 85.00 |
  - Think C 4.0 | (not available)

### International Business Software

DataClub

How would you like an all-inclusive networking package? DataClub lets you choose the features you need and nothing you don't. You can have all this and more with DataClub—the breakthrough in file server software. Instead of requiring dedicated hardware, DataClub utilizes Macs on the network to create a powerful virtual server. The result is parallel processing with the ability to perform with blending speed.

**DataClub 3 Pack:** $198

**10 Pack:** $38

### PROGRAMMING

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AppleModem 1200</td>
<td>264.00</td>
</tr>
<tr>
<td>AppleModem 2400</td>
<td>417.00</td>
</tr>
<tr>
<td>BlueSoft</td>
<td>85.00</td>
</tr>
<tr>
<td>Global Village</td>
<td>85.00</td>
</tr>
<tr>
<td>Hays</td>
<td>85.00</td>
</tr>
<tr>
<td>Shiva Corporation</td>
<td>85.00</td>
</tr>
<tr>
<td>IntelM30</td>
<td>85.00</td>
</tr>
<tr>
<td>Just Enough Pascal</td>
<td>85.00</td>
</tr>
<tr>
<td>Think Pascal 3.0</td>
<td>85.00</td>
</tr>
<tr>
<td>Think C 4.0</td>
<td>85.00</td>
</tr>
</tbody>
</table>
Quark XPress 3.0

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

XPress 3.0 .......... $518

Dantz

Retrospect 1.2

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

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

Storm Technologies

PicturePress

PicturePress compresses and decompresses 24-bit color images 10 to 60 times, using the emerging Joint Photographic Experts Group international still image compression standard. PicturePress operates alone or can be accelerated 20 to 50 times by the PicturePress Accelerator Card, a programmable 90 MIPS image processing NuBus Card.

PicturePress .......... $120

Zedcor

DeskPaint 3.03

DeskPaint is a 58K DA that works as well with black & white images on a Macintosh Plus or Classic as does with color images on a lisa or lfx (even in 24-bit color). It reads and writes PICT, TIFF, and MacPaint files. It does smoothing, auto-trace, graduated fills, multiple windows, and a lot more. DeskDraw is a DA comparable to MacDraw. Some of it's features include hairlines, rotated text and arrows. It reads and writes PICT files compatible with SuperPaint, MacDraw II and Canvas.

DeskPaint 3.03 ........ $113

Call us first for low prices • 1-800-248-0800
Meca Software, Inc.  
Managing Your Money 4.0

Andrew Tobias’ Managing Your Money is personal financial software that includes powerful financial “chapters” that provide everything from basic budgeting and checkbook management to life insurance and tax planning, even complex portfolio management. These integrated chapters allow transactions made in one part of the program to be automatically recorded in the other chapters.  

Managing Your Money .......... $134

Utilities

<table>
<thead>
<tr>
<th>Utility</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prescience</td>
<td>$335</td>
</tr>
<tr>
<td>Vertical Solutions</td>
<td>$198</td>
</tr>
<tr>
<td>Satori</td>
<td>$120</td>
</tr>
<tr>
<td>Software Applications</td>
<td>$140</td>
</tr>
<tr>
<td>Software Discoveries</td>
<td>$120</td>
</tr>
<tr>
<td>Strategic Mapping INC</td>
<td>$150</td>
</tr>
</tbody>
</table>

MicroTouch Systems  
UnMouse  
The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface; to make a selection, merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you instantly have a Power Keypad with 16 keys available to execute macros. With its million touch points the UnMouse also performs admirably as a graphics tablet.  

UnMouse ............... $180
Cutting Edge 15" Full Page Monitor
You can now eliminate all the scrolling, scrunching and squinting of small screen Macintosh computing. Word processing, financial analysis and graphics have never looked as good as they do on this full screen viewing area. The monitor can display an entire 8-1/2 x 11 inches of screen with a flicker-free refresh rate of 75 Hertz and a high resolution of 640 by 870 pixels.

15" Monitor $579

Sigma L-View Multi-Mode Monitor
An ergonomic monitor design offers user-oriented details like a tilt/swivel base and paper white phosphor. L-View’s Low-Emission design meets guidelines for electromagnetic field emissions established by the Swedish National Board for Measurement and Testing. L-View includes video card, 19" monitor, control panel software, and user’s guide.

Multi-Mode Monitor $1475

E-Machine T-16 Color Display
Spread out with almost twice the display area of the standard 13" color monitor. View your work exactly as it will be printed at actual size - 72 dpi. Save almost one half the cost of a 19" color monitor. Get the sharpest, clearest color display at any price. The T16 has excellent colors, linearity, and sharpness, and it sells for a lot less than its larger cousins. The T16 is an excellent choice for CAD/CAM or color graphics. Retail $2995.

T16 Color Monitor $2275

Mega Graphics Rival B & W Monitor
The officially acclaimed Mega Graphics Rival is now available for all Macintosh models. It gives you the most crisp, most clear, and brightest image in the business, with true "What you see is what you get." Because the 16" screen display two facing pages, it is ideal for use in desktop publishing, layout and word processing. The wide expanse of workspace is an enormous benefit when using CAD and spread sheet applications.

Rival 2001 $1199

New Full Page Plus and Classic Monitors

Classic $649
Plus $679

Call us first for low prices
1-800-248-0800
Data storage from MacZone that you can always depend on

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

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

### Jasmine 40 mb Portable Hard Drive
Jasmine Technologies has consistently finished first in the MacUser Lab's Buyers' Guide and we've been praised in every major Macintosh publication for the quality of our drives and for the ease of use in DriveWare, our custom drive utility. DriveWare, provides the best SCSI partitioning, password protection, error correction, diagnostic and help software. And included with this drive is two award-winning utility software packages, Sum II and Virex plus over 10 megabytes of Shareware and Freeware programs.

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

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

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

### Cutting Edge 20 Mb Drive
Cutting Edge hard drives represent the best value in Macintosh storage. Major enhancements include quieter fan, two power outlets and added surge protection.

**20 Mb Drive** ............................ $299

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

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

---

### Data Storage Devices

<table>
<thead>
<tr>
<th>Device</th>
<th>Manufacturer</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD Technology</td>
<td>Toshiba Mechanisms</td>
</tr>
<tr>
<td>Porta Drive CD ROM</td>
<td>648</td>
</tr>
<tr>
<td>Cutting Edge</td>
<td>Seagate Mechanisms</td>
</tr>
<tr>
<td>30MB External</td>
<td>379</td>
</tr>
<tr>
<td>45MB External</td>
<td>439</td>
</tr>
<tr>
<td>60MB External</td>
<td>469</td>
</tr>
<tr>
<td>80MB External</td>
<td>529</td>
</tr>
<tr>
<td>Dyna Communications</td>
<td>DOS Mounter</td>
</tr>
<tr>
<td>EMAC - Impact</td>
<td></td>
</tr>
<tr>
<td>20MB External</td>
<td>385</td>
</tr>
<tr>
<td>40MB External</td>
<td>520</td>
</tr>
<tr>
<td>80MB External</td>
<td>750</td>
</tr>
<tr>
<td>170MB External</td>
<td>1,305</td>
</tr>
<tr>
<td>Jasmine - Portable</td>
<td></td>
</tr>
<tr>
<td>40MB</td>
<td>299</td>
</tr>
<tr>
<td>Microlith</td>
<td></td>
</tr>
<tr>
<td>Seagate Mechanisms</td>
<td>625</td>
</tr>
<tr>
<td>100MB External</td>
<td></td>
</tr>
<tr>
<td>White supplies fast</td>
<td></td>
</tr>
<tr>
<td>La Cie - Tsunami</td>
<td></td>
</tr>
<tr>
<td>Quantum Mechanisms</td>
<td>70MB</td>
</tr>
<tr>
<td>40MB</td>
<td>428</td>
</tr>
<tr>
<td>60MB</td>
<td>596</td>
</tr>
<tr>
<td>100MB</td>
<td>679</td>
</tr>
<tr>
<td>Quantum Mechanisms</td>
<td>120MB</td>
</tr>
<tr>
<td>40MB</td>
<td>768</td>
</tr>
<tr>
<td>50MB PLS External</td>
<td>928</td>
</tr>
<tr>
<td>La Cie - Tsunami</td>
<td></td>
</tr>
<tr>
<td>Quantum Mechanisms</td>
<td>40MB</td>
</tr>
<tr>
<td>40MB</td>
<td>428</td>
</tr>
<tr>
<td>60MB</td>
<td>596</td>
</tr>
<tr>
<td>100MB</td>
<td>679</td>
</tr>
<tr>
<td>Quantum Mechanisms</td>
<td>120MB</td>
</tr>
<tr>
<td>40MB</td>
<td>768</td>
</tr>
<tr>
<td>50MB PLS External</td>
<td>928</td>
</tr>
</tbody>
</table>

---

LaCie Tsunami drives come initialized with Silverlining, the standard of hard disk utility software, and Norton system, five megabytes of public domain software and Norton Utilities are also included on the drive. Ask your MacAdvisor about the new 2 plus warranty on Tsunami drives.

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

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

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

### Cutting Edge 20 Mb Drive
Cutting Edge hard drives represent the best value in Macintosh storage. Major enhancements include quieter fan, two power outlets and added surge protection.

**20 Mb Drive** ............................ $299

---

Call us first for low prices • 1-800-248-0800
Don't use a Mac anywhere without a Kodak Diconix M150 plus printer. Especially now that it's more affordable than ever!

Just think of all the things you can do if you have a Diconix printer with your Macintosh Portable or Classic computer. Those last-minute improvements on the presentation. The letters and reports that could be on their way right now. And, because it's so small and quiet, it works as well on the desktop as it does on the road.

It's all easy with the Kodak Diconix M150 plus printer. One of the world's smallest, lightest (3.1 lbs.), quietest printers, it's easy to carry. And it prints high-quality outline fonts, using Adobe Type Manager™ software, and presentation graphics as well. Go ahead, give in to temptation. Call for the name of your nearest dealer in the U.S. or Canada: 1 800 344-0006, Ext. 405.

Macintosh computer and new Kodak Diconix printer

WHAT'S ONE WITHOUT THE OTHER?

KODAK

The new vision of Kodak
Death and Taxes

Fortunately, Mac users can avail themselves of a variety of products — from MacInTax to WillMaker — to help deal with life’s little inevitabilities.

As April 15 approaches, you start hearing that old saw about Death and Taxes again. That’s because it’s true. But the Mac can help, to some extent, in both areas.

Take taxes. They may not be avoidable, but they can be managed. And the Mac’s graphics capabilities make it perfect for running software to help you with your taxes. You won’t even have to worry about copying information by hand or lining up forms in your printer, because the Mac can print reasonable facsimiles of completed tax forms.

At present there are two major tax-preparation packages: MacInTax, from SoftView (1721 Pacific Avenue, Suite 100, Oxnard, CA 93033; [800] 622-6829) and TurboTax, from ChipSoft (P.O. Box 85709, San Diego, CA 92186; [800] 755-8829). Both offer a wide range of forms and schedules, and both can print beautiful copies of tax forms on a LaserWriter or other high-resolution printer.

MacInTax is the original Mac tax package. All tax packages must be revised annually just to keep up with changes in the tax codes, but the 1990 version of MacInTax has also been upgraded with more tax forms, more on-line help, improved speed, additional error-checking, and so on. The package costs $99, plus $69 for any one of 13 state-forms modules.

In a way, MacInTax is responsible for the whole forms-processing boom, and SoftView also markets a range of forms-processing packages called if:X.

TurboTax, a port from the DOS world, is a newcomer to the Mac. TurboTax costs $89, plus $49 for any of 11 state-forms modules. Although either MacInTax or TurboTax can help you fill out the 1040 forms as well as all the associated forms and schedules, each program takes a slightly different approach and each has a very different feel.

You don’t have to buy a tax-specific package to prepare your taxes on your Macintosh (although I certainly recommend it). You can use any spreadsheet program for this task, and there are some relatively inexpensive Excel templates available from Heizer Software (1941 Oak Park Blvd., Suite 30, Pleasant Hill, CA 94523; [800] 887-7667 or [415] 943-7667). A full personal-tax-forms package costs $39, plus $19 for any one of nine state-forms modules.

But remember, doing your taxes with a spreadsheet program means more effort on your part. MacInTax and TurboTax do a lot of the hard work for you. Of course, no matter what software you use to prepare the actual forms, you’re responsible for collecting the data and sorting through your records.

Plan Ahead

Once the immediate pressure of April 15 has passed, you should start planning for the 1991 tax year. Tax advisers recommend that you finish planning by December at the latest, so you can have all your options available.

With all the limitations the IRS places on itemized deductions, for example, some experts recommend itemizing your deductions only every other year. This lets you delay as many deductible expenses as possible into January, take as many as possible during that year, and even pull some for the following year back into that December. Once you’ve gotten to April, these kinds of options aren’t available.

Tax-preparation packages have value as tax planners, even if just for playing “what if” games, but more-specialized packages are available. For example, SoftView offers if:X Personal Tax Analyst ($79), as well as MacInUse ($99). MacInUse tracks how long you spend doing things on your Mac (a must if you want to deduct the business use of your personal Mac).

You might find some general financial-planning products useful as well. Andrew Tobias’ Managing Your Money, from Meca Software (327D Riverside Avenue, Westport, CT 06880; [203] 222-9150), is a best-selling package that keeps track of your personal finances. Managing Your Money also has many tax-planning features built in (enough so that it too requires a new version each year as the tax laws change). The manual also doubles as a financial-advice column by Tobias, and many people appreciate his quick wit when facing a financial morass.

Two other popular personal-finance packages are Quicken, from Intuit (P.O. Box 3014, Menlo Park, CA 94026; [415] 322-0573), and MacMoney, from Survivor Software (11222 La Cienega Blvd., Suite 450, Inglewood, CA 90304; [213] 338-0155). Quickencosts $59.95, and MacMoney is priced at $119.95. Neither has as many tax-planning features as Managing Your Money, nor are the manuals as entertaining. Their bank-account-management capabilities match those of Managing Your Money, however.

For a new slant on financial-planning software, consider WealthBuilder from Reality Technologies (3624 Market Street, Philadelphia, PA 19104; [215] 387-6055). This $250...
To Go Forward You Must Backup

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

Retrospect. The Best Backup for Your Creativity.

CALL OR FAX
CALL: (415) 849-0293 FAX: (415) 849-1708

ColorSnap 32+

Most of the real world does not fit in a scanner. And, your time is precious. Use ColorSnap32+™ to immediately acquire a high quality image from any video source: live camera, still video camera, laserdisk or VCR. ColorSnap 32+ is REAL TIME and captures images with crisp, stop-action clarity and professional quality. Save files in PICT or TIFF, export them to image processing or page layout programs, or create your own image databases. Built-in modules capture images directly into Adobe's PhotoShop™ or Letraset's Color Studio™. Also capture and attach stereo sound to your images with the Audio Option (hardware and software), and use the Compression Option (software) to dramatically reduce the size of your image files.

ColorSnap 32+; $995 and available now! Call us at (503) 626-2291 for details.

Dealing with Mister D

With all these products, you may feel well prepared to deal with your taxes. But what about death? Can the Macintosh help there too? Yes, it can, thanks to WillMaker 4.0, for $69.95, from Nolo Press (950 Parker Street, Berkeley, CA 94710; (415) 549-1976).

WillMaker has been available for years, and this new version offers only minor improvements, but, as with all legal and tax software, you should always use the latest version. If you want a valid will without having to hire a lawyer, WillMaker is for you. It leads you through creating a will by asking a series of questions. The excellent manual is more a tutorial on wills than it is a software manual. Although it's not the most polished package you'll see this year, WillMaker is utilitarian and can create a valid will for you no matter which of the 50 states you live in.

One problem that applies to both estate planning and tax planning is keeping track of all your records, receipts, and important papers. Nolo Press has a package, For the Record 2.0, that is essentially a database program designed to keep track of your important documents, inventory your assets, and collect all your personal information in one place. It costs $59.95.

There are also many specialized HyperCard stacks for tracking your records. The stacks are available as freeware or shareware (check with your local user group, BBS, or on-line service); none of them are as complete as For the Record, though, and you may need two or three of them to cover all the possibilities. You can also write your own HyperCard stack or database program, but that would be a lot of work.

None of this software will let you evade the inevitable. But while you’re waiting for that dreaded call from the IRS (or worse!), at least you have the satisfaction of knowing that your Mac has prepared you for whatever may be in store.
At Prometheus*, our only business is communication products. Consequently, you'll find we have the best data/fax modems you can buy.

And we're not the only ones who think we make the best products... MacUser nominated the ProModem® 9600 Plus as the Best New Communications Product for 1990 and also chose it as the ultimate modem for their ULTIMAC in the Sept. 1990 issue. Only Prometheus offers you so much.

Only Prometheus offers a complete communication solution! We include cable, fax fonts, fax and data communications software with every data/fax modem we sell.

Only Prometheus includes MACkNOWLEDGE™ data communications software (a $125 value!) free with every modem so you can easily access popular on-line services, bulletin boards and other computer systems.

Only Prometheus offers a complete line of data/fax modems to suit your communications needs. Prometheus has you covered from our send-only data/fax modems to our new ProModem Ultima, a high-end, 14,400 bps data/fax modem. — All with the same, great fax software!

Guaranteed! We're so sure you'll like our ProModems, we'll let you buy it and try it. If you don't agree it's the best product, return it to your dealer within 30 days for a full refund.

**Compare these features**

<table>
<thead>
<tr>
<th>Feature</th>
<th>ProModem® 9600M Plus</th>
<th>ProModem 24/96MSR</th>
<th>ProModem 24/96Mlnifax</th>
<th>Abaton* 24/96SR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$449</td>
<td>$399</td>
<td>$299</td>
<td>$495</td>
</tr>
<tr>
<td>Maximum Modem Speed</td>
<td>2400</td>
<td>2400</td>
<td>2400</td>
<td>2400</td>
</tr>
<tr>
<td>Fax Speed</td>
<td>9600</td>
<td>9600</td>
<td>9600</td>
<td>9600</td>
</tr>
<tr>
<td>Send/Receive Fax</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Communications Software</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Includes Fax Fonts</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>V.42bis Option</td>
<td>Optional*</td>
<td>Optional*</td>
<td>Optional*</td>
<td>Optional*</td>
</tr>
<tr>
<td>Software Features</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduled Transmissions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manual Resend</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Manual Deletion</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Multiple Address Books</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Distribution Lists</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Convert Fax</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Print Fax</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>View Fax</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Flip Page in View Mode</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Online Help</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Fax Status Desk Accessory</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Automatically Launch DA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Automatic Resend</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Automatic Deletion</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Custom Cover Pages</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nested Distribution Lists</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Save To Fax File</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Append To Fax &amp; Send</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Set Dialing Prefix</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Set Dialing Suffix</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Resend Unsent Pages Only</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Unlimited Cover Pages</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Import/Export Address Book</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Direct Grey Scale/Color Out</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Color Icons</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

* These options also available as upgrades

Prometheus Products, Inc.

7225 SW Bonita Rd. * Tigard, OR 97223
(503) 624-0671 • (800) 477-3473 • Fax (503) 624-0843

Please circle 174 on reader service card.
Before you had these modern shortcuts, you could still do everything you needed to do. It was just harder. Or took longer. You had to wait until Monday for cash. Get up to change channels. Balance your checkbook with pencil, paper and lots of swearing. It's hard to imagine going back.

Tens of thousands of people depend on QuicKeys® as their modem shortcut for the Mac. Reviewers rate it "right up there with sliced bread, the Great Pyramid of Cheops, and other wonders."

"How 'bout a quickie?"

Now there's QuicKeys2™ — an exponentially more powerful way to automate your Mac. It's the easiest way to speed up the slowest part of your Mac work — the time you spend launching, choosing, selecting, changing, and all the other commands you do over and over every day.

Say you just printed a letter and you need to print an envelope to go with it. Without QuicKeys2, you select the address, copy it, open a new document, hit the return key 15 times, select Paste, select All, change the margin, select Page Setup, click landscape, OK, Print, manual feed, OK and close the document without saving changes — every time. As a QuicKeys Sequence, you just select the address and press a key — instant envelope!

It's that simple. Think of all the shortcuts you could create.

"QuicKeys see, QuicKeys do."

Customize your Mac without learning to program. QuicKeys2 can watch what you do and record your every move. Have it duplicate your routine exactly, or edit out "unwanted" steps and add additional ones.

You can even instruct your Mac to play QuicKeys at pre-set times. Automatically save every 15 minutes. Pop up your "to do" list once an hour. Launch your back-up program at 3:30 Friday. You'll never forget again.

Try QuicKeys2. You'll wonder how you ever did without it.

"Call for a free demo disk."

Call 1-800-523-7638 and ask for Dept. CE28
Suggested U.S. retail price $149.95.

© 1990, CE Software, Inc.P.O. Box 65580, West Des Moines, IA 50265 USA. QuicKeys and QuicKeys2 are trademarks of CE Software, Inc. All other registered and unregistered trademarks are the sole property of their respective companies.

Please circle 99 on reader service card.
I Love Mail

It's been a year since I began writing this column for MacUser. In that year, I've learned a lot about what kind of people read MacUser.

During this past year, I got love mail and I got hate mail. I did not get love/hate mail. My mail came from NRA members, civil libertarians, ministers, and Apple shareholders. My mail isn't namby-pamby, wimpy form-letter stuff. Here's what I mean.

Rahid

MacUser readers are rahid (according to Webster's New World Dictionary, Third College Edition, rahid means "fanatic or unreasonably zealous in beliefs, opinions, or pursuits"). Let me share some rahid mail.

"It's disappointing to see Guy join the liberal goon squads that find it trendy to assassinate the character of the NRA by misrepresenting its position." Lynn Muzzy.

More on the NRA: "Mr. Kawasaki, if someone has called you or someone you love an unkind name or has committed some act of violence based upon bigotry, stand and take it like a man. Move on. Your attitude is affecting your job and ultimately, your livelihood. Yes, Mr. Kawasaki, I am a member of the NRA, and yes, I bear arms . . . ." Paul Schwarz.

"Your piece on Singapore in the October 1990 issue makes it seem that you either don't know or don't care about the widespread concern over that country's increasing restrictions on freedom of expression and other basic human rights," Angus MacDonald.

More on Singapore — this comment is a little al dente: "I'm glad Guy had a ball in Singapore. He'd probably have enjoyed Mussolini's Italy as well. After all, didn't he make the trains run on time? Good pasta too." Richard Pachter.

All I can say is that in Singapore everything runs on time, and the satay is good too. The funny thing is that Singaporeans liked the column. This must be a coincidence. Prime Minister Lee Kuan Yew recently retired from office; maybe he'd like the vice-president-of-marketing job at Apple. He could reposition the Portable as the "Singapore Sling."

Reasonable

MacUser readers are reasonable people, so don't misinterpret these quotations. They feel passionate about things. They must — they bought Macs instead of You-Know-Whats from You-Know-Whom. I believe that it's quite reasonable, and even desirable, for people to write passionate mail to me — positive or negative.

That's because I enjoy getting mail — any kind of mail. I try to respond to all the letters. Here's a case where I really wooed a reader back: "In answer to your letter, to the contrary, I do not hate your column in MacUser." Richard Greenstone. You see that? I really know how to charm people. Richard ended up sending me his HyperCard stack about the Copyright Act of 1976 and a copy of the law journal he edits.

Funny

MacUser readers have a wonderful sense of humor. The funniest line was in a letter from a minister named William Lesch in Southern California: "Well, I know who John Sculley is, and a pastor with his speaking ability should think twice about changing careers." Come to think of it, I've never seen a pastor use a Religion Navigator video.

Here are a few more good ones: "I have often wondered why Apple was so slow to meet customers' demands for lower-cost CPUs and who the idiots were behind the flying-car commercial." Scott Bittnick.

"If I thought it would help, I'd take the money I'm saving for a Macintosh IIsi and use it to buy Apple stock in order to be able to vote for your election to the Apple board of directors." Chris Bergman. I told Chris to take his money and buy that IIsi. I was at least six million votes short of being elected to the board.

Speaking of Apple, all my columns on Apple generated the same kind of letters. Most of them started like this: "I bought my first Apple II ten years ago. Since then, I've bought a Macintosh 128K and upgraded it to a Plus. I love my Macintosh, but in all those years, whenever I went to Apple dealers, they never knew what they were talking about. When I called Apple, no one ever returned my phone calls. I hope you get appointed so you can change that. P.S. Now I'm saving my money to buy a Macintosh IIC." Do you see a pattern there? People are longtime Apple customers. They receive nothing but bad service. Yet they're anxiously anticipating the next time they can afford to buy another Apple computer. If any of you are agnostics or atheists, I suggest that you rethink your position. Only God can account for this kind of company loyalty.
The only table built around the Macintosh.

Critical
MacUser readers are critical. This is good, because good criticism yields good columns. The best criticism of my writing was this: "Conspicuous cleverness can be overdone. When it's merely 'cute,' it can be mildly annoying and easy to overlook (we all show off occasionally). But when it's used to make MacUser a vehicle for snide editorializing on issues totally unrelated to the Mac, it needs to be confronted." Robert Mathews.

Robert continues to say, "... Mr. Kawasaki's being a Macintosh expert does not necessarily make him an expert (or even well informed) on guns, criminology, or politics... I am not advocating that MacUser censor Mr. Kawasaki or other columnists. I am suggesting that readers, as well as editors, let columnists know that they expect responsible, appropriate, and authoritative columns."

Not much I can say to that. Robert pretty much sliced and diced me. There's nothing I like more than a good case, and his case was superb. There's only one problem: If I were restricted to "authoritative" columns, I couldn't write one every month — if you know what I mean.

Caring
Above all, MacUser readers are caring. I believe that even my most passionate critics care about Macintosh, MacUser, and me as a person. Therefore, please keep those letters coming.

I prefer to get letters electronically. Try MacUser's own Zmac service on CompuServe (GO ZMAC: MACUSER); CompuServe: 76703,3031; America Online: MacWay; or AppleLink: Kawasaki2. Or you can send me a fax. My fax number is (415) 326-2398. But in fact, I'll take letters any way you want (even via U.S. mail — try c/o MacUser). Including your fax number makes it much more convenient for me to respond.

If you do write me, next year you may see your letter appear in this column. Assuming, of course, that I can come up with 11 other authoritative columns in the meantime. You can even help in this area. I'd love to get suggestions about future column topics.

Speaking of caring, let me close with a quotation from a letter from the Rev. Peter McKnight. "You may find, if you haven't already, that 'the power to be your best' doesn't come from a box full of microchips; it comes from a relationship with the God who lives." Amen to that.
Now you can travel from here to there with twice the horsepower.

Getting from your Macintosh to virtually any fax machine in the world is now a lot faster.

Because the new 9600-bps Abaton InterFax 24/96 gets your message across twice as fast as before. And since the InterFax software compresses the file before sending it out, you spend even less time faxing than with any other 9600-bps fax/modem.

But we didn't just double the raw output speed, we made it easier to use. We included direct scan support, so you can fax art and photos straight from the scanner with excellent resolution. We also made the software easier to use—it's as simple as printing to any printer. And we made the InterFax work in background (with or without Multifinder), so you can get back to work while your Mac faxes. You can even schedule when faxes are sent to take advantage of lower phone rates.

As an added plus, the new InterFax also works as a 2400-bps Hayes-compatible data modem with MNP 5 error correction. All these features together made MacUser name the InterFax 24/96 the best communication product of 1989.

If you want to get from here to wherever with twice the horsepower, call Abaton at 1-800-444-5321 (In Canada, 1-800-663-5161) or fax a note and your business card to (415) 683-2956. The new InterFax 24/96 will make your ideas easier to publish. Anywhere.

Abaton
We Make Your Ideas Easier to Publish™

Introducing the Interfax 24/96

Please circle 61 on reader service card.
Today, over 1.1 million hours will be tracked using Timeslips III. And every one of them will be billed.

It is the supreme irony of modern business. That until now, it has been impractical—and often unprofitable—for a business to treat its people's time with the same respect automatically accorded its money.

What's more, it's a costly shame. Because for most businesses, time is by far their most valuable resource. Now you can track time for all it's worth.

For today's business, the answer is Timeslips III for the Mac. A complete, sensible, and surprisingly powerful software program that helps accurately track, analyze, and charge-out both time and expenses. And do so with unprecedented facility and speed. Timeslips III for the Mac has an extensive security system. This option lets a supervisor choose from multiple levels of password security that restrict access to sensitive client information or confidential productivity and financial reports.

The Bill Layout Tool makes it fast and easy to alter the appearance of your bills. Use your mouse to move or change fields on the billing screen. You can also change fonts, include lines, add boxes and extra text, even import PICT format graphics.

Thanks to Timeslips, many people report up to a 25% increase in accountable time. Which means an equal improvement in productivity and income.

Best of all is that Timeslips III won MACUSER Editor's Choice Award for Best New Professional Financial Package of 1989.

Get time on your side today.

Timeslips III for the Mac is just $299.95 at your software dealer or from TIMESLIPS Corporation. And ask about our network version which can support up to 255 stations. We also have a free HyperCard demonstration disk that shows you how effective Timeslips III can be for your bottom line.

Timeslips III for the Mac has a desk accessory stopwatch to quickly record time and activities in detail. With reporting that's thorough and flexible. In a variety of formats you determine. And with instant graphing for performance and financial evaluation. It even produces custom invoices in the font of your choice, aging reports, mailing labels, and billing worksheets.

But don't wait. Call today. Because Timeslips III on your computer is as good as money in the bank.

Call 1-800-338-5314 (508-768-6100 in MA) or FAX 508-768-7660. In Canada call 1-800-359-3343.

Please circle 125 on reader service card.
More than meets the eye . . . Because the human eye can't distinguish 16.7 million hues, you'd think that 24-bit color would be enough for anyone. Apparently not. Strata ([800] 869-6855), the maker of StrataVISION 3d, has announced StrataVision Paint, a 64-bit-color painting program it claims can reproduce 281 trillion colors — once a 64-bit-color standard has emerged. Sometimes you can get more than you paid for — whether you know it or not.

By Russell Ito

Small is big . . . Whether it's miniskirts or miniburgers, there's big business in getting small — and that's especially true when it comes to data. With files frequently reaching multimegabyte sizes, data compression is a hot topic and the acronym of the moment is JPEG (Joint Photographic Experts Group). JPEG compression is an international standard for still images that's platform-, hardware-, and software-independent, so a JPEG-compressed file can be decompressed with any system that supports the standard. These compression ratios are as high as 50:1. Of course, when you squeeze your bytes that hard, some of them can get squeezed out permanently, but that's part of how the JPEG standard works: It eliminates redundant color information that your eyes can't distinguish anyway. With the JPEG specification nearing final revision, the first JPEG products are hitting the market.

Radius' ImpressIt is a software-only package. Until now, software JPEG has been considered far too slow to be usable, but this package from Radius ([408] 434-1010) is nearly as fast as hardware JPEG and costs significantly less — $179. ImpressIt lets users selectively preview the effects of compression and even select areas within an image to compress.

Storm Technology ([415] 322-0506) straddles the hardware/software line with PicturePress and the PicturePress Accelerator. Although the PicturePress software can do the job alone, adding the accelerator makes it much faster. The accelerator card is unique in that there are no custom chips on it. The heart of the card is a pair of AT&T DSP (digital-signal processor) chips that aren't dedicated to compression. The 60-megahertz DSP chips are software-programmable, so if the JPEG standard changes — as it has frequently over the course of its development — Storm has only to change its software, meaning that users never have to worry about hardware upgrades. (Micron Technology ([208] 383-4000] also sells the Storm products as the ICDP-II.)

Up to Date . . .

StuffIt Deluxe, Aladdin System's compression standard, is now in version 2.0. Improvements include self-extracting files and automatic application launching from a compressed document. $99.95. (408) 685-9175. VideoQuill, the type-manipulation package from Data Translation, now includes an optional FontPack that formerly doubled the cost of the package. The bundle price is $695. (508) 481-3700. Transform, Spyglass' data-visualization package, has been upgraded to version 2.0. The enhancements include color contour, surface, and vector plots and support for fast Fourier transforms. $395. (217) 355-1665.
Kodak's Printer Plus

It's been a long time since we could call a printer unique, but the Kodak Ektaplus 7016 earns the description. If there ever was a printer that could claim to be a one-size-fits-all unit, this may be it — and it's a bargain.

The Ektaplus 7016 is a 300-dpi 16-ppm (page per minute) printer that has on-the-fly emulation switching. It can be configured with up to four ports, all of which are live; it comes loaded with five standard emulations (HP-PCL, HP-GL, Diablo 630, IBM Proprinter, and Epson FX80); and Adobe PostScript is available on a board. With its four ports, the Ektaplus 7016 can handle four different emulations simultaneously and switch among them for each print job, so Mac and DOS users — and networks — can share it.

But the Ektaplus 7016 is more than just a printer. It also includes a 6-ppm convenience copier, which lets you interrupt a print job, make copies, and then continue printing just by pressing a button on the front panel. Kodak also includes a Chooser-level driver that supports dual paper trays (either sequenced or continuous), and the Ektaplus 7016 also features a manual envelope feeder.

The guts of the Ektaplus 7016 include a Motorola 68010 processor for all the I/O activity and 2 megabytes standard on the motherboard (it can be upgraded to 4 megabytes). The Adobe PostScript board includes 35 Adobe outline fonts and adds a Motorola 68020 and 4 megabytes of its own strictly for handling PostScript imaging. In fact, the 68020 is so dedicated to its task that the 68010 has to poll it to send the print job to the engine; the 68020 doesn't send any messages. The Ektaplus 7016's engine is an LED unit designed and built by Kodak that has no moving parts.

So how much does all this cost? That's the best part. Fully configured for the Mac, the Ektaplus 7016 lists for less than $7,200.

Eastman Kodak Co., Printer Products Division, Rochester, NY 14653; (800) 344-0006. Ektaplus 7016PS, $6,995; AppleTalk port, $195.

A Multimedia Cataloger

The more you do on your Mac, the harder it is to stay organized. Symmetry's Mariah is a cataloging utility designed to help you store and search your files. Mariah creates named "collections" of picture, text, and/or sound files. You can have up to 32,000 items in a collection, and you can associate an unlimited number of keywords with each file. Performing a keyword search is fast and doesn't require a disk index. Collections can be browsed through in a thumbnail view, and the package even permits some limited sound editing.

Because Mariah doesn't compress files, it doesn't necessarily save disk space. Because the program doesn't recognize proprietary formats, files must be in generic formats such as PICT, TIFF, EPS, text, SND, and so on. Symmetry may add proprietary file-format capabilities to the next version of the program. Meanwhile, don't be surprised if you start seeing some CD-ROM discs being distributed in Mariah format — Symmetry is working on it.

Symmetry, 8603 E. Royal Palm Road, #110, Scottsdale, AZ 85258; (602) 998-9106. $149.

Making Meetings: Meeting Maker

Meetings are the bane of every working person's life, and often the only thing worse than attending a meeting is the hassle of setting it up. ON Technology's Meeting Maker is an attempt at eliminating this hassle.

A multiuser scheduler, Meeting Maker doesn't require any networking software, because it uses ADSP (AppleTalk Data Stream Protocol). An INIT/DA combination, Meeting Maker gives you a 24-hour calendar in 1- to 14-day views. You can choose to keep your appointments secret or share them with others. When you want to schedule a meeting, you simply select the attendees (you can designate optional attendees as well). You can also schedule facilities such as rooms and equipment. Meeting Maker supports named groups, and you can alter a group for a particular meeting without permanently changing the group.

As you assemble a list of attendees, Meeting Maker shows you a composite schedule that displays the available times for all the attendees. You can choose a convenient time yourself or have Meeting Maker select a time for you.

Mariah is a multimedia cataloger that lets you associate keywords with your files so you can find your documents quickly.
Maker automatically pick the first available time slot that matches the length you want. Once you've sent a message regarding the meeting, Meeting Maker lets you know who has agreed to attend and updates all the calendars involved. If you cancel the meeting, the calendars are updated appropriately.

If you spend nearly as much time scheduling meetings as attending them, Meeting Maker is for you.

ON Technology, Inc., 155 Second Street, Cambridge, MA 02141; (617) 876-0900. Five-user pack, $495; ten-user pack, $895.

**Envelope Writer**

What’s kept the typewriter alive? The envelope. Just ask anyone who’s ever tried to address one with a laser printer. CoStar’s AddressWriter, however, may finally put an end to the typewriter.

The AddressWriter is a 144-dpi dot-matrix printer designed specifically for addressing envelopes — not labels, although an optional label feeder is available. The AddressWriter prints with 24-pin quality, and can hold up to 100 envelopes. Using a special version of MacEnvelope that comes with the unit, the AddressWriter can print return addresses, logos, and postal bar codes, all from a DA.

A serial AddressWriter should start shipping in May, and an AppleTalk version is expected to follow. Pricing for the AppleTalk unit hadn’t been determined at press time, but it was expected to be more expensive than the serial edition.

CoStar Corp., 22 Bridge Street, Greenwich CT 06830; (800) 426-7827 or (203) 661-9700. $595.

**Pixar Showplace**

Pixar Showplace is a 3-D-photo studio. You arrange and light your objects and give them a surface in Showplace and then render the whole image in MacRenderMan.

**Pixar Perfect**

MacRenderMan is great for rendering images but not for composing them. Enter Showplace, Pixar’s 3-D-composition program that’s the software equivalent of a photo studio.

To create a scene in Showplace, import an object created in a 3-D-modeling application or pick an object from Pixar’s ClipObjects library, which is bundled with Showplace. The next step is to position wire frames of the objects as desired. You can give each figure a surface, using Pixar’s First Looks (also included with Showplace), and light sources (lamps, spotlights, windows) can be added. You can set up a camera to “shoot” the picture, and Showplace produces a prototype 3-D rendering. If the prototype is acceptable, the image is then photo-realistically rendered with MacRenderMan. Showplace renderings can be saved as TIFF or PICT images for use in other applications.

Pixar, 1001 W. Cutting, Richmond, CA 94804; (415) 236-4000. $695.

**3Com Shrinks and Splits**

SCHAUMBURG, IL - Despite the recent opening of a chip-manufacturing plant in Austin, Texas, Motorola will produce its four-megabit DRAM chips in a plant in Japan. Motorola jointly owns the Japanese plant with Toshiba.
ANIMATION

FilmMaker

This year's winner of the Eddy award for the best animation program of 1990 is a powerful animation tool with a decidedly unique personality.

FilmMaker, a French program co-developed and distributed in the U.S. by Paracomp, combines some astonishing animation capabilities with enough Gallic quirks to temper your artistic ambitions. In fact, FilmMaker is actually five separate application modules (just counting the major ones), which in itself can be pretty exasperating — until the logic behind the design has had a chance to reveal itself.

Animation Bound

FilmMaker definitely has limits. It's an animation package, but it doesn't include any graphics software for creating pictures from scratch. Instead, you create your images in a painting or 3-D program and then import them into FilmMaker as PICT, PICS, or EPS files.

If you want to sequence images into a classic frame-by-frame animation, FilmMaker isn't for you, because it doesn't allow for precise registration of individual frames. But if you need to perform complex motion studies and need to make minute adjustments to that motion quickly and accurately, or if you need to manage color palettes of several completely different graphics in an 8-bit environment, then FilmMaker is an animation application that will interest you.

The initial difficulty with FilmMaker is easy to understand: Developed by the French company Encore Development, FilmMaker sometimes seems to not have entirely made the transition from its origins as an in-house tool to its new role as a mass-market product. Its modularity, sample graphics-file titles that are still in French, and a quick-start tutorial that's short of examples of what FilmMaker can really do all suggest that FilmMaker was rushed to market prematurely. When you begin to work with the product, however, its shortcomings are counterbalanced by its strengths or, as is the case with FilmMaker's modularity, actually prove to be a virtue. For example, even though it's less convenient than an integrated approach, FilmMaker's modular strategy leaves a lot more memory available for RAM-intensive activities such as sequence rendering.

Complex Animation

If FilmMaker seems dense and confusing at first, it's because the program can perform some fairly complex chores. FilmMaker requires a Mac SE/30 or a Mac II-family CPU, with 32-bit QuickDraw activated. The five primary application modules are Mark, Animate, Color, Sound, and Present. FilmMaker also includes a utility for exporting animations to HyperCard and a DA for converting images into bit maps (FilmMaker's format).

In Mark, you create a simple outline, or tracing, of a graphic that is referenced to a PICT, PICS, or EPS file. The outline is a guide that lets you create, view, and alter your animation quickly without having to wait for the machine to redraw a complex color image.

The Mark outline is then manipulated in the Animate module, where you control scale, position, path, and acceleration over time relative to an anchor point/vanishing point. (The anchor point is an object's center of gravity, and when you scale an object, the anchor point becomes the vanishing point.)

One of FilmMaker's wonderful features is that you can link objects to each other or to other, "invisible" objects that independently control some aspect of the object's size or motion. These linked objects can be ganged to create complex animation paths, or, more significantly, they can be linked to other components in a hierarchical fashion that seems to let your artwork move independently while ultimately being controlled by a master object.

You create a path simply by dragging an object with the move tool. You can then change the animation path and instantly view your alterations, because FilmMaker displays all the key frames.

Dialog boxes give you fine control of various animation commands, and there's a basic array of transitions as well. You have complete control over the transparency of the images in an animation, so graphics can fade in, fade out, or superimpose over other images. FilmMaker transitions include dissolves, fades, and wipes.

When you decide that you're ready to

FilmMaker is a French import that takes a modular approach to animation. The Animate module gives you control over the path, scale, and transparency of your graphic objects. The Tool palette controls paths and scaling, and transparency is set in a dialog box.
FilmMaker offers you several options when rendering your animation. The Antiflickering option is for use with animations being exported to videotape. The Step value lets you create "draft" animations by compiling only every nth frame and repeating that frame n times so that the animation's length is maintained.

The rendered animation sequence can be played back in the Sequence Runtime module, which accelerates the file for realtime playback.

The Sound module lets you import SoundEdit audio-resource files, but you're limited to only one sound per frame or range of frames. If you want both sound effects and music to play during a specific sequence, for example, you must premix the audio in SoundEdit before importing the file into FilmMaker, which is a definite limitation in that you often have to tweak the sound once you've heard it combined with the visuals. FilmMaker will sustain a sound if the animation sequence containing it is interrupted in midplay while new information is loaded into RAM.

Present, the last module in the package, lets you combine animated FilmMaker sequences with picture files to produce fully realized presentations. A degree of interactivity can be embedded in Present's iconic script in the form of gate conditions (mouse clicks, keyboard commands, pauses), and time and transition cues can be added too.

The Bottom Line
FilmMaker doesn't try to do everything, but what it does, it does very well indeed. To be sure, its interface needs some improvement, and Paracomp promises refinements to the whole package in future releases (incorporating Mark into the Animate module, for instance). FilmMaker takes some getting used to—especially if you're accustomed to MacroMind Director's way of doing things. The modules tend to crash if you inadvertently try to make them do something they weren't meant to do, so the initial learning process can be frustrating. Serious animators and graphic artists, however, will see FilmMaker as a real boon to their work.

—Bill Camenga

Get Info

FilmMaker

Published by: Paracomp, Inc.,
1725 Montgomery Street, Second
Floor, San Francisco, CA 94111;
(415) 956-4091.
Version: 2.0.1.
List Price: $695.

FilmMaker's Present module is an icon-based flowchart that lets you combine animations and still images into interactive presentations. The level of interactivity isn't as extensive as that of MacroMind Director, however.
MacInTax and TurboTax

If you're still looking for an electronic tax preparer, either of these packages can fill the form.

Almost as long as there's been a Macintosh, there have been tax-preparation aids for it, and this year a DOS product, TurboTax, makes the move to the Macintosh (turnabout's fair play — the major Mac package, MacInTax, has moved to Windows). Competition usually benefits consumers, and this is no exception: Now you have two major tax-preparation packages to choose from, and both have a lot to recommend them. (This review is based on the preliminary versions of both packages, but the applications will be the same. Neither package was final, because the IRS hadn't approved all the forms by review time. The release versions should be available long before you read this.)

MacInTax

MacInTax, the first Mac tax-preparation package, originated the concept of working on actual on-screen forms that could be printed out and mailed to the IRS. Today this is a common feature in other applications, but MacInTax still does it well. Using MacInTax is much like filling out the forms manually, with some major advantages. First, all major (and even many minor) forms and schedules are included, so you don't have to try to get copies from the IRS or go from bank to post office to bank collecting them. Second, all the forms are interlinked, so when, for example, you enter your deductions on Schedule A, the totals automatically appear in the proper place on Form 1040. Third, all the information from the IRS booklets, as well as a lot of other helpful hints and tips, is included and integrated into a useful and valuable help facility. Help is available for each line item, not just for each form, so you can usually get a detailed explanation of the particular item that confuses you just by double-clicking on the line in question.

MacInTax has many minor yet useful features. For example, you can enter estimated amounts, and the abbreviation EST appears to the right of the dollar value. Any calculations based on estimates are noted. You can later locate estimates (as well as other missing values) by using Option-Tab or Option-Return.

In conjunction with SPEED>S Corp., Softview offers special services for electronic filing (called SPEED>FILING) and for refund-anticipation loans (SPEED>REFUND). For a fee, you can mail or fax printed copies of your return or mail a disk to SPEED>S, which will do the electronic part of the filing for you.

TurboTax is a newcomer to the Mac, and its first version gives MacInTax a stiff challenge. With TurboTax, you enter some of your data into the Personal Information Worksheet. There is also a hypertext-like help facility. Note how clicking on the words filing status in the Consult with TurboTax window has opened another window that contains a more detailed explanation.

Softview also offers a separate tax planner, Personal Tax Analyst. And if taxes are your life, you can avail yourself of the professional versions of MacInTax, not only for 1040 forms but for Forms 1065, 1220, and 1120S as well.

TurboTax

Although TurboTax is new to the Mac, it has been a successful DOS product for some time. Possibly because of its DOS background (with its lack of WYSIWYG), TurboTax takes a different tack from that of MacInTax. For some forms, you fill out worksheets and answer questions instead of filling out the forms directly; TurboTax then fills out the forms for you.
There are, however, some forms that you do fill out (at least partially) directly.

TurboTax has several excellent features. There’s an extensive hypertext help system, in which clicking on highlighted words opens up additional help windows for many levels of help. TurboTax also lets you post yourself reminder notes associated with particular line items (this feature didn’t work in the Head Start version I tested, because of either a program bug or system incompatibility). It also has a Planning mode so you can look ahead to 1991 without having to purchase a separate tax planner.

TurboTax’s best feature is Consult TurboTax, which is on the Assistance menu. When you select this menu item, TurboTax asks a series of yes/no questions in dialog boxes and determines which forms and schedules you need to fill out, automatically presenting them to you one at a time with instructions. When you use this option, it is almost like having an accountant.

TurboTax has other accountant-like features on the Assistance menu. Select Tax Savings, and TurboTax analyzes your return and suggest ways you might reduce your tax (you can also get general suggestions not specific to your tax return). Select IRS Audits, and TurboTax lets you know of any items on your return that could cause an audit (such as a home office). Select Data Examiner, and TurboTax determines if there is any missing information on any forms or schedules and flags any critical areas that are missing data.

The Bottom Line

MacInTax and TurboTax are both good tax-preparation applications, but MacInTax is the better Mac application, being more Mac-like. This is not to say that TurboTax isn’t an excellent first effort at a Mac version; improved versions in the future will provide some serious competition for MacInTax.

To decide between the two programs, look at your personal situation. If you’re used to MacInTax, by all means stay with it. TurboTax’s different orientation may confuse you, and you may find little things about it annoying (for example, it doesn’t calculate fields immediately unless you specify Autocalculate, and then it’s very slow). If you’re fairly experienced at doing your own taxes but this is the first time you’ve used your Mac to do them, MacInTax should fit your needs.

TurboTax might be the better choice for a variety of reasons: If you need a lot of help, you may find the Consult TurboTax option useful; if you want to do some tax planning for 1991, TurboTax’s built-in Planning mode can save you some money; and if you’re a Quicken user, TurboTax’s interface with Quicken makes it the logical choice.

If you live in California, Illinois, Massachusetts, Maryland, Michigan, New Jersey, New York, Ohio, or Virginia, you can choose either program, as both have state-tax versions. If you live in North Carolina, only TurboTax has a state-tax version. If you live in Washington, D.C.; Connecticut; Minnesota; or Pennsylvania; MacInTax has the only state versions. Residents of all other states can choose either program but will have to do their state taxes the old-fashioned way. MacInTax’s state-tax versions cost $69 each; TurboTax’s are $49 each.

You really can’t go wrong picking either program. Both offer free upgrades to the final version, extended support hours during tax season, on-line support on CompuServe and GEnie, and reduced rates for next year’s versions.

If you already have an accountant you’re comfortable with, there’s really no reason to switch to a software tax preparer. After all, no program — no matter how well written it is — can replace a knowledgeable human being. On the other hand, if you don’t have an accountant, or if you’re brave enough to want to assume direct control of your finances, good tax software is essential, and either of these two programs would be an excellent choice.

— Robert R. Wiggins

Tips for the Tax-Tardy

If you’re reading this with an eye toward picking a tax-preparation package, you’re already running out of time. There’s good news and bad news for last-minute taxpayers. The good news is that you can get an automatic four-month filing-deadline extension by filing Form 4868 before April 15. The bad news is that the extension is only for filing, not paying. You have to pay all your taxes by April 15 (you send in a payment with Form 4868 if necessary). Tax software can still help, however.

The first thing you need to do when you open your tax-software package is send in the registration card so you can get the final version sent to you free of charge. Although both MacInTax and TurboTax’s final versions were supposed to be ready by February, many of the older versions remain in stores long after the new versions are available, so send in your registration card no matter when you bought your software. The IRS won’t accept old software as an excuse. This is especially important in the case of MacInTax, because Form 4868 is one of the forms missing from the preliminary version.

Once you’re registered, you can go ahead and use the package you have to make your best estimate of what you will owe. After you have calculated your estimated tax, you can fill out Form 4868 and send it in with your check (if your estimate is higher than what you’ve already paid in).

If you’re using MacInTax and your final version hasn’t arrived in time, you can either use a paper Form 4868 (available at many banks and post offices) or download Form 4868 from SoftView’s support section on CompuServe (MACAVER Library 17) or GEnie. TurboTax users can find Form 4868 in both the Head Start and final versions of the product.

If you do file for an extension, remember that you won’t get much sympathy when you run around complaining about taxes right before August 15. For maximum sympathy, you have to complain by April 15. There’s no extension on time for complaining.

Get Info

MacInTax 1990

Published by: SoftView, Inc., 1721 Pacific Avenue, Suite 100, Oxnard, CA 93033; (805) 385-5000.
Version: 1.4.
List Price: $99; state-tax versions, $69 each.

TurboTax

Published by: ChipSoft, Inc., P.O. Box 85709, San Diego, CA 92186; (800) 755-8829.
Version: 1.0.
List Price: $89; state-tax versions, $49 each.
**MiniCad+ 3.0**

This Eddy-award-winning CAD package is tops in features and value.

With Claris CAD and Ashlar Vellum posing serious challenges, Graphsoft has responded with a completely rewritten MiniCad+, version 3.0, that raises the stakes even higher. While retaining the extensive feature set of the previous version, Graphsoft has extended its power, and given it a more refined and coherent feel, thus making it easier to use.

**Intelligence and Programming**

As soon as you start to edit a document, you notice a difference from version 2.0. The Smart Cursor with Screen Hints automatically highlights and identifies relevant drawing snaps, intersections, tangents, and other constraint criteria. This feature speeds up drawing and placement operations considerably and makes it easier to maneuver around within the document. For most CAD users, this option alone will justify the upgrade to version 3.0.

Version 2.0 introduced MiniPascal as MiniCad+’s macro-programming language, but the only way to create a MiniPascal command file was through a text editor. MiniCad+ 3.0 adds a series of dialog boxes that you can use to create macros. Although this isn’t nearly as developed as the same sort of facilities in dedicated database applications such as FileMaker Pro or 4th Dimension, it is a step in the right direction for those who want to create custom commands but shy away from the notion of programming. You can also use these dialog boxes to create custom drawing tools.

MiniCad+ 3.0 makes it seem as if anything you can do in the Drawing mode, you can also accomplish with a preprogrammed command. Because MiniPascal supports the Macintosh interface by allowing the definition of dialog boxes, alteration of application menus, monitoring of events, and access to the spreadsheet facility, MiniPascal should be considered a full-blown development environment, optimized for CAD and analysis, residing inside MiniCad.

The third major new feature, the Data Palette Relational Database, is an extension of version 2.0’s facilities. Although the manual uses the term *relational* to describe the Data Palette, this is slightly misleading. A better explanation is that the Data Palette, which is a floating window, links typed-in data (class designation, manufacturer, and pricing, for example) to drawn elements and provides you with ways to view and analyze your graphic objects. By using the MiniCad Worksheet (linked spreadsheet facility), you can select different classes of objects and combine them to form relationships that can be used in calculations via MiniPascal’s and the Worksheet’s access to the Data Palette information. This isn’t quite 4th Dimension, but using the Data Palette and the Worksheet together can let you dispense with the need for a separate file-management application for costing and model information.

MiniCad+ 3.0 sports a completely re-done manual that’s divided into three sections: a tutorial of more than 80 pages, a MiniCad user guide (with reference), and a MiniPascal language manual that is as long as the entire MiniCad reference. The tutorial is a welcome addition, and it does a good job of introducing some of MiniCad+’s new features. Unfortunately, some important features, such as command creation and usage, are missing. Graphsoft sells a HyperCard-based tutorial that extends the tutorial booklet.

Since MiniCad is an ever-developing product with a rapid rate of new-feature introduction, the documentation lags a step behind in some spots. Some features are not explained in depth within the user/reference guide, leaving users to their own devices to figure some things out. Luckily, Graphsoft’s support people fill in the gaps.

**The Bottom Line**

Thanks to MiniCad+ 3.0’s enhancements, the program keeps its place as the Mac power-CAD bargain—even considering its competition. The new features don’t slow the program down or make it more difficult to use. In many ways, MiniCad+ 3.0 is still a sleeper; at a fast 2-D/3-D CAD program with an exhaustive feature set, analysis tools unsurpassed in its price range, and a close adherence to the Mac way of doing things. Even allowing that Claris CAD may still have a slightly smoother interface, MiniCad+ 3.0’s extended capabilities make it too good to ignore.

— Peter Mengaziol

---

**Get Info**

**MiniCad+ 3.0**

**Published by:** Graphsoft, Inc.,
8370 Court Avenue, Suite 202,
Ellicott City, MD 21043;
(301) 461-9488.

**Version:** 3.0.

**List Price:** $795.
OUR LETTERS ARE EQUALLY IMPRESSIVE.

Chances are we don't have to tell you how great laser printing is. What you may not know, though, is how affordable it is. Thanks to the newly-priced Personal LaserPrinter™ II from GCC Technologies.

For a lean $999, you get the sharpest text and the cleanest graphics. In essence, the exact same print quality as laser printers costing six times as much.

As for competition from the inkjets, there is none. The PLP™ II prints up to four times faster than the leading inkjet printer. And two times cheaper.* The PLP II also prints edge-to-edge. With on-screen page preview.

One last thing the PLP II has over the rest — more brain power. GCC's custom-designed integrated circuits keep the PLP II small and smart, with features like silent "sleep" mode, automatic toner recycling and unmatched paper handling. Not to mention the ability to upgrade to PostScript.

Impressive facts, indeed. Made all the more remarkable by one outstanding figure. The PLP II...$999.

Call us toll-free at 800-422-7777 for the name of an Authorized GCC Dealer near you or to order your Personal LaserPrinter II direct from GCC.

*Based on consumable cost-per-page for first 25,000 pages.

© 1991 GCC Technologies, Inc. GCC Technologies and the GCC Technologies logo are registered trademarks of GCC Technologies, Inc. PLP is a trademark of GCC Technologies, Inc. PostScript is a registered trademark of Adobe Systems Incorporated. QuickDraw is a trademark of Apple Computer, Inc. In Canada, 800-263-1405.
M.Y.O.B. Teleware's budget accounting system is an excellent choice for small businesses.

In the last two years, M.Y.O.B. has received two Eddy-award nominations. As accounting programs go, it packs more punch per dollar than almost any other system on the market. What makes the program different is that it combines the functionality experienced accountants expect with the ease of use that novices demand. M.Y.O.B. is a solid, double-entry accounting system that can work in any small business. However, it can't handle multiple companies or departments, so its usefulness as a write-up tool for an accounting practice is limited.

Almost All in One
M.Y.O.B. consists of fully integrated accounts-payable, accounts-receivable, general-ledger, and inventory modules. It still doesn't include an integrated payroll system, which limits its usefulness, but many small businesses opt for private payroll services anyway.

M.Y.O.B. incorporates a unique filing concept called Card File that acts like an electronic Rolodex for important business information. If you want to get fancy, you can use a modem as an auto-dialer to make telephone calls from Card File. It combines this feature with a full accounting history for each card, so you can use the package as a sales tool to keep track of your customers' orders.

M.Y.O.B.'s inventory system isn't terribly sophisticated, but it is sufficient for time-and-material shops that keep small inventories and use straightforward valuation methods.

To keep the accounting system simple, M.Y.O.B. uses a five-digit account number that some large businesses may find problematic. Another accommodation to small-business owners is a function that keeps fiscal periods open indefinitely.

Although many professional accountants frown at the mouth at the thought of this approach, M.Y.O.B.'s approach lets the program be used as more than an accounting tool. Teleware recognizes that a small business's accounting system is more than just its books; it's that company's entire management-information system — and the more information easily available, the better.

M.Y.O.B.'s high-end features are accounts-receivable credit warnings, partial payments, invoicing and statements, accounts-payable partial payments using the open-invoice method, automatic late charges and discounts, and budgeting comparing prior year with current year.

New and Better
Version 2.0's new features round out some of the first release's rough spots. Enhancements include custom form printing, an auto-build inventory, an expanded to-do list, new reports, a handwritten option, and an improved command center.

Its custom form-printing system is highly flexible and lets you change the look and content of printed checks, invoices, statements, purchase orders, and mailing labels to give them a unique look and feel.

The auto-build inventory feature keeps track of what parts you use when building an item. When you record completion of a manufactured product, M.Y.O.B. automatically debits all your inventory accounts for the parts used in the manufacturing process and makes all the necessary accounting entries to account for the cost of the parts. Unfortunately, you still have to record spoilage manually.

The program's to-do list has always been one of its most attractive features. The list automatically alerts you about overdue receivables, overdue payables, discounts about to expire, and so on. The expanded to-do list shows a listing of all receivables with overdue items marked with an asterisk. The same holds true for payables, inventory, purchases, and sales.

M.Y.O.B.'s report repertoire has always been well rounded. In addition to the standard accounting reports such as income statement and balance sheet, M.Y.O.B. now produces customer sales details based on a date range; invoice summaries by date range; purchases by date range; pending sales items; a job-inquiry report; and reports by user-specified identifier, such as account types and geography.

The command center, M.Y.O.B.'s navigation system, stays on-screen and remembers where it was placed even when you exit from M.Y.O.B. under MultiFinder. This new feature again demonstrates Teleware's understanding of small businesses: You can enter and exit gracefully as you use your Mac for other daily business tasks, whereas most accounting systems tie up your Mac.

The Bottom Line
M.Y.O.B.'s main competition is still Insight's atOne!. atOne! has the payroll edge over M.Y.O.B., but M.Y.O.B offers inventory control to atOne!s manual system. What was once a clear win-and-show horse race with atOne! in the lead is now a photo finish. The winner depends on which module you bet you can live without. If it's payroll, M.Y.O.B. is the sure winner.

— Ken Landis

Get Info

M.Y.O.B.

Published by: Teleware, Inc., 22 Hill Road, Parsippany, NJ 07054; (201) 334-1154.
Version: 2.0.
List Price: $249.
EVERY YEAR, WE GIVE THE INDUSTRY A LESSON IN PRICE AND PERFORMANCE.

CLASS IS NOW IN SESSION.
Presenting the newly-priced $1999 BLP II.

Two years ago, they called our Business LaserPrinter' "The future of PostScript.®" Last year, they gave our PLP™ II the MacUser Editors' Choice Award. But this time, we're really giving them something to study. Because now, we've done what was considered impossible. We've produced a printer that dramatically outperforms the Apple® LaserWriter® II NT, at half the cost: the $1999 Business LaserPrinter II (BLP™ II).

PostScript For Less.

This is the printer you've always wanted, at a price you never thought you'd see. With true Adobe® PostScript and built-in AppleTalk®, you and everyone else on your Macintosh® network can immediately start producing the highest quality, 300 dots-per-inch (dpi) graphics and text using your favorite software. You even get the same 35 fonts as you get with the Apple LaserWriter. But now, the real lesson begins.

Better At Any Price.

Even if money were no object, the BLP II would still be the printer of choice. It has 2 megabytes of RAM, user expandable to 4, plus a high-speed processor so it can image your document almost twice as fast as the II NT. And unlike the competition, the BLP II's SCSI port boosts performance and provides access to unlimited on-line fonts. Want more? How about a small footprint and silent sleep mode. Edge-to-edge printing. User-friendly LCD front panel display, cost-saving toner recycling system, and our advanced QuickEnvelope™ software that makes printing envelopes a snap. Still not enough?

The Fast Track: BLP IIS.

Maybe you have a large network, with a heavy print load. A network you thought required the speed, power and price tag of a LaserWriter II NTX. Well, think again. Because the BLP IIS gives you performance rivaling the II NTX at a considerably lower price: an 8-page-per-minute printer for just $2899. Whether you choose the BLP II or the BLP IIS, you get compatibility not only with Macintosh, but with IBM® and compatibles, using PostScript or the optional LaserJet II emulation. And you get it fast.

Dealer or Direct: Your Choice.

Just call us toll-free. We'll give you the name of your nearest GCC Technologies dealer. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery. The $1999 BLP II and $2899 BLP IIS. What else can we say, except "class dismissed."

800-422-7777.

GCC TECHNOLOGIES
Peripherals With Vision.

Please circle 92 on reader service card.
Intouch

A worthy successor to QuickDex at last

The first great Mac name-and-address keeper was QuickDex, a small, blazingly fast, free-form database program. Since QuickDex’s debut three years ago, we’ve seen a few good envelope printers with address-book facilities built in (Easy Envelopes, Kiwi Envelopes, and Fast-Envelopes), and some excellent address-book programs (DynoDex, AddressBook Plus, MacPhoneBook). We haven’t, however, seen the blazingly fast name-and-address keeper that would improve on QuickDex.

The Challenger

The DA Intouch, from Advanced Software (its other product is DocuComp), competes directly with QuickDex. It gives away a little in speed but adds a lot in features. Unlike address-book programs with their multiplicity of fields, Intouch has only two data fields per record—a name-and-address field and a notes field in which you store phone numbers and anything else you wish. The notes field can hold up to 32K of information.

Printing abilities are built in. The search-for-box is also always available. Just type in your request, and press Return. In fact, the search-string box is one of the three fields to which tabbing through a record takes you (address, then notes, then search).

You enter data into the two data fields separately. Intouch uses the entire first field, exactly as you’ve entered it, for printing envelopes and labels. The arrangement of data in the second field is up to you. Searches, which are very fast, look through everything in the data fields and find things no matter where you’ve tucked them.

The Snapshot button is a nice feature. It either copies the current address field into the Clipboard or pastes the contents of the Clipboard into the address field if that field is blank. The notes field can be zoomed to take up the whole active window; doing so produces a time-and-date-stamp button at the bottom of the window.

The search functions opt for speed over complexity. You enter a simple ASCII string, and that’s what you search for: no multiple criteria, no Booleans. The Dial button dials the first number in the notes field. If you want to dial another number, you must place the cursor directly before it.

Intouch’s printing capabilities are numerous. You can build custom layouts for envelopes or arrangements of labels as well as use the built-in selection of basic envelope and label layouts. Bar codes and FIsMs (facing identification marks) can be generated on envelopes (except on DeskWriter printers, where the smaller active print area doesn’t allow room for bar codes). Return addresses can have graphics embedded, and the program can store up to ten different return addresses. The printing can be in any typeface and size that fits. You can add messages to the lower left corner of envelopes. Finally, the Print Preview button gives you a look at what you’re about to print.

A Challenge Well Met

Intouch works very well. With more than a thousand records in my file, some with extensive note fields, performance is more than adequate. It’s not as fast as QuickDex, but it’s not so slow as to make me long for QuickDex. The interface is attractive and intuitive.

The phone-dialing capabilities of Intouch are more than adequate. All the features users have come to expect are there: automatic prefixes and suffixes, skipping of area codes for local calls, special dialing-command strings, and the ability to use either the speaker or a modem.

Intouch can import QuickDex and tab-delimited ASCII-text files. It handled my large, messy QuickDex file quickly and well, requiring minimal cleanup after the import. Exporting options are much broader, with 19 formats built in. The export formats cover tab-delimited ASCII and those of all the major database programs and word processors—yes, Word, Excel, and 4D are there. You’re sure to find something useful in the list. You can export just names and addresses or entire records.

The two major drawbacks are the size of the working window, which is on the small side and fixed, and the 9-point type used in the window. I’d really appreciate a resizeable window and the ability to select a different typeface and size for display.

The navigational controls above the address and notes fields take up too much space, especially as they’re not very useful. Records are not sorted into any particular order (they’re kept in the order entered), so there’s usually no reason to scroll through a big file, record by record.

The Bottom Line

Intouch is currently the best pure name-and-address keeper for the Mac. It’s not an address-book printer but a screen program with good one-shot printing ability. Searching is fast, data entry is simple, and it has no glaring flaws or bugs. I use it for names and phone numbers and, thanks to the free-form notes field and time-stamp button, as a contact history. Other users will find it helpful for doing simple project-tracking chores.

In a crowded market, the simplicity and power of Intouch make it stand out. It’s a worthy successor to the old QuickDex 1.4.

— Steven Bobker

Get Info

Intouch

Published by: Advanced Software, Suite 103, 1095 E. Duane Avenue, Sunnyvale, CA 94086; (408) 733-0735. Version: 1.0. List Price: $79.95.
NOW THE ONLY TIME YOUR PRESENTATION HAS TO LEAVE YOUR OFFICE IS WHEN YOU’RE READY TO GIVE IT.

Now, you can produce your own professional-quality 35mm color slides, overhead transparencies, and prints, right at your desk. Without the service bureau, without the long turnaround time, without the high cost, and without losing control. All it takes is your color Macintosh® and ColorFast®, the new color digital film recorder from GCC Technologies™.

As Easy As “Print!”

If you know how to use a laser printer, you know how to use ColorFast. Simply select the ColorFast driver in the Chooser and you’re ready to go. Design your presentation using your favorite software—Microsoft® PowerPoint™, Aldus Persuasion™, you name it. Then, select “print” and you’ll be amazed.

What you see on the screen will be transformed into beautiful, 32-bit color slides, transparencies, or prints, at a fraction of what service bureaus charge. The average production cost with ColorFast is just 75¢ per 35mm slide. So, you reduce your costs up to 94%, without sacrificing any quality.

Incredible Quality, Fast.

ColorFast uses the newest technology from Polaroid®, the undisputed leader in digital film recording. This results in incredible colors, generated by our 33-bit (11 bits per color) pixel recording. To that we’ve added our imaging software (including outline fonts), so you get true “Professional-quality” at a full 4K resolution. There is also a faster “High-quality,” 2K resolution and a quick 1K “Draft” mode. You can even use our “Enhanced Color Resolution” software option to get 4K results at 2K speed.

And because the typical business slide takes only two minutes, what you see on your Macintosh can be on the presentation screen almost instantly. Which means you can make those last minute decisions and changes without sacrificing the quality of your presentation. Or a major chunk of your budget.

Even with all it does, perhaps the most amazing thing about ColorFast is its price: just $5,999. This includes everything: film recorder, 35mm and Pack Film adapters, instant 35mm slide processor, overhead enlarger, software, sample films, slide mounts, and cables.

Two-Year Warranty.

Finally, ColorFast is the only digital film recorder with a two-year warranty. To get ColorFast, all you have to do is call 800-422-7777. We’ll give you the name of your nearest GCC Technologies dealer, or you can order direct. When you buy direct from GCC, you get a 30-day money-back guarantee and $9 overnight delivery. Call today. And start creating more professional presentations, in your own office, tomorrow.

800-422-7777.

 GCC TECHNOLOGIES
 Peripherals With Vision.

Gee Technologies dealers are independent businesses, and as such they may offer different prices, policies, and service arrangements. In Canada call 800-288-0409. © 1990 GCC Technologies, Inc.
The companies participating in this program
The majority of products we carry are offered
There's nothing we like better than seeing
all of the original packaging
call us for an authorization and return it
deserve. Which is the way we feel about all
with your purchase of any of these products,
limit quantities on such returns.

Awards. So this month, to highlight their
achievement, we're featuring plenty of Eddy
Mentions (Eddy H.M.) along with our other
winning products.

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

LATEST VERSIONS
We only carry the very latest versions of
products so, rest assured, that's what you'll
receive when you order. The version numbers
shown here are based on the best available
information at press time. If a newer version
has come out in the meantime, or if there's
been a price change, we'll let you know before
taking your order. Also, all software is not copy-
protected, unless indicated otherwise by (CP).

DAILY BUSINESS

Not every Tom,

There's nothing we like better than seeing
some old friends get the recognition they
deserve. Which is the way we feel about all
the honorable mentions and winners of the
6th annual MacUser Editor's Choice (Eddy)
Awards. So this month, to highlight their
achievement, we're featuring plenty of Eddy
(Hight) award winners and Eddy Honorable
Mentions (Eddy H.M.) along with our other
winning products.
270U

1-800/334-4444

MacConnection®

14 Mill Street, Marlow, NH 03456  603/446-7711  FAX 603/446-7791

Innovative Data Design

Dantz Development ... 30 day MBG
7945 Retrospect Remote 1.2—Honorable Mention—
1990 MacUser Editors' Choice Award for Best
Convenience Software. Provides automatic, unattended
workgroup backup using AppleTalk network.
Supports tape, optical, & cartridge drives $265.

* Aldus/Silicon Beach ... 30 day MBG
6674 Personal Press 1.0 .................. 199.
3506 SuperPaint 2.0A .................. 135.
8811 SuperPaint/Personal Press Bundle . 279.
3980 Digital Darkroom 2.0 ............ 259.
3507 Super3D 2.1 .................. 279.

PERSUASION, Persuasion, Print or Free-land ea. 329.

Danz Development

7088 PageMaker 4.0 .................. 499.
8054 Design Team (PM, FH & PrePrint) . 899.

* Softsynic/BLOC ... 30 day MBG
7129 Accountant, Inc. 2.0 . ... 345.
Eddy H.M. - Best Financial Management

* Symantec ... 30 day MBG
3422 More 3.0 . ... 265.
Eddy - Best Presentation Product

* Symphony ... 30 day MBG
3639 WriteNow 2.2A/Grammatik Mac .... 117.
Eddy H.M. - Best Financial Management

* Synergy ... 30 day MBG
5425 Art Importer 2.0 ............ 89.
6499 Metamorphosis 1.5 .......... 89.

* Syngovis, Inc ... 30 day MBG
1195 Fontgrapher 3.2 .......... 265.

* Symantec ... 30 day MBG
8118 Record-Holder Plus 3.1 ...... 85.

* Survivor Software ... 30 day MBG
8279 HyperTax Tutor/Tax闰 output . 99.

* SYSTAT, Inc .... 30 day MBG
3980 WordPerfect Mac 2.0 .......... 279.

* Survivor Software ... 30 day MBG
1195 Fontgrapher 3.2 ........ 265.

* Survivor Software ... 30 day MBG
1195 Fontgrapher 3.2 ........ 265.

* Symantec ... 30 day MBG
8171 Adobe Illustrator 3.0 .......... 159.

* Survivor Software ... 30 day MBG
1195 Fontgrapher 3.2 ........ 265.

* Symantec ... 30 day MBG
8171 Adobe Illustrator 3.0 .......... 159.

* Survivor Software ... 30 day MBG
1195 Fontgrapher 3.2 ........ 265.

* Survivor Software ... 30 day MBG
1195 Fontgrapher 3.2 ........ 265.

* Survivor Software ... 30 day MBG
1195 Fontgrapher 3.2 ........ 265.
## Has the specs

<table>
<thead>
<tr>
<th>Program</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic Arts</td>
<td>$199</td>
</tr>
<tr>
<td>Studio 8</td>
<td>$189</td>
</tr>
<tr>
<td>Studio 9</td>
<td>$449</td>
</tr>
<tr>
<td>MacRecorder Voice Digitizer</td>
<td>$99</td>
</tr>
<tr>
<td>MacRecorder Sound System 2.02</td>
<td>$159</td>
</tr>
<tr>
<td>MacPaint 1.1</td>
<td>$92</td>
</tr>
<tr>
<td>MacDraw 1.1V</td>
<td>$289</td>
</tr>
<tr>
<td>Canvas 2.1.1</td>
<td>$189</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Ventura Publisher 3.0</td>
<td>$499</td>
</tr>
<tr>
<td>MacDraft 2.1</td>
<td>$279</td>
</tr>
<tr>
<td>MacRecorder Man</td>
<td>$549</td>
</tr>
<tr>
<td>DeltaGraph 2.0</td>
<td>$109</td>
</tr>
<tr>
<td>ColorStudio 1.1</td>
<td>$649</td>
</tr>
<tr>
<td>ColorStudio 1.1</td>
<td>$60</td>
</tr>
<tr>
<td>Color Press Pro Press Program</td>
<td>$43</td>
</tr>
<tr>
<td>MacDraft 2.1</td>
<td>$279</td>
</tr>
<tr>
<td>MacRecorder Man</td>
<td>$549</td>
</tr>
<tr>
<td>Letraset 1.5</td>
<td>$79</td>
</tr>
<tr>
<td>FontStudio 1.0</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$399</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Multimedia Software</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$299</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
<tr>
<td>Eddy H.M. - Best Animation Program</td>
<td>$499</td>
</tr>
<tr>
<td>Eddy H.M. - Best Page Design Program</td>
<td>$349</td>
</tr>
<tr>
<td>Eddy H.M. - Best Typographic Product</td>
<td>$359</td>
</tr>
<tr>
<td>Eddy H.M. - Best Graphics Program</td>
<td>$159</td>
</tr>
<tr>
<td>Eddy H.M. - Best Data Resource</td>
<td>$549</td>
</tr>
</tbody>
</table>
to earn the name Ed.

Adobe Systems
6644 Adobe Place
Palo Alto, CA 94304

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

$499.

PROGRAMMING & UTILITIES

Abbott Systems ... 30 day MBG
5236 CanOpen 1.1 63.

Advanced Software ... 30 day MBG
8051 In Touch 1.0 40.

Affinity Microsystems ... 60 day MBG
7835 Tempo II Plus 105.

Aladdin Systems ... 30 day MBG
6169 Shortcut 1.0 46.

Alux/Silicon Beach ... 30 day MBG
6740 Stuff! Deluxe 2.0 63.

Baseline Publishing ... 30 day MBG
7783 INIT Manager 35.

Berkeley Systems ... 30 day MBG
5738 After Dark 2.0T 22.

Casady & Greene ... 60 day MBG
1541 Stepping Out II 2.02 49.

CE Software ... 60 day MBG
2269 QuickDEX 1.4D 34.

FileGuard Extended 2.5.2 (1 user) 199.
7443 A.M.E. 1.1.2 159.

FileGuard Extended 2.5.2 (5 users) 349.
7422 FileGuard Extended 2.5.2 (10 users) 579.

Fifth Generation ... 30 day MBG
7085 INIT Manager 35.

Fifth Generation ... 30 day MBG
8264 SuperSPOOL 3.0 62.

ICOm Simulations
4084 On Cue 1.3 35.
4085 TMON 2.8.4 86.

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

$349.

FastBack 1.5 or Disklock 2.0 118.

Fourth Generation ... 30 day MBG
7830 Maxima 1.0 45.

FutureTranslation III 2.0 63.
6123 Virtual 2.04 (for SE/30, Irix, & Irix) 115.

Smart Alarms 3.0 125.
7463 Smart Alarms 3.0 w/Appointment Diary 3.1 125.

Smart Alarms 3.0 w/Appointment Diary 3.1 125.
6122 Virtual 2.02 (for Mac II, incl. PMMU) 188.

HandOff II 1.1.3 57.
6647 HandOff II 1.1.3 57.

Speedy H.M. - Best Utility
7946 ClickChange 1.0 41.
1824 Calculator Construction Set 2.09 6.

SMTP ... 30 day MBG
5255 Retrospect 1.2 148.
7945 Retrospect Remote 1.2 65.

Easy H.M. - Best Connectivity Software
7946 Remote (10 Pack of initi) 148.

Dantz Development ... 30 day MBG
5255 Retrospect 1.2 148.

Digital Tah 60 day MBG
5166 SmallTalk/V Mac 1.1 124.

Dumbi-Click Software
7974 ClickChange 1.0 41.
1824 Calculator Construction Set 2.09 6.

Dantzel ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

FindExpress ... 30 day MBG
4084 On Cue 1.3 35.
4085 TMON 2.8.4 86.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

FindExpress ... 30 day MBG
4084 On Cue 1.3 35.
4085 TMON 2.8.4 86.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.

FastBack 1.2.5 or DiskLock 2.0 118.
8264 SuperSPOOL 3.0 62.
8266 SuperSPOOL 3.0 62.

Fifth Generation ... 30 day MBG
4287 PYROI 4.0 25.
3955 Suitcase II 1.2 6.
When put to the test

**Preferred Publishers** ... 30 day MBG
6656 Personality 1.1 ........................ $49.
6654 DiskDoubler 3.1 ......................... 45.
6653 SuperMac Tech. .............. 60 day MBG
3377 DiskFit 2.0 .................................... 58.
3447 SmartScrap & The Clipper 2.1 .... 56.
3443 Norton Utilities for the Mac 1.0 .... 75.
6656 Personality 1.1 ........................ $49.
"Highlighted Data" 30 day MBG
3377 DiskFit 2.0 .................................... 58.
3447 SmartScrap & The Clipper 2.1 .... 56.
3443 Norton Utilities for the Mac 1.0 .... 75.
6656 Personality 1.1 ........................ $49.
*Salient Software* ... 30 day MBG
7404 DiskDoubler 3.1 ......................... 45.
7408 MacEnvelope 5.02 ..................... 57.
6657 Prograph 2.0 .............................. 245.
8057 CD-ROM Porta Drive .............. 649.
7688 Porta Drive & MS Office CD-ROM 999.
Chinon 8813 CDA-431 CD-ROM Drive .... 639.

**CD-ROM**

**Activision**
8125 Cosmic Osmo (CD-ROM) .............. 46.
8126 Eddy - Best Recreation Program
8057 CD-ROM Porta Drive .................. 649.
7688 Porta Drive & MS Office CD-ROM 999.
Chinon 8813 CDA-431 CD-ROM Drive .... 639.

**Microcom** ... 30 day MBG
4803 Vinx 3.0 ................................. 149.
8561 911 Utilities - Troubleshooting file/disk recovery, complete undelete, isolate bad sectors, & Vinx. 89.
8562 Complete Undelete - Recovers deleted files 48.

**EDUCATION & RECREATION**

**Acclaim**
8220 Activision .......................... 34.
4486 Manhole ................................... 28.
8217 Stratego or Balance of the Planet ea. 29.
8220 Jack Nicklaus Greatest 18. .... ..... 34.
3480 HyperBible 2.0 (KJ or NI) ........... ea. 125.
8220 Practica Musica 2.2 ................. 69.
5726 Voyager 1.2 .................. 88.
8217 Ishido: The Way of the Stones ... ea. 32.
8220 Jack Nicklaus Greatest 18. .... ..... 34.
5726 Voyager 1.2 .................. 88.
8220 Practica Musica 2.2 ................. 69.

**EDUCATION & RECREATION**

**Acclaim**
8220 Activision .......................... 34.
4486 Manhole ................................... 28.
8217 Stratego or Balance of the Planet ea. 29.
8220 Jack Nicklaus Greatest 18. .... ..... 34.
3480 HyperBible 2.0 (KJ or NI) ........... ea. 125.
8220 Practica Musica 2.2 ................. 69.
5726 Voyager 1.2 .................. 88.
8217 Ishido: The Way of the Stones ... ea. 32.
8220 Jack Nicklaus Greatest 18. .... ..... 34.
5726 Voyager 1.2 .................. 88.
8220 Practica Musica 2.2 ................. 69.

**Electronic Arts** ... 30 day MBG
8056 Studio/8 2.0-1990 MacUser Editors' Choice Award for Best Graphics Program. The professional's tool for all aspects of design. $449.
8315 Studio/8 2.0-Now packed with more features and lower in price! $189.

**Broderbund Software**
4314 Typer 1.0 .................................. 18.
6516 The Playroom 1.1 (CP) ............ 29.
8266 SimEarth 1.0 .......................... 40.
4969 SimCity 1.2 (CP) ....................... 29.
5871 SimCity Supreme 1.2 (CP) ......... 47.
5871 SimCity Supreme 1.2 (CP) ......... 47.

**Carina Software**
4074 PS1 Mustang (CP) ................. 36.
5726 Voyager 1.2 ............................. 68.
4720 Geom., Physics, or Calc. (CP) ... ea. 58.

**Davidson & Associates**
7343 Math Blaster! 1.0 (Color) .......... 29.
8108 MusicProse 2.0 .......................... 30.
9626 Math Blaster Mystery 1.0 .......... 41.
2268 Crystal Quest 2.2 ..................... 29.
5726 Voyager 1.2 ............................. 68.
4720 Geom., Physics, or Calc. (CP) ... ea. 58.

**Eddy H. M.**
6653 Norton Utilities for the Mac 1.0 .... 84.
6653 Norton Utilities for the Mac 1.0 .... 84.
6653 Norton Utilities for the Mac 1.0 .... 84.
6653 Norton Utilities for the Mac 1.0 .... 84.
6653 Norton Utilities for the Mac 1.0 .... 84.
6653 Norton Utilities for the Mac 1.0 .... 84.
6653 Norton Utilities for the Mac 1.0 .... 84.
against all the rest

Custom Applications ... 30 day MBG

6517 Freedom of Press 1.0 - Brings PostScript printing capabilities to non-PostScript, black and white devices. New features include Adobe Type 1 support and compatibility with all Macs. $255.

8057 Freedom of Press Light 3.0 (17 fonts) ... 56.

Earthquest ... 30 day MBG

8050 Earthquest 1.0 ... 48.

Electronic Arts ... 30 day MBG

6716 Pipe Dreams 1.0 ... 17.

8643 Harpoon ... 39.

Great Wave ... 30 day MBG

6611 Kanjimaster · Beg. ... 43.

HyperGlot Software ... 30 day MBG

3434 NumberMaze ... 8.

Pentona Overseas ... 30 day MBG

5391 Moraity Revenge ... 32.

Nordic Software ... 30 day MBG

8258 Turbo Math Facts 1.1 ... 26.

Passport Designs

8253 TRAX 2.0 ... 59.

8254 Desktop Music Creativity Kit ... 189.

3117 Master Tracks PRO 4 1.4 ... 319.

8250 Encore 1.3.1 ... 379.

Postcard

6466 Citadel ... 26.

Premier Technology

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

Sierra On-Line

8228 Wizardry II (CP) ... 29.

Software Toolworks ... 30 day MBG

4619 Mavis Beacon Typing 1.3 (CP) ... 32.

5488 Life & Death (CP) ... 32.

Spectrum Holobyte ... 30 day MBG

3464 Tetris 1.1 ... 22.

6112 Wettliss 1.1 ... 22.

Eddy H.M. · Best Recreation Program

8180 Faces ... 24.

Vettel 1 or Falcon 2.2 ... 32.

Spinnaker ... 30 day MBG

2328 Sargon IV (CP) ... 28.

Strategic Studies ... 30 day MBG

8084 Halls of Montezuma ... 26.

8085 Panzer Battles ... 26.

StudyWare

4CT, GMAT, GRE, or SAT Prep ... 29.

8098 LSAT Tutor for Mac ... 35.

Terrace Software ... 30 day MBG

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

Individual Software

Training for Word or PageMaker ea. $35.

Online Design ... 30 day MBG

5870 Bomber 1.3 (includes headphones) ... 32.

Darwin's Dilemma 1.0 ... 32.

Tesserac 1.0 ... 32.

Learning Company ... 30 day MBG

2670 Reader Rabbit 2.2 (CP) (ages 4-7) ... 30.

5453 Talking Math Rabbit 2.0 (ages 4-7) ... 30.

Leister Productions ... 30 day MBG

7126 Reunion 2.0 ... 95.

Microsoft ... 30 day MBG

2666 Flight Simulator 1.0.2 (CP) ... 32.

Mysterium Tremendum ... 30 day MBG

5841 Morality Revenge (CP) ... 32.

Nordic Software ... 30 day MBG

8258 Turbo Math Facts 1.1 ... 26.

8257 PreSchool Pack 1.0 ... 36.

Postcard Designs

8253 TRAX 2.0 ... 59.

8254 Desktop Music Creativity Kit ... 189.

3117 Master Tracks PRO 4 1.4 ... 319.

8250 Encore 1.3.1 ... 379.

Postcard

6466 Citadel ... 26.

Premier Technology

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

Sierra On-Line

8228 Wizardry II (CP) ... 29.

Software Toolworks ... 30 day MBG

4619 Mavis Beacon Typing 1.3 (CP) ... 32.

5488 Life & Death (CP) ... 32.

Spectrum Holobyte ... 30 day MBG

3464 Tetris 1.1 ... 22.

6112 Wettliss 1.1 ... 22.

Eddy H.M. · Best Recreation Program

8180 Faces ... 24.

Vettel 1 or Falcon 2.2 ... 32.

Spinnaker ... 30 day MBG

2328 Sargon IV (CP) ... 28.

Strategic Studies ... 30 day MBG

8084 Halls of Montezuma ... 26.

8085 Panzer Battles ... 26.

StudyWare

4CT, GMAT, GRE, or SAT Prep ... 29.

8098 LSAT Tutor for Mac ... 35.

Terrace Software ... 30 day MBG

8192 Mum's The Word (gardening) ... 79.
The Eddies have

Berkeley Systems ... 30 day MBG
5737 After Dark 2.07-New! Over 30 displays & SOUND. Ticking clocks, thunder, munching worms. Use company logo, messages. Great Fish, Flying Toasters, & MultiModule. Random display, & password sleep. ......... $22.

Intel Corporation
5119 2400EX Modem ........... $199.
6420 2400EX NMP Modem........ 229.

International Business Software
8581 DataCube (3 use) 199. 8580 (10 use) 139. Edy H. M. - Best Work-Group Product

*Kennect Tech. ... 30 day MBG
5631 Rapport 1.3.4 ............... 195.
7588 Drive 260 (512*) ............ 249.
7585 Drive 272 (512*) ............ 249.
5632 Drive 2.4 (516*) (incl. FastBack II) ......... 325.

*Microcom ... 30 day MBG
7465 CarbonCopy Mac (Twin Pack) ........ 169.
8027 MacModem V.32 ............... 689.

*Nuvotech ... 60 day MBG
3000 TurboNet ST (DIN-8) ....... 30.
6751 TurboNet ST (12-Pack) ....... 279.
6647 Nuvolink SC (DIN-8) ........ 325.

*Orchid Technology ... 30 day MBG
6949 OrchidFAX Modem 1.06 ...... 429.

*Practical Peripherals ... 30 day MBG
3102 2400 baud External Modern ....... 179.
5285 PM2400SA NMP Modern ....... 209.
7534 PM9600SA Modern 1.26 ....... 469.
3089 MacCommunications Pack 1.5.... 225.

*t CE Software ... 60 day MBG
5173 QuickMail 2.2.3 ............. 351.
1676 Macintosh Membership Kit 1.03 ... 23.
1673 CompuServe Membership Kit 3.0 ... 49.
1674 Membership Kit/Navigator Bundle ... 69.

*DataViz ... 60 day MBG
1823 MacLink Plus/PC 5.0 ......... 117.

Dayna Communications
8719 EtherPrint ..................... 349.
8720 DayTalk (5 Pak) ............ 389.
8721 DayTalk (10 Pak) ............. 695.

*Dove Computer ... 60 day MBG
6758 DoveFax Desktop 1.1.1 ......... 299.

*Dom Jones ... 30 day MBG
5295 News/Retrieval Membership Package 24.

EveryWare
8077 AllShare 1.0 .................. 139.

*Farallon Computing ... 30 day MBG
5707 Timbuktu 3.1 ............... 95.

Edy H. M. - Best Connectivity Software
4867 Timbuktu 3.1 30-Pack ........ 1285.
4966 Timbuktu/Remote 2.0 ........ 123.
6371 Timbuktu/Remote Access Pack ... 845.
8707 Liaison 3.0 ................. 259.
6273 PhoneNET StarConnector 10-Pack .... 129.
4869 PhoneNET Connector 10-Pk (DIN-8) ...... 198.
2206 PhoneNET StarController 300 .... 825.
6687 PhoneNET StarController-EN .... 1589.
6766 MediaTracks ....... 189.

*Freesof Software ... 60 day MBG
6115 White Knight 11 .............. 65.

*Global Village ... 30 day MBG
8946 TelePort A300 ............... 129.
8945 TelePort/FAX ................. 185.

Hayes
2300 Smartcom II 3.2 ............. 84.
2307 Smartmodem 2400 ............. 349.
5991 V9600 baud Modern ......... 689.

Insignia Solutions
7557 Access PC 1.0 ............... 62.
7058 SoftPC-AT/EGA Module .... 125.
4089 SoftPC 1.3 ................... 213.

Kenncott Technology ... 30 day MBG
5707 Timbuktu 3.1-1990 MacUser Editors Choice Award for Best Connectivity Software. Allows a Mac to view and control other Macs on a network simultaneously. A great brain-storming tool. $95.

*Preferred Publishers ... 30 day MBG
8943 DoubleTalk (1 Pak) 79, 8942 (2 Pak) 129.

*Prometheus ... 30 day MBG
8762 Travel Modern .......... 195.
8350 2400 Mini for Mac .......... 149.
8348 24/96 Minifax .......... 199.
8349 Maxifax .......... 295.
8738 9600M Plus .......... 599.

Eddy H. M. - Best Communications Prod.
8440 NetSerial 3.3 ............... 275.
4347 NetBridge ............... 409.
4942 TeleBridge ............... 409.
3443 NetModem V2400/3.3 ....... 339.
6917 Edy H. M. - Best Connectivity Hardware .... 1169.
6519 EtherGate ............... 1619.
8189 FastPath IV .............. 1889.

*Sitka/TOPS ... 30 day MBG
4188 TOPS Telecontroller (DIN-8) .... 23.
3720 TOPS Flashcard ............ 155.
6264 TOPS Networking Bundle 3.0 .... 187.

Pixar
5966 MacRenderMan — Honorable Mention — 1990
MacUser Editors Choice Award for Best 3D Modeling/Rendering Pkg. Combine with any 3D program to create photographic-quality images with the most advanced rendering software $549.

*Software Ventures ... 30 day MBG
3455 MicroPhone II 3.0 ........... 215.

*Sitka/TOPS ... 30 day MBG
6720 FAXGATE Plus 1.1.2 ......... 239.

Synergy ... 30 day MBG
6618 VersaTerm 5.5 ............ 174.

Traveling Software ... 30 day MBG
3729 LapLink Mac III Connectivity Pac. 93.

INPUT/OUTPUT

*Abaton ... 30 day MBG
7432 Scan 300/GS (reqs. Scan Kit) .... 999. Includes free ProPoint ($79 value).

American Power
5895 UPS 110SE ............... 209.
6686 UPS 370ci ............... 329.

Caere
8124 Typist ........... 479.
4476 OmniPage 2.1 ............. 495.

Chinon
8814 DS-3000 Scanner w/Dig. Darkroom 699.
8815 DS-3000 Scanner w/OmniPage .... 1099.

Kenncott Technology ... 30 day MBG
Drives—Owners of any Macintosh (512e-IIIi) can get complete compatibility with all IBM and Apple formats by plugging one or more of Kenncott's 3 1/2" or 5 1/4" drives into Rapport. see line listing for prices.
Dear MacConnection,

As usual, I'm extremely happy with every aspect of your company. Yesterday I ordered additional memory for my SE and after watching the video twice, it was installed and working in less than 20 minutes. Pretty exciting for a homemaker! And to think, our local computer stores wanted $60 - $65 to do the job! The video instructions really made the difference. Also, thank you for being ecologically minded. Your catalogs are beautiful (better than before).

And I sure don't miss the "peanuts."

Diana Robinson
Diamond Bar, CA

"Pretty exciting for a homemaker!"

MacConnection®

MacConnection, 14 Mill Street, Marlow, NH 03456  603/446-7711  FAX 603/446-7791

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

Global Village ... 30 day MBG
TelePort A200-950 MacUser Editors' Choice Award for Best Communications Product. 2400 bps/MNP-5 modem connects via ADB Port. Send/Fax (9600 baud) optional. 8946 Basic ... $129. 8945 with FAX ... $185.

Quantum
40 Meg & 80 Meg Internal Drives for Mac SE, SE/30, IIX, IIX, IICX & IICXc ... call SuperMac Tech. 7451 Dataframe XP 200 Hard Drive ... 1399. 5451 Dataframe XP 330 Hard Drive ... 2249.

STORAGE MEDIA

★ Sony ... 60 day MBG
3297 3 1/2” DS/DD Disks (10) ... 12. 6148 3 1/2” DS/DD Disks 3 Pak (30) ... 29. 3298 3 1/2” HD Disks 1.44 Meg (10) ... 19. 6375 3 1/2” HD Disks 3 Pak (30) ... 49.

★ MacConnection ... 60 day MBG
6592 44 Meg Removable Cartridge ... 75. ★ MAXELL ... 60 day MBG
2792 3 1/2” DS/DD Disks (10) ... 13. 2793 3 1/2” HD Disks 1.44 Meg (10) ... 21.

★ 3M ... 60 day MBG
3943 DC2000 40 MB Data Cartridge ... 19.

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

ACESSORIES

Apple Computer
7748 Personal LaserWriter Toner Cart ... $89. 1115 LaserWriter II Toner Cartridge ... 105.

★ Avery ... 60 day MBG
4807 Laser Labels 1” x 2 1/8” (Qty. 3000) ... 24. 5392 Disk Labels 3 1/2” Laser (Qty. 630) ... 29. 4865 Address Labels 3 1/2” x 1 1/2” (3750) ... 15. 4811 Transparencies 8 1/2” x 11” (Qty. 50) ... 22.

★ Basic Needs ... 60 day MBG
Dust Covers ... 10, to 13. 7413 Mac Icx/ct Monitor Stand ... 48.

★ Computer Coverup ... 60 day MBG
1723 ImageWriter II Cover ... 8. 1725 Mac SE Ext. Keyboard Cover set ... 10.

★ CoStar ... 30 day MBG
7453 The Organizer Jr ... 79. 6091 The Organizer ... 199.

Curtis Manufacturing
8046 MVP Mouse ... 89.

★ Goldstein & Blair ... 30 day MBG
8198 “What Do I Do Now?” Book ... 9. 2267 The Macintosh Bible (3rd Ed.) ... 19.

MegaGraphics
49” Rival Monochrome System for SE, SE/30 or II—Macworld Editors’ Choice in large screens. Also includes coupon book with over $300 in savings on special 3rd party products. ea. $1199.

★ Targus ... 60 day MBG
3617 Mac Plus/SE Carry Case ... 55. 4015 Mac SE & Ext. Kybd. Carry Case ... 69.

★ Trip Lite ... 30 day MBG
6200 Isobar 6 (surge suppressor, 6 outlets) ... 59.

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 (in the U.S.).
• No sales tax, please Ohio residents (please add applicable 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 clear the same day for immediate shipment of your order.
• Corporate F.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.
• Our order lines are now open 24 hours a day Monday through Friday, and 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 events beyond our control, all credit card orders phoned in weekdays by 3:15 AM EST will ship by overnight delivery for the next business day. Which means same day delivery for orders placed between midnight and 3:15 AM EST. (Some orders may ship by UPS Ground for next day delivery). Saturday delivery available to many areas upon request. Some areas require an additional day delivery. The freight charge on any order placed for an additional day delivery. All other areas: Call 603/446-7711 for information on shipping and charges.

Virgin Islands: Call 800/334-4444 for information on shipping and charges.
come out ahead.

Computer Friends

8271 ColorSnap 32+ ........................................ $649.
8272 CoStar ........................................... 30 day MBG
6036 LabelWriter .......................................... 185.
6630 Datadesk ........................................... 30 day MBG
6631 Switchboard (modular keyboard) 159.
8273 Eddy H.M. - Best Input Device
MAC-101 Keyboards .......................... ea. 129.
8274 DayStar Digital .................................. 30 day MBG
8565 FastCache for Mac Ici .................. 279.
8566 40 MHz PowerCache Iicl ......... 949.
8567 50 MHz PowerCache Iicl ........ 1689.
6632 SCSI PowerCard ............................... 1095.
19 MHz PowerCard 300 (IIx, Iicx) ea. 1095.
40 MHz PowerCard 300 (IIx, Iicx) ea. 1389.
50 MHz PowerCard 300 (IIx, Iicx) ea. 1995.
6620 MacTRAC ........................................... 62.
6621 MacTRAC ADB ................................. 75.

Kodak

6730 DICONIX M150 Plus Printer .... 489.
7519 KM30 ADB Joystick .......................... 42.
5082 ScanMan Mac Model 32 ................. 299.

Magnavox

6690 14" Color Monitor with Micron Xceed
for SE/30 (640 x 480) ........................ special 849.
8741 16" 24-bit Color System for Mac II .... 699.
19" Rival Sys. SE, SE/30, or II .... 1199.
19" 8-bit System for SE/30 or II ........ 4295.
8740 19" 24-bit Color System for Mac II .... 699.
19" GS System for SE/30 or II ........ 4295.
8745 19" 24-bit Color System for Mac II .... 699.
19" GS System for SE/30 or II ........ 4295.
7149 Xceed Ici-128 Cache Card .............. 239.
6680 Xceed Ici-SE/30 (640 x 480) .......... 329.
8276 MicroSpeed .................................. 30 day MBG
6620 MacTRAC ........................................... 62.
6621 MacTRAC ADB ................................. 75.

Total Systems

8653 Galileo I Video Board (for Mac SE) $449.
7817 16 MHz Mercury Q30 (for Mac SE) 369.
8624 16 MHz Mercury Q30 (for Mac Plus) 499.
7816 20 MHz Gemini 030 ........................ 799.
8708 25 MHz Gemini G50 w/o copro. .... 999.
7814 33 MHz Gemini II 030 ................. 1199.
8371 40 MHz Gemini II 030 ................. 1339.

MEMORY & DRIVES

SiSIMMs .... 2 year warranty includes free instructional video tape (specify VHS or Bmm) and booklet.
1107 1 Mag SiSIMMs (80ns) ....................... 57.
6316 2 Mag SiSIMMs Set (80ns) .............. 99.
7497 1 Mag SiSIMMs for Mac IIfx (80ns) .... 119.

Applied Engineering

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

Company

8353 Pli TurboFloppy 1.4 .......................... 309.
8334 Pli SuperFloppy 1.4 ......................... 449.
8336 Pli DOS Floppy ................................. 469.
8327 Pli Infinity 40 Turbo ......................... 749.

Cutting Edge .................................. 30 day MBG
Cutting Edge Hard Drives are fast and reliable with access times as low as 23 milliseconds and a mean time between failure rating of up to 100,000 hours. An outstanding combination of quality and low price. .... see line listing.

RasterOps

7457 Video ColorBoard 364—1990 MacUser
Editors' Choice Award for Best Desktop-Video
Product. "Full 24-bit color display and live video
in a single affordable package" ................ $975.

Mouse Systems .................................. 30 day MBG
7560 Trackball ADB ................................ 69.
Little Mouse or Little Mouse Plus. ea. 74.

Nutmeg Systems .................................. 30 day MBG
15" Mono: SE, SE/30, II or Iicx ea. 599.
19" Monitor: SE, SE/30, II or Iicx ea. 995.
8319 20" Color Trinitron: SE/30, Iicx ea. 2595.

Orange Micro .................................. 30 day MBG
3036 Grappler 2.0 (9 pin) ......................... 87.
6229 Grappler LX ................................ 134.

Pacific Data Products

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

RasterOps

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

Sophisticated Circuits .......................... 30 day MBG
8009 PowerKey 65, 8008 Wake-Up Cable 32.

Thunderware

6104 Hall-Page Scanner/400 .................... 295.
4994 LightningScan 400 ......................... 385.

Shiva .................................... 30 day MBG
6917 NewModem V32—Honorable Mention—1990
MacUser Editors' Choice Award for Best
Connectivity Hardware. This shared modem
now includes V.42 and V.42bis for higher
performance, speed, and reliability. .... $1169.

Cutting Edge .................................. 30 day MBG
Shiva .................................... 30 day MBG
3989 800K External Disk Drive ......... 149.
5133 20 + Meg Hard Drive ................. 329.
3990 30 + Meg Hard Drive ................. 369.
3991 45 + Meg Hard Drive ................. 449.
5276 80 + Mag Hard Drive ..................... 539.
5456 45 Meg Removable Drive .......... 649.
5736 45 Meg Removable Cartridge .... 69.

Dayna Communications

6723 DaynaFILE 360k Drive ................. 449.
6722 DaynaFILE 1.2 5¼" Drive .......... 489.
6927 DaynaFILE 1.4 MB ......................... 629.
6725 DaynaFILE Dual 380k & 1.2 MB .... 669.
6724 DaynaFILE Dual 380k & 1.44 MB ... 739.

Dove Computer .......................... 60 day MBG
6872 Marathon 030 Upgrades .............. 529.
6186 MacSnap 52X4E ......................... 199.
6187 MacSnap 52X4S (w/SCSI Port) ... 249.
6849 MacSnap 596XE (4 MB) ................. 299.
6852 MacSnap 596XS (4 MB w/SCSI Port) 365.

Peripheral Land, Inc. (PLI)

8335 Pli TurboFloppy 1.4 ....................... 309.
8334 Pli SuperFloppy 1.4 ......................... 449.
8336 Pli DOS Floppy ................................. 469.
8333 Pli Sony 40 Turbo Ext. Drive ....... 489.
8327 Pli Infinity 40 Turbo ......................... 749.
Three Archiving Packages

Compactor, the Eddy-winning shareware program, and DiskDoubler threaten StuffIt's dominance.

For a long time, StuffIt has been the most popular utility for compressing and archiving files. Virtually every BBS and on-line service stores its files in StuffIt format. But StuffIt is showing its age. Having looked at StuffIt Deluxe recently (see review, December '90, page 68), I tested DiskDoubler, Compactor, and Diamond to discover which was the easiest to use and which produced the smallest files in the shortest time. All were dramatically faster than StuffIt, and the first two are a real challenge to the de facto standard.

DiskDoubler

DiskDoubler consists of an application and an INIT. You'll rarely open the application. You can do everything necessary with the DD menu that the INIT adds to your desktop. To compress or decompress a file, select its icon on the desktop and choose the Compress or Expand command in the menu. If you select a disk or folder, the command will apply to all the files within it. The filenames and their locations within folders always remain the same. In addition to its own compressed files, DiskDoubler also expands archives created with StuffIt through version 1.5.1 and PackIt III through version 1.3.

DiskDoubler was designed to stretch disk space. You initially compress your document files, saving 50 percent or more of their normal size. You can select between two compression methods. Method A consistently makes smaller files than Method B. The INIT is also useful for converting files created with a non-compressed version of a document into a compressed form. You can then use the INIT to convert those files back into their original form.

Small Is Beautiful

Although most of the compressed files were about the same size, the time it took to produce those files varied widely. The times and file sizes shown are for the smallest compressed file produced by each package. Tests were run on a Mac IIfx with 8 megabytes of RAM in 8-bit-color mode under the Finder. The results for StuffIt and StuffIt Deluxe are presented for comparison.
Designing the Future...
MicroStation

From the world's leading supplier of computer-aided design solutions comes MicroStation, the first production CAD package for the Apple Macintosh. MicroStation is a powerful 2D/3D CAD system incorporating a full implementation of the Macintosh user interface to give you the standard look and feel of Macintosh software. Easy to learn and easy to use.

MicroStation lets you share common data simultaneously within a network of PCs, Macintoshes, and UNIX workstations.

MicroStation offers a wide range of third-party applications and a sophisticated platform for developing your own applications.

When productivity is a requirement, let MicroStation give you the advantage — power, sophistication, and ease of use, plus worldwide product support. The promise of the future... today!

For a free MicroStation Mac demo or further information on MicroStation and related products: in the U.S., call 800-345-4856; in Alabama only, call 800-345-0218; in Canada, call 416-625-2081; in other countries outside the U.S., contact an Intergraph sales office.
UNDISPUTED CHAMPION WAULTIFTER

Raymond Lou has been lifting weights since he was sixteen.

Now quicker and more powerful than ever, Stufflt Deluxe 2.0 remains not only the number one ranked compression program for saving disk space, but time as well. 

FILEs in less time. Double-clicking on a compressed file's icon automatically decompresses the file, launches the file's original application, and opens the file. Compressed files even appear within the Open dialog box of their applications and can be opened in the same way as uncompressed files. When you quit an application, DiskDoublcr automatically recompresses previously compressed files.

Although DiskDoublcr can combine multiple files into a single archive, it can't decompress individual files - it's all or nothing! It's also unlikely that other users will have a copy of DiskDoublcr lying around to decompress any files you give them, because the program hasn't achieved the industry-standard status of Stufflt.

DiskDoublcr includes expand-only versions of both the application and INIT, which you can distribute freely with your files, but these add-ons occupy 154K of valuable disk space. And those extra bytes may mean the difference between getting everything on one disk or two or may generate a fair amount of additional on-line time.

Compactor

Compactor is a shareware application that promises to become the next Stufflt - at least as far as the noncommercial world is concerned. Its archive windows and operation are similar to those of the original Stufflt, but it's much faster and consistently makes the smallest files. Its real strength, however, is its optional ability to create self-extracting archives. Simply double-clicking on the archive decompresses it, even when Compactor is unavailable. The self-extracting feature adds a measly 14K to an archive - or less than one-tenth of DiskDoublcr's add-ons. Compactor unstuffs Stufflt files through version 1.5.1.

Diamond

Diamond also operates as an application. Its simple interface has only four menu commands. The Pack and Unpack commands bring up a dialog box in which you choose the file, folder, or disk to compress or decompress. Extract lets you decompress individual files and folders from an archive. Preferences displays a dialog box in which to set your preferences and select among three compression levels or no compression. The TIFF and spreadsheet archives are the same size no matter which compression level is used. Like Compactor, Diamond optionally creates self-extracting archives. This option adds about 35K to each archive.

The Bottom Line

DiskDoublcr has the simplest interface: It lets you use compressed documents without changing your normal way of working, it is very fast, and it makes very small files. Unfortunately, its inability to decompress selected files from archives makes it a poor archive utility. Compactor, at $25, is the best value in the group, even though it lacks the convenience features that DiskDoublcr and Stufflt Deluxe offer. Compactor consistently created the smallest compressed files, and its performance is rapidly winning it converts - especially among on-line users. Its speed and self-extracting function make it an ideal tool when you're preparing to send a file to someone, because you don't have to worry about whether or not the recipient has the software necessary to decompress your package. Other than its simple interface and very fast decompression times, Diamond has little to recommend it.

— Darryl Lewis

Get Info

DiskDoublcr

Published by: Salient Software, 124 University Avenue, Suite 103, Palo Alto, CA 94301; (415) 852-9567.
Version: 3.0.1.
List Price: $79.

Compactor

Published by: Bill Goodman, 109 Davis Avenue, Brookline, MA 02146; written inquiries only.
Version: 2.2.
List Price: $25 (shareware).

Diamond

Published by: Sextant Corp., 1501 Laurel Street, Sarasota, FL 34236; (800) 282-6665 or (813) 954-5922.
Version: 5.3.
List Price: $75.
Planisoft shows promise, but it's not yet the king for tracking contacts and appointments.

When it comes to keeping track of time and appointments, I've tried everything from Layered's Front Desk to HyperCard. I even tried Chang Lab's CxAT III and found it too confusing and unintuitive. I finally settled on a custom application built in Odessa's Double Helix. And then Planisoft from asd Software arrived, and it was exactly what I wanted — almost.

Several Appointments
Planisoft's central theme is multiple schedules. You can use it in single-user mode, but it is best when it's attached to a network and the appointment files are merged. A secretary can use the single-user mode to track several individuals, but the software is intended to be installed on individual Macs that share an AppleShare or TOPS volume.

Its primary function is tracking appointments. Dragging the cursor over the appropriate time segments in the rolling weekly calendar sets an appointment. If your appointment is with someone familiar, you can pick the name from a list. If the name is new, the program presents you with a contacts entry form in which you can enter the person's phone number and address. Once you've set an appointment, Planisoft lets you call the person via the speaker in the Mac or via modem.

Planisoft can assign up to four appointment codes when you initialize a new appointment. The calendar view uses the appointment codes to display a schedule in more than one dimension. You can always see what time your appointments are, but by clicking in the lower left-hand corner of the screen (or by switching among categories in the Appointment Codes window), you can view your appointments by type of activity, by location, and by two user-defined codes. Managers will find the visual information about their clients' locations good for gauging traffic, and the activities view

FOUR AWARD-WINNING APPLICATIONS IN ONE EASY-TO-USE BUNDLE!

The SmartBundle is a collection of four easy-to-use, award-winning applications bundled together at an incredible price—the best value in Mac software today!

And because each application has won a MacUser Magazine Eddy Award recognizing it as the 'best' in its field, you know each part of the SmartBundle is extraordinarily capable—a claim other starting Macintosh® packages simply can't make.

The SmartBundle: Easy, powerful, and affordable... the smart choice in software for new Macintosh buyers!
With the HP DeskWriter, you can
tell them how many times they need to
shift mental gears. You can define other
codes for personal or office needs.
The program can set schedules days or
even years in advance. It can also inte­
rate to-do lists, priorities, and deadlines.
These functions are not tied to appoint­
ments and act only as simple reminders.
The icons across the top of each day in the
calendar represent to-do lists, priorities,
and deadlines and provide single-click
entry or retrieval of these information
categories. These icons — actually
squares, dots, and diamonds — have no
contextual meaning, but there are only
three of them, so you should be able to
remember which is which very quickly.
Groups of people are linked with the
Group command, which makes it easy to
locate schedule conflicts and to schedule
appointments with several people in a
group. For law offices or manufacturing
facilities, this feature alone can be worth
the cost of the program.
On the whole, Planisoft is an easy-to­
use, well-integrated system. You can call

Planisoft is an integrated appointment and time-management program that needs more
database capabilities to make it viable for power users.
your appointment's contact seconds after clicking on the phone icon in the Appointment window, and you can quickly see overviews of your entire week. To-do lists and deadlines help keep you on track, and the icon-driven tool panel and menus are uncluttered and easy to follow. The program also comes in a Windows version that can share files with the Mac edition and vice versa.

Schedule an Update
Being easy to use and being a good tool are two different things, however. I found Planisoft's scheduling portion well conceived and constructed, but its contacts database is flawed. The structure of my contacts file is ever-changing, but Planisoft won't let me change the structure of the database by adding new fields. This limits its usefulness and necessitates the use of a custom database application for functions Planisoft does not have. I don't like typing information into my computer more than once (or even importing and exporting records among applications). If you want to use it in addition to your own database manager, Planisoft has export file formats for most popular word processors and database programs.

Although Planisoft is well integrated and easy to use, its programming does need modifications beyond the database part. Windows, such as the Appointment window, that look as though they're floating above the schedule's plane are modal, so clicking on the schedule does nothing. I'd like to start entering an appointment and be allowed to click on the schedule to check another function and return to my waiting Appointment window. Planisoft works with one appointment or information item at a time.

The program's manual is thin and doesn't include an index, which makes finding information on defining your own appointment codes impossible.

The Bottom Line
Planisoft is almost the software I've always wanted. If the to-do list, priorities, and deadlines were better integrated into the application (cross-referenced both to each other and to my appointments) and if they could be manipulated in a text-editing screen—or even better, an outliner—I might trade in my Helix application, but when it comes to managing my schedule, the tool I use has to fit my needs precisely.

Planisoft has ease of use down pat, but it needs to be more flexible before it'll be truly useful.
—Daniel W. Rasmus

Get Info
Planisoft

Published by: asd Software, 4650 Arrow Highway, E-6, Montclair, CA 91763; (714) 624-2594.
Version: 1.1.
List Price: $349; five-pack, $895; ten-pack, $1,295.

The HP DeskWriter printer puts laser-quality printing right at your fingertips.

With a small size and a $995* price tag, the DeskWriter printer easily fits on your desk and in your budget. And its advanced 300 dpi inkjet technology lets you print sparkling text and detailed graphics.

The DeskWriter is also designed for easy use with your Macintosh, and has both serial and AppleTalk interfaces. It even includes scalable and outline fonts. Combine that with the DeskWriter's whisper-quiet operation, and keeping it to yourself will be that much easier.

So call 1-800-752-0900, Ext.1004 for your authorized HP dealer.

There is a better way.
REVIEWS

UTILITIES

Now Utilities

The previous version of Now Utilities was a hit-and-miss affair, but the latest one is a winner.

Now Utilities 2.0 is a dramatic improvement over version 1.0. Now Software has added important new programs and beefed up and knocked the rough edges of others. Even better, the price is now a bargain at $129. Now Utilities 2.0 promises to make your Mac faster, easier, and — yes — more fun to use.

Super Boomerang

The star of Now Utilities 2.0 is a newcomer, Super Boomerang, a hypercharged version of Hiroaki Yamaomo's shareware favorite, Boomerang. Super Boomerang adds a menu bar to the standard dialog boxes you use to open and save files. It automatically remembers names of folders you've opened and files you've opened or saved, and it lists up to 30 of these in its File and Folder menus. Select a file or folder from the menus, and Super Boomerang instantly takes you to it. And if you don't remember the complete name or location of a file, Super Boomerang's lightning-fast Find command supports wildcard searches and zips through the contents of even the largest hard-disk drive.

You can combine applications and DAs in up to five groups, each of which shares a list of files and folders (any applications you don't group share a universal file-and-folder list), and you can switch from group to group at any time. The Rebound feature remembers and automatically scrolls to the last item you selected in any folder. An editing view lets you change the order in which files are listed (by name, modified date, type, creator, or size) in the currently open folder and rename or delete them.

The DirectOpen option adds a hierarchical menu of available files next to the Open command in any application's File menu. You can open any file on this menu just by selecting the filename. Although Super Boomerang can't de-compress StuffIt archives, as can its nearest competitor, Aladdin Systems' Shortcut, Super Boomerang is, in all other ways, the best open/save-file enhancer on the market.

Now Menus

Now Menus is better than ever. It pops up a hierarchical version of your menu bar wherever you click on the desktop or if you use a user-definable key-and-click combination. If you're running MultiFinder, this menu also lets you jump to any open applications or DAs (new). Hold down the Option key as you switch.

With the HP ScanJet Plus, you've

The HP ScanJet Plus scanner provides 8-bit photographic-quality scanning.

That means 256 shades of gray for the hottest-looking output from your Mac. And it's so easy, too. At the click of a mouse, you can get negative or mirror images, as well as scaling in 1% increments from 4-200%. All for $2,190*— about what you would expect to pay for a 4-bit scanner.

So if you want the richest, most detailed images from your Mac, you've got it made with Hewlett-Packard. Call 1-800-752-0900, Ext. 1005 for your authorized HP dealer.

There is a better way.

HEWLETT PACKARD
applications, and (also new) Now Menus hides the windows of the application you’re leaving, sparing you the embarrassment of MultiFinder screen clutter. Now Menus enhances your Apple menu, showing every DA’s menu as hierarchical submenus. It also makes a submenu of every available cdev, so you can open the Control Panel with whatever cdev you choose at the top of the list. It also adds a Chooser submenu. Just pick an item from the list, and it’ll automatically be selected when the Chooser loads.

A new utility, MultiMaster, works very much as On Cue does. Click in the corners of your menu bar or use a key-click combination, and MultiMaster pops up a menu listing of your installed applications. You can launch any listed application by selecting it and can attach frequently used documents to an application’s name. Some of MultiMaster’s features caused my system to freeze occasionally, however, and I sometimes had to click more than once in the menu bar to make the MultiMaster menu appear.

Alarms Clock
Alarms Clock is little changed from the last version. It puts a clock in the right side of the menu bar and also lets you set a number of simple alarms. Alarms Clock seems to cause none of the problems that the freeware SuperClock does.

Startup Manager
If you’ve got lots of INITs, Startup Manager does a great job of controlling which of these critters load and in what order. You can even create groups of INITs, so you can quickly configure your Mac for different purposes. Startup Manager lets you change the order in which INITs load by dragging their names up and down in a list instead of by appending a number to the beginning of the file’s name, as it used to do. However, it still turns a file “off” by changing the file type from INIT to xINIT, cdev to xdev, and so on. I prefer Microseeds’ INITPicker, but Startup Manager is a capable alternative.
REVIEWS

Other Goodies
Among the other Now Utilities, WYSIWYG Menus is a real sleeper. Not only does it list every typeface in a Font menu, using the appropriate screen font but it also combines font family names (similar to Adobe Type Reunion). It does sometimes cause keyboard shortcuts to vanish or be modified in the menus it affects, and it becomes sluggish in Microsoft Word.

Screen Locker allows you to password-protect your Mac. It's well designed but seems to crash a lot if you access the cdvr with many other INITs running. Print Previewer is a Chooser device that lets you preview what documents look like before you actually send them to a printer. Customizer lets you modify the appearance of your Finder. Profiler prints a copious listing of information about your Mac, from current system software and hardware to all active INITs. DeskPicture lets you select a PICT file to replace your desktop pattern. Finally, FinderKeys lets you select a file in a Finder window by typing its name. You can copy and move files into other windows without making the destination window active — convenient if you have lots of open windows.

The Bottom Line
Now Utilities 2.0 is a terrific value. You could put together an equivalent package on your own, but you'd pay far more and you wouldn't have Super Boomerang. Now Utilities is a must-have for experienced Mac users and novices alike.

— Eric Taub

Get Info

Now Utilities

Published by: Now Software, 520 W. Harrison Street, Suite 435, Portland, OR 97201; (503) 274-2800.

Version: 2.0

List Price: $129.

SECURITY

FileGuard and MacaccessCard Reader

ASD Software's top-notch security package is the only Mac software that supports a magnetic-card reader.

FileGuard (originally reviewed in May '90, page 97) is one of the finest European Macintosh software imports and continues to keep pace with its competition. Some new features, fine-tuning, and

It's no pigment. It's pigments for

For a limited time only, you'll get a $200 rebate when you buy a fully Macintosh-compatible HP PaintWriter color printer. Imagine that. Now imagine having your output colors match your screen colors. Right down to the exact PANTONE® number. Our new, enhanced software drivers and improved, brighter inks make sure of that. And, as always, you get high-quality output in millions of colors for paper or transparencies.

For shared use, check out the PaintWriter XL. It offers AppleTalk, faster speed, and auto-sheet feed.

But whatever you do, do it soon. This rebate offer expires May 31, 1991. So call us at 1-800-752-0900, Ext. 2113. We'll quickly send you the name of your authorized HP dealer and a piece of sample output.

You'll see that anything else is unimaginable.
support for the optional MaccessCard reader make FileGuard a hard-to-beat security package.

FileGuard version 2.5 offers the same transparent operation as earlier versions. DES encryption (a U.S. government standard) is, of course, still absent, but the proprietary encryption scheme seems solid. Once installed, this version adds the ability to protect folder access with an interface that's familiar to any AppleShare user. Hard-disk partitions can be similarly protected. FileGuard prevents the copying of applications on an individual-user basis and can create demo versions of software. FileGuard now comes with User Mover, a Font/DA Mover clone that lets you save backups of your user/group lists or transfer lists to other copies of FileGuard.

One of the most delightful new features is the way FileGuard builds groups (where users with similar access privileges can be assigned). You simply drag names from the User list to build the desired group.

FileGuard is still the only Mac security software that supports magnetic-card readers. The MaccessCard reader is a plug-and-play box that attaches to an ADB port or between your mouse and the keyboard. You can use Maccess cards to log on or enter your access key in any dialog box (rather than typing it in). You can also use most ATM or credit cards, so purchasing Maccess cards isn't required. The unit I used worked flawlessly with Apple keyboards but was incompatible with a DataDesk unit.

The Bottom Line
FileGuard adds folder and enhanced hard-disk protection that turns an already good program into an excellent one. This is a dependable and superbly implemented program, and the optional MaccessCard reader makes it an ideal choice for service bureaus or special security installations. The MaccessCard reader lets you add another level of security without severely altering your normal routine. Although it lacks some of the high-end capabilities of A.M.E., a security program from Casady & Greene, FileGuard, unlike A.M.E., doesn't force users to make painful adjustments to their work habits. It's sleek, fast, and safe. I highly recommend it.

— Gregory Wasson

Get Info

FileGuard

$499

Published by: ASD Software, 4650 Arrow Highway E-6, Montclair, CA 91763; (714) 624-2594.

Version: 2.5.

List Price: $249.

MaccessCard Reader

$349

Manufactured by: ASD Software, 4650 Arrow Highway E-6, Montclair, CA 91763; (714) 624-2594.

List Price: $349.
Click, It's A MAC.

Load SoftPC, click twice, and you've got a window wide open to the entire MS-DOS world. Everything a Mac can do plus everything a PC can do, in one machine.

Whether you're a Macintosh user who needs access to PC software and data, or a PC user who wants to go Macintosh without losing PC compatibility, you can have it all with Insignia's best-selling software solutions. SoftPC is a software emulation precise enough to run the toughest PC applications—Norton Utilities, Lotus 1-2-3, Harvard Graphics, AutoCad, even custom development programs. You get complete XT or AT compatibility for the SE/30, Macintosh II family and the Macintosh Portable.

Add an EGA/AT Option Module, and get vibrant EGA color compatibility, LIM expanded memory and math coprocessor support.

New AccessPC lets you use PC and PS/2 disks just like Mac disks. Now you can move and view PC file and disk icons—even in locked or full disks!—format DOS disks, launch Mac applications and much more.

For more information and the name of a SoftPC dealer near you, call Insignia at 800-848-7677 (U.S. only) or 408-522-7600 (outside U.S.).

Insignia Solutions, Inc. 254 San Geronimo Way, Sunnyvale, CA 94086. Fax: 408-723-9541. We give a SoftPC retail $399 or AccessPC program retail $129 daily to a caller selected at random. SoftPC is a registered trademark and AccessPC is a trademark of Insignia Solutions, Inc. Other product names are trademarks or registered trademarks of their respective owners.

Please circle 155 on reader service card.
**Quick Clicks**

**FullWrite Professional**

FullWrite Professional is a program I want to like. Version 1.5 is now stable and easier to use than previous versions, but the program still lacks a few features.

FullWrite now has file-import filters for Microsoft Word versions 3.0 and 4.0; MacWrite 5.0; Word Perfect Mac; Multi­mate versions 3.3, 4.0, and Advantage; and PC Word Perfect versions 4.1, 4.2, 5.0, and 5.1. Many of these conversions are made through a separate program called Word for Word (see review, March ‘91, page 68), which isn’t convenient.

Creating sidebars in version 1.5 is a vast improvement over previous versions. Moving and resizing sidebars requires only a point, click, and drag.

The FullWrite package now includes Tycho Table Maker. You can paste Tycho tables into FullWrite documents when the tables are completed, but you have to edit them in Tycho, which is not as convenient as creating tables directly in FullWrite.

Still missing from my wish list are smaller graphic sizing and direct support for MORE II and 3.0 outlines. Add-on utilities such as QuitKeys and OnCue still don’t work when FullWrite is the active application.

FullWrite limits graphics to a size no smaller than 1 x 1 inches, which makes embedding small items difficult. Although FullWrite includes an outline, I still use MORE, and I’d like to be able to import outlines directly into FullWrite. I would also like to see more formatting features, such as paragraph justification, moved from the Format menu onto the ruler.

FullWrite might be a good choice for users who shy away from Word because of its complexity. Most of its menus and features are well thought out and easy to understand. This bulky program needs 2 megabytes of RAM to run well.

Ashton-Tate, 20101 Hamilton Avenue, Torrance, CA 90509; (213) 329-9989. Version 1.5. $395.

— Daniel W. Rasmus

**Checkwriter II**

Checkwriter II is a personal-accounting package that uses your checkbook like a ledger. The previous version was good, and although the current edition adds some interesting functionality, it’s still not quite enough to push it all the way to the top of the heap.

Checkwriter II’s main competition is Intui’s Quicken, but version 3.1 is not a Quicken-killer. Checkwriter II offers a lot of functionality at a reasonable price, but it still doesn’t have Quicken’s refined look and feel.

Checkwriter II’s new features include an over-budget warning, which tells you when you’re spending more money in a category than you allotted; a transfer command, which lets you transfer funds from one account to another easily; an address database; a set of drawing tools to design check forms; alphabetized budget reports; a Quick file converter; a WYSIWYG report preview; and an updater for recurring transactions. These are nice features, but they’re not earth-shattering.

The one new feature that is bound to catch your eye is Checkwriter II’s ability to let you print checks by feeding your personal check through your laser printer or ImageWriter.

Other than this new check-writing feature, which is very handy, little has changed in this new version of Checkwriter. The system still has a credible interface, works smoothly, and offers you the option of seeing your financial information in horizontal-bar, vertical-bar, and pie charts, as well as in tabular-report form.

Compared with its competition, Checkwriter II has come a long way. Quicken still has an edge with its tax-imeterization scheme, but Checkwriter II offers an automatic MacIntax link. Checkwriter II can be run as either a DA or as a standalone application. Checkwriter II is within pennies of providing more functionality than Quicken. In the next release, Checkwriter II may be No. 1.

Aatrix Software, P.O. Box 5359, Grand Forks, ND 58206; (701) 746-7202. Version 3.1. $59.

— Ken Landis

**Where In Time Is Carmen Sandiego?**

Where In Time is the fourth in the ever-popular Carmen Sandiego series. Where In Europe/USA/World Is Carmen Sandiego? teach geography to the young user: Where In Time adds time travel (read: history) to the geographic jaunt.
Have you ever noticed the way your colleagues use graphics? How they seem to make their reports and presentations come alive? Chances are, they're using MacDraw® II software, the most popular drawing tool for the Macintosh.

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

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

So as you find more things to do with graphics, MacDraw II gives you plenty of power to draw from. And don't be surprised if you advance quickly.

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

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

**Special Offer**

**Free Upgrade.**

Buy MacDraw II now and get a free upgrade this spring to MacDraw Pro. Plus, buy now, join our 500,000 other users, and you'll get free MacPaint and free clip art along with MacDraw II. See your Claris dealer today.
Once again, the Acme Detective Agency has assigned you the task of tracking Carmen Sandiego and her gang across the globe. This time the baddies have come into possession of a time machine that lets them make off with international treasures from the past. Acme has supplied you with the Chronoskimmer 325i, a time-travel device that whisks you to 48 locations over the span of 1,500 years.

As you travel from one location to another, you gather clues about a particular villain who has, for example, absconded with the bulls of Pamplona. By questioning informants and witnesses, you learn about the villain’s physical attributes as well as his artistic and literary preferences, and you pick up clues that let you track him to the next location in time. If you correctly guess the thief’s identity and trace him to his final destination before the timer runs out, a robot is dispatched to haul the Chronoskimmer 325i. A time-travel device that uses pages of buttons to open applications, DA, or documents. There can be as many as 16 pages of buttons with as many buttons as the screen size permits. Aside from the name change, there’s no difference between File Director and the last version of PowerStation.

The Calendar DA is a basic monthly calendar that allows you to attach notes to any day. You can search for text in your note set and dial phone numbers directly. Notes covering any selected range of dates can be archived into a text file.

The Phone Pad DA is a notepad with an index. As with the Calendar DA, it can also dial phone numbers.

The two calculator DAs are powerful versions of the standard Mac Calculator DA.

Disk Tools is as good a Finder replacement as exists. Its marking and grouping features propel it to the top of its class. File Director is somewhat of an acquired taste, but if your file structure is complex, it can be a real time-saver. The four other DAs are good, useful programs.

Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809; (504) 291-7221. Versions: Disk Tools, 3.0; File Director, 2.5.5. $129.95.

— Steven Bobker

WillMaker 4.0

WillMaker 4.0 is the latest version of what has become an old standby. Nolo Press’ package is a fairly basic program with the sole function of asking you pertinent questions for producing a will.

The program’s interface is (still) pretty basic, but fanciness wouldn’t add anything to it. It works easily and reliably. You can elect to see full information screens or just basic questions. The output is a rather plain document, but it meets all legal requirements. Wills can be saved as text and made fancy in the word processor of your choice. One of the few things you can’t do, however, is make conditional bequests (such as Jon gets $10,000 if he leaves Hoboken).

The second part of the package is the combined manual and book about wills. It’s detailed, easy to read, and generally excellent. There are lots of examples, which elements were in the same folder, even though they can be located in different folders and drives.

The second major component of the package is File Director. It’s a launcher that uses pages of buttons to open applications, DA, or documents. There can be as many as 16 pages of buttons with as many buttons as the screen size permits. Aside from the name change, there’s no difference between File Director and the last version of PowerStation.

The Calendar DA is a basic monthly calendar that allows you to attach notes to any day. You can search for text in your note set and dial phone numbers directly. Notes covering any selected range of dates can be archived into a text file.

The Phone Pad DA is a notepad with an index. As with the Calendar DA, it can also dial phone numbers.

The two calculator DAs are powerful versions of the standard Mac Calculator DA.

Disk Tools is as good a Finder replacement as exists. Its marking and grouping features propel it to the top of its class. File Director is somewhat of an acquired taste, but if your file structure is complex, it can be a real time-saver. The four other DAs are good, useful programs.

Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809; (504) 291-7221. Versions: Disk Tools, 3.0; File Director, 2.5.5. $129.95.

— Steven Bobker

WillMaker 4.0

WillMaker 4.0 is the latest version of what has become an old standby. Nolo Press’ package is a fairly basic program with the sole function of asking you pertinent questions for producing a will.

The program’s interface is (still) pretty basic, but fanciness wouldn’t add anything to it. It works easily and reliably. You can elect to see full information screens or just basic questions. The output is a rather plain document, but it meets all legal requirements. Wills can be saved as text and made fancy in the word processor of your choice. One of the few things you can’t do, however, is make conditional bequests (such as Jon gets $10,000 if he leaves Hoboken).

The second part of the package is the combined manual and book about wills. It’s detailed, easy to read, and generally excellent. There are lots of examples, which elements were in the same folder, even though they can be located in different folders and drives.

The second major component of the package is File Director. It’s a launcher that uses pages of buttons to open applications, DA, or documents. There can be as many as 16 pages of buttons with as many buttons as the screen size permits. Aside from the name change, there’s no difference between File Director and the last version of PowerStation.

The Calendar DA is a basic monthly calendar that allows you to attach notes to any day. You can search for text in your note set and dial phone numbers directly. Notes covering any selected range of dates can be archived into a text file.

The Phone Pad DA is a notepad with an index. As with the Calendar DA, it can also dial phone numbers.

The two calculator DAs are powerful versions of the standard Mac Calculator DA.

Disk Tools is as good a Finder replacement as exists. Its marking and grouping features propel it to the top of its class. File Director is somewhat of an acquired taste, but if your file structure is complex, it can be a real time-saver. The four other DAs are good, useful programs.

Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809; (504) 291-7221. Versions: Disk Tools, 3.0; File Director, 2.5.5. $129.95.

— Steven Bobker

WillMaker 4.0

WillMaker 4.0 is the latest version of what has become an old standby. Nolo Press’ package is a fairly basic program with the sole function of asking you pertinent questions for producing a will.

The program’s interface is (still) pretty basic, but fanciness wouldn’t add anything to it. It works easily and reliably. You can elect to see full information screens or just basic questions. The output is a rather plain document, but it meets all legal requirements. Wills can be saved as text and made fancy in the word processor of your choice. One of the few things you can’t do, however, is make conditional bequests (such as Jon gets $10,000 if he leaves Hoboken).

The second part of the package is the combined manual and book about wills. It’s detailed, easy to read, and generally excellent. There are lots of examples, which elements were in the same folder, even though they can be located in different folders and drives.

The second major component of the package is File Director. It’s a launcher that uses pages of buttons to open applications, DA, or documents. There can be as many as 16 pages of buttons with as many buttons as the screen size permits. Aside from the name change, there’s no difference between File Director and the last version of PowerStation.

The Calendar DA is a basic monthly calendar that allows you to attach notes to any day. You can search for text in your note set and dial phone numbers directly. Notes covering any selected range of dates can be archived into a text file.

The Phone Pad DA is a notepad with an index. As with the Calendar DA, it can also dial phone numbers.

The two calculator DAs are powerful versions of the standard Mac Calculator DA.

Disk Tools is as good a Finder replacement as exists. Its marking and grouping features propel it to the top of its class. File Director is somewhat of an acquired taste, but if your file structure is complex, it can be a real time-saver. The four other DAs are good, useful programs.

Fifth Generation Systems, 10049 N. Reiger Road, Baton Rouge, LA 70809; (504) 291-7221. Versions: Disk Tools, 3.0; File Director, 2.5.5. $129.95.

— Steven Bobker

WillMaker 4.0

WillMaker 4.0 is the latest version of what has become an old standby. Nolo Press’ package is a fairly basic program with the sole function of asking you pertinent questions for producing a will.

The program’s interface is (still) pretty basic, but fanciness wouldn’t add anything to it. It works easily and reliably. You can elect to see full information screens or just basic questions. The output is a rather plain document, but it meets all legal requirements. Wills can be saved as text and made fancy in the word processor of your choice. One of the few things you can’t do, however, is make conditional bequests (such as Jon gets $10,000 if he leaves Hoboken).

The second part of the package is the combined manual and book about wills. It’s detailed, easy to read, and generally excellent. There are lots of examples, which
INTRODUCING THE COOLEST NEW DISPLAY SYSTEMS FOR THE HOTTEST NEW MACINTOSHES.

Every time a hot new Macintosh® computer is announced, we're out there first with the coolest technology in display systems.

We custom design our VLSI chips and use surface mount technology to create display systems that are smaller, smarter and so power efficient they run at temperatures cooler than Apple's recommended standards. That means your computer will live a longer life.

But technology isn't the only area where RasterOps boards are cool. Consider our new display systems.

For the Macintosh IIsi, we present the 24si board. It's a single slot board with built on acceleration that brings brilliant 24-bit color to any Apple 13" monitor up to 600 times faster than before.

For the Macintosh LC, the ClearVue/LC is an unbeatable monochrome system. The ClearVue/GSLC brings you the highest resolution gray scale. The 8LC display system puts 256 brilliant colors at your fingertips. And the affordable ClearVue/LC Monochrome and ClearVue/GSLC display boards bring high image clarity to the 15" Apple Portrait Display.

So see your RasterOps dealer or call 800.468.7600. And be prepared for chills to run down your spine.
QUICK CLICKS

aid greatly in clarifying some of the arcane details of will writing. The manual goes beyond basic wills into estate planning. It is clear about the limits of the manual as well as the software and doesn’t hesitate to tell you to seek professional advice when appropriate. There is also some good advice about finding and dealing with legal professionals.

A major advantage of using WillMaker is that your wills can be easily and quickly modified as your circumstances change. Even if your circumstances are beyond what WillMaker is designed to handle, using it to focus your ideas and wishes before you see an attorney, who can draw up a more complicated will, can save you time and money. If you don’t have a will, you no longer have an excuse. WillMaker can build you a will in less than an hour.

Nolo Press, 920 Parker Street, Berkeley, CA 94710; (415) 549-1976. Version 4.0. $69.95.
—Steven Bobker

Darwin’s Dilemma

“I used to be a better swimmer, but I outgrew it, thanks to . . . evolution.” Emo Phillips would have felt right at home with Darwin’s Dilemma, where, as the saying goes, the solution is evolution.

The setup is simple. The play window is made up of an invisible 9 x 6 grid on which reside icons representing life in simple to complex forms, starting with the lowly amoeba and progressing through different game levels to self-actualized Man. You are provided with a game piece, named Darwin, whose only purpose is to shove the icons in one of the four compass directions. You shove these icons either to position them or to combine them with like icons. An example: Your window contains, among other things, four amoebas. If properly combined, they become, through the process of evolution, a single paramecium. Position Darwin to bang the paramecia together, and you get a jellyfish. Jellyfish become octopi, octopi become crabs, and you’re on your way. A technique called teleswapping lets you shift icons from one location on the grid to another, but beware: Teleswaps are limited.

That’s all there is to it. Darwin’s Dilemma is easy to play but difficult to win. To play Darwin’s Dilemma properly, you need to plan several moves in advance and use your teleswaps judiciously. Yes, you can undo as many as 120 moves, but it costs points. Then again, points seem to be of little concern in this game. In Darwin’s Dilemma, it’s strictly survival of the fittest. Highly recommended for those who enjoy pondering and puzzling.

Baseline Design, 5 W. Mountain Road, Sharon, CT 06069; (203) 364-0063. Version 1.0, $49.95.
—Christopher Breen

KiwiFinder Extender

Like Aladdin Software’s ShortCut and Now Software’s Super Boomerang, Kiwi Software’s KiwiFinder Extender tries to make the Open and Save dialog boxes more useful. But where the competition keeps only short lists of files or folders, KiwiFinder’s file management is far more ambitious: It quickly sorts and organizes every file on your hard-disk drive.

KiwiFinder’s Manager application creates a database about all the files on your hard-disk drive. You can view all your files organized into virtual folders. Using the Sort By menu, you can choose whether these folders are based on the file’s name, its type, creator, modification or creation date, actual folder, or any assigned keywords.

KiwiFinder adds a button to every Open dialog box. This button calls up a box similar to the Manager, except that the only visible files are those that the current application can open. The program also adds buttons to Save dialog boxes for adding keywords and notes to a file.

Thanks to its indexed database, KiwiFinder has a fast and simple Find command as well as a fast and powerful Search command.

There are few drawbacks. If you’re in a hurry to find a file, you may not appreciate the slight delay between clicking on KiwiFinder’s button and the appearance of its window. Another bug I encountered once made it necessary for me to trash a drive’s database and reindex it.

Despite this, KiwiFinder can still be a great time-saver if you’ve never gotten around to organizing your hard-disk drive. But if you enjoy shuffling files from folder to folder as your organizational needs change, stay clear of this baby.

—Eric Taub
When you're waiting to print, your Mac is anything but free. And on a network, you may be in for some serious tie-ups. But now you can liberate your Mac for good.

SuperLaserSpool™ gives you your Mac back in seconds and handles all the printing in the background.

Along with processing documents, sending them to the printer and downloading fonts, SuperLaserSpool gives you extra control with the exclusive LaserQueue™ desk accessory. You can preview documents. Change the order they print in. Reroute them to other printers. Or delete them altogether. It even tells you when documents are finished printing.

SuperLaserSpool works with virtually all Macintosh applications and stand-alone or networked ImageWriter,™ LaserWriter,™ HP DeskWriter™ and PostScript-compatible printers using standard Apple drivers. All you do is load it and forget it.

Call the 800 number below to order SuperLaserSpool and—for a limited time—get a free copy of File Director,™ the ultimate file management program valued at $129. It'll work great on your free Mac.

1-800-873-4384 EXT. 146
Fifth Generation Systems, Inc.
10049 N. Reiger Road Baton Rouge, LA 70809
Technical Support (504) 291-7283

Please circle 156 on reader service card.
If you own a Mac, you should own a hard-disk drive. If you own a hard drive, you should protect what's on it. MacUser Labs examined 32 of the best basic drives and now reveals the fastest and sturdiest. We also tested five programs that make your drive a safe place to store your files — and that rescue you when disaster strikes. If you don't own a hard drive, now's the time to buy one — and MacUser Labs shows you how best to spend your storage dollar.
To Save Over $6000 On Your File Server

Apple
- Mac IIci with 80MB: $6669
- AppleShare software: $799
- Monitor: $299
- Keyboard: $125
- Total: $7892

Jasmine
- LocalLink Server: $999
- 90MB Drive: included
- Software: included
- Total: $999

LocalLink is a super fast, 100% AppleShare 2.0 compatible file server. LocalLink's proprietary software enables the network manager to assign users, passwords and privileges. LocalLink is as fast of a server as a IIci. 90 MB to 1GB.
Portable
Portable’s sleek design, reliability and low cost is for the user who knows what value is.
Portable 40MB to 120MB from $299
BackPac 40MB to 80MB from $369

Traditional “Direct Drive”
Offers all the premium features such as two surge protected AC outlets, a noiseless fan, a SCSI select switch and others too numerous to mention. Select the drive other hard disk manufacturers copy.
40MB to 200MB Direct Drive from $369

Removable
Add another cartridge when you need more storage. And because our DriveWare software locates and locks out all bad sectors, you don’t lose important data.
The Jasmine 45 Removable (SyQuest) $599

LocalLink “Network Server”
LocalLink is a super fast, 100% Appleshare 2.0 compatible file server. LocalLink’s proprietary software enables the network manager to assign users, passwords and privileges. LocalLink is as fast of a server as a Hci.
From $999

Bundles
A lot to choose from:
- Two award winning utility software packages: Sum II and Virex.
- Memory: one meg sims.

To Order With Your Visa or MasterCard in the USA, Call:
1-800-347-3228

Jasmine Europe Parc Club - 32 Jean Rostand 91403
Orsay Cedex France
Tel: 33 1 60 19 25 05 Fax: 33 1 60 19 10 32

©1990 Jasmine Technologies, Inc. 1225 Elko Drive, Sunnyvale, California 94089
Featured products and pricing are valid in the 50 United States. For international inquiries call (408) 752-3900 or fax (408) 752-2916.
Jasmine, DirectDrive and DriveWare are registered trademarks of Jasmine Technologies. All other trademarks are of their respective manufacturers.

Please circle 145 on reader service card.
Planning to add a modest-sized external hard-disk drive (40 to 50 megabytes) to your Mac? MacUser Labs tested 32 competing brands and came up with some that are best buys and some that are best left on the shelf.

Without a hard-disk drive, your Macintosh is little better than a toy. A hard-disk drive makes your Mac several times faster and much more convenient for daily use. Your important files and folders are waiting on your desktop, ready for instant access. Launching applications, copying and moving files, and saving your work all happen quickly.

Many people discover too late how necessary hard-disk drives are — and how many drives are available at attractive prices. That’s why MacUser Labs tested 32 external drives for this report. These drives simply plug into the SCSI port on the back of any Mac; the mass storage they provide will bring your Mac up to speed.

BY WINN L. ROSCH AND THE MACUSER LABS STAFF
Small Hard Drives

How It Works: The Ideal External Hard-Disk Drive

SCSI ports: Most drives provide two SCSI connectors so you can daisy-chain additional SCSI devices.

SCSI ribbon cable: Each mechanism has a single SCSI connector, and vendors add a short ribbon cable to extend this connection to the rear panel of the drive case. These drives connect to your Mac through its SCSI port.

Disk mechanism: The heart of any external hard-disk drive is the disk mechanism itself, packaged as a complete assembly by the OEM. The mechanisms in the 32 drives in this report came from just four OEMs: Conner Peripherals, Fujitsu, Western Digital, and Quantum. Although drives come in various sizes, all in this review had 3.5-inch disks.

Terminator: Generally, drive mechanisms have removable SCSI-terminating resistors already installed. Some drive vendors force you to remove internal resistors, but most drives provide a more convenient method of controlling SCSI termination: either a rear-panel switch or an external "flow-through" SCSI terminator (shown here).

External SCSI-ID switch: Most drive vendors extend the SCSI-ID-selection circuitry of the hard drive to the case with a short cable. Although any number of selection schemes (DIP switches, push buttons, rotary switches) can be used, MacUser Labs prefers the push-button type shown here — as long as it is limited to selecting IDs 0 through 6, which is the only valid choice you have with your Mac.

Fuse holder: Power supplies should be fuse-protected so that a short circuit inside your external hard-disk drive won’t burn down your office. A fuse that you can access without opening the case is easiest to replace.

Power-on/off switch

Power-supply plug

Adding one of these modest-sized drives can benefit nearly any Mac — or a network of them. Even if you already have an internal or external hard-disk drive, you can use one of the smaller drives for backup or totable storage. A compact external hard drive offers a convenient system for transporting data (also see the "Other Storage Options" sidebar).

All these drives deliver about 40 megabytes (a few as much as 50 megabytes) of storage — today's best deal for an entry-level or supplemental hard-disk drive. Apple established 40 megabytes as the recommended hard-drive capacity for the Classic — that configuration (along with extra RAM) is the only alternative to the stripped Classic with just a floppy-disk drive.

Although some vendors might offer 20-megabyte drives at lower prices, 40-megabyte units cost less per megabyte. Also, most 40-megabyte drives contain newer technology than is found in smaller drives. That means that 40-megabyte drives are typically faster and more compact than smaller drives. Although larger hard-disk drives offer the same advantages, 40-megabyte drives remain the best choice for basic office computing on a tight budget.

Ins and Outs

A hard-disk drive can live in one of two places: inside or outside your Mac. An internal hard drive is aesthetically preferable — it hides in your Mac and leaves your desk clear.

For the Mac Classic, Apple's internal hard-disk drive is also a good buy: The official Apple upgrade for the Classic has a $500 list price. It provides a slow but reliable 40-megabyte...
On the other hand, an external drive provides benefits other than speed that compensate for its clutter and cables. If used as your Mac's primary (startup) or secondary hard-disk drive, it lets you take your files with you or lock them safely away at night. Just unplug the drive, and carry it away or stash it in a locked closet or cabinet.

External drives also serve as shared backup units — just (gently) pass the drive around the office and copy important files. An external SCSI drive also provides upward mobility: Plug the drive into your Plus today and then into your Mac IIfx after you win the lottery.

Good Connections

The Mac makes adding a hard-disk drive relatively easy. For each drive, you normally have two cables to connect (power and data), and — if your hard drive was properly designed — you have little chance of damaging your Mac, the drive, yourself, or your pride. Just make sure the power to every component is off before you start connecting things.

Because all Mac models use the same external SCSI hard-drive link, you can plug almost any Mac hard-disk drive into almost any Mac. Although SCSI connections can become complex if you start chaining several devices together (see the "SCSI Strategy" sidebar), a single hard-disk drive is unlikely to threaten your patience. Once you've made your SCSI connection, you might need to install driver software for your hard-disk drive.

Typically, a couple of mouse clicks in the vendor's formatting utility will have your hard-disk drive ready for normal use in a few minutes. All the hard-disk drives examined here came ready to run — preformatted and loaded with System 6.0.5. Hard-disk drives should now come equipped with System 6.0.7 (required for the Classic).

Naming Names

The name on the front panel of an external hard-disk drive tells you who assembled the unit — bringing together the hard-drive mechanism, a power supply, the case, the fan, and the electronic components. The overall quality of the drive — how much care went into its construction, how long it's guaranteed, what support to expect when something goes wrong — depends on this name.

But if you look inside these 32 hard-disk drives, you'll find basic mechanisms from only a very few OEMs. The mechanism you'll find most often is the Quantum P40S, a fast and trouble-free performer. It has its own built-in 64K memory cache that isolates you and your Mac from most of the confusing details of fine-tuning your drive. For example, you have no worries about details such as setting the interleave (see Figure 2). The Quantum cache ensures that the P40S is optimally matched no matter what your Mac's interleaving requirements are. Four of MacUser Labs' seven Bottom Line picks — the EMAC Metro 40, GCC UltraDrive 40S, Liberty 40, and Microtech Europa 40 — use the Quantum P40S mechanism.

Quantum has also developed an even faster drive mechanism, the LP52S, which offers a capacity of about 50 megabytes; its improved performance comes at a higher price. The other three Bottom Line picks — the FWB PocketHammer50, PCPC MacBottom 50MB, and La Cie Tsunami 50 — use this mechanism.

Another mechanism favored by many vendors is the Conner CP3040. Although it's relatively quick, it can't keep up with the Quantum. One vendor, Computer Products, uses a similar but older version of this Conner mechanism in its DataStor DS40, which proved the slowest of all the drives reviewed.

Also slow was the Fujitsu MZ261S mechanism that Jasmine chose for its DirectDrive 40, but the company claims that its product was optimized for reliability. Western Digital uses its own mechanism (the 1006VSCS); its 40AP drive also proved unexpectedly slow, in spite of its 32K memory cache.
### Overall Speed:
Overall speed is a composite of the results of three sets of tests: Average Seek Time, Data-Transfer Rate, and Real-World Performance. All the charts show how the drives stack up against the best performer in each test. A drive's speed depends on the make and model of its internal hard-disk mechanism and the driver software that manages its operation. As anticipated, performance of the tested drives was determined mostly by the basic mechanism and secondarily by the efficiency of the driver.

### Average Seek Time:
There are many ways to measure how long it takes a hard-disk drive to find data — we use SCSI Evaluator, which provides one of the more conservative measures. The times claimed by vendors, along with the actual seek times recorded in our tests (ranging from 19 to 29 milliseconds), are listed in Table 2 at the end of this report.

### Speed-upmanship
Speed is only one factor to consider when selecting a hard-disk drive for your Mac — and in most cases it's not even the most important. After all, any hard-disk drive can easily outrun the quickest floppy-disk drive — by a factor of 10. Buying the biggest, most expensive, fastest version of everything is a game of one-upmanship that's wasteful and misleading.

For example, not all Macs can take

---

**Table 1: Hard-Drive Performance**

<table>
<thead>
<tr>
<th>Overall Speed</th>
<th>Average Seek Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>FWB PocketHammer50</td>
<td>Worse</td>
</tr>
<tr>
<td>La Cie Tsunami 50</td>
<td>Better</td>
</tr>
<tr>
<td>PCPC MacBottom 50MB</td>
<td>Worse</td>
</tr>
<tr>
<td>MacinStor 40-ZFP</td>
<td>Better</td>
</tr>
<tr>
<td>MacProducts Magic 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>Total Peripherals 040X</td>
<td>Better</td>
</tr>
<tr>
<td>Aristotle Hardpac 40</td>
<td>Worse</td>
</tr>
<tr>
<td>EMAC Metro 40</td>
<td>Better</td>
</tr>
<tr>
<td>MacLand 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>Ehman HD 40</td>
<td>Better</td>
</tr>
<tr>
<td>Apple 40SC</td>
<td>Worse</td>
</tr>
<tr>
<td>TMS Pro 40</td>
<td>Better</td>
</tr>
<tr>
<td>Cutting Edge 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>Liberty 40</td>
<td>Better</td>
</tr>
<tr>
<td>APS 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>MacAvenue Protego 40</td>
<td>Better</td>
</tr>
<tr>
<td>MacTel Index 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>Bay Microsystems HD40</td>
<td>Better</td>
</tr>
<tr>
<td>Ruby StarDrive 40DX</td>
<td>Worse</td>
</tr>
<tr>
<td>Microtech Europa 40</td>
<td>Better</td>
</tr>
<tr>
<td>GCC UltraDrive 40S</td>
<td>Worse</td>
</tr>
<tr>
<td>Mirror M 40</td>
<td>Better</td>
</tr>
<tr>
<td>PLI PL 40 Turbo</td>
<td>Worse</td>
</tr>
<tr>
<td>Deltaic DS40Q</td>
<td>Better</td>
</tr>
<tr>
<td>Tulin HalfShell 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>iDS Wip 40MB</td>
<td>Better</td>
</tr>
<tr>
<td>CMS Platinum 40MB</td>
<td>Worse</td>
</tr>
<tr>
<td>MicroNet CPK-40P</td>
<td>Better</td>
</tr>
<tr>
<td>Jasmine DirectDrive 40</td>
<td>Worse</td>
</tr>
<tr>
<td>Optima Diskcovery 40</td>
<td>Better</td>
</tr>
<tr>
<td>Western Digital 40AP</td>
<td>Worse</td>
</tr>
<tr>
<td>DataStor DS40</td>
<td>Better</td>
</tr>
</tbody>
</table>
advantage of the quickest drives. The SCSI circuitry of a Mac Classic, Plus, or SE, rather than the hard-disk drive itself, is the real data-throughput bottleneck. Check the Real-World Performance scores in Figure 1: With a Mac SE, overall performance of the tested drives is generally only about 70 percent of what's possible on an SE/30. If you have a Classic, Plus, or SE, it doesn't make sense to spend extra dollars for a drive that can prove its
worth only with a faster Mac. However, if you anticipate buying a faster Mac in the future, then a hard-disk drive with greater potential performance will justify its expense later.

The drive mechanism isn't the only influence on drive performance; almost as important is the SCSI-driver software installed by the vendor or user. Some drivers squeeze extra speed from some hard-drive mechanisms. The quickest driver comes with the FWB PocketHammer 50. Although FWB licenses driver software to other vendors, the company apparently doesn't share all of its secrets.

MacUser Labs used several tests to evaluate the performance of the 32 external hard-disk drives. The average seek time (how long the drive takes to find where data is stored on the disk) and data-transfer rate (SCSI throughput, or how much data per second the drive can transfer to and from the Mac) of each product was measured with the program SCSI Evaluator. Running on a Mac SE/30, SCSI Evaluator reveals optimum throughput and average seek times. For a more realistic perspective, MacUser Labs' custom application DiskBasher simulates a drive's real-world performance on both the SE/30 and SE. (The SE delivers performance comparable to that of the Classic.)

Case Studies

Rather than limit your consideration to raw performance, you should choose a hard-disk drive based on how well its features suit your needs. First examine the drive's exterior case. You'll find that the cases of Mac external hard drives fall into two categories: "zero footprint" (drives that fit under one-piece Macs such as the Plus, SE, SE/30, and Classic) and everything else.

Slide a zero-footprint drive under your one-piece Mac, and you haven't wasted any work space on your desk. In addition, your Mac gains stature, putting its screen at a more favorable viewing angle. Most zero-footprint cases were designed long ago and have flat faces to match the original Mac case. The first vendor to update drives to the rounded styling of the latest one-piece Mac is Microtech International, whose Europa 40 is a perfect pedestal for your curvaceous Mac Classic.

Among the cases that won't fit under your Mac Classic are several that give back in styling what they take in additional desk area. The La Cie Tsunami 50 uses a distinctive love-it-or-hate-it case designed for vertical placement by itself or for horizontal stacking of multiple drives (La Cie sells larger-capacity drives with zero-footprint cases). The MacAvenue Protege 40 is shaped like a compact loaf of sandwich bread; its solid design provides good air circulation and a secure footing but not a handy platform on which to place a Mac. Other vendors have simply shrunk their products as much as possible. Their powerful little drives require less desk space and are portable but can cost more.

No matter the size or shape, cases can be made from metal or plastic. Metal has a sturdier feel, but even the stylish plastic cases are tough enough to shrug off a modest plummet to the floor (the paint on a metal case would probably chip off).

The better cases comply with the standards of various regulatory and testing agencies. The FCC (Federal Communications Commission) Class B certification indicates that a drive can be used in residential areas. Class A devices are verified under looser RFI (radio-frequency interference) standards and may be used only in business settings. An Underwriters Laboratories listing ensures the electrical safety of the drive.

Most drive vendors provide other electrical protection in the form of fuses to keep the drive safe from short circuits in the power supply. Drives that let you change the fuse without opening the case are preferable. If the fuse has done its job, someone will still need to open the drive to fix any underlying problem, but sometimes fuses simply die of old age and an easily accessible fuse is a welcome convenience.
Other Storage Options

An external hard-disk drive is not your only option when you need more storage for your Mac. A broad array of technologies is available — each with advantages and, of course, disadvantages.

Removable-hard-disk-cartridge drives (see "Portable Secure Unlimited-Storage Cartridge Drives," February '91, page 205) have the appeal of unlimited capacity. When you run out of space on one disk, you only have to replace it with another. Although cartridge drives make a perfect backup and data-exchange medium (with capacities of up to 45 megabytes), MacUser Labs doesn't recommend using them as your primary mass-storage system. The disk and drive mechanism are too exposed to the elements (conventional hard-disk drives are sealed), and cartridge drives are more vulnerable to impact and dust.

WORM (write once, read many) optical drives resemble erasable optical drives, but WORM technology only lets you write data. You can pile on the megabytes and then read it later, but you can never change what you've written. That makes a WORM drive an excellent choice for archival storage but not suitable for use as your primary mass-storage medium.

Erasable optical drives (also called magneto-optical) match CD-ROM’s 600-megabyte capacities and data stability but let you read, write, and erase data. Unfortunately, these drives are costly (figure on $4,000 as the average entry fee) and a little slower than magnetic-hard-disk drives. Use erasable optical as primary or secondary storage, but have a compelling reason to spend this kind of money (see "Erasable Optical Drives," November '90, page 102).

Tape-cassette/cartridge drives (see "Getting It on Tape," December '89, page 189) are an excellent mass-storage option. But tape is a sequential, rather than random-access, medium — you can store megabytes or even gigabytes of data on tape, but you can't retrieve your data quickly. Tape has the advantages of high capacity and convenient transportability. Tape drives are used most frequently for routine backup of much faster storage systems, such as magnetic-hard-disk drives.

Power to the Product

Most computer peripherals use 120-volt alternating current (AC), which they then convert to lower-voltage direct current (DC). You plug the device's cord and the Mac's into a wall outlet (or preferably a reliable surge/spike protector), and your local utility takes care of everything else. With external hard-disk drives, however, electrical power can be delivered in one of three ways: conventionally (via an AC plug in the drive's rear panel), through a separate transformer "brick," or from your Mac's external-floppy-drive connector.

In the case of conventional power, a power-supply transformer built in to the drive case converts the local utility's AC power into the low-voltage DC required by the hard-drive mechanism. An external brick accomplishes the same thing outside the drive case. The brick has advantages. It keeps the drive cool and its case small. It also saves the manufacturer (and, hopefully, you) the cost of the power supply or brick. But when a hard-disk drive takes over your external-floppy-drive connector, you can't add a secondary floppy-drive port to your Mac. Any hard-disk drive that gets power from a floppy-drive port can't be used with the new Mac LC, because that Mac doesn't have a port for an external floppy-disk drive. Aristotle Industries solves this problem for its Hardpac 40, which is normally powered through the floppy-drive port, by offering an optional power-supply brick.

With the Mac Classic, the floppy-drive power issues are even more complex. Apple equips the Classic with a minimal — although highly reliable — power supply, so the Classic relies on a special power-up sequence. When you turn on a Classic, the computer first powers up, and then, following a one-second delay, the internal hard-disk drive (if the Mac has one) requires a huge initial surge of current to spin up the disk. The external-floppy-drive port of the Classic isn't part of this prioritized startup procedure. Consequently, a hard-disk drive connected to the Classic's external-floppy port might overload the system, either preventing it from booting up reliably or reducing its potential life span. Avoid floppy-connector-powered hard drives if you have a Classic.

SCSI Uncertainties

The seemingly straightforward task of plugging in a SCSI cable is sometimes complicated by connections to the external hard-disk drive. All Macs, as well as the portable Aristotle and LaCie drives, use 25-pin connectors, whereas most drives use shielded 50-pin connectors. The latter are better than 25-pin connectors, because they have a ground wire to each active line on the SCSI bus (the multiple-wire pathway found in SCSI cables and connectors); this helps ensure reliable

MacUser April 1991 Buyer's Guide 11
Five Simple Reasons:

1. **Quality:** While our products may not be fancy, our cases are all domestically manufactured, none of those light-weight imported knock-offs. They utilize the best auto-switching digital power supplies and quiet, high capacity fans. Our connectors are all name brands of the finest quality. Our drive mechanisms speak for themselves. Quantum, WREN, Maxtor, Conner, Syquest, Teac... Industry standards... the best available.

2. **Knowledge:** Our helpful, knowledgeable sales associates will help you determine what is the best drive for your needs (not just the most expensive). They'll help you navigate those thorny termination issues, and help you decide the right drive for your particular hardware configuration.

3. **Support:** Our trained technical associates will help you address any questions you might have about an APS drive.

Are you running into conflicts when you use certain combinations of hardware and software? Our technical associates can help you sort through the kinds of problems that plague both the novice and the power user.

4. **Service:** Absolutely the best in the industry! If we tell you we have it, WE DO! We'll ship your drive when we promise, as we promise. We never charge your credit card until after your order has shipped from our factory. In the unlikely event that you have a problem with your drive, our exclusive 30 day performance guarantee goes immediately into effect. We'll ship you a new drive over night* and have the suspect drive picked up at our expense. After the first 30 days, our warranty turn-around time is 48 hours (often 24). We'll ship back to you via overnight air* - our expense. Our one and two year warranties include a thirty day money-back guarantee. Your toll-free phone call to either sales or technical support is answered by a real person 24 hours a day, none of those frustrating voice mail mazes that you find other places.

Our goal is to care for you better and faster than the dealer down the street.

5. **Economy:** Our prices speak for themselves! APS consistently offers the lowest prices on immediately available inventory in the business. Our pricing is based on assembled, formatted* products with everything you need to plug-n-play. Our external drives are available in externally terminated (with termination) or internally terminated units, - your choice. Need a Mac to SCSI, or daisy-chain cable? Take your pick, - no extra charge. Need multiple units? Don't pay for the same piece of bundled software three times, buy them only if you need 'em*. We have outstanding values on several "industry standard" drive utility products at as much as 80% off retail prices!

*Some limitations may apply.
Quantum 10 - 12ms Access

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 mb</td>
<td>$299</td>
<td>$389</td>
</tr>
<tr>
<td>52</td>
<td>329</td>
<td>429</td>
</tr>
<tr>
<td>105</td>
<td>399</td>
<td>499</td>
</tr>
<tr>
<td>105LPS</td>
<td>509</td>
<td>609</td>
</tr>
<tr>
<td>120</td>
<td>599</td>
<td>699</td>
</tr>
<tr>
<td>170</td>
<td>729</td>
<td>829</td>
</tr>
<tr>
<td>210</td>
<td>859</td>
<td>959</td>
</tr>
</tbody>
</table>

MAXTOR 15 - 17ms Access

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>$299</td>
<td>$399</td>
</tr>
<tr>
<td>80</td>
<td>429</td>
<td>529</td>
</tr>
<tr>
<td>200</td>
<td>859</td>
<td>959</td>
</tr>
</tbody>
</table>

Conner 25ms Access

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>$319</td>
<td>599</td>
</tr>
<tr>
<td>120</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Syquest Syquest

<table>
<thead>
<tr>
<th></th>
<th>Removable</th>
<th>$549</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 meg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Syquest 45 meg Removable 999

- All include one cartridge • $72 per cartridge for additional cartridges

Teac 155mb Tape

<table>
<thead>
<tr>
<th></th>
<th>Include Retrospect</th>
<th>$629</th>
</tr>
</thead>
<tbody>
<tr>
<td>WangDAT</td>
<td></td>
<td>1749</td>
</tr>
</tbody>
</table>

Dual Drive Combo's

<table>
<thead>
<tr>
<th></th>
<th>$4999</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 gig WREN/WangDAT</td>
<td>3799</td>
</tr>
<tr>
<td>600 mb/WangDAT</td>
<td>2699</td>
</tr>
<tr>
<td>600/Teac 155</td>
<td>2599</td>
</tr>
<tr>
<td>600/SyQuest</td>
<td>2049</td>
</tr>
<tr>
<td>300/Teac 155</td>
<td>1999</td>
</tr>
<tr>
<td>300/SyQuest</td>
<td>2399</td>
</tr>
<tr>
<td>330/Teac 155</td>
<td>2399</td>
</tr>
<tr>
<td>330/SyQuest</td>
<td>2399</td>
</tr>
</tbody>
</table>

- All Tape Combo’s include one cassette and Retrospect!
- All SyQuest Combo’s include one Cartridge

ASK ABOUT OUR OTHER COMBOs, SUN & IBM SCSI DRIVES

All Drive products carry a 30 day Money-back guarantee. Quantum and Syquest Drives carry a two year “parts & labor” disk-for-disk replacement warranty. WREN, Maxtor, Teac, WangDAT and Syquest Cartridges carry a one year “parts & labor” disk-for-disk replacement warranty. All Hard Drives Include all brackets, cables and cords and LED's required for operation. All Hard Drives come pre-formatted with Apple's latest stable System software, 18.8MB of Publicly Distributable software from the EMUZ Library, and the "ALLIANCE POWER TOOLS" SCSI format & Partitioner. If your drive fails to perform properly in the first 30 days and our technical support staff can't solve the problem over the phone, we'll ship you a replacement drive overnight and have your defective drive picked up at our expense. Offer is subject to some limitations. Products being returned for credit and international orders do not apply.

Alliance
Peripheral Systems

1-800-233-7550

0014 800 125 875

Toll Free from Australia
0800-897545
Toll Free from U.K.

Toll Free U.S. and Canada
VISA/MC, Corp., Gov., Univ. POS, NO SURCHARGE
AMEX ACCEPTED

International Orders Call (816) 478-8300

9:30am - 7:00pm Central Time
fax: (816) 478-8300 24hrs.
A SCSI Strategy

Connecting SCSI devices isn’t difficult — but getting them all to work can be. The best approach is to follow the SCSI rules and, if that doesn’t work, to bend them a little. The SCSI specifications let you connect up to seven devices to your Mac. One of those seven may be an internal hard-disk drive, or all seven may be external devices, such as scanners, tape drives, and CD-ROM drives.

All SCSI devices connected to a Mac are daisy-chained together. A cable leads from your Mac to the first device, then another cable connects the first device to the second, and so on. The two limits on chaining are a maximum of eight devices (including the Mac itself and any internal SCSI device) and a maximum chain length of 18 feet.

Because all the devices are connected in a single chain, your Mac looks for a unique SCSI-ID number as an address when it sends commands and data to an attached device. Without individual IDs, none of the SCSI devices can operate correctly.

SCSI ID 7 is reserved for the Mac itself. By convention (and usually with a permanent hardware adjustment), an internal hard-disk drive is installed with ID number 0 — the first SCSI ID that the computer checks for an available System Folder (if no floppy drive can provide one) when the Mac starts up. External drives are normally allowed to use the ID 0, which would conflict with any internal drive. (Note that the SCSI ID has nothing to do with the relative position of a SCSI device in the daisy chain.)

The SCSI daisy chain must be terminated at both ends. A terminator is a set of resistors, electronic components that absorb current. Terminators absorb signals at the ends of the daisy chain so that they don’t bounce back down the line and interfere with other signals.

Each terminator also reduces the voltage of the signal and draws current from each SCSI device. If you connect too many terminators to a SCSI chain, the voltage may be reduced so much that signals become unreliable or the chain may draw so much current that it overloads and damages your Mac’s circuitry.

To terminate your SCSI chain properly, add a terminator only to the first and last devices in the chain (an internal hard-disk drive has a terminator). All devices in the middle of the chain should have termination removed or disabled.

Occasionally, one or more devices in the SCSI chain might not mount on your Mac’s desktop. First, check that all the devices have unique ID numbers and are correctly terminated. Be sure to use matched SCSI cables that conform to ANSI (American National Standards Institute) specifications; a frequent problem is impedance mismatch among cables from different vendors.

If things still don’t work, then it’s time to experiment. First turn off the Mac and then all the devices in the daisy chain. Rearranging your SCSI cables to new positions in the chain may alter where signal reflections occur and allow all your SCSI devices to work.

If playing musical cables isn’t successful, connect the SCSI devices in a different sequence (properly terminated). Ensure that each SCSI device is functional by disconnecting from the chain all the other devices or at least enough devices to isolate problem devices. Also try moving the SCSI terminator at one end of the chain to a few other positions, or try adding a third terminator in the middle of the chain. You should never have more than three terminators in a chain.

Termination Tips

### With internal hard drive, internally terminated
(Mac is SCSI ID 7; internal drive is 0)

<table>
<thead>
<tr>
<th>Flow-through terminator</th>
<th>External SCSI device</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-inch adapter cable</td>
<td>Flow-through terminator</td>
</tr>
<tr>
<td>Flow-through terminator</td>
<td>Maximum daisy-chain length: 18 feet</td>
</tr>
</tbody>
</table>

### Without internal hard drive, (Mac is SCSI ID 7)

<table>
<thead>
<tr>
<th>Flow-through terminator</th>
<th>External SCSI device</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-inch adapter cable</td>
<td>Flow-through terminator</td>
</tr>
<tr>
<td>In emergency:</td>
<td>SCSI cable: 3 feet to 16 feet</td>
</tr>
<tr>
<td>18-inch adapter cable</td>
<td>In emergency:</td>
</tr>
</tbody>
</table>

operation — particularly when many SCSI devices are daisy-chained.

The MacProducts Magic 40MB includes two 50-pin SCSI connectors, but the connectors are unshielded plastic rather than the sturdy metal of all the other drives’ connectors. Plastic is not only flimsier than metal but it’s also unable to shield against electromagnetic interference, which can let signal noise scramble your data. The Magic 40MB we tested also lacked the clips necessary to keep the SCSI cable from slipping off, but MacProducts assured us that all of its drives now ship with clips and that the company will upgrade the clipless models for free.
Most external hard-disk drives have two SCSI connectors to allow daisy-chaining. Of the vendors whose drives we tested, only Liberty Systems had the ingenuity to find room for two 50-pin connectors on a drive package that you can fit easily into your parka pocket. In the continuing quest for miniaturization, the drives from Tulin and d1S omit one of the connectors on their products, sacrificing expansibility for size. You can put one of these single-connector drives at the end of your daisy chain, but your flexibility is limited and you can’t connect two such drives to your Mac.

External drives usually include one 25-pin SCSI cable. Typically, this cable has a 25-pin connector on one end to match up with your Mac and a 50-pin connector at the other end to connect with most drives. If you already have SCSI devices attached to your Mac, you’ll probably need a different cable, generally one with two 50-pin connectors. If you can choose what type of cable to receive when you order your drive, be sure to specify the correct configuration, including whether male or female connectors are needed.

Cable length is important. If you’re daisy-chaining several drives, long cables can be a problem, because SCSI specifications limit the length of the entire daisy chain to 18 feet. If your daisy chain gets complex (see the “SCSI Strategy” sidebar), you’ll find it helpful to have many cable lengths.

The PCPC MacBottom 50MB comes with one SCSI cable permanently attached to its case, which reduces your options when connecting the drive in a daisy chain but makes installing a single hard-disk drive straightforward. This drive includes a second SCSI connector for daisy-chaining.

In addition to providing conventional fuse protection against short circuits, the EMAC Metro 40 includes SCSI Sentry hardware to monitor and protect the delicate components dedicated to SCSI circuitry.

Meet the Terminator

Any series of SCSI devices (including the Mac itself) requires termination, which regulates electrical signals in the cable. External hard-disk drives use either internal or external methods for terminating daisy chains. An external terminator looks like a SCSI connector with no cable attached. It’s easy to use and also easy to lose. Internal termination can take several forms. Typically, there’s a set of resistor packs on the hard-drive mechanism inside the case. Some manufacturers — Tulin and Aristotle, for example — give you no termination options. That’s an acceptable scheme only for single-connector drives that you can’t chain but that must be terminated.

Ehman, Cutting Edge, and Jasmine provide easy access to their internal terminations; you just open an access hatch and pull off the resistor packs when you don’t need termination. However, the termination resistors are easy to misplace (a problem when you want to plug them in again) or to break during removal.

For these reasons, we prefer internal terminations that can be turned on and off externally. La Cie includes an external switch, and the PLI drive has a bank of 18 DIP switches for this purpose. The Western Digital 40AP uses a rotary switch that lets you choose terminated or nonterminated operation as well as its SCSI-ID number, but there’s no label to tell you which position does what.

A Better ID

Every SCSI drive needs a way to change its SCSI-ID number in a chain of connected devices. Again, drive...
Hidden Dangers

The worst you can expect from a badly designed hard-disk drive is poor performance, right? Wrong. As we discovered, seemingly innocuous details can lead to potentially disastrous consequences.

The POWERDrive 40MB from HDI (Hard Drives International) that we tested was fast and affordable, but it had one fatal flaw: Its SCSI connectors were so small that you could install the SCSI cable upside down. The resulting scrambling of voltages could disable not only the POWERDrive 40MB but also your Mac's sensitive circuitry. What's more, the drive's undersized connectors were made of unshielded plastic rather than the sturdy metal of the other drives' connectors. Without shielding, electromagnetic interference can garble your data.

Fortunately, HDI is now shipping a totally new POWERDrive 40MB. Although it arrived too late to be tested, the new POWERDrive 40MB is attractive and sturdy built and includes most of the features we recommend in small-capacity hard-disk drives. If it's as fast as the original POWERDrive 40MB—which was one of the fastest we tested—the second-generation POWERDrive 40MB (at the same low price of $359 as the old model) is well worth a look.

If you're one of the unlucky few who purchased an original POWERDrive 40MB, HDI will replace your old drive with a new, spiffy model at no charge (other than shipping). Just call the company at (800) 488-0004 for information about its replacement program.

The old POWERDrive 40MB (top) has lll msy plastic SCSI ports; the new HDI POWERDrive 40MB (bottom) not only solves problems found in the old model but it's built better as well. The old POWERDrive 40MB (top) has flimsy plastic SCSI parts that let you install a SCSI cable upside down.

Software and Service

Many of the hard-disk drives reviewed here seem similar enough that price might be considered their only distinguishing characteristic—but there are other important differences. All these products come equipped with their own driver software that matches the disk format to your Mac. The drivers differ not only in speed and performance but also in the methods used to set up and run the drive. Vendors frequently also bundle drive-formatting software from third-party developers.

Look closely, and you'll find that the different vendors use only a handful of drivers and formats. The formatter from FWB is easy to use but has one potentially disastrous flaw: It doesn't keep you from inadvertently formatting your startup drive! A better approach is to use a separate startup floppy. FWB plans to release a revised version of its software to correct this problem. La Cie's Silverlining is a powerful formatter—it even has built-in timing loops that determine the optimum installation settings—but it's not intuitive to use.

Several vendors use On-Track Computer Systems' Disk Manager, which is unremarkable except for its ability to choose software-selectable SCSI IDs (in drives that allow this method). MicroNet's driver is easy to use, incorporates built-in diagnostic functions, and can be used with larger-capacity drives.

Vendors' customer-service policies vary widely (see Table 1). If your local dealer can't provide repairs or software assistance, look for special long-term programs from vendors. Some, such as Apple, sell contracts that simply extend their warranties. CMS vendors use several strategies. The best method is to use rotary thumb wheels and push-button switches that are plainly labeled. With the drive turned off, just adjust the switch until you reach the appropriate number.

SCSI-ID switches should give you a selection range of 0 through 6; 0 is used by external drives only when the Mac has no internal hard-disk drive (the Mac is always ID 7). ID switches with impossible-to-use, higher-number options (7, 8, or 9) let you travel into the Twilight Zone—where you're not sure what default ID the drive is using.

Lower on our list of recommended SCSI-ID-setting schemes are the DIP switches used by APS and La Cie—especially La Cie's, because the drive lacks an explanatory label. Although DIP switches are handy and effective, the lack of a label leaves you guessing which position of the switch is on and which is off, as well as what pattern to use for each ID setting.

For most users, the least desirable way to set SCSI IDs is with software—the method used by the MacProducts Magic 40MB. With software-selectable IDs, you can't tell what number is assigned to a drive by looking on its case. Instead, you must run a program to peek at the ID—and if the ID of the drive you're checking conflicts with that of another drive in your SCSI setup, you might corrupt data on both drives.

Drives with software-selectable IDs are safest when used with a Mac that has no internal hard-disk drive. To check or select the SCSI ID on such a drive, first connect the (terminated) external drive all by itself to the Mac. Then insert a floppy that contains only a System Folder and the drive vendor's SCSI-management utility. Turn on the hard-disk drive and then the Mac, and you'll be able to change the SCSI ID of the hard-disk drive.

Software and Service

Many of the hard-disk drives reviewed here seem similar enough that price might be considered their only distinguishing characteristic—but there are other important differences. All these products come equipped with their own driver software that matches the disk format to your Mac. The drivers differ not only in speed and performance but also in the methods used to set up and run the drive. Vendors frequently also bundle drive-formatting software from third-party developers.

Look closely, and you'll find that the different vendors use only a handful of drivers and formats. The formatter from FWB is easy to use but has one potentially disastrous flaw: It doesn't keep you from inadvertently formatting your startup drive! A better approach is to use a separate startup floppy. FWB plans to release a revised version of its software to correct this problem. La Cie's Silverlining is a powerful formatter—it even has built-in timing loops that determine the optimum installation settings—but it's not intuitive to use.

Several vendors use On-Track Computer Systems' Disk Manager, which is unremarkable except for its ability to choose software-selectable SCSI IDs (in drives that allow this method). MicroNet's driver is easy to use, incorporates built-in diagnostic functions, and can be used with larger-capacity drives.

Vendors' customer-service policies vary widely (see Table 1). If your local dealer can't provide repairs or software assistance, look for special long-term programs from vendors. Some, such as Apple, sell contracts that simply extend their warranties. CMS
The newest Macintosh computers were designed to deliver leading edge technology in the most cost effective packages. With them, Apple has taken a giant step into the world of value. Frankly, it's a world in which we at Storage Dimensions have been doing business for some time now.

Our new slimline ZFP (zero footprint) models, for instance, reflect giant steps of their own — and leave no footprints. Tucked smartly under the Mac Classic, or just as smartly between the Mac SE chassis and monitor, they're available in 50, 100, and 205 MB capacities. And they're among the fastest in the industry. What's more, they include comprehensive disk management software, with advanced features like disk mirroring and volume spanning.

In fact, features like these have always been included across the entire MacinStor product family. Whether it's a 650 MB internal or a 4 GB external. Whether it's an erasable optical solution or a hard disk standalone solution, every MacinStor delivers more for your money. Because Macintosh users expect more.

Take a giant step in performance, reliability, features, support and value. Ask for more than just storage. Ask for Storage Dimensions. Call (408) 879-0300. Storage Dimensions, 2145 Hamilton Avenue, San Jose, CA 95125.

STORAGE DIMENSIONS

Macintosh is a registered trademark of Storage Dimensions. © 1981 Storage Dimensions.

Please circle 166 on reader service card.
Small Hard Drives

Enhancements' ANDT (Absolutely No Down Time) program guarantees shipment of a replacement drive via priority overnight air-freight delivery. Microtech International offers an attractive Step Up trade-in program for older drives — even those from other vendors.

Above and beyond their driver software, hard-disk drives often come with handy utilities. EMAC and La Cie include the powerful Norton Utilities for the Macintosh. Jasmine and CMS Enhancements give you SUM II (Symantec Utilities for Macintosh). Among other features, these programs offer file-defragmenting and disk-optimizing features.

Vendors often include the popular utilities SCSI Probe and SCSI Tools (which are also available from Zmac and other on-line services). Some vendors pack their drives with megabytes of public-domain software and shareware — 14 megabytes' worth come with the Jasmine DirectDrive 40 and the MacTel Index 40MB. If you decide to keep the shareware programs, you must pay the registration fees, but these programs are a great way to test what's inexpensively available for your Mac.

Hard Choices Made Easy

If you're using a Mac without the benefit of a hard-disk drive, you're making your life unnecessarily difficult. Your storage space is limited, and your work creeps along at a snail's pace. Now that files and applications are growing, 40 megabytes of memory isn't a luxury — it's a necessity.

If you own a Mac Plus or a floppy-disk-drive-only SE (and you can find some great used-Mac buys as users upgrade to more powerful models), read the “Bottom Line” sidebar to find our picks among the 32 small hard-disk drives we tested. And if you're considering buying a Mac Classic, think seriously about buying one of the drives we recommend instead of opting for the 40-megabyte Conner mechanism that Apple bundles in the $1,499 version of its low-priced gem (the Classic minus hard drive lists for $999). Although you won’t save a lot of money — Apple, for once, offers the hard-disk drive and memory-upgrade Classic option at a very reasonable price — you will gain a faster drive that, being external, can easily tag along as you move up the Mac's evolutionary ladder.

The Bottom Line

In a closely matched field of 32 contenders, one drive stood out as both the best performing and the best designed: the FWB PocketHammer 50 ($895). One of three drives equipped with Quantum's fast new LP52S mechanism, the PocketHammer 50 has a compact metal case that is sturdy and well finished. It includes external SCSI termination, push-button SCSI-ID selection, and an external fuse. FWB provides great software for managing software partitions, backup, and formatting (but be careful — it doesn't prevent you from accidentally formatting your startup volume).

Two other Quantum LP52S-equipped drives, the La Cie Tsunami 50 ($649) and PCPC MacBottom 50MB ($399), finished a strong second and third in our speed tests. On the plus side, the MacBottom 50MB's fan blows cooling air up through a Mac Classic's fan vent, and the La Cie Tsunami 50 has space-age styling that is either sexy or silly, depending on your taste. However, both score lower than the PocketHammer 50 in other areas: Both have 25-pin SCSI connectors, and the MacBottom 50MB has an undetachable SCSI cable that's a mixed blessing — idiotproof but limiting. However, the MacBottom's low, low price makes its failings forgivable.

A total of 21 drives use the fast and familiar Quantum P40S mechanism — and their speed is virtually identical. Construction quality, features, software, warranty, price, and solid company reputations for stability and service separate the EMAC Metro 40 ($799), GCC UltraDrive 40S ($579), Liberty 40 ($699), and Microtech Europa 40 ($569) from the crowd.

The Metro 40 includes an external switch that configures the drive for optimum Mac Plus compatibility; styling that complements Apple's; the SCSI Sentry feature, which guards against problems with the SCSI circuitry; a front power switch; and either vertical or horizontal orientation. Unfortunately, its SCSI-ID switch allows settings up to 9.

The UltraDrive 40S, Liberty 40, and Europa 40 all offer good performance, solid construction, and all the right features at attractive prices. The UltraDrive 40S and Europa 40 are elegant and are backed by experienced vendors with long histories of reliable service. The Liberty 40's unique feature is its small size, which — along with its attractive carrying case — makes it a popular choice for folks who lug data from Mac to Mac. It includes two 50-pin SCSI connectors, auto-sensing (U.S. or overseas) AC power, and a thumb-wheel SCSI-ID selector. Its internal SCSI-termination mechanism, however, is difficult to disable.

Seven entry-level drives live up to our high expectations: (clockwise from top) the FWB PocketHammer 50, La Cie Tsunami 50, Liberty 40, Microtech Europa 40, GCC UltraDrive 40S, EMAC Metro 40, and PCPC MacBottom 50MB.
Introducing the RAVEN Series. The First Macintosh Disk Array With 5.7 ms Average Access and 4.1 MB/sec Sustained Transfers.

You may be wondering just how fast 4.1 MBytes per second really is. Well here's the bottom line—the RAVEN is so fast, you can now accomplish I/O intensive applications such as animation and graphic design, three times faster than you've ever been able to before! We're not talking about small cache bursts here, but real honest to goodness sustained data transfers.

The RAVEN also gives you incredible disk array power. MicroNet starts with a pair of high speed spindle hard disk drives. Then we maximize the Macintosh NuBus by connecting them in parallel to a pair of MicroNet NuPORT, SCSI-2, synchronous host adapters. What we've created is a very powerful 16-bit disk array subsystem. Capacities range from 606 to 2,500 MB with average access times as fast as 5.7 ms. The RAVEN also makes fault tolerant RAID technology possible for the Macintosh II family, ensuring real-time data integrity.

By now you're probably wondering what else the RAVEN and our other unique SCSI storage products can offer you. Give us a call today. We'd love to tell you all about our RAVENous storage systems. 1-714-837-6033.
### Table 1: Service and Support

<table>
<thead>
<tr>
<th>Model</th>
<th>Standard warranty</th>
<th>Extended warranty</th>
<th>Money-back guarantee</th>
<th>Toll-free support</th>
<th>Service center</th>
<th>Guaranteed turnaround</th>
<th>Data recovery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple 40SC</td>
<td>1 year</td>
<td>AppleCare</td>
<td>none</td>
<td>no</td>
<td>dealer</td>
<td>none</td>
<td>no</td>
</tr>
<tr>
<td>APS 40MB</td>
<td>2 years</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct</td>
<td>48 hours</td>
<td>$75/hour</td>
</tr>
<tr>
<td>Aristotle Hardpac 40</td>
<td>1 year</td>
<td>none</td>
<td>30 days</td>
<td>no</td>
<td>direct</td>
<td>1 week</td>
<td>no</td>
</tr>
<tr>
<td>Bay Microsystems HD40</td>
<td>1 year</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct</td>
<td>none</td>
<td>(claim 24-hour average) $75/hour</td>
</tr>
<tr>
<td>CMS Platinum 40MB</td>
<td>1 year</td>
<td>$99 for add'1 year*</td>
<td>none</td>
<td>no</td>
<td>direct or dealer</td>
<td>none</td>
<td>24-hour average</td>
</tr>
<tr>
<td>Cutting Edge 40MB</td>
<td>2 years</td>
<td>none</td>
<td>30 days</td>
<td>no</td>
<td>dealer</td>
<td>none</td>
<td>no</td>
</tr>
<tr>
<td>DataStor DS40</td>
<td>1 year</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct</td>
<td>24 hours</td>
<td>no</td>
</tr>
<tr>
<td>Deltaic DS400</td>
<td>1 year</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct</td>
<td>48 hours</td>
<td>no</td>
</tr>
<tr>
<td>Ehman HD 40</td>
<td>2 years</td>
<td>$20 for add'1 year#</td>
<td>30 days</td>
<td>no</td>
<td>direct</td>
<td>72 hours</td>
<td>no</td>
</tr>
<tr>
<td>EMAC Metro 40</td>
<td>2 years</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct or dealer</td>
<td>none</td>
<td>no</td>
</tr>
<tr>
<td>FWB PocketHammer50</td>
<td>1 year</td>
<td>$72 for add'1 year</td>
<td>none</td>
<td>no</td>
<td>direct</td>
<td>48 hours</td>
<td>yes</td>
</tr>
<tr>
<td>GGC UltraDrive 40S</td>
<td>2 years</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct or dealer</td>
<td>none</td>
<td>yes</td>
</tr>
<tr>
<td>IDS Wd 40MB</td>
<td>2 years</td>
<td>$119 for 5 years$</td>
<td>none</td>
<td>yes</td>
<td>dealer</td>
<td>3 – 5 days</td>
<td>no</td>
</tr>
<tr>
<td>Jasmine DirectDrive 40</td>
<td>2 years</td>
<td>$120 for 5 years$</td>
<td>30 days</td>
<td>no</td>
<td>direct</td>
<td>48 hours</td>
<td>$60/hour</td>
</tr>
<tr>
<td>La Gle Tsunami 50</td>
<td>5 years</td>
<td>none</td>
<td>none</td>
<td>yes</td>
<td>direct</td>
<td>36 hours</td>
<td>yes</td>
</tr>
<tr>
<td>Liberty 40</td>
<td>2 years</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct</td>
<td>72 hours</td>
<td>no</td>
</tr>
<tr>
<td>MacAvenue Protege 40</td>
<td>2 years **</td>
<td>price not yet set</td>
<td>none</td>
<td>no</td>
<td>direct or dealer</td>
<td>48 hours</td>
<td>no</td>
</tr>
<tr>
<td>MaciStor 40-ZFP</td>
<td>2 years</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct</td>
<td>48 hours</td>
<td>yes</td>
</tr>
<tr>
<td>MacLand 40MB</td>
<td>2 years</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct or dealer</td>
<td>none</td>
<td>no</td>
</tr>
<tr>
<td>MacProducts Magic 40MB</td>
<td>2 years***</td>
<td>none</td>
<td>30 days</td>
<td>no</td>
<td>direct</td>
<td>none</td>
<td>yes</td>
</tr>
<tr>
<td>MacTel Index 40MB</td>
<td>2 years**55</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct</td>
<td>24 hours</td>
<td>yes</td>
</tr>
<tr>
<td>MicroNet CPK-40p</td>
<td>1 year</td>
<td>$195 for add'1 year</td>
<td>30 days</td>
<td>no</td>
<td>dealer</td>
<td>48 hours</td>
<td>no</td>
</tr>
<tr>
<td>Microtech Europa 40</td>
<td>1 year</td>
<td>lifetime</td>
<td>yes</td>
<td>direct or dealer</td>
<td>none</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Mirror M 40</td>
<td>2 years**66</td>
<td>***</td>
<td>30 days</td>
<td>no</td>
<td>direct</td>
<td>24 hours</td>
<td>no</td>
</tr>
<tr>
<td>Optima Diskover 40</td>
<td>1 year</td>
<td>$100 for 3 years</td>
<td>30 days</td>
<td>no</td>
<td>dealer</td>
<td>24 hours</td>
<td>no</td>
</tr>
<tr>
<td>PCC PL40 Turbo</td>
<td>2 years</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct</td>
<td>none</td>
<td>yes</td>
</tr>
<tr>
<td>Ruby StarDrive 40DX</td>
<td>1 year</td>
<td>$63/year, max. 3 years</td>
<td>30 days</td>
<td>yes</td>
<td>direct or dealer</td>
<td>none</td>
<td>yes</td>
</tr>
<tr>
<td>TMS Pro 40</td>
<td>2 years</td>
<td>none</td>
<td>30 days</td>
<td>yes</td>
<td>direct</td>
<td>48 hours</td>
<td>yes</td>
</tr>
<tr>
<td>Total Peripherals D40X</td>
<td>2 years</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct</td>
<td>72 hours</td>
<td>yes</td>
</tr>
<tr>
<td>Tulin HallShell 40MB</td>
<td>1 year</td>
<td>price not yet set</td>
<td>none</td>
<td>no</td>
<td>direct or dealer</td>
<td>48 hours</td>
<td>$50/hour</td>
</tr>
<tr>
<td>Western Digital 40AP</td>
<td>1 year</td>
<td>none</td>
<td>none</td>
<td>no</td>
<td>direct</td>
<td>none</td>
<td>(claim within a month) no</td>
</tr>
</tbody>
</table>

*ANDT (Absolutely No Down Time) program ($249): In addition to honoring your extended warranty, CMS will ship you a drive in less than 24 hours.

1EEP (Ehman Extended Service Program): Ehman will send you a new drive within 24 hours.

2You can purchase the extended warranty up to 90 days after your purchase.

*You can purchase the extended warranty up to 90 days after your purchase, but you will receive a 20-percent discount if you buy the extended warranty at the time of purchase.

*If something goes wrong within 90 days, MacAvenue will ship a new drive overnight and pay for return shipping of the broken drive.

1Advanced Replacement Policy ($50 covers the two-year warranty): If your drive goes down, MacProducts will send you a drive within 24 hours.

2MacTel will service the drive for the first 30 days, but then you must take the drive to Quantum for warranty service.

3DriveCare: Mirror repairs not only its drives but its competitors' as well. Mirror has a 90-percent success rate for recovering crashed data.

**$47 for one additional year, $89 for two additional years, and $126 for three additional years.
This is your hard disk severely fragmented

This is how a typical fragmented hard disk looks. The abuse fragmentation can deal is a crime, and it’s causing a national epidemic in offices everywhere. But the more you use your computer, the more your files are spread all over your hard disk. As a result, your disk has to work a whole lot harder than it has to. And increased head movement not only slows down your file access times, it will slow you down, too.

This is your hard disk defragmented

Even defragmentation software can’t help much. Wimpy defraggers just place pieces of individual files adjacent to each other. Defraggers just don’t have the intelligence to constantly monitor your file usage. So, any increases in performance are modest and only temporary, disappearing as soon as you use your computer again.

This is your hard disk with DiskExpress II

Only DiskExpress II has revolutionary Disk Optimatic™ technology designed to safely keep your disk optimized forever. And only DiskExpress II has the intelligence to work transparently while you work, the way you work. Which means only DiskExpress II can monitor your daily file activity and determine the absolute optimum priority for file placement on your particular computer. Frequently used files are placed first, then free space and then seldom used files at the back of your disk where they belong. That not only minimizes head movement, it delivers the kind of mind-boggling increase in speed and performance you could get hooked on and be better off for it. To order your new DiskExpress II 2.04, call ALSoft today.

Any Questions?

ALSoft, Inc.
P. O. Box 927 • Spring TX 77383-0927
713/353-4090 SALES • 713/353-9868 FAX
ALSoft, MasterJuggler, DiskExpress, MultiDisk and Optimatic are trademarks of ALSoft, Inc. All other trademarks acknowledged. © 1990 ALSoft, Inc., all rights reserved. Shipping and handling $3 inside USA, $5 outside USA.
## Table 2: Features of Small Hard Drives

<table>
<thead>
<tr>
<th>Feature</th>
<th>Apple 40SC</th>
<th>APS 40MB</th>
<th>Aristotle Hardpac 40</th>
<th>Bay Microsystems HD40</th>
<th>CMS Platinum 40MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/street)</td>
<td>$1,299/$969</td>
<td>$399</td>
<td>$565</td>
<td>$430</td>
<td>$919/$610</td>
</tr>
<tr>
<td>Pros</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity (advertised/actual)</td>
<td>40/39.3 MB</td>
<td>40/40.3 MB</td>
<td>40/40.2 MB</td>
<td>40/40.3 MB</td>
<td>40/40.3 MB</td>
</tr>
<tr>
<td>Average seek time, milliseconds (ad./actual)</td>
<td>19/21 ms</td>
<td>12/21 ms</td>
<td>19/21 ms</td>
<td>19/22 ms</td>
<td>24/26 ms</td>
</tr>
<tr>
<td>Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal mechanism</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
</tr>
<tr>
<td>Automatic head parking</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>SCSI-ID selector</td>
<td>thumb wheel</td>
<td>DIP switch</td>
<td>rotary switch</td>
<td>rotary switch</td>
<td>push button</td>
</tr>
<tr>
<td>SCSI termination</td>
<td>external</td>
<td>internal</td>
<td>internal</td>
<td>internal</td>
<td>internal</td>
</tr>
<tr>
<td>SCSI cable</td>
<td>2 ft, 50/25-pin</td>
<td>3 ft, 50/25-pin</td>
<td>3 ft, 25/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>6.5 ft, 50/25-pin</td>
</tr>
<tr>
<td>Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCSI driver</td>
<td>HD SC Setup</td>
<td>Powertools 1.13</td>
<td>Disk Manager 2.02</td>
<td>Pro Driver 1.2</td>
<td>CMS utility v. 6.0</td>
</tr>
<tr>
<td>Bundled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bundled disk</td>
<td>Disk First Aid</td>
<td>12 MB of shareware</td>
<td>1.2 MB of shareware</td>
<td>none</td>
<td>SUM II</td>
</tr>
<tr>
<td>Selectable interleave</td>
<td>o*</td>
<td>o*</td>
<td>o*</td>
<td>o*</td>
<td>o*</td>
</tr>
<tr>
<td>Partitioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password protection</td>
<td>o*</td>
<td>o*</td>
<td>o*</td>
<td>o*</td>
<td>o*</td>
</tr>
<tr>
<td>Data encryption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disk optimizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case construction</td>
<td>plastic</td>
<td>plastic</td>
<td>plastic</td>
<td>plastic</td>
<td>plastic</td>
</tr>
<tr>
<td>Auto-switch/power supply</td>
<td>85 – 270V</td>
<td>90 – 240V</td>
<td>optional</td>
<td>internal</td>
<td>internal</td>
</tr>
</tbody>
</table>

*Quantum mechanism uses only 1:1 interleave.

*Zero footprint on one-piece Mac.
The only other name you need to know.

Microtech International.

Along with Apple, we've listened to your demands for new products. That's why we continue to develop products that keep pace with the latest technology, including the new Macintosh Classic, LC and IIsi. For these new computers, we have developed upgrade solutions that allow dozens of economical memory and storage options with strict adherence to Apple specifications.

Quality upgrades with more value.

Upgrade your new Mac with Microtech products that fit your needs. Add muscle with a new, high speed Europa™ internal Classic drive of 20, 50, or 100MB, or a Europa external drive of 20, 40, 80 or 100MB. The Europa Series is the perfect upgrade solution — built for economy without sacrificing quality.

Pump up the performance of your Mac with one of our new Io™ memory boards. Our 1MB board offers the flexibility of SIMM expansion. And if System 7.0 is in your future, our unique 3MB solution is a must.

For the convenience and portability of removable media, our R50, utilizing the reliable Ricoh mechanism, offers speed, flexibility and unlimited storage capacity.

The Microtech name means quality.

For over 5 years, Microtech International has been setting the precedence in quality, service and support. Because we know what quality means to you — a product you can depend on, service you can rely on. Microtech products are backed by the longest warranties in the industry, and our service and support team, accessible toll-free, are winners of Macworld Magazine Service Hero Awards. Microtech also has an outstanding record for repairs in 48 hours or less, and our MicroLink BBS is available 24 hours a day.

So for quality, value, service and support in new Macintosh products, there really is only one other name you need to know... Microtech International.

1-800-325-1895

International inquiries call: 203-467-6223 (FAX 203-467-8124)

Please circle 127 on reader service card.
## Small Hard Drives

### Table 2: Features of Small Hard Drives, continued

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cutting Edge 40MB</th>
<th>DataSter DS40 534Q</th>
<th>Deltaic DS40Q 534Q</th>
<th>Ehman HD 40 534Q</th>
<th>EMAC Metro 40 534Q</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/ street)</td>
<td>$799/$435</td>
<td>$339 direct</td>
<td>$449 direct</td>
<td>$429 direct</td>
<td>$799/$470</td>
</tr>
<tr>
<td>Capacity (advertised/actual)</td>
<td>42/40.2 MB</td>
<td>42/40.2 MB</td>
<td>40/40.3 MB</td>
<td>40/40.2 MB</td>
<td>40/40.3 MB</td>
</tr>
<tr>
<td>Average seek time, milliseconds (ad./actual)</td>
<td>19/21 ms</td>
<td>29/27 ms</td>
<td>19/24 ms</td>
<td>19/21 ms</td>
<td>19/21 ms</td>
</tr>
<tr>
<td>Technology</td>
<td>Quantum P40S</td>
<td>Conner CP340 v. 0608</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
</tr>
<tr>
<td>Internal mechanism</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Automatic head parking</td>
<td>push button</td>
<td>thumb wheel</td>
<td>push button</td>
<td>push button</td>
<td>push button</td>
</tr>
<tr>
<td>SCSI-ID selector</td>
<td>internal</td>
<td>internal</td>
<td>internal</td>
<td>internal</td>
<td>internal</td>
</tr>
<tr>
<td>SCSI termination</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
</tr>
<tr>
<td>Software</td>
<td>proprietary</td>
<td>H. D. Formatter 1.2</td>
<td>Deltaic Installer 2.01</td>
<td>proprietary</td>
<td>EMAC Disk Utility 3.31</td>
</tr>
<tr>
<td>Bundled</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Selectable interleave</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Partitioning</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Password protection</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Data encryption</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Disk optimizer</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Backup</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>File recovery</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
<td>o</td>
</tr>
<tr>
<td>Case</td>
<td>Fan</td>
<td>access, power</td>
<td>access, power</td>
<td>access, power</td>
<td>access, power</td>
</tr>
<tr>
<td>Indicator lights</td>
<td>access, power</td>
<td>access, power</td>
<td>access, power</td>
<td>access, power</td>
<td>access, power</td>
</tr>
<tr>
<td>Outlets</td>
<td>2 (switched)</td>
<td>2 (switched)</td>
<td>2 (switched)</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>Size (L x W x H, in.)</td>
<td>10.5 x 10 x 2.51</td>
<td>10 x 10 x 2.51</td>
<td>10 x 10 x 2.51</td>
<td>10.5 x 10 x 2.51</td>
<td>10.5 x 10 x 2.51</td>
</tr>
<tr>
<td>Weight</td>
<td>5.8 lb</td>
<td>6 lb</td>
<td>6 lb</td>
<td>5.8 lb</td>
<td>6 lb</td>
</tr>
<tr>
<td>Case construction</td>
<td>metal</td>
<td>plastic</td>
<td>metal</td>
<td>metal</td>
<td>plastic</td>
</tr>
<tr>
<td>Auto-switch power supply</td>
<td>90 - 270V</td>
<td>90 - 240V</td>
<td>90 - 240V</td>
<td>90 - 270V</td>
<td>90 - 260V</td>
</tr>
<tr>
<td>Fuse (internal/external)</td>
<td>external</td>
<td>external</td>
<td>external</td>
<td>external</td>
<td>external</td>
</tr>
</tbody>
</table>

*Quantum mechanism uses only 1:1 interleave.

*Zero footprint on one-piece Mac.
In a shakedown of removable storage devices, one drive quickly rises to the top. The new 44MB Bernoulli® Transportable. A drive that delivers reliable hard-disk-like performance day in and day out. In the office or on the road. Bernoulli’s patented design draws a flexible disk up to the read/write head. Which, unlike hard disks, makes Bernoulli virtually head-crash free. Should the drive encounter a jolt or a dust particle, the disk falls harmlessly away from the head, making Bernoulli the most reliable removable system available. Period.

 drives have an unbeatable MTBF of 60,000 hours. And Bernoulli’s 44MB disks can take 1,000Gs of shock force (or an 8-foot drop). We back that up with an unprecedented Gold Standard 5-year media life limited warranty.

The Transportable’s performance puts you in the fast lane, too. A high transfer rate, with an intelligent buffer and user-configurable cache, gives Bernoulli exceptional real-life performance.

If you’d rather go cordless, there’s a battery-powered version, which, like the Transportable fits neatly under a Mac SE. And now, Bernoulli takes your dollar the extra mile with dramatically reduced prices (up to 20 percent) that affect the entire Bernoulli family, including the Dual.

Which all adds up to one thing: Bernoulli’s closest competition isn’t close at all.

So call 1-800-777-6101 for free Bernoulli literature. Because no matter what road you travel, Bernoulli is the only system that can take it. Over the long haul.

INTRODUCING THE RUGGED, RELIABLE, REMOVABLE BERNOULLI TRANSPORTABLE.

The Iomega logo and Bernoulli are registered trademarks, and Bernoulli Means Security For Your Data is a trademark of Iomega Corporation. All other company names are registered trademarks of their respective companies.
## Table 2: Features of Small Hard Drives, continued

<table>
<thead>
<tr>
<th>Feature</th>
<th>FWB PocketHammer50</th>
<th>GCC UltraDrive 40S</th>
<th>IDS Wip 40MB</th>
<th>Jasmine DirectDrive 40</th>
<th>La Cie Tsunami 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/street)</td>
<td>$895/$720</td>
<td>$679/$547</td>
<td>$529/$499</td>
<td>$399 direct</td>
<td>$549 direct</td>
</tr>
<tr>
<td>Capacity (advertised/actual)</td>
<td>50/50.2 MB</td>
<td>40/40.2 MB</td>
<td>40/40.2 MB</td>
<td>40/43.2 MB</td>
<td>50/49.9 MB</td>
</tr>
<tr>
<td>Average seek time, milliseconds (ad./actual)</td>
<td>17/19 ms</td>
<td>19/21 ms</td>
<td>25/26 ms</td>
<td>25/25 ms</td>
<td>15/19 ms</td>
</tr>
<tr>
<td>Technology</td>
<td>Quantum LP52S</td>
<td>Quantum P40GS</td>
<td>Conner CP3040 v. 2.24</td>
<td>Fujitsu M3611S</td>
<td>Quantum LP52S</td>
</tr>
<tr>
<td>Internal mechanism</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Automatic head parking</td>
<td>push button</td>
<td>push button</td>
<td>rotary switch</td>
<td>push button</td>
<td>DIP switch</td>
</tr>
<tr>
<td>SCSI-ID selector</td>
<td>external</td>
<td>external</td>
<td>internal</td>
<td>internal</td>
<td>internal</td>
</tr>
<tr>
<td>SCSI termination</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 25/25-pin</td>
</tr>
<tr>
<td>Software</td>
<td>H. D. Fornatter 1.3</td>
<td>Drive Manager 6.13</td>
<td>IDS Express 1.3</td>
<td>DriveWare 1.71</td>
<td>Silverlining 5.27/11</td>
</tr>
<tr>
<td>Bundled</td>
<td>HD Partition, Deadbolt, Util</td>
<td>QuickEnvelope, QuickSpool II, SUM II</td>
<td>proprietary, 10 MB of shareware</td>
<td>proprietary, SUM II, 10 MB of shareware</td>
<td>Silverlining, Norton Utilities</td>
</tr>
<tr>
<td>Selectable interleave</td>
<td>O*</td>
<td>O*</td>
<td></td>
<td></td>
<td>O*</td>
</tr>
<tr>
<td>Partitioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data encryption</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disk optimizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator lights</td>
<td>access, power</td>
<td>access, power</td>
<td>access</td>
<td>access, power</td>
<td>access, power</td>
</tr>
<tr>
<td>Outlets</td>
<td>none</td>
<td>none</td>
<td>none</td>
<td>2 (switched)</td>
<td>1 (nonswitched)</td>
</tr>
<tr>
<td>Size (L x W x H, in.)</td>
<td>8.5 x 3 x 6.5</td>
<td>11 x 9.5 x 2.51</td>
<td>8 x 5 x 1.5</td>
<td>10.5 x 9.5 x 2.1</td>
<td>8.5 x 6 x 2.5</td>
</tr>
<tr>
<td>Weight</td>
<td>3 lb</td>
<td>6.6 lb</td>
<td>1.5 lb</td>
<td>4 lb</td>
<td>2.6 lb</td>
</tr>
<tr>
<td>Case construction</td>
<td>metal</td>
<td>plastic</td>
<td>plastic</td>
<td>plastic</td>
<td>plastic</td>
</tr>
<tr>
<td>Auto-switch/power supply</td>
<td>90 - 240V</td>
<td>90 - 240V</td>
<td>NA</td>
<td>90 - 260V</td>
<td>110 - 220V</td>
</tr>
<tr>
<td>Fuse (internal/external)</td>
<td>FWB, Inc. 2040 Polk St. Suite 215 San Francisco, CA 94109 (415) 474-8055</td>
<td>GCC Technologies 580 Wetter St, Walther, MA 02154 (800) 422-7777 (617) 890-0880</td>
<td>IDS Systems, Inc. 2107 N. First St. Suite 280 San Jose, CA 95131 (800) 733-0078 (408) 752-2952</td>
<td>Jasmine Technologies 1225 Elko Dr., Sunnyvale, CA 94087 (800) 347-3228</td>
<td>La Cie, Ltd. 19552 S.W. 90th Ct., Tualatin, OR 97062 (800) 999-0143 (503) 691-0771</td>
</tr>
</tbody>
</table>

*Quantum mechanism uses only 1:1 interleave.

*Zero footprint on one-piece Mac.
Introducing:

Mariah™: The Multimedia Organizer
Put Everything/Find Anything
• Build multi-megabyte catalogs filled with text, sounds, animations, and art
• Cut, paste, and play all items including sounds and animations
• Boolean search & filter through hundreds of megabytes and infinite items in seconds!
• Up to 32,000 items per catalog with multiple catalogs open at once
• Works with networks and file servers
• Search by name, type, or unlimited keywords
• Scroll full color type, or unlimited keywords
• Supports B&W to 32 bit color

"Provides the highest degree of functionality and the best on-screen and printed graphic ability in its class." MacUser, October 1989.

Call 800-624-2485

Symmetry
860 E. Imperial Hwy., Suite 110, Scottsdale, Arizona 85257
Tel: (602) 996-9106 FAX: (602) 996-9105 ATECH D003

Please circle 131 on reader service card.

FastTrack Schedule™ 1.5
Create and Update Presentation Quality Gantt Charts quickly and easily!

So much to schedule—so little time.

Please circle 100 on reader service card.

©1989 Synergy Corporation
MARIAH is a registered trademark of Interactive Media Intelligence, Inc.
All other trade names are registered trademarks of their respective companies.

"Provides the highest degree of functionality and the best on-screen and printed graphic ability in its class." MacUser, October 1989.

Please circle 131 on reader service card.
## Table 2: Features of Small Hard Drives, continued

<table>
<thead>
<tr>
<th>Liberty 40</th>
<th>MacAvenue Proteg4 40</th>
<th>MacinStor 40-ZFP</th>
<th>MacLand 40MB</th>
<th>MacProducts Magic 40MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/street) $699 direct $455 direct $979/$649 $399 direct $409 direct</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity (advertised/actual) 40/40.3 MB 40/40.2 MB 40/40.2 MB 40/40.2 MB 40/40.2 MB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average seek time, milliseconds (ad./actual) 12/21 ms 19/21 ms 19/21 ms 19/21 ms 19/21 ms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology Internal mechanism Quantum P40S Quantum P40S Quantum P40S Quantum P40S Quantum P40S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic head parking yes yes yes yes yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCSI-ID selector thumb wheel push wheel push button thumb wheel software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCSI termination internal external external internal external</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCSI cable 3 ft, 50/25-pin 2 ft, 50/25-pin 2 ft, 50/25-pin 3 ft, 50/25-pin 2 ft, 50/25-pin</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software SCSI driver Liberty Formatter 2.0 DiskMaster proprietary MacinStor Installer 3.0 MacLand Smart Software</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bundled none On Location proprietary proprietary proprietary</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selectable interleave o° o° o° o° o°</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partitioning • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Password protection • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data encryption • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disk optimizer • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>File recovery • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case Fan • • • • •</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indicator lights access, power access, power access, power access, power access, power</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outlets none 1 (nonswitched) none none none</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size (L x W x H, in.) 7 x 2 x 5 9.5 x 5 x 4.5 11 x 10 x 3 10 x 10 x 2.5 11 x 10 x 2.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight 3 lb 6.5 lb 5.5 lb 5.9 lb 6 lb</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case construction metal plastic plastic plastic plastic metal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuse (internal/external) Liberty Systems 122 Saratoga Ave. Suite 16 Santa Clara, CA 95051 (408) 983-1127 MacAvenue 12303 Technology Blvd. Austin, TX 78727 (800) 777-4326 Storage Dimensions 2145 Hamilton Ave. San Jose, CA 95125 (408) 879-0300 MacLand 4685 S. Ash St. Suite H-5 Tempe, AZ 85282 (800) 333-3353 MacProducts USA 8303 Mopac Expwy. Suite 218 Austin, TX 78759 (512) 343-9441</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Quantum mechanism uses only 1.1 interleave.

*Zero footprint on one-piece Mac.
I had a dream of how it should be...

So tiny and light I could carry all 120 MB in the palm of my hand.

So reliable I could trust it with my most important data even if it took a fall.

So fast that it waits for me, I don't wait for it...

...and iDS made my hard drive dream come true.

- Tiny in size (1.3" x 4.7" x 7.9")
- Light in weight (less than 1.5 lbs)
- Big in capacity (up to 120MB)
- Heavy in reliability (100,000 MTBF)
- Fast in performance (as low as 15ms)
- Affordable in price (from $329)

The stuff dreams are made of.

See it for yourself.
Or call 1-800-733-0078 and ask for your local dealer.
International sales call (408) 752-2952.

Please circle 79 on reader service card.
<table>
<thead>
<tr>
<th>Price (list/street)</th>
<th>$439 direct</th>
<th>$825/$829</th>
<th>$569/$484</th>
<th>$457 direct</th>
<th>$695/$444</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity (advertised/actual)</td>
<td>40/40.3 MB</td>
<td>40/40.3 MB</td>
<td>40/40.2 MB</td>
<td>42/40.2 MB</td>
<td>40/40.2 MB</td>
</tr>
<tr>
<td>Average seek time, milliseconds (ad./actual)</td>
<td>19/21 ms</td>
<td>25/26 ms</td>
<td>19/22 ms</td>
<td>19/22 ms</td>
<td>25/23 ms</td>
</tr>
<tr>
<td>Technology</td>
<td>Internal mechanism Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Conner CP3040 v. 2.24</td>
</tr>
<tr>
<td></td>
<td>Automatic head parking yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>SCSI-ID selector push button</td>
<td>push button</td>
<td>push button</td>
<td>push button</td>
<td>push button</td>
</tr>
<tr>
<td></td>
<td>SCSI termination internal</td>
<td>external</td>
<td>internal</td>
<td>external</td>
<td>external</td>
</tr>
<tr>
<td></td>
<td>SCSI cable 3 ft, 50/25-pin</td>
<td>3 ft, 50/25-pin</td>
<td>2.5 ft, 50/25-pin</td>
<td>1 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
</tr>
<tr>
<td>Software</td>
<td>SCSI driver FWB/HD Chauffeur</td>
<td>MicroNet Utility 4.4</td>
<td>Europa Formatter 3.26</td>
<td>Media Manager v. 1.33</td>
<td>DiskMount 2.0</td>
</tr>
<tr>
<td></td>
<td>Bundled Backmate 1.1, AutoSave II, 14 MB of shareware</td>
<td>none</td>
<td>Apple System</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Selectable interleave</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partitioning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Password protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Data encryption</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Disk optimizer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Backup</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>File recovery</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case</td>
<td>Fan</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Indicator lights access, power</td>
<td>access, power</td>
<td>access, power</td>
<td>access, power, termination</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Outlets 2 (nonswitched)</td>
<td>none</td>
<td>none</td>
<td>2 (switched)</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Size (L x W x H, in.)</td>
<td>10 x 10 x 2.5</td>
<td>8 x 6 x 2.5</td>
<td>10.5 x 9.5 x 2.5</td>
<td>11 x 10 x 2.5</td>
</tr>
<tr>
<td></td>
<td>Weight 5.5 lb</td>
<td>3 lb</td>
<td>6.6 lb</td>
<td>11 lb</td>
<td>9 lb</td>
</tr>
<tr>
<td></td>
<td>Case construction metal</td>
<td>plastic</td>
<td>metal</td>
<td>plastic</td>
<td>metal</td>
</tr>
<tr>
<td></td>
<td>Auto-switch/power supply 90 - 240V</td>
<td>90 - 260V</td>
<td>110 - 220V</td>
<td>96 - 240V</td>
<td>90 - 260V AC, 47 - 440 Hz</td>
</tr>
<tr>
<td></td>
<td>Fuse (internal/external) MacTel Technology</td>
<td>MicroNet Technology</td>
<td>Microtech International</td>
<td>Mirror Technologies</td>
<td>Optima Technology</td>
</tr>
<tr>
<td></td>
<td>3007 N. Lamar</td>
<td>20 Masjon</td>
<td>158 Commerce St.</td>
<td>2644 Patton Rd.</td>
<td>17528 Von Karman</td>
</tr>
<tr>
<td></td>
<td>Austin, TX 78704</td>
<td>Irvine, CA 92718</td>
<td>East Haven, CT 06512</td>
<td>Roseville, MN 55113</td>
<td>Irvine, CA 92714</td>
</tr>
<tr>
<td></td>
<td>(512) 451-2600</td>
<td>(714) 637-6033</td>
<td>(800) 626-4276</td>
<td>(612) 633-4450</td>
<td>(714) 479-0515</td>
</tr>
</tbody>
</table>

* Quantum mechanism uses only 1:1 interleave.

* Zero footprint on one-piece Mac.
A Few Magic Tricks

Sacrificial RAM
1 MB SIMMs $44*

Since 1987 MacProducts USA has been delivering SIMMs to the Macintosh community at the lowest prices available. Fortune 1000 companies and major universities, including Motorola, Apple, Dupont, NASA, MIT and Yale University, rely on MacProducts USA for high quality, inexpensive memory. Manufactured in Austin, Texas, our SIMMs have always been backed by a lifetime manufacturer's warranty. No bull.

We have memory for all computers and printers in all sizes and configurations. Call for pricing.

Take our RailGun
Dove hunting

With the RailGun 030 Accelerator in your Macintosh you can blow almost anything away- including the Dove Marathon. Choose from 16, 25, and 33 MHz speeds. And with our accelerated SCSI and optional math coprocessor, data will move even faster. The test results speak for themselves- RailGun wins this marathon!

<table>
<thead>
<tr>
<th>CPU</th>
<th>16 MHz Dove Marathon</th>
<th>16 MHz RailGun 030</th>
</tr>
</thead>
<tbody>
<tr>
<td>processing</td>
<td>1.96</td>
<td>3.94</td>
</tr>
<tr>
<td>Disk functions</td>
<td>6</td>
<td>1.39</td>
</tr>
<tr>
<td>Math functions</td>
<td>1.44</td>
<td>12.65</td>
</tr>
<tr>
<td>Overall improvement</td>
<td>1.58</td>
<td>5.18</td>
</tr>
</tbody>
</table>

RailGun Math performance with 68852 is 90.5% Data derived from Spectrometer benchmark tests. Data compared to a standard 58100. Larger numbers indicate faster processing.

Still not convinced? Our RailGun 030 is $300 less than the Dove Marathon.

Available for Plus, SE, & Classic from $99

The Magic Networking Line

Drive One Home

No single company has been continuously shipping Macintosh hard drives longer than we have. Since 1986 MacProducts USA has been shipping hard drives with the best warranties in the business. Today MagicDrives come standard with a two year warranty* and an available overnight replacement warranty. That's Magic.

Magic Drives

<table>
<thead>
<tr>
<th>Model</th>
<th>Quantum 45R M190</th>
<th>Magic Tape 600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal</td>
<td>$229</td>
<td>$709</td>
</tr>
<tr>
<td>External</td>
<td>$300</td>
<td>$679</td>
</tr>
</tbody>
</table>

40 MB hard drive: $300 $420
52 MB low profile HD: $359 $481
80 MB hard drive: $479 $651
160 MB hard drive: $799 $961
165 MB hard drive: $999 $1251
210 MB hard drive: $1150 $1450
300 MB ODC hard drive: $1390 $1780
500 MB hard drive: $2350 $2950
1.2 gig hard drive: $2795 $3495
Internal kit $29

Magic 45R

<table>
<thead>
<tr>
<th>Model</th>
<th>Magic 45R MB removable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magic 45 MB removable</td>
<td>$699</td>
</tr>
</tbody>
</table>

Magic Tape

<table>
<thead>
<tr>
<th>Model</th>
<th>Magic Tape 600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magic Tape 600</td>
<td>$679</td>
</tr>
<tr>
<td>Magic Tape 150</td>
<td>$699</td>
</tr>
<tr>
<td>Magic Tape 525</td>
<td>$799</td>
</tr>
<tr>
<td>Magic Tape 1.5 giga</td>
<td>$1099</td>
</tr>
<tr>
<td>Magic Tape 2.4 giga</td>
<td>$2095</td>
</tr>
</tbody>
</table>

Free Retrospect software included.

*Each drive covers a one year warranty.

MacProducts USA 1-800-MAC-USA1

Telex 69619017917

MacProUSA.com
<table>
<thead>
<tr>
<th>Feature</th>
<th>Quantum LP52S</th>
<th>Quantum P40S</th>
<th>Quantum P40S</th>
<th>Quantum P40S</th>
<th>Quantum P40S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price direct</td>
<td>$389</td>
<td>$389</td>
<td>$389</td>
<td>$389</td>
<td>$389</td>
</tr>
<tr>
<td>Pros</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Capacity (advertised/actual)</td>
<td>50/48.2 MB</td>
<td>40/40.2 MB</td>
<td>40/40.3 MB</td>
<td>40/40.3 MB</td>
<td>40/40.2 MB</td>
</tr>
<tr>
<td>Average seek time, milliseconds (ad./actual)</td>
<td>15/19 ms</td>
<td>19/22 ms</td>
<td>19/21 ms</td>
<td>19/21 ms</td>
<td>19/22 ms</td>
</tr>
<tr>
<td>Technology</td>
<td>Quantum LP52S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
<td>Quantum P40S</td>
</tr>
<tr>
<td>Internal mechanism</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Automatic head parking</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>SCSI-ID selector</td>
<td>Push button</td>
<td>Rotary dial</td>
<td>Push button</td>
<td>Thumb wheel</td>
<td>Push button, software</td>
</tr>
<tr>
<td>SCSI termination</td>
<td>Internal</td>
<td>External</td>
<td>Internal</td>
<td>Internal</td>
<td>Internal</td>
</tr>
<tr>
<td>SCSI cable</td>
<td>2 ft, 25-pin (attached)</td>
<td>2 ft, 50/25-pin</td>
<td>3 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
<td>2 ft, 25/25-pin</td>
</tr>
<tr>
<td>Software</td>
<td>SCSI driver</td>
<td>PLI Formatter 3.0</td>
<td>Nuvo Labs 1.12</td>
<td>STI Formatter 1.2</td>
<td>TPI Disk Manager 1.01</td>
</tr>
<tr>
<td>Bundled</td>
<td>Demos of Nisus, Synchronicity, C.A.T.</td>
<td>9 MB of shareware</td>
<td>None</td>
<td>Proprietary, 8 MB of shareware</td>
<td>None</td>
</tr>
<tr>
<td>Selectable interleave</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Partitioning</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Password protection</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Data encryption</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Disk optimizer</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Backup</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>File recovery</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Case</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Indicator lights</td>
<td>Access, power</td>
<td>Access</td>
<td>Access, power</td>
<td>Access</td>
<td>Access</td>
</tr>
<tr>
<td>Outlets</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Size (L x W x H, in.)</td>
<td>9.5 x 9.5 x 2&quot;</td>
<td>10 x 9.5 x 2.5&quot;</td>
<td>10.5 x 10 x 2&quot;</td>
<td>10.5 x 10 x 2&quot;</td>
<td>10.5 x 10 x 3&quot;</td>
</tr>
<tr>
<td>Weight</td>
<td>4.5 lb</td>
<td>6 lb</td>
<td>12 lb</td>
<td>4 lb</td>
<td>10 lb</td>
</tr>
<tr>
<td>Case construction</td>
<td>Plastic</td>
<td>Metal</td>
<td>Metal</td>
<td>Plastic</td>
<td>Metal</td>
</tr>
<tr>
<td>Auto-switch powersupply</td>
<td>80 - 260V</td>
<td>None</td>
<td>120 - 230V</td>
<td>110 - 220V</td>
<td>90 - 260V</td>
</tr>
<tr>
<td>Fuse (internal/external)</td>
<td>Internal</td>
<td>Internal</td>
<td>External</td>
<td>External</td>
<td>Internal</td>
</tr>
<tr>
<td>*Quantum mechanism uses only 1:1 interleave.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Zero footprint on one-piece Mac.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Why settle for an incomplete set of utilities when you can have them all?
Presenting MacTools® Deluxe—the most comprehensive, powerful collection ever assembled for the Macintosh.
It lets you find misplaced files, recover crashed disks, undelete trashed files, backup your data, optimize volumes, secure files and folders, quickly copy floppies, organize folders, and even partition your hard disk.
Not only do you get the broadest range of utilities available, but each function sets new standards for performance. For instance, let’s say you want to undelete a trashed file. Using a selective search, MacTools locates likely candidates and lets you view their contents prior to recovery—so you don’t waste time or retrieve unwanted files. No other utility even comes close.
So why settle for some, when you can have it all?
MacTools Deluxe…from the leading developer of Macintosh utilities since 1984.
For a free brochure or the MacTools dealer nearest you, call 1-800-445-0412.
### Table 2: Features of Small Hard Drives

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Tullin HalfShell 40MB $499 direct</th>
<th>Western Digital 40AP $3999/$700</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/street)</td>
<td>$499 direct</td>
<td>$3999/$700</td>
</tr>
<tr>
<td>Cons</td>
<td>Single SCSI port. Difficult to set SCSI ID.</td>
<td>Slow. Expensive. 25-pin SCSI ports. SCSI-ID switch allows 7 – 9, A – F.</td>
</tr>
<tr>
<td>Capacity (advertised/actual)</td>
<td>40/40.3 MB</td>
<td>40/39.2 MB</td>
</tr>
<tr>
<td>Average seek time, milliseconds (advertised/actual)</td>
<td>25/25 ms</td>
<td>29/29 ms</td>
</tr>
<tr>
<td>Technology</td>
<td>Conner CP3040 v. 2.32</td>
<td>W.D. 1006VSCS</td>
</tr>
<tr>
<td>Internal mechanism</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Automatic head parking</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>SCSI-ID selector</td>
<td>Jumpers (on drive)</td>
<td>Rotary switch</td>
</tr>
<tr>
<td>SCSI termination</td>
<td>Internal or external</td>
<td>Internal</td>
</tr>
<tr>
<td>SCSI cable</td>
<td>3 ft, 50/25-pin</td>
<td>2 ft, 50/25-pin</td>
</tr>
<tr>
<td>Software</td>
<td>Disk Manager Mac</td>
<td>WD Formatter 2.0.2</td>
</tr>
<tr>
<td>Bundled</td>
<td>None</td>
<td>Proprietary, 2 MB shareware</td>
</tr>
<tr>
<td>Selectable interleave</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Partitioning</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Password protection</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Data encryption</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Disk optimizer</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Backup</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>File recovery</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Case</td>
<td>Fan</td>
<td>•</td>
</tr>
<tr>
<td>Indicator lights</td>
<td>Access</td>
<td>Access, power, parked</td>
</tr>
<tr>
<td>Outlets</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Size (L x W x H, in.)</td>
<td>7.5 x 5.5 x 1.5</td>
<td>8 x 7 x 3</td>
</tr>
<tr>
<td>Weight</td>
<td>2.25 lb</td>
<td>5 lb</td>
</tr>
<tr>
<td>Case construction</td>
<td>Metal</td>
<td>Plastic</td>
</tr>
<tr>
<td>Auto-switch powersupply</td>
<td>None</td>
<td>90 – 230V</td>
</tr>
<tr>
<td>Fuse (internal/external)</td>
<td>Internal</td>
<td>Internal</td>
</tr>
<tr>
<td>Tullin Corp.</td>
<td>2156H O'Toole Ave., San Jose, CA 95131 (408) 432-9025</td>
<td>Western Digital 8105 Irvine Center Dr., Irvine, CA 92718 (714) 932-5000</td>
</tr>
</tbody>
</table>

### Criteria

- **Price (list/street)** — The list price is the manufacturer's suggested retail price. The street price is an average actual price charged by dealers around the U.S. in December 1990.
- **Capacity** — The advertised capacity of a drive typically differs from the actual formatted capacity (useful storage space). The actual capacity listed is that reported in the Finder.
- **Average seek time** — The theoretical average time required to move the read/write head between any two tracks on the disk (as reported by the manufacturer) versus the actual seek time as reported by our SCSI Evaluator testing. The lower the rating, the faster the drive.
- **Internal mechanism** — The OEM model name of the disk mechanism used in the drive. Check with the vendor to see if the mechanism used varies.
- **Automatic head parking** — When a Mac shuts down and its power is switched off, a hard-disk drive should move its read/write heads off the disk surface.
- **SCSI-ID selector** — The method used to change the SCSI ID.
- **SCSI termination** — Is the drive's termination inside the case or outside the case, using a terminator block or switches?
- **SCSI cable** — The length of the SCSI cable and the types of connectors on each end.
- **SCSI driver** — The software that manages a hard-disk drive.
- **Bundled** — Commercial applications, utilities, or shareware that the vendors include with the drive along with software developed exclusively for their hard-disk drives.
- **Selectable interleave** — Can the user specify the desired interleave ratio for the drive, or is it always automatically set by the software or the drive itself?
- **Partitioning** — Does the drive come with the ability to divide one large physical drive into several smaller logical drives?
- **Password protection** — Does the drive come with a method to prevent others from accessing it without a password?
- **Data encryption** — Does the drive come with a method of scrambling its contents to prevent others from accessing the data without a password?
- **Disk optimizer** — Does the drive come with software that reorganizes its contents into contiguous blocks to improve its performance?
- **Backup** — Does the drive come with software that copies files from the hard-disk drive to another medium for safekeeping?
- **File recovery** — Does the drive come with a utility for recovering deleted or damaged files?
- **Fan** — Does the drive contain a fan?
- **Indicator lights** — What do the lights (if any) on the front of the drive indicate?
- **Outlets** — A switched AC outlet allows you to control power to both the drive and another device by using the drive's on/off switch. A nonswitched outlet provides power even when the drive is turned off.
- **Size** — The dimensions of the case, rounded to the nearest quarter of an inch.
- **Weight** — The weight of the case, rounded to the nearest quarter of a pound.
- **Case construction** — The primary material used for the case.
- **Auto-switch power supply** — What voltage range does the drive's power supply automatically accept?
- **Fuse** — Is the drive internally or externally fused?
Buying Macintosh-compatible products has never been easier — or more worry free — than on MacAvenue. We give you unmatched service while you’re making up your mind, when you place your order and after you get down to work. At MacAvenue, we build on the CompuAdd tradition of award-winning service. For nine years, CompuAdd has been helping people choose reliable computer systems. And we share that commitment. The result? MacAvenue is your best full-service resource for Mac products. Look how stress-free MacAvenue can be:

Every hardware product carried by MacAvenue is covered by a 30-day, no-questions-asked, money-back guarantee.

If you have a problem with any MacAvenue product during the first 90 days, we will replace the product with equivalent merchandise and pay for Federal Express shipping both ways.

The easy living on MacAvenue starts with a toll-free call to our MacsFAX information service. Dial 800-933-9002, punch in a product number, and we’ll fax you a detailed spec sheet on any one of hundreds of products. Absolutely free.

When you’ve decided on a software package or a system enhancement, call our toll-free ordering number, 800-395-6221. You’ll receive prompt attention from savvy Macintosh experts.

In most cases, we ship your order the same day you call. And for only $2, we will send your purchase via Federal Express for next-day delivery.

Once you have your hardware or software up and running, you might have a question or two. Feel free to call. Just place a toll-free call to MacAvenue's technical support staff (800-766-6221). Problem with a particular program? Our technicians probably can bring the same program up on their screen and answer your questions in just a few minutes.

Whatever your needs, calls to MacAvenue are always absolutely FREE!

Call Today! 800-395-6221

MacAvenue
A Division of CompuAdd Corporation
Choose MacAvenue's Protegé Line for a Great Picture or a Smooth Drive.

MACAVENTURE ANNOUNCES THE END OF THE SCROLL BAR

Constant scrolling takes the creative joy out of graphic design — not to mention driving you crazy. And waiting for the screen to refresh can chase off the most ardent Muse. MacAvenue rescues you from the creative doldrums with a larger and sharper image of your whole design. No scrolling.

Our Protegé Display systems are value leaders in large-format Macintosh displays. Sharp screen images, flicker-free refresh rates and convenient ergonomic features such as a tilt/swivel base mean Protegé Displays are comparable to Apple and Radius products that can cost twice as much.

The 15-inch, ultra-high resolution screen of the Protegé Full-page Display features a complete 8 1/2" x 11" page with no reduction of image size or quality. Complete with video card, it's only $495. Or get a 2-page view with the 20" Protegé Dual-page Display for a mere $895. Just to make sure you get full enjoyment from your Protegé Display, we bundle Now Utilities and the After Dark screen saver — FREE! For a second opinion, ask Bob LeVitus, author of Dr. Macintosh, who says, "I love the crisp, bright image I get with a Protegé Display. And with the 30-day, no-questions-asked money-back guarantee, you just can't go wrong. I highly recommend the Protegé Display." Sure, other companies offer large monitors. But MacAvenue's prices let you actually take one home.

PROTEGE — THE BEST HARD DRIVE IN THE BUSINESS

How can we look you straight in the face and tell you we have the best hard drive on the market? Everyone knows that the heart of any hard drive system is the drive mechanism — and it's usually the same, no matter whose name is on the product.

So what makes the Protegé drive different?

It's not just another pretty case. The Protegé's metal interior and plastic exterior — just like the Mac's— allows us to control air flow and buffer the drive noise. When you work with the Protegé, all you hear is the sound of one hand clapping! Our DiskMaster™ management software lets you set up password-protected partitions that are easily accessible via the Control Panel. ProDOS and A/UX are also supported. But don't take our word for it. Ask Robert Wiggins, MacUser's longtime business columnist, who gives the Protegé drive his "highest recommendation." Or Steven Bobker, contributing editor to MacUser and Computer Shopper who says the Protegé is "far and away the best value on the market."

MacAvenue
A Division of CompuAdd Corporation
800-395-6221
Tax Help From MacInTax
Four-time World Class and Eddy award winner! MacInTax is the best-selling tax product for the Macintosh. Loaded with new features for 1990! And MacInTax is the only tax product available that prints exact replicas of IRS forms and schedules on blank paper. Full integration with 13 optional state supplements.
MacInTax (SoftView). 28502................. $59

TIME AND PROJECT SCHEDULING

ON THE MODERN

Fairshare Computing
Timbuktu/Remote v2.0 .......................... 27669 $123
Nihon
SmartCom IV v2.2 ............................... 27663 $84
Microsoft
Carbon Copy Mac v1.04 ........................ 27708 $19
Microsoft
MS Mail 20 Pack v2.0 .......................... 27680 $399
MS Mail Workstation ........................... 27676 $83
Prodigy Services
Prodigy Start-up Kit .............................. 27726 $27
Solutions Inc.
Spaces Plus ........................................ 27712 $27
SW Ventures
Microphone v3.0 ................................. 27660 $123

Education and Entertainment

ON THE LEARNING CURVE

A Lasting Impression
Resume Expert .................................... 28016 $38
Broadbund Software
Calculation v2.1 .................................. 27964 $57
Geometry v2.1 ..................................... 27962 $47
Physics v2.1 ....................................... 27966 $57
Type v1.0 ........................................... 27958 $18
Sensible Software
Mac Bible, 3rd Edition ........................... 28026 $22
Mac Bible (Super) ................................. 28028 $28
Great Wave
KidStart v1.1 ....................................... 27990 $25
Individual SW
Training for Pagemaker ......................... 28030 $38
MECC
Exploring Microsoft Works ....................... 28032 $17
Number Munchers ................................. 28034 $20
World Munchers .................................. 28036 $20
Sensible Software
Sensible Grammar v1.6.2 ....................... 28010 $50
Simon & Schuster
Typing Tutor ....................................... 28008 $26
Visionary Software
Synchronizer v2.25 .............................. 28040 $50

JUST FOR THE FUN OF IT

Accurate
Mean It ............................................ 28690 $12
Stars .................................................. 28722 $20
Achivision
Couple Quizz ...................................... 28700 $50
Manhole ............................................. 28696 $20
Manhole (CD ROM) .............................. 28698 $20

Create Professional Animation

FilmMaker from Paracomp gives you professional-quality animation with features such as real-time control over position, scale and rotation of animated objects, as well as full-screen anti-aliasing. And with the help of FilmMaker, your presentations also will take on new power.
FilmMaker (Paracomp). 29900.................. $437

Desktop Publishing Made Easy

Publish It! Easy 2.0 from Timeseworks gives you high-end desktop publishing features at a low-end price. Word processing, graphics and page-layout features work on any Mac — Publish It! Easy doesn’t require a hard drive, a MacColor Eddy award winner.
Publish It! Easy 2.0 (Timeworks). 28966...$145

NIGHTMARE DRAWING, PAINTING

Adobe
Illustrator v3.0 .................................. 29789 $448
Photoshop v1.0 ................................... 29266 $498
Apple Computers
Logicolor v2.0 ..................................... 28164 $30
Clock Maker Software
Roadshow v2.0 ................................... 28164 $30
Earl Weaver Baseball ............................ 28768 $12
In-Line Design
Bomber v2.0 ....................................... 28139 $10
Sierra-On-Line
King’s Quest 1 ...................................... 28728 $24
King’s Quest 2 ..................................... 28726 $24
King’s Quest 3 ..................................... 28728 $24
Software Toolworks
Life & Death ........................................ 28658 $31
Spectrum Holobyde ............................. 28766 $24
Action v2.0 ........................................ 28614 $20
Tennis ................................................ 28606 $19
Weavers
Single Speakers ................................. 28652 $25
SW Toolworks
Chemist 2100 ...................................... 28748 $31
XOR
MacDraw II v1.1 .................................. 28708 $13
MacGolf ............................................. 28708 $13
MacPaint Classic ......................... 28714 $15
MacPaint v1.0 .................................... 28736 $15
NFL Challenge v1.0 ............................. 28730 $15

New Tricks for Your Mac

The Macintosh is fun to use, but a few Stupid Mac Tricks will make it even better. Use this book and the free disk to teach your Mac to make strange sounds and perform off-beat antics.
Stupid Mac Tricks (Addison-Wesley). 28750...$16

Create Professional Animation

FilmMaker from Paracomp gives you professional-quality animation with features such as real-time control over position, scale and rotation of animated objects, as well as full-screen anti-aliasing. And with the help of FilmMaker, your presentations also will take on new power.
FilmMaker (Paracomp). 29900.................. $437

800-395-6221
Customer Service is Our Most Important Product

More Serial Ports

Expand your system's expandability.

Applied Engineering's easy-to-install QuadraLink lets you add four additional serial ports to your Macintosh. Includes a "shadow driver" so that all the new ports will be recognized by virtually all software.

QuadraLink (Applied Engineering). 26917 .................. $205

KEYBOARDS, MICE, ETC.

Apple RGB Anti-Glare Filter .................... 26891 162
Mac 11 Monitor Extended Kil ................... 26899

TurboMouse ADB ..... 2S281 !107
WIZ ................................ . ......... 26918 !IS7
SWITCHBOARD..... ............ 25182 ll59
SCSI Tenminator, 50pin male ...................26296 118
SCSITerminator, SOpin M/f Daily·Chain.. 26295 11 8
9 Pin Male to
QuzdraLink ...... 26917 120S
The Library (grey) ........... ....... 26903 112
The Library (black) .................................. 26905 112
Little Mouse... ................... 2S283 175
Trackball ADB ....................................... 25284 169

ABetter Network Manager

External Tape B.lck·Up 50601120 .. ... .23833 1719
MacPlus, SE, II to lmgwrtr DINS to 25pin .. 26286 17
MacPlus, SE, II to Apple Modem ............. .26284 17
MacPlus Peripheral Adapter cable, lit......26283 17
Mac to SCI! Sysiem Cable, 6ft ................. 26290 115
Mac 128/SI 2to Hayes DB9 lo 2Spin, 6ft..26281 !7
Keyboard Replacement Cable, Jft ............ 26900 17
Mac Plu1 KB Skin (w/ ' Pad) .... ........... 2S781 11 4.95
Diskette Walle! IOpk (alligator) ............... 26909 17.50

ACCESSORIES

Alfonson·Tote

KateLite.. ........... 30450 1115
WordPerlect Mac v2.0 ... ......JOS91 1 234

UTILITIES FOR WRITERS/PUBLISHERS

fullWrite Professional v I .S ...................... 30601 1253
Microsoft Word v4.0 ..JOS82 1245
Microsoft Write v1.0 ..JOS84 177
MacWrite II vi.

Microsoft Office v2.2.1 ....................... 29600 1359
Microsoft Works v2.0 n' Quicken v3.1.1 ..30580 199

ACCOUNTING/BOOKKEEPING

Microsoft Works v2.0 A11-in-One v1.0.

FOOTNOTE: Table entries are per unit. 

For complete line card, please contact Sales.

Call 800-395-6221
## NEW MacAvenue Software Paks!

**More Fun, Less Money**

The MacAvenue Fun Pak includes 5 programs: Hitchhiker's Guide to the Galaxy, Leather Goddesses of Phobos, Crystal Quest, Solitaine Royale and Talking Mouse. **$39.95** value!

**Fun Pak 29400**

---

## New Low Price! $52/Megabyte

Get the most processing power out of your Mac: build your four-slot SE to 4MB or your 8-slot Mac to 8MB. Only the best surface-mounted 80 nanosecond memory products. Call MacsFax for pricing.

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 1MB SIMM Kit</td>
<td>$104</td>
</tr>
<tr>
<td>4 x 1MB SIMM Kit</td>
<td>$208</td>
</tr>
</tbody>
</table>

---

## Hardware

### STORAGE DEVICES

- Quantum
  - 40MB External Protege
  - 80MB External Protege
  - 160MB External Protege
  - 210MB External Protege
  - 240MB Internal Protege
  - 360MB Internal Protege
  - 40MB External SE-llx
  - 80MB External SE-llx
  - 160MB External SE-llx
  - 210MB External SE-llx
  - 40MB Internal SE-llx
  - 80MB Internal SE-llx
  - 160MB Internal SE-llx
  - 210MB Internal SE-llx
  - 430MB External Protege

### PRINTERS, SCANNERS AND FAXES

- *Add**
  - Postscript for U/L
  - Complete PC
  - Best
  - Personal Scan w/ Recognizer Software
  - Digital Vision
  - Computer Eye B/W
  - Dave
  - Doppes Scanning External
  - Epson ES-300C Color Scanner w/ IF
  - Kodak M360 Mac Portable
  - Logitech Scanman 32
  - Microtek-MISF
  - Micromax 300C Color Scanner
  - Onsale
  - OrchidFAX Modern
  - Artex
  - TelaRZ1101
  - Seiko Label Printer
  - Labels for Seiko Label Printer
  - Texas Instruments
  - 17 font microlaser XL w/ ATalk board
  - 17 font microlaser XL w/ ATalk board
  - 35 font microlaser XL w/ ATalk board
  - 35 font microlaser XL w/ ATalk board
  - Envelope Feeder
  - Legal Paper Tray
  - Microtender Laser Cartridge

### COMMUNICATIONS MODULUS

- Against Engineering
  - Datalink Express w/ NPN-5Send Fax... $239
  - DataLink/Mac w/ NPN-5Send Fax options... $275

### Monitor/Video Cards

- Global Village
  - Teleport Modern
  - Hayes
  - Smartmodem 9600

- MacAvenue
  - 2400 External w/ SW

---

## Wired for Performance

To build a high-performance network, you need the best cables. MacAvenue offers two of the most popular (and reliable) phone connectors to get your system wired. Take a look at the product listings for more MacAvenue cable options.

- Seiko Raster/Cable Connectors
  - Phone Connector DB-9... $282
  - Phone Connector DB-9 w/ cable...

## More Fun, Less Money

- MacAvenue
  - Mac Portable 1MB Upgrade Kit
  - Mac Portable 3MB Upgrade Kit

---

## ACCELERATOR AND EXPANSION BOARDS

- **DayStar**
  - 070 25Mhz KIC w/o 8882...
  - 070 33Mhz KIC w/ 8882...
  - 070 40Mhz KIC w/ 8882...
  - 070 50Mhz KIC w/ 8882...

## MEMORY EXPANSION

- Applied Engineering
  - 1MB Upgrade for Mac Ram Portablo Card...
  - Mac Ram Portablo Card w/ 1MB...

---

## MONITORS AND VIDEO CARDS

- **MacAvenue**
  - Mac Portable 1MB Upgrade Kit...
  - Mac Portable 3MB Upgrade Kit...

---

800-395-6221
Try MacsFax 800-933-9002

Build Your Wealth

WealthBuilder by Money magazine will guide you through the stormy waters of financial planning and give you advice on investing, saving, and strategic planning. You just ask questions, WealthBuilder has all the answers.

WealthBuilder v1.0 by Money magazine (Reality Software), 28496

$145

Other Utilities

<table>
<thead>
<tr>
<th>Company</th>
<th>Version</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abbott Systems</td>
<td>CanOpen v1.3</td>
<td>$63</td>
</tr>
<tr>
<td>Baseline</td>
<td>Talking Mouse v3.0</td>
<td>$23</td>
</tr>
<tr>
<td>Bruderhand</td>
<td>SimEarth</td>
<td>$45</td>
</tr>
<tr>
<td>CE Software</td>
<td>QuickKeys v2.0</td>
<td>$94</td>
</tr>
<tr>
<td>Custom Applications</td>
<td>Freedom of Press Light v3.0</td>
<td>$58</td>
</tr>
<tr>
<td></td>
<td>Freedom of Press v3.0</td>
<td>$255</td>
</tr>
<tr>
<td>Fifth Generation</td>
<td>Suite II v2.3</td>
<td>$47</td>
</tr>
<tr>
<td>GDT</td>
<td>PressLink Express</td>
<td>$99</td>
</tr>
<tr>
<td>Insight Development</td>
<td>MachFile v1.2</td>
<td>$46</td>
</tr>
<tr>
<td></td>
<td>New Software</td>
<td>$46</td>
</tr>
<tr>
<td></td>
<td>New Utilities v2.0</td>
<td>$46</td>
</tr>
<tr>
<td>Power Up</td>
<td>Calendar Creator v1.0</td>
<td>$46</td>
</tr>
<tr>
<td></td>
<td>Letter Writer Plus/Address Book Plus v1.0</td>
<td>$46</td>
</tr>
</tbody>
</table>

CD-ROM Software

Safety, Maintenance and Repair Utilities

Data Organization

<table>
<thead>
<tr>
<th>Company</th>
<th>Version</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>On Technologies</td>
<td>OnLocation v1.0</td>
<td>$75</td>
</tr>
</tbody>
</table>

Data Storage, Management, Repair

<table>
<thead>
<tr>
<th>Company</th>
<th>Version</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple Express v1.0</td>
<td>$35</td>
<td></td>
</tr>
<tr>
<td>Central Point</td>
<td>Mac Tools Deluxe v1.0</td>
<td>$79</td>
</tr>
<tr>
<td>Microcom</td>
<td>911 Utilities</td>
<td>$92</td>
</tr>
<tr>
<td></td>
<td>Complete Undakte v1.0</td>
<td>$48</td>
</tr>
<tr>
<td>Siemens</td>
<td>Disk Doubler v8.0</td>
<td>$47</td>
</tr>
<tr>
<td>Norton Utilities for the Mac v1.0</td>
<td>$79</td>
<td></td>
</tr>
<tr>
<td>Sum II v2.0</td>
<td>$349</td>
<td></td>
</tr>
</tbody>
</table>

Screen Saver Utilities

<table>
<thead>
<tr>
<th>Company</th>
<th>Version</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Berkeley Systems</td>
<td>After Dark v2.0</td>
<td>$24</td>
</tr>
<tr>
<td>CHIP General</td>
<td>Pyro v4.0</td>
<td>$25</td>
</tr>
<tr>
<td>Abs Software</td>
<td>Protector Shark</td>
<td>$31</td>
</tr>
</tbody>
</table>

Virus Detectors and Eradicators

<table>
<thead>
<tr>
<th>Company</th>
<th>Version</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microcom</td>
<td>Vax v2.7</td>
<td>$33</td>
</tr>
<tr>
<td>Siemens</td>
<td>SAM v2.0</td>
<td>$63</td>
</tr>
</tbody>
</table>

Why Buy From MacAvenue?

That's as easy as 1, 2, 3!

1. 30-Day Money-Back Guarantee
   Every hardware product and every office accessory MacAvenue sells will give complete satisfaction. If not, return it in the original packaging within 30 days of purchase for a full refund. Consumable items, opened software, videotapes and shipping costs are not refundable.

2. Toll-Free Technical Support • 90-Day Product Replacement
   If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 1-800-766-6221 weekdays from 8:00 am to 7:00 pm, CST. We will replace the item and pay Federal Express shipping both ways.

3. One-Year Limited Warranty
   For up to one full year after your purchase, MacAvenue will replace or repair (at our option and without cost to you) any product with which you are not completely satisfied, and we will pay for Federal Express return freight to you.

Everything at MacAvenue is designed to give you the affordable, reliable Macintosh products you want when you want them.

Orders placed by 6:00 pm, CST, weekdays for in-stock items ship the same day (barring system failure) with a $2 overnight delivery charge.

For your convenience, we accept VISA, MasterCard, Discover or American Express — no surcharge will be added.

If you use a credit card to pay for your order, your account will not be charged until we ship your order.

If we have to split an order into two shipments, you will be charged only once for shipping. All orders under $30 will be shipped UPS Ground.

COD orders accepted (Add $8, including shipping).

Corporate and institutional purchase orders accepted, $500 minimum for the first order, $50 thereafter.

Look for MacAvenue products in the following CompuAdd Superstores:

Portland, Oregon — 117th Avenue
Austin, Texas — Shoal Creek
Chicago, Illinois — Golf Road
Watch for More Store Openings Soon!

Call now for FREE catalog!

800-395-6221

A Division of CompuAdd Corporation

12303 Technology Boulevard — Austin, Texas 78727

MacAvenue is a trademark and CompuAdd is a registered trademark of CompuAdd Corporation. Mac, Macintosh, HyperCard, and Apple are registered trademarks of Apple Computer, Inc. All other trademarks are the property of their respective companies. All return items must be accompanied by a return merchandise authorization (RMA) number. Prices and product descriptions are subject to change without notice. Neither CompuAdd nor MacAvenue is liable for damage due to tampering or typographical error.

Key Code 870
Who Does More Translations Every Day?

With hundreds of thousands of users and over 175 translator options, MacLinkPlus/PC is the world's leading file translator.

Only MacLinkPlus/PC gives you one-step translation and transfer in either direction between Macintosh and PC, Sun or NeXT. Files created in one program on one machine arrive ready to use in a different program on a different machine.

For example, you can take a document created in WordPerfect on the PC and send it to Microsoft Word on the Mac, so it arrives completely ready to use, with style and formatting intact... graphics too! The product comes complete with everything you'll need... software for both machines, built-in communications to work with the included cable or your modems, and our complete library of over 175 translators.

MacLinkPlus/PC eliminates the time loss, the productivity loss, and the dollar loss caused by frustrating hardware and software differences. It lets you continue to use your machine and programs of choice without giving a thought to incompatibility with clients, other departments, and other users.

So put an end to costly hardware and software disputes with the industry's most diplomatic solution — MacLinkPlus/PC.

If you're already using your server, network, or DOS drive to access PC files, then you can simply purchase MacLinkPlus/Translators. It's the same product without the cable and communications software.

For more information, call DataViz at (203) 268-0030.

DataViz. The Industry Leader in File Translation.

Please circle 146 on reader service card.
SURVIVING THE CRASH:

Hard-Disk Recovery

You can pay now or later, but someday you’re certain to need one of these four indispensable lifesavers.

It’s 2:00 in the morning. You’re finishing a crucial presentation that will make or break your career. Suddenly your mouse stops dead in its tracks, and your heart skips a beat. You restart the computer — but instead of the reassuring happy-Mac icon, you’re faced with a blinking black question mark. Your hard disk is damaged. You’re in big trouble.

This can happen to anyone, at any time. Software can be unreliable, and viruses can wreak havoc on precious data. You can accidentally delete an important file or even erase your entire disk. Sooner or later, you will encounter a data-destroying hard-drive problem — and you can bet that it will happen when you’re on a tight deadline.

Regular, frequent backups will, of course, save you in the event of any crash. But let’s be honest: Not even the most conscientious of us perform backups as often as we should, and the hours’ worth of work since your last backup is still worth recovering — and is often the most valuable.
To save you days — perhaps even months — of work as well as countless hours of anguish, you should have a hard-disk-recovery program installed on your drive. Such a program can often return your crashed disk to its original working state, something a tape backup can't do.

But which one? To find out, MacUser Labs tested four recovery packages: Central Point Software's MacTools Deluxe, Microcom's 911 Utilities, Symantec's Norton Utilities for the Macintosh, and Symantec's SUM II. We also looked at Apple's Disk First Aid — which comes with Apple System software — because it can diagnose and fix some minor problems. Besides emergency recovery, the four recovery programs also offer backup programs, virus detection, and other useful software. But the main reason to buy any of these packages is for recovering valuable data.

To put the programs through the MacUser wringer, we wrote our own program for crashing disks: DiskCrasher. More dangerous than the worst virus, DiskCrasher can render all the data on a hard disk unusable. This is one program that won't become part of the download library of Zmac, MacUser's on-line service.

We discovered that many factors make one recovery program better than another. Can it recover all the files? How long does it take? Do files remain in the right folders, or are you forced to reorganize your thousands of files? Is the program easy to use, or would a panicked user be completely overwhelmed? Is the manual helpful if you're in a hurry? A recovery program should make your life as easy as possible.

**An Ounce of Prevention**

The recovery packages come in two parts. The first is the recovery program you run when your hard disk has crashed. The other is an INIT that stores copies of the critical information the Mac uses to keep track of files and folders. This INIT should be preinstalled — so if you buy a recovery program after your disk has already crashed, the INIT won't do you much good.

Many people don't think about recovery software until they're in big trouble. But you should still install the recovery INIT from your recovery program on your hard disk even if everything seems to be in working order. Your chances of fast and complete recovery will be significantly better if the INIT is installed on your disk prior to a disaster. If you have a software catastrophe before you get a chance to install it, however, there is still hope, if you use the right recovery program.

The information your Mac uses to find data on a hard disk is stored in what are generically called **data structures**, with names such as VIB (volume-information block), AVIB (alternate volume-information block), catalog B-tree, extents B-tree, volume bit map, and Desktop file (see the "How It Works: Hard-Disk Data Structures" sidebar). If these sound a little scary, don't worry — you'll never have to deal with them directly. Your Mac uses these data structures as you would a card catalog in a library. If you can't find a book's card, you assume the book is not in the library. If any data structure is corrupted, the Mac may assume that a file does not exist. Worse yet, the Mac may not be able to recognize the disk at all.

A recovery utility can resurrect files that have been accidentally deleted or damaged by software corruption. Even if you erase your entire hard disk, a recovery program may be able to save you. However, if your hard drive falls off the table and stops working or it won't boot because your SCSI bus is improperly terminated, a recovery program isn't going to help (see the
“Fix It Yourself” sidebar).

Symptoms of software corruption include disappearing or unopenable files or folders (see “Symptoms of a Damaged Hard Disk” in the “How It Works” sidebar). More obvious symptoms include the dreaded blinking question mark and dialog boxes that tell you your disk is unreadable or that it’s not a Macintosh disk. These dialog boxes give you the option of initializing your disk. If you want to recover the data, do not initialize at this point. Initializing wipes out useful information and makes it even harder for a recovery program to get your files back. Initialization writes zeros over all the data structures that keep track of the files, although the files remain intact on the disk.

Worse than initializing is formatting your disk, which “zeros out” the entire data area, thereby overwriting all files. Recovery software cannot recover files after they have been completely zeroed out by a format, but even after formatting, there is still a chance — however slim — that not all of the disk has been zeroed out.

The Finder’s Erase Disk command formats floppy but initializes hard disks. If you accidentally select your hard disk and choose Erase Disk, you may not have to worry too much. Recovery programs can often read files from a hard disk that has been accidentally initialized, especially if the recovery INIT was installed beforehand. The recovery software keeps its own copy of important data structures in a secure place. Some programs create special areas on a hard disk where they store the copies; others let you save the copies onto other hard disks or floppy disks.

Sometimes files are in fact unrecoverable. When you create a file and save it onto your hard disk, the file is written to the data area of the disk and information about its location and size and other factors is recorded into the disk’s data structures. The file’s location in the data area is marked as occupied. If you delete the file by dragging it into the Trash, the data structures indicate that the file’s location is unoccupied and available for storage, even though the file actually remains on the disk. The next time you save a file, it might be saved onto this “unoccupied” area, thereby overwriting the contents of the first file. If so, the portion of the first file that was written over, perhaps even all of it, will be unrecoverable. A recovery program may be able to recover some data from a partially overwritten file, but there is no guarantee that what’s left of the file will be usable.

**Setting Up**

When your drive crashes at 2:00 A.M., the last thing you should have to do is fight with your recovery program. With this in mind, we first compared the programs and documentation for their “panic performance.”

Luckily for you, all the packages come with a bootable recovery disk — essential if your one-and-only hard disk has crashed. Don’t forget to make a copy of this all-important disk — imagine the depth of your despair if after your hard drive has crashed, your Mac then fails to recognize your one-and-only emergency disk.

The next requirement is documentation that informs while calming your nerves. Norton Utilities’ manual is especially helpful if you’re in a hurry. Although the SUM II program is difficult to use, its manual is exceptionally “panic friendly,” beginning with a flowchart that tells you exactly what to do if your hard disk has crashed. Both Norton Utilities and SUM II have color-coded, easy-to-find recovery-procedure summaries. Norton Utilities also includes the Norton Disk Companion booklet, a tour through the inner workings of Mac disk drives and a nice addition to any technical library.

The other manuals are good for
SIX REASONS WHY LA CIE HARD DRIVES ARE THE BEST YOU CAN BUY.

Quantum drive mechanisms offer blazing-fast effective access time as low as 8 milliseconds.*

No other drive mechanisms in their class (Mac*-compatible) run faster, which is why they are in La Cie drives.**

*Typical application access time using 64KB DisCache®
**Seagate drive mechanisms also available (capacities from 300MB to 1.2GB).
Software with a Silverlining.

Every La Cie drive includes a FREE copy of Silverlining, the #1-rated hard drive management utilities program. Silverlining drivers can get 30% more speed from a drive than the competition. It works with any drive in your system, internal or external. So one program can manage it all. Plus, Silverlining optimizes your data so it's consecutive on your drive, which makes your applications run faster. And, Silverlining drivers are intelligent. They test the drives' functionality at startup to ensure that everything is working properly. If it's not, it protects you.

For even more protection, every La Cie drive includes a FREE copy of Norton Utilities for the Macintosh. It automatically diagnoses, reports and repairs common and dangerous disk problems. Silverlining and Norton Utilities are regularly priced at $149 each. So, you get software worth almost $300—ABSOLUTELY FREE—when you buy a La Cie drive!

A Company You Can Count On.

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

The Most Unusual Warranty in the Business.

La Cie features a RENEWABLE 2-YEAR LIMITED WARRANTY. If anything goes wrong with your La Cie Quantum drive within two years, we'll repair or replace it within 48 hours—and then renew your warranty for another 2 years. Free of charge!

Every La Cie drive is backed by toll-free support from customer service and technical assistance experts.

Award-Winning Design.

Hard drives that win design awards? Who says intelligence has to be ugly? The Tsunami and Cirrus hard drives have received prestigious awards from both the industrial design and computer communities.

La Cie drives are designed from the inside out. Designed to be quiet (with a ½ speed fan), lightweight (as light as 2½ lbs.), durable and reliable. Plus, they have an external termination switch, which means you'll never have to open the case for any reason! You don't win awards for these features, but you do win a loyal following.

Rave Reviews from Critics and Customers.

Frankly, there's been a lot of talk about La Cie hard drives. Leading Macintosh consumer magazines praise us. Customers write us fan letters. In fact, we're happy to let critics and customers have the last word about La Cie drives. Because they tend to be words like these:

—MacUser
"...the cream of the crop."—Macworld
"Of all the drives tested we recommend La Cie's drive."—MacUser
"This is an excellent drive and Silverlining is great!"—D. Jordan, Burbank, CA

La Cie offers internal and external hard drives from 40MB to 1.2 Gigabytes. Choose from the award-winning Tsunami, Cirrus, and ZIP family of drives. Pius, La Cie now offers the Boaster, a hard drive that attaches directly to the back of a Macintosh Plus or SE.

To order or for more information, call toll-free 800-991-0143, ext. 44

La Cie Limited
A Plus Development Company

LACIE
LIMITED
A PLUS DEVELOPMENT COMPANY

Please circle 414 on reader service card.
**Hard-Disk Recovery**

### How It Works: Hard-Disk Data Structures

Programs create, modify, and delete files by using a part of the Mac ROM code called the File Manager. It is the File Manager, in conjunction with the hard disk's driver software, that translates the program's requests and communicates with the disk. The File Manager maintains several data structures on the disk that keep track of files, folders, and their locations.

If any structure becomes corrupted, the File Manager will have problems finding files or recognizing the disk. If, for example, a reset, power-down, or system error occurs while the File Manager is trying to update a data structure on the disk, the data structure can become corrupted. Also, if the File Manager is working with a data structure in the System RAM cache and a software bug corrupts the cache, bad data can be written back to the disk. Symptoms of corrupted data structures can range from a single vanished file to an entirely unreadable disk.

**AVIB (alternate volume-information block):** a backup copy of the VIB.

**Boot blocks:** information used to configure the Mac operating system during the booting (startup) process. If the boot blocks are corrupted, the volume may seem — appear on the desktop — but it may not work as a startup device.

**Catalog B-tree (often called the Directory):** indexes the location of every file and the contents of every folder on the disk.

**Desktop file:** a file the Finder uses to store icons (and the type and creator codes associated with them); also a cross-reference that links applications to the files they can open. Stores the Finder's Get Info comments too.

**Driver software:** enables the Mac to communicate with a particular hard-disk-drive model. If a drive's SCSI driver has been corrupted, it is unlikely that the Mac will be able to read any data from the drive. It may not even mount.

**Extents B-tree:** As a file grows, its fragments may be stored on noncontiguous areas of the disk. Each piece is called an extent. The catalog B-tree can index three extents. If a file has more than three, they are indexed in the extents B-tree.

**VIB (volume-information block):** also known as the master-directory block, it contains the volume name, the number of allocation blocks (areas into which files are written) on the volume, the allocation-block size, and other volume attributes. If the VIB is damaged, the drive may be unmountable.

**Volume bit map:** keeps track of which allocation blocks are occupied by files. Each bit corresponds to a single allocation block (if a block is unoccupied, the bit is set to 0; if it is occupied, the bit is set to 1).

### Symptoms of a Damaged Hard Disk

There are many ways to crash a hard disk: system errors, power outages, viruses, and power fluctuations, to name a few. The result can be the corruption of vital data structures the Mac uses to keep track of its contents. Depending on which structure and how badly the structure is damaged, the effect can be subtle or can render your entire drive unusable.

**Happy Mac**

- **Symptom:** Happy Mac appears briefly and disappears, and then a floppy-disk icon appears with a blinking question mark.
- **Cause:** Bad boot blocks, corrupted disk-data structure, or corrupted system files.
- **Action:** Run recovery program; reinstall Apple System software.

**Sad Mac**

The sad Mac appears when your Mac fails one of the diagnostic tests on startup; it can also indicate that the driver software or boot blocks on the startup disk are bad.

The characters below the unhappy Mac tell you what has gone wrong. With the Mac Plus and earlier, if the first two characters are OF, there is some kind of software error; any two other characters mean a hardware failure. With the Mac SE, II, and later, if the last four characters in the first line are 000F, the problem is software, and the last four characters of the second line indicate the specific error — they correspond to System error codes, which you can look up in *Inside Macintosh, Volume II*, or in a freeware DA called SysErrorTable.

- **Symptom:** Multiple drive icons appear on the desktop for the same drive.
- **Cause:** SCSI-ID conflict.
- **Action:** Check that all devices have unique SCSI-ID numbers that range between 0 and 6, inclusive.
- **Symptom:** Drive does not mount.
- **Cause:** Can be just about anything — setup, hardware, or software.
- **Action:** Check cables, power, SCSI ID, termination; try updating hard drive's SCSI driver with drive-formatting software.
- **Symptom:** "Disk is full" message when you know the disk is not full.
- **Cause:** Corrupted disk-data structures; invisible or temporary files.
- **Action:** Run recovery program.
- **Symptom:** Drive mounts, but you cannot use it as the startup disk.
- **Cause:** Bad boot blocks, bad System file, or drive-hardware problem.
First block on volume

- Boot blocks
- VIB
- Volume bit map
- Extents B-tree
- Catalog B-tree
- Data area includes all of your files plus the Desktop file

Last block on volume

- AVIB

File-Content Area

- Action: Reinstall Apple System software; check hardware connections; run recovery program.
- Symptom: A dialog box says, "This disk is unreadable. Do you want to initialize it?"
- Cause: Corrupted data structure.
- Action: Do not click on OK! Run recovery program.
- Symptom: A dialog box says, "This is not a Macintosh disk. Do you want to initialize it?"
- Cause: Corrupted data structure.
- Action: Do not click on OK! Run recovery program.
- Symptom: A dialog box says, "This disk needs minor repairs. Do you want to repair it?"
- Cause: Corrupted Desktop file.
- Action: Click on OK to rebuild Desktop file.

Data Structures and Data

- Action: Check cabling and termination; run hard-drive formatting software and test for bad media.
- Symptom: File cannot be opened from within an application.
- Cause: File corrupted; file-type code incorrect; wrong version of application.
- Action: Check the Get Info box on file; reinstall application.
- Symptom: Parent application cannot be opened when you double-click on file icon.
- Cause: Application corrupted or missing; file's creator or type codes inconsistent with application; Desktop file corrupted.
- Action: Rebuild Desktop file; reinstall the application.
- Symptom: You can't throw away a file or folder or empty the trash.
- Cause: File or folder busy or locked; invisible file in folder; corrupted catalog.
- Action: Restart and try again; rebuild Desktop file; run recovery program.
- Symptom: You cannot rename a folder.
- Cause: Locked disk; corrupted catalog B-tree.
- Action: Unlock the disk; run recovery program.

- Symptom: A folder takes a long time to open.
- Cause: Excessive number of files in folder; corrupted Desktop file.
- Action: Rebuild Desktop file; reorganize folder hierarchy.
- Symptom: Programs bomb when you try to launch them.
- Cause: Corrupted application or INIT conflict.
- Action: Reinstall application; turn off INITs.
- Symptom: Icons appear, disappear, or become "generic" icons.
- Cause: Corrupted Desktop file.
- Action: Rebuild Desktop file.
- Symptom: A folder or file disappears.
- Cause: Corrupted disk-data structures.
- Action: Run recovery program.

System Bomb

- Symptom: System error (bomb icon).
- Cause: Can be caused by almost any type of software bug — including conflicts with other applications or with an INIT.
- Action: Attempt to restart; if bomb persists, run recovery program, reinstall software — and hope for the best.
Fix It Yourself

If you don’t own a recovery program, you may still be able to diagnose and fix a hard-disk problem. One frequent source of Mac problems is the Desktop file — an invisible file that provides a cross-reference between files’ creator codes and the applications to which they belong. The Desktop file also keeps a record of all the icons on the hard disk and the Get Info information for each file. You can tell when your Desktop file is having problems when icons appear in their generic (rather than application-specific) form or when a folder takes a long time to open.

Rebuilding the Desktop file should fix these problems — and some other inexplicable oddities. Hold down the Option and Command keys while restarting your Mac. You’ll be asked if you want the desktop rebuilt. Answer “OK.” If you have more than one volume to rebuild, keep the keys pressed until the next dialog box appears. One word of caution, however: By rebuilding your Desktop file, you will lose any comments in any Get Info box.

You can rebuild the Desktop file on floppy disks by holding the Option and Command keys down as you’re inserting the floppy. This works only if you’re in the Finder, so if you’re in an application, quit first—or if you’re running MultiFinder, switch to the Finder before inserting the disk.

If you’re having trouble booting and have a Mac SE or later, zap (clear) the PRAM (Parameter RAM) by holding down the Command, Option, and Shift keys and choosing Control Panel from the Apple menu. The PRAM is battery-powered RAM that stores Control Panel settings, including the startup device. If this information gets mixed up, the drive may not boot properly.

If zapping the PRAM doesn’t work, try booting from another disk and see if the offending drive’s icon will appear on the desktop. If you can get the drive to mount, back it up before you do anything else. If the drive mounts but you can’t use it as the startup device, there’s probably something wrong with the boot blocks or the System software. Use Apple’s installer program to reinstall the System software, and try booting from the drive again. If that doesn’t work, start up from your other disk again, back up the drive, initialize it (either by selecting the drive and choosing Erase Disk from the Finder’s Special menu or by using the formatting/initializing utility that came with your drive), and then restore your files back to the disk.

If the drive doesn’t mount at all, run the formatting/initializing utility that came with it and reinstall or update the drive’s SCSI-driver software — without initializing or formatting the drive. The SCSI driver is the invisible software the Mac uses to communicate with the drive. If it’s been corrupted, a recovery utility will probably not be able to help you out.

If you cannot select the drive in question from within the formatting/installing software, chances are that you have a cabling or hardware problem. Setup problems can include bad or loose cabling, improper termination, and SCSI-ID conflicts. If you have recently changed your SCSI setup, check the connections, change the cables, make sure only the first and last devices are terminated, and confirm that every device has a unique ID number between 0 and 6, inclusive.

Drive-hardware problems are rare, but when they happen, it’s a grave situation. A bad power supply or connector must be fixed by the manufacturer; fuses are only sometimes user-replaceable. Problems with the drive mechanism itself are yet more serious; malfunctions can occur in the HDA (head-disk assembly — the part of the drive that communicates with the computer) or in the controller electronics (the circuitry that controls the movement of the HDA and communicates with the computer). If the trouble is within the HDA, there is little hope of recovering data; if it’s somewhere in the electronics, there is a good chance the drive can be repaired with the data still intact. In either case, just hope that your warranty is still good. If not, be prepared to spend some money. It might be cheaper to buy a new hard drive, but that won’t get your data back.

When you install Norton Utilities onto your hard disk, the installer warns you not to install onto a disk containing files you want to unerase, lest the utility overwrite the files you want to recover. We would have liked the other programs’ installers to emphasize this point, given that all the programs can overwrite exactly those files you’re trying to recover.

After installation, the next step is to configure the INIT. In all the recovery packages, the INIT doubles as a cdev and is configured in the Control Panel, where you can turn the INIT on and select how many deleted files to keep track of and which volumes to save essential data structures from.

The Norton Utilities and MacTools INITs are straightforward: Check boxes and buttons configure the options...
The Ultimate Fax
For Your Mac...
From Dove!

At last, there's an inexpensive, high-quality fax for your Macintosh. And it's from Dove Computer Corporation, a leader in Macintosh productivity enhancement products. DoveFax™ puts a full-featured fax in your Mac.

- It combines a 9600-baud fax modem and a 2400-baud data modem.

It's convenient.
- You can send and receive fax documents at your desktop.
- Automatic answer lets you receive faxes without interruption. A redialing feature makes sure your fax is sent.

It's flexible.
- You can continue to work in your application while DoveFax works quietly in the background, sending and receiving fax documents.
- An automatic activity log lets you track incoming and outgoing faxes.

It's inexpensive to own and operate.
- Not only is DoveFax the value leader, but with its pre-scheduled transmission feature, you can send faxes during times when the phone rates are lower.

It's multi-featured. DoveFax has more features than a full-function fax machine, including customized cover pages, multiple phone book support, distribution lists, a quickfax desk accessory, call grouping, auto delete, and the most intuitive interface on the market. All this, plus more, priced hundreds of dollars less than the traditional fax machine.

Dove's Guarantee of Quality: We're so confident about DoveFax, we'll let you buy it and try it for 30 days. If you're not satisfied completely, return it to your dealer for a full refund. Dove quality, speed, affordability, and all the features of a stand-alone fax — no wonder we're so confident.
The
New MORE 3.0 Vs. All The

Only MORE 3.0 lets you create and save custom color palettes by combining colors and patterns of millions of colors.

(Exhibit A)

Examine The Evidence, In Graphic Detail.

You’ve seen the evidence. Here are the facts. First, because it gives you the flexibility to create or import graphics, new MORE 3.0 can create more colorful, creative, and persuasive presentations than any other Macintosh® presentation program.

Second, MORE 3.0 has a library of over 100 templates, and a unique Library Browser feature to help you choose the look you need in seconds. And apply it to your entire presentation instantly.

Finally, MORE now includes Chart Tutor, which guides you step-by-step through the process of creating any kind of presentation.

Only MORE 3.0 has the Gradient Editor which gives you the most control over the look of your gradient fills and backgrounds. MORE 3.0 also gives you the most styles to choose from, and lets you create your own variations.

Increased Output
Jan.-Mar. 64%
Apr.-Jul. 89%
Aug.-Dec. 41%

Edison Electric

80%
The verdict? The presentations you create with MORE 3.0 will be faster, more colorful, more impressive, and more persuasive than with any other software.

But don't take our word for it. Witness it for yourself. Call now for a FREE MORE 3.0 Trial Size. The winning presentations you create will prove one thing beyond a shadow of a doubt. MORE presents you best.

FREE DEMO, CALL NOW!
(800) 228-4122 Ext. 530F

Judge For Yourself, Free.
### Figure 5: Crash-Test Results

**Corruption Tests**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>100% success rate (disk fixed in place)</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
<tr>
<td>100% success rate (to second disk)</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
<tr>
<td>75% - 90% success rate (to second disk)</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
<tr>
<td>50% - 75% success rate (to second disk)</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
<tr>
<td>25% - 50% success rate (to second disk)</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
<tr>
<td>Failure (no data restored)</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
<tr>
<td>NA Not applicable</td>
<td>Preinstalled</td>
<td>Emergency (no preinstallation)</td>
<td>Preinstalled</td>
<td>Preinstalled</td>
</tr>
</tbody>
</table>

**Symantec Norton Utilities for the Mac**

![Results](image1)

**Symantec SUM II**

![Results](image2)

**Central Point Software MacTools Deluxe**

![Results](image3)

**Microcom 911 Utilities**

![Results](image4)

**Apple Disk First Aid**

![Results](image5)

---

**Figure 5:** To test hard-disk-recovery programs, we did the logical thing: We crashed disks. We used MacUser Labs' DiskCrasher, a program that crashes disks in different ways, repeatedly and consistently. We then sent the programs on a data hunt to see how well they could recover the disks' contents.

There were eight crashes in all: for five corruption tests in which we damaged data structures, one detection test to see how smart the programs were in sensing nonfatal problems, and two tests that simulate user errors. We ran each of the eight crash tests in two ways: first, in an emergency situation without having preinstalled the programs, and second, after having installed the programs along with their INITs.

Ideally, the recovery program fixed the crashed disk "in place" — returned it to its previous working state with all files intact. If this wasn't possible, we tried to recover the files to another volume, preferably with the folder hierarchy intact.

**1. Symptom:** "This is not a Macintosh disk. Do you want to initialize it?"

The VIB contains the most-basic data about the volume — the number of blocks on the disk and the locations of the other data structures. When the VIB has been erased, the volume will not mount on the desktop. The recovery programs' task is to either regenerate the VIB or get the data off the damaged disk and restore the contents of the crashed disk to another disk.

Without preinstallation — no INITs installed and no backup-volume information — Norton Utilities, MacTools, and Disk First Aid were all able to fix the problem and restore the original disk. SUM II was able to recover all the files to another disk. 911, however, was unable to guess the proper volume-information parameters and required the user to enter them manually — an unreasonable requirement. 911 was the only program that could neither fix the crashed volume in place nor recover any folder hierarchy.

**2. Symptom:** "This is not a Macintosh disk. Do you want to initialize it?"

The Mac keeps a second copy of the VIB called the AVIB. This test destroyed both. Without its INIT, MacTools flunked. MacTools, like Apple's Disk First Aid, apparently uses the AVIB to recover the crashed disk. Norton Utilities and SUM II apparently handle this situation by figuring out what should be in the VIB, either making good guesses or examining other parts of the disk for hints.

As in the previous test, preinstalling the programs' INITs enabled all of them to fix the damage to the volume in place — except for 911, which recovered all the data to another disk and lost all the folders in the process.

**3. Symptom:** "The disk 'X' needs minor repairs. Do you want to repair it?"

The catalog B-tree consists of a collection of index and leaf nodes. An index node can be thought of as a fork in a branch. At the end are leaf nodes, which contain the records that index files and folders. If an index node
### 5. Corrupt Both Catalogs

- **Symptom:** "This disk needs minor repairs. Do you want to repair it?"

### 6. Erase AVIB

- **Symptom:** No visible symptoms

### 7. Delete File

- **Symptom:** You have inadvertently dragged a file into, and then emptied, the Trash.

### 8. Erase Disk

- **Symptom:** You have inadvertently used the Finder’s Erase Disk command.

<table>
<thead>
<tr>
<th>Key</th>
<th>100% success rate (disk fixed in place)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100% success rate (to second disk)</td>
</tr>
<tr>
<td></td>
<td>75% - 90% success rate (to second disk)</td>
</tr>
<tr>
<td></td>
<td>50% - 75% success rate (to second disk)</td>
</tr>
<tr>
<td></td>
<td>25% - 50% success rate (to second disk)</td>
</tr>
<tr>
<td></td>
<td>Failure (no data restored)</td>
</tr>
<tr>
<td>NA</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

#### File

- Symantec Norton Utilities for the Mac
- Symantec SUM II
- Central Point Software MacTools Deluxe
- Microcom 911 Utilities
- Apple Disk First Aid

---

is corrupted, the Mac may not be able to find any files or folders whose leaf nodes are at the end of that branch.

Without INITs, none of the utilities could fix the catalog in place. SUM II and Norton Utilities were able to recover all the files to another volume. 911 recovered all but one file and no hierarchy to a different volume, whether or not it had been preinstalled. With INITs, Norton Utilities, SUM II, and MacTools restored the volume in place.

**4. Symptom:** "The folder/disk 'X' could not be opened (-127)"

Each leaf node contains records that index folders and/or files. If a leaf is corrupted, any files and folders indexed by that node are likely to be lost.

The results of this test were similar to those of the Catalog Index test, except that SUM II lost track of two files and both SUM II and Norton Utilities failed to recover as many folders as they had in the Catalog Index test.

**5. Symptom:** "This disk needs minor repairs. Do you want to repair it?" This test is a true challenge of a recovery program’s abilities, because the index and the leaf nodes are corrupted. All the programs did as well on this test as they had done on the Catalog Leaf test, except for SUM II, which lost three files.

**6. Symptom:** None visible.

Although you wouldn’t notice if your AVIB was gone — until you lost your primary AVIB — a recovery utility should be able to detect and correct its absence. Only Norton Utilities and MacTools could properly detect the problem, and only Norton Utilities could fix it.

**7. Symptom:** You have inadvertently dragged a file into, and then emptied, the Trash.

Without their INITs, none of these utilities was 100 percent successful. MacTools recovered significantly more files than did either Norton Utilities or SUM II, and it did so on the first try, whereas getting Norton Utilities to find the files needed two different methods.

With their INITs, all four utilities were completely successful, but only SUM II and 911 retrieved the files onto the original disk. Norton Utilities could indicate the folders the files were originally in — very useful when you have a lot of files.

**8. Symptom:** You have inadvertently used the Finder’s Erase Disk command.

When an Erase Disk command is executed, the Mac zeros out the catalog and other data structures on the disk. The actual disk data is still there. This test determined whether the products could retrieve the files by using only the remnants left by Erase Disk or, in the case of preinstallation, by using the copies of the catalog that the products’ INITs had previously created.

MacTools repeated its impressive performance — with Norton Utilities and SUM II drifting further behind. All four retrieved every file but one that had been obliterated by the new Desktop file created after the Finder’s Erase Disk had finished.
for any drives on the SCSI bus (see Figures 2 and 3). Again, the SUM II setup is a bit confusing — the program doesn’t allow you to configure the features for multiple volumes. Instead, you have to run the installer again to save the data structures for a second hard disk.

The Norton, SUM II, and MacTools INITs keep track of deleted files in addition to copying critical data structures to help restore disks. Microcom’s 911 INIT keeps track of deleted files, and the main program allows you to manually back up the data structures, but it’s not immediately obvious that the program lets you do this. Searching through the manual was little help. In fact, we had trouble finding clear instructions on how to use most aspects of the program.

Hardest to use overall was 911, running us into a brick wall during several tests. At one point, we had to enter information on our hard-disk data structures manually, because 911 couldn’t recover files with the parameters it had “guessed.” We had to call the hard-drive manufacturer and ask for the information we needed to fill in a dialog box that requested “Bitmap start,” “Block size,” “Start of data,” and so on (see Figure 4). These are numbers everyday users should never have to wrestle with — and the person you talk to at the drive company may not have the correct numbers on hand.

The two programs that never forced us to pore through their manuals were Norton Utilities and MacTools Deluxe. The friendly Norton Disk Doctor interface guides you through diagnostics, informs you of any problems with the critical data structures, and allows you to fix each one individually if you wish. MacTools’ Rescue program has a similar easy-to-follow diagnostic procedure.

Crash Tests

We tested how well each recovery program handled three types of disk problems: corruption, detection, and user error. We conducted eight different crash tests that simulated these problems: five corruption tests of damaged data structures, one detection test that determined how smart the programs were in sensing problems, and two tests that simulated user errors.

We crashed disks with MacUser Labs’ DiskCrasher (see Figure 6), which was written to crash disks in different ways repeatedly and consistently. DiskCrasher first creates a set of text files in a three-level folder hierarchy and then erases or corrupts various data structures, thus “crashing” the disk. Different crashes yield different symptoms.

DiskCrasher’s corruption tests are cruel things to do to a hard disk — they involve corruption or erasure of the critical data structures the Mac uses to identify and locate files. The DiskCrasher detection test erases a data structure (the AVIB) whose absence doesn’t produce any visible symptoms but that should still be restored for maximum safety. Finally, DiskCrasher simulates those dumbuser errors we hate to admit we all make: throwing away an important file or accidentally erasing a hard disk.

After introducing all these problems, we sent each recovery program on a data hunt. We ran the eight crash tests in two ways: first, in an emergency situation without having preinstalled the programs, and second, after installing the programs along with their INITs. After each recovery, we checked to see how many files were recovered and if the files’ data was intact. We also took note of whether all files were in their appropriate folders and whether the folder hierarchy — the order of files and folders in other folders — had been altered.

Whether or not your recovery software is preinstalled, you probably don’t have much time to spare when you’re recovering your crashed disk. The fastest way a recovery program can get you up and running after a crash is to fix the hard disk itself by repairing its corrupted data structures. So we first asked the programs to fix the drive in place—that is, to return the drive to its original precrash state. If that failed, we then recovered files to a second hard disk. All the programs also allow you to recover files to multiple floppy disks, although if you have a large hard disk, be ready to do a lot of disk swapping.

Scanning for files and folders and recovering them to another disk takes much longer than fixing in place. Scanning alone can take several minutes, depending on the size of the drive. The time it takes to copy the files depends on how many megabytes you need to recover and whether you are copying the files to another hard disk or to floppies. However, any scan-and-recover time is well worth it if you manage to get your files back.

The Super Saver

The clear winner was Norton Utilities for the Macintosh. This program recovered the greatest number of files,
Survival of the fittest.

Which color scanner is the natural selection?

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

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

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

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


La Cie Silverscanner: 16 million beautiful colors, 256 smooth shades of gray, incredible line art, up to 1200 dpi all in a single pass.

Silverscanner only $1999!

FREE $1400 value with the purchase of Silverscanner!

800-999-0143
For product information, or to order, call toll-free.

La Cie Limited
A PLUS DEVELOPMENT COMPANY

Please circle 416 on reader service card.
Hard-Disk Recovery

An Ounce of Prevention

Everyone who uses a hard-disk drive — and that's pretty much everybody who uses a Mac — should have a backup program and at least one recovery program. You should back up your files regularly, because not even the best recovery program can remedy a hardware failure.

The most obvious way to back up is to copy files from your hard disk to floppies, but if you’re backing up a large drive, swapping floppies is a hassle — and human nature being what it is, the more hassle, the less frequently you’ll back up. You can get larger HFS volumes (hierarchical-file-system volumes, whose icons appear on the desktop) such as removable magnetic drives. SyQuest, Bernoulli, and Ricoh cartridges can hold more than 40 megabytes each, and a magneto-optical cartridge can hold from 600 megabytes to a gigabyte (1,000 megabytes) of data. You can also use a tape drive — a DC600, DC2000, TEAC, or DAT — made expressly for backup. Your need for a dedicated device depends on how much data you plan to back up each day.

Whatever hardware and media you decide on, the right software can make a big difference in the ease of backup and thus in how often you will back up. Backup-software features can be basic or complex. Most programs perform incremental backups, in which only the files that have been created or changed since the last backup are backed up, so incremental backups may take you only a few minutes per day — well worth the trouble when your hard disk starts acting flaky. More complex backup programs work with most backup devices on the market and allow you to centralize backups of an entire network, run unattended backups, create scripts, and compress or encrypt files. Maintained the most correct hierarchy, and restored the disk to its original state more often than any other program (see Figure 5). Norton Utilities was also the fastest in scanning the disk and saving information at shutdown.

When we ran these tests without the INITs installed, Norton Utilities still led the pack, completely fixing the hard disk in place in two corruption tests. In the other three corruption tests, Norton Utilities successfully recovered all the files and most of the hierarchy to a second hard disk. SUM II was second, recovering all files from three of the corruption tests but always to a second hard disk. SUM II even did slightly better than Norton Utilities in one of the corruption tests, completely recovering the folder hierarchy. Without the INIT, MacTools was virtually useless in the corruption tests. MacTools is not the program to buy if your hard disk has already crashed.

All the programs fared better when we had installed and configured them before the test. MacTools, Norton Utilities, and SUM II all performed well in the corruption tests, usually recovering all (or almost all) the files and usually getting the folder hierarchy correct. When preinstalled, 911 recovered nearly all the files but failed to recover any hierarchy. Because the files were displayed in the correct hierarchy in the program’s window, we were curious about why it didn’t recover the hierarchy. When we asked Microcom, we were told that 911 often loses the hierarchy.

In the user-error tests, all the utilities, with the exception of 911, recovered most or all of the files with the INITs installed. When we used the Erase Disk command on the Finder Special menu to erase the hard disk, 911 failed to recover any files. The 911 program keeps a record of deleted files on the same disk where it is installed, and Erase Disk apparently erases the record’s file along with the rest of the files on the disk.

Two of the recovery packages reviewed in this article include backup programs. The SUM II package includes SUM Backup, which works with any HFS volume. The MacTools Deluxe package includes a backup utility that works with HFS volumes and Apple tape drives.

There are also two ways to keep a duplicate image of your hard disk on another hard disk. Disk mirroring uses software to write the data written to one hard disk onto a second hard disk on the same SCSI chain. Disk duplexing uses a separate SCSI bus to create a duplicate image. Neither method is a replacement for backup, however. Although disk mirroring and duplexing will help you out in the event of a hardware failure, they are not likely to prevent data loss due to software corruption — the usual cause of a hard-disk crash. Because the drives are duplicates and both are active at the same time, if a virus or a bug-ridden application trashes your first disk, the second drive will probably also fail.

Disk-mirroring software also slows down some operations of your system, because the SCSI bus cannot transfer data to two different devices simultaneously. Write operations can take twice as long as they would without the mirroring software. Disk duplexing, on the other hand, uses a separate SCSI bus, so it doesn’t slow down the Macintosh.

After you’ve decided on the best backup hardware and software for your needs, back up often. Keep multiple complete backups, because even backup media can become damaged, lost, or inadvertently overwritten. Rotate among these backups, so all copies are relatively recent. Also, keep an up-to-date backup in a completely different location, such as a safe-deposit box or at home.

In the user-error tests without the INITs installed, MacTools recovered more files than did any of the other utilities, more than 80 percent for both tests. Norton Utilities was a not-so-close second, with SUM II third and 911 unable to recover any user-deleted files.

In the detection test, Norton Utilities and MacTools were able to detect that the AVIB data structure had been erased, but only Norton Utilities repaired the problem. SUM II and 911 couldn’t find anything wrong.

Bonus Software

Besides being the clear winner in the recovery tests, the Norton Utilities package includes some handy utilities that make it an even bigger buy. Norton’s Fast Find is what Apple’s Find File should be: It lets you speedily search multiple volumes at once and open files and launch applications from within the DA. The Directory Assistance INIT enhances the standard...
You know you need to back up. In today's computing world, that's a fact of life.

But does backing up really have to be such a big production?

Not if you have FastBack II, the world's fastest and most reliable backup software for the Macintosh.

And for the ultimate backup system, combine FastBack Tape with a fast, ultra-reliable 120 megabyte tape drive. Just pop in a cartridge and schedule your backup to take place automatically and unattended, whenever you choose.

Which turns a major production into a very short subject.
Open, Save, and Save As dialog boxes to let you create folders, delete files, search for files, and change the way files and folders are listed. There's even a hard-disk optimizer and a powerful bit-by-bit disk editor.

The other three programs also offer some handy additional utilities. One of the better ones is 911's Virex, a virus-detection program. To their credit, SUM II and MacTools are the only ones to include backup programs. But to their discredit, they both offer a feature we don't recommend using: soft partitions.

Soft partitions can be dangerous to your data. The Mac's operating system lets you treat a single hard disk as multiple volumes, or partitions. Partitions come in two types: hard and soft. A hard partition is created by separating a physical hard disk into several logical areas, defined at a basic level that is transparent to the Mac. The Mac sees hard partitions as separate hard disks, even though there is only one physical hard disk. In the case of soft partitions, software fools the Mac into thinking there are separate partitions by defining large files as separate partitions. Not all hard partitions necessarily crash when a software problem attacks a hard disk, but all soft partitions on the same hard disk will be affected by a software crash. Soft partitions also lack the performance enhancements of hard partitions, and they are incompatible with some backup utilities. We don't recommend using any program's soft-partition feature—if you want to partition your hard disk, use formatting software that offers hard partitions.

**Conclusion**

Recovery software and backup routines are critical to the safety of your data. One is not a substitute for the other; both hardware failure and software corruption are constant threats to your hard disk. Used in tandem, backup and recovery software provides a safety net for your valuable work.

Recovery programs should help you immediately in panic situations and, when preinstalled, guard against future problems. They may also come with extra features that enhance the overall use and performance of your Mac, but the bottom line is how well they recover data that's disappeared from your hard disk.

In our tests, Norton Utilities, SUM II, MacTools, and 911 all performed better when installed prior to a crash, reinforcing our belief that all Mac users should get a recovery program while their system is in working order. You may never have had a data-corruption problem, but your hard drive may be humming along contentedly, but — like death and taxes — a crash is inevitable. Read "The Bottom Line," buy the program that best meets your needs, and install it the minute you get it home. If you don't and if your hard drive drops dead tomorrow morning, don't say we didn't warn you.

Paul Wolf accidentally deleted this article, and Jackie Taylor recovered it.

---

**The Bottom Line**

You depend on your hard-disk drive. You can't afford to have it fail and lose your data. You should back up often and be prepared for an eventual software or hardware failure. If your hardware fails, there's nothing more to do than send your drive back, hope your warranty is up-to-date, and trust that your most recent backup is recent enough. But failures are usually caused by software problems or user errors, and a recovery program can save you valuable time and data.

We strongly recommend Symantec's Norton Utilities for the Macintosh ($129) for anyone using a hard disk. With Norton's File Saver INIT installed, Norton Utilities performed more recoveries than any of the other utilities we tested and its recoveries were more complete. Without the INIT and preinstallation, Norton Utilities still recovered a higher percentage of files overall. The on-line help was thorough and even fun to use. Besides being the most reliable recovery program, Norton Utilities provides extras, such as Fast Find and Directory Assistance, that are practical and convenient enhancements to the Mac's system software.

If you're a network administrator or MIS director with a department relying on you to save its data, you need all the tools you can get — you may want to have more than one hard-disk-recovery program on hand. Although Norton Utilities is our overall top choice, Symantec's other recovery program, SUM II ($149.95), recovered data almost as well. With its Mirror INIT installed, Central Point Software's MacTools Deluxe ($129) recovered files as well as Norton Utilities did in all tests. Without preinstallation, MacTools did better in the Erase Disk and Delete Files tests than all the other utilities, but its performance in most corruption tests was unsatisfactory. Microcom's 911 Utilities ($149.95) might be the last number you want to call if your hard disk is having trouble — it had little luck in recovering our test files.

If your hard disk has crashed, turn to Norton Utilities (center) rather than the other recovery programs: MacTools (left), SUM II (top), and 911 (right).
The new Macs started a Sound Revolution. With VoiceLink, you can afford to join it.

With the introduction of the new Macintosh® LC and IIsci, Apple has brought the power of sound manipulation to every Mac user-as long as you own one of these two new Macintoshes.

Well, your Mac has always possessed sound output capabilities, it just lacks the digital technology to input audio signals.

Now, we've changed that. VoiceLink combines advanced hardware and software that allows any Mac, from the Plus and Classic on up, to record sound.

Using a built-in Digital Signal Processor, Unidirectional microphone, & on-board digital compression, VoiceLink provides unsurpassed audio quality, and doesn't tie up the Mac's Central Processor. Others do.

VoiceLink also comes with powerful software tools to allow you to edit and process your sound recordings.

With VoiceLink, you can now experience the real power of sound-voice communication. Incorporate voice communications into your daily work.

Send voicemail messages over your E-Mail network. No more typing or proofreading your mail messages. Annotate spoken comments to your word processing and spreadsheet documents. Add high-quality sound to your multimedia presentations.

And that's just the beginning of voice applications and the Mac!

For additional information or the name of your nearest authorized VoiceLink reseller, please call us at:

Toll free in USA: 1-800-443-7077
in Europe: (Switzerland) + 41 22 42 96 47

Please circle 90 on reader service card.
# Table 1: Features of Hard-Disk-Recovery Programs

<table>
<thead>
<tr>
<th>Feature</th>
<th>Apple Disk First Aid</th>
<th>Central Point Software MacTools Deluxe</th>
<th>Microcom 911 Utilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>NA</td>
<td>$129</td>
<td>$149.95</td>
</tr>
<tr>
<td>Pros</td>
<td>Free; diagnoses some problems and fixes minor ones.</td>
<td>Recovers deleted and erased files well if preinstalled.</td>
<td>Undeletes files in place and has good troubleshooting guide.</td>
</tr>
<tr>
<td>Panic performance</td>
<td>good</td>
<td>good</td>
<td>poor</td>
</tr>
<tr>
<td>Configuration</td>
<td>39K</td>
<td>349K</td>
<td>177K</td>
</tr>
<tr>
<td>Size of basic application</td>
<td>1 MB</td>
<td>1 MB</td>
<td>1 MB</td>
</tr>
<tr>
<td>Minimum memory configuration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard-disk functionality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back up data structures</td>
<td>⊗</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Undelete files</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not preinstalled</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Preinstalled</td>
<td>NA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Recover from Erase Disk</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not preinstalled</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Preinstalled</td>
<td>NA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Fix disk in place</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Not preinstalled</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Preinstalled</td>
<td>NA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Recover to second hard disk</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Recover to floppies</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diagnose disk</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Generate reports</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Floppy functionality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recover files</td>
<td>NA</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Diagnose disk</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Package</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup utility</td>
<td>none</td>
<td>MacTools Backup</td>
<td>none</td>
</tr>
<tr>
<td>Virus protection</td>
<td>none</td>
<td>none</td>
<td>Virex</td>
</tr>
<tr>
<td>Disk optimizer</td>
<td>none</td>
<td>MacTools Optimizer</td>
<td>none</td>
</tr>
<tr>
<td>Disk/sector editor</td>
<td>none</td>
<td>MacTools FileEdit</td>
<td>none</td>
</tr>
<tr>
<td>Other software</td>
<td>NA</td>
<td>MacTools Launcher, Locate, Secure, FastCopy, Partition (soft partitioning), CPS TagFix</td>
<td>Sector Collector Cache Flow, Minor Repairs Soft Lock</td>
</tr>
<tr>
<td>Technical support</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Warranty</td>
<td>none</td>
<td>30 days*</td>
<td>90 days*</td>
</tr>
<tr>
<td>Company</td>
<td>Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (408) 996-1010</td>
<td>Central Point Software 15220 N.W. Greenbrier Pkwy. Beaverton, OR 97006 (800) 888-8199</td>
<td>Microcom P.O. Box 51489 Durham, NC 27717 (919) 490-1277, ext. 921</td>
</tr>
</tbody>
</table>

*Money-back guarantee

1Backs up volume-information block only

2Undelete only
Any resemblance to other Macintosh utilities is pure coincidence.

If that sounds like an outrageous statement, it sure is. But then, this is one outrageous set of utilities.

In fact, comparing the Norton Utilities® for the Macintosh® to anybody else's utilities for the Macintosh is, well, kind of embarrassing.

Because when it comes to fixing your disk problems, rescuing your data and daily getting the utmost from your Mac®, nobody else even comes close.

Why you need a Doctor in the house.
To see what we mean, see what happens when you call up our revolutionary Norton Disk Doctor®

Which is what you'll do whenever you're having trouble doing things like booting your system, recognizing or reading disks, opening, closing or trashing folders, locating icons or launching applications.

The Disk Doctor automatically diagnoses and repairs the 45 most common—and dangerous—problems your disk can confront you with.

Including a whole bunch of things the other guys can't even detect, let alone repair.

Which is one reason why—unlike other programs—we don't display hair-raising messages warning you of the “Risk of losing data” from using our utilities.

We save your trash.
Of course, any time a human being uses a computer—yes, even a Mac—there's a risk of losing data.

Which is why, seven years ago, Peter Norton Computing invented the legendary UnErase®.

Like the rest of the tools in this box, UnErase has been designed expressly for the Mac, to recover more kinds of trashed files, more quickly and with less effort on your part than any other program.

You can UnErase by File Type, By Text Search. Or use Quick UnErase to scan your fully loaded hard drive in as little as five seconds.

(You don't even want to know how long it takes everybody else.)

Whether your drive is fully loaded or nearly empty, Speed Disk® is—here we go again—the quickest, easiest and safest way to dramatically accelerate disk access.

And unlike other programs, Speed Disk won't lose your data even if your Mac loses power.

What a find.
Of course, you don't have to lose your data to want to get at it as quickly as possible.

That's something you want to do every day, every time you open a file.

So you'll be interested to know that Fast Find locates and opens files so quickly, you may never use the Mac's standard Find File accessory again.

If all of this looks too good to be true, see your favorite software dealer for a demonstration.

If you haven't got a favorite software dealer, call us right away at 1-800-343-4714 Ext 703F.

We'll send you more information.

SYMANTEC.
### Table 1: Features of Hard-Disk-Recovery Programs, continued

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Symantec Norton Utilities for the Macintosh</th>
<th>Symantec SUM II</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$129</td>
<td>$149.95</td>
</tr>
<tr>
<td>Pros</td>
<td>Very easy to use, last. Recovered the most data. Fixes files in place.</td>
<td>Recovers files in most situations.</td>
</tr>
<tr>
<td>Cons</td>
<td>Sometimes indicates that it has fixed something it hasn't.</td>
<td>Difficult interface. Hard to install.</td>
</tr>
<tr>
<td>Panic performance</td>
<td>Very good</td>
<td>Poor</td>
</tr>
<tr>
<td>Configuration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of basic application</td>
<td>629K</td>
<td>368K</td>
</tr>
<tr>
<td>Minimum memory configuration</td>
<td>1 MB</td>
<td>1 MB</td>
</tr>
<tr>
<td>Hard-disk functionality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Back up data structures</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Undelete files</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Not preinstalled</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Preinstalled</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Recover from Erase Disk</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Not preinstalled</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Preinstalled</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Fix disk in place</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Not preinstalled</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Preinstalled</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Recover to second hard disk</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Recover to floppies</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Diagnose disk</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Generate reports</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Floppy functionality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recover files</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Diagnose disk</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Package</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backup utility</td>
<td>none</td>
<td>SUM BackUp</td>
</tr>
<tr>
<td>Virus protection</td>
<td>detects only</td>
<td>none</td>
</tr>
<tr>
<td>Disk optimizer</td>
<td>Speed Disk</td>
<td>SUM TuneUp</td>
</tr>
<tr>
<td>Disk/sector editor</td>
<td>Norton Disk Editor</td>
<td>Sum Tools</td>
</tr>
<tr>
<td>Other software</td>
<td>Directory Assistance, DiskLight, Fast Find, KeyFinder, Layout Plus</td>
<td>SUM Encrypt, QuickCopy, SUM Partition (soft partitioning)</td>
</tr>
<tr>
<td>Technical support</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Warranty</td>
<td>30 days*</td>
<td>30 days*</td>
</tr>
<tr>
<td></td>
<td>Symantec Corp. 10201 Torre Ave. Cupertino, CA 95014 (408) 253-9900</td>
<td>Symantec Corp. 10201 Torre Ave. Cupertino, CA 95014 (408) 253-9900</td>
</tr>
</tbody>
</table>

*Money-back guarantee
I take extra pride in every drive that leaves our shipping dock because it carries the Ehman name. And because of that little extra dedication, what started in my garage six years ago, has mushroomed into the largest third party producer of Macintosh mass storage.

Today I honestly believe no one makes a better hard drive than Ehman. Our newest E-series products have all the “bells and whistles” of drives costing several hundred dollars more. Features like two extra power outlets for single switch, system bootup and dual fuse circuitry for added protection in the event of an electrical power surge.

Ehman drives are fast and quiet, but it’s our commitment to your total satisfaction that separates us from the pack. All our drives come with a 30 day money back guarantee and a two year limited warranty as well as my own personal commitment to giving Ehman customers the best. If you’re not happy with an Ehman drive I want to hear from you and I’ll make it right.

After all it’s not just a hard drive you’re getting, it’s an Ehman.

— Michael Ehman, President
One of the most exciting advances in data storage technology of the decade.

The simplest, most effective system for security, back-up, archiving, and data-sharing available today. Remove a cartridge and lock it away, store it, or take it with you.

There's nothing to learn—if you can use diskettes, you already know how to use the Infinity 40.

Unlimited storage. When you run out of space, just put in a new cartridge.

It's affordable. Additional 44MB cartridges cost just a little more than diskettes on a per-megabyte basis.

The most trusted name in this technology. And top performance.

PLI is one of the oldest manufacturers of hard disk systems for the Macintosh. We have been making innovative, highly-rated storage solutions since 1985.

When SyQuest was ready with a removable-cartridge drive, PLI was ready to deliver it to you—right from the start. Through our experience, we have learned to make the most recommended, most reliable SyQuest-mechanism drive you can buy.

What about performance? Our TurboCache software accelerates disk access time, boosting data throughput up to 50% for many applications. The actual performance enhancement depends on your application.

PLI also offers PC compatibility and platform versatility. You can plug in your Infinity 40 to a PC today, a Mac tonight. Just swap cartridges.

One more thing. Because we know that some of you just want to know you'll get there, and don't want a thrilling ride, we offer an economy model, too.

To find out more about the difference, call PLI today.

Peripheral Land Incorporated
47421 Bayside Parkway, Fremont, CA 94538
800-288-8754 or Fax 415-683-9713
"I designed Managing Your Money® to do everything I need. The idea is to make Managing Your Money your financial control center—to have everything you're ever likely to need in one place, working as one."

Andrew Tobias, Financial Expert

NEW Andrew Tobias’ Managing Your Money® Version 4.0!
The ONLY financial software that does it all.

- Budgeting
- Checkwriting
- Electronic bill payment with CheckFree® system
- Tax planning
- Teams up with MACIN Tax® for tax preparation
- Insurance
- Portfolio management
- Net worth calculator
- Retirement planning
- College planning
- Loan amortization
- Full business features
- Exports to Microsoft® Excel, Works, and most spreadsheets

Why not explore Managing Your Money for yourself?
For a FREE interactive demo disk* call 1-800-237-8400 ext. 217.
You won’t be disappointed.

*Offer good while supplies last. MACU 4/91
Remember those carefree networking days of old? Because the Mac came with its own network protocols (AppleTalk) and its own network connections (LocalTalk), it was easy to share a LaserWriter among the dozen or so Macs in your department. You just plugged in a few feet of cable and attached some LocalTalk connectors. Soon, however, the folks in finance down the hall wanted to use your LaserWriter to print their monthly reports, so they hooked their LocalTalk cable up to your LocalTalk cable. Your network instantly doubled in size — and ground to a halt because of the increased load.

But wait, there's a solution: a router — or a pair of routers. Rather than plug all those Macs into one large network, you can keep each group distinct — and more efficient — by using a router to connect your department’s network with finance’s network. And finance to sales, and sales to marketing, and marketing to design, and so on. You’ve just created an internet — a network of networks.
EtherTalk-to-LocalTalk Routers

To further enhance overall network performance, you can connect LocalTalk networks to an Ethernet backbone running AppleTalk protocols (an EtherTalk network). This central network can connect tributary networks and can move data at 10 mbps (megabits, or millions of bits, per second), compared with LocalTalk's sluggish 230 kbps (kilobits, or thousands of bits, per second). All you need is a pair of EtherTalk-to-LocalTalk routers—one to jump onto the EtherTalk network and one to jump off.

An Ethernet backbone provides the networking equivalent of a superhighway between two small towns. Data zips along on the Ethernet freeway and slows down on the single-lane roads in the towns. An EtherTalk-to-LocalTalk router provides the accelerator or brakes for negotiating between the two types of roadway (see "Are You Ready for Ethernet?", June '90, Buyer's Guide, page 20).

In addition to simple routing—segregating traffic among the networks that make up an internet—some routers provide other functions, such as gateway entry into non-AppleTalk environments (TCP/IP [transmission control protocol/internet protocol] and DECnet, for example), dial-up access, and WAN (wide-area networking) over telephone lines or satellite hookups. A router can enable file sharing, printer sharing, and terminal communications between AppleTalk and other network protocols. Even if your network consists of only two Macs, if they are on Ethernet, you'll need an EtherTalk-to-LocalTalk router if you plan to print with your LocalTalk-only LaserWriter ever again.

Before buying a router, you need to analyze your existing internet and anticipate future needs. Gaze into your

Network Glossary

AppleTalk: Apple's set of specifications that describes network hardware, software, and protocols and lets an assortment of Mac and non-Mac devices communicate over a variety of transceivers and media. The specifications were upgraded in AppleTalk Phase 2 (announced in June 1989), which removes some of the limitations of the original AppleTalk, referred to as Phase 1.

bandwidth: the information-carrying capacity of a communication link.

bridge: a device that connects two or more network segments. The bridge passes packets between segments, based on node-address information and/or any filtering criteria established by the network manager.

daemon: a background UNIX process that performs a utility function, such as print spooling.

DECnet: Digital Equipment's set of network specifications for use with its minicomputers and workstations.

EtherTalk: an implementation of low-level AppleTalk protocols that communicates on Ethernet.

Ethernet: a specification for a local-area-network transceiver, protocol, and cabling running at 10 megabits/second.

file server: a computer/hard-drive/software configuration that lets network users share files and applications on the hard disk.

gateway: a device that translates protocols between two types of networks, such as AppleTalk and TCP/IP. Also can refer to a device that provides routing between two or more TCP/IP networks with different network numbers.

hub: a multiport repeater, usually with intelligence and/or network-management capability. Also called a concentrator.

Internet: a system of distinct physical networks connected by routers and gateways.

LAN (local-area network): a group of connected computers and shared peripherals residing at a specific location.

LocalTalk: 1: an inexpensive, 230.4-kbps implementation of AppleTalk that is native to all Macintoshes. 2: the cabling system that is used to connect devices using this network technology, including Apple's connectors and cabling and Farallon's PhoneNet system or similar connector hardware.

network: a group of computers and shared peripherals connected in a continuous cabling system. In an AppleTalk internet, the boundaries of a network are defined by routers and gateways.

node: any device on a network that can independently send or receive information and has a network address. (Devices such as modems are usually not nodes.)

protocols: a set of rules that govern the communication and interaction of nodes on a network. Low-level protocols define transmission rates, data-encoding schemes, physical interfaces, the method by which nodes contend for the chance to transmit data over the network, and network-addressing schemes. High-level protocols define user-oriented functions such as printing and print spooling; file sharing; and the association of Chooser names with printers, servers, and other shared network devices.

repeater: a device that extends the maximum physical length of a network by amplifying and/or retransmitting signals between network segments. Repeaters usually have no bridging or routing capability, and they have a maximum delay between network segments of a few bits.

router: a device that connects two or more networks and intelligently decides the most efficient route for data passing from one network to another. Multiprotocol routers can handle this job simultaneously for two or more protocols.

department: shared network resources — such as file sharing, print spooling, and E-mail — available to all users.

TCP/IP (transmission control protocol/internet protocol): a set of standard, nonproprietary protocols standard on most UNIX devices and used by many other computing devices as well.

-TokenTalk: the low-level protocol that lets AppleTalk data be transmitted by use of token-ring hardware.

token ring: a ring of devices that passes a sequence of bits called the token from node to node to determine which device can transmit data on a network.

topology: the physical layout of a network.

transceiver: hardware that can simultaneously send and receive network signals.

UNIX: a multiuser, multitasking operating system used by a variety of computers.

WAN (wide-area network): a group of computer networks connected over long distances, often using telephone lines and satellite transmission.
Whenever you connect two or more networks, you have an internet. Routers—used to join networks—vary in the type and number of networks they support. Of the eight routers we tested, all support connection to at least one LocalTalk network and one EtherTalk network. You can put two or more routers together to construct a far-reaching internet of EtherTalk and LocalTalk networks. Some routers also provide various levels of support for UNIX-based TCP/IP (transmission control protocol/internet protocol), dial-up access, and WAN (wide-area-networking) capabilities.
crystal ball and ask lots of questions: How much do you expect your network to grow? Do your suburban employees hope someday to telecommute via modem? Will you ever need access to UNIX-based government or university databases? Are you going to connect other computers beside Macs? What about that VAX in the accounting department? — surely marketing can make use of its client database (see "The Invisible Bridge to Mainframe Data," January '91, page 138).

Different routers provide different capabilities, so speed isn't the only factor to consider. By picking the right routers, network managers can fine-tune a vast—or not-so-vast—internet for maximum performance. But as with any high-powered tool, a good deal of understanding is required to choose the right tool for the right job.

That's where the MacUser Labs NetWorkShop can help. In our new state-of-the-art test facility, we conducted extensive tests on a variety of internet configurations. We took an in-depth look at eight EtherTalk-to-LocalTalk routers, ranging in price from $395 to $5,495. The inexpensive AppleTalk Internet Router and Farallon PhoneNET Liaison are software that turns a Mac into a router, whereas the APT Communications ComTalk, Cayman GatorBox, Compatible Systems Ether•Route, Shiva EtherGate, Shiva FastPath 4, and Tri-Data Systems MaxWay 500E are hardware routers.

We timed the performance of all the routers in real-world tests such as file transfers between client/server pairs in two basic test configurations. We also tested multiport (multiple LocalTalk networks) routing and UNIX-based TCP/IP capabilities for those routers that have these additional features. (See the "Network Glossary" sidebar for definitions of unfamiliar terms.) Many AppleTalk managers need TCP/IP capability in mixed-network environments, where such protocols are common.

**Routing 101**

A router connects two or more networks to create an internet (see Figure 1). Each network within an internet has its own network address. On any network within the internet, data moves between nodes (computers, printers, and other devices) in chunks called data packets. A router straddles the junction of two or more networks and monitors the activity on all the networks attached to it. When a data packet from a node on one network is bound for a node on another network, the router takes the packet from the sending network, stores it in a holding area (called a buffer), and then forwards it to the second network. The router forwards packets between networks according to the rules of each network's protocol. Because a router forwards exclusively the data that needs...
forwarding and keeps all other network activity confined to the network on which it originated, the traffic level in each of the networks remains at a reasonable level.

A router keeps track of network information in its routing table. Once in service, routers periodically exchange routing tables with each other, thus keeping a dynamic and accurate picture of how the internet is constructed. This periodic — every ten seconds — exchange creates a small amount of background traffic in addition to the data that is traversing the internet. A routing table must be constructed for each protocol for which the router is responsible, and each protocol creates its own level of background traffic.

The larger the internet and the greater the number of routers and different protocols, the greater the background traffic. In an effort to reduce such overhead or simply to make use of existing cabling and protocols, many network managers incorporate their LocalTalk networks into existing Ethernet backbones running TCP/IP protocols. TCP/IP is especially well suited to large internets.

IP functionality in AppleTalk routers comes in a few different flavors (see the "TCP/IP and AppleTalk" sidebar). Both the Shiva FastPath 4 and the Cayman GatorBox can route packets by using TCP/IP protocols, and more vendors are providing this capability (see the "On the Horizon" sidebar).

**Router Features**

Before thinking about TCP/IP, though, you might simply want to get your AppleTalk networks — whether LocalTalk or EtherTalk — under better control. Software routers, which run in the background on a Mac, are an especially economical option when you have an older Mac that you want to retire from its current service. You might, for example, install EtherGate cards into two software-router-equipped SEs to add an EtherTalk backbone to your LocalTalk internet. Alternatively, you can combine routing with an existing file or mail server. Combining a server with a router has the advantage that traffic coming to the server from either of two networks won’t affect the other network (see “Work Groups or Work Teams?”

**Figure 3:** You must plow through three screens to reach this dialog box to change from thin Ethernet to thick Ethernet cable or to change from AppleTalk Phase 1 to Phase 2 — but EtherGate’s software is not any more convoluted than that of other routers.

October ’90, page 234). But don’t consider using a software router in the background of someone’s workstation. Although such penny-pinching is technically possible, a system crash on that workstation can cause the loss of the router capability — and mess up everyone’s access to network resources at the same time.

Another advantage of software routers is that they have multiprotocol capability. Because AppleTalk Internet Router and Farallon PhoneNET Liaison both run on Macs, they can use the Mac’s two built-in ports (the Macintosh’s printer and modem port can both be used for LocalTalk networking) for routing among two LocalTalk networks. In addition, both software routers support multiple Ethernet and token-ring networks. PhoneNET Liaison lets you put up to three network cards in your Mac, whereas AppleTalk Internet Router can support up to six additional network cards (the maximum number of slots available in a Mac II, IIx, or IIIf).

For more than two LocalTalk networks, look to a hardware router. The APT ComTalk ships in 40 different configurations, including one with one EtherTalk and six LocalTalk networks. The model we tested was configured for one EtherTalk and two LocalTalk ports. The Tri-Data MaxWay 500E serves one EtherTalk and four LocalTalk networks.

The Shiva FastPath 4 and Cayman GatorBox are the only routers we tested that have just one LocalTalk port each — if you want to connect 200 LocalTalk networks with either of these, you’ll need 200 FastPath 4s or GatorBoxes, which may not be efficient or economical (see Figure 2). You’d need only 40 or 50 ComTalks or MaxWay 500Es. The Shiva EtherGate, Farallon PhoneNET Liaison and APT ComTalk also enable dial-up access, for wide-area networking.

**Installation and Configuration**

Whether you choose a hardware or a software router, you must correctly install its configuration software. You must also provide network information — network addresses, for example — that’s specific to your internet. And, of course, you must physically connect the network cables to the router.

With a software router, these connections are to ports in your Mac — to the LocalTalk port, say, and to an EtherTalk card in one of the Mac’s slots. With a hardware router, you make the connections to ports in the box itself.

Then you let the router know what kind of cable — thick or thin coaxial — is attached to it. This can be tricky. For example, you must open the Ether*Route’s* case and move a jumper to change from thick to thin Ethernet. Fortunately, Compatible Systems will ship the Ether*Route configured
Figure 4: We transferred 500K files between 5-megabyte Mac Iicx AppleShare client/server pairs. We repeated the tests between one, two, and four client/server pairs — in the four-client/server test, for example, we copied files from four different servers on one network to four different clients on a separate network. To test the software routers, we ran the same tests, using Mac SE/30s with Asante Ethernet cards to run the routing software. We ran these time trials on three different network configurations — EtherTalk to LocalTalk, LocalTalk to EtherTalk to LocalTalk, and multiport — to test each of the routers:

**EtherTalk to LocalTalk:**
This is a common routing model: many small LocalTalk networks sharing services that reside on an EtherTalk network. File transfers between a client and server on the same LocalTalk network are faster than with any of the routers, however, so unless users on other LocalTalk networks need a service — a printer or server, for example — keep clients and servers together. If you do need to share services on EtherTalk with many LocalTalk networks, the Tri-Data Systems MaxWay 500E, APT ComTalk, and AppleTalk Internet Router are fastest at routing in this model.

**LocalTalk to EtherTalk to LocalTalk:**
Our second platform timed routing from one LocalTalk network to another LocalTalk network via EtherTalk. This setup doesn't show especially good network utilization, but occasionally you may need to access services on another LocalTalk network — to use another department's LocalTalk printer, for example. The results show why you won't want to do this frequently — transfer time among routers is dramatically different as the number of client/server pairs increases. The APT ComTalk, Tri-Data Systems MaxWay 500E, and Compatible Systems Ether-Route turned in the best performance in this scenario.

**Multiprot:**
The fewer devices on LocalTalk, the better, as the results of this test prove. We spread the clients among two LocalTalk networks (in the multiple-client/server-pair tests) and found that overall speed does not diminish as dramatically as it does when all clients are on one LocalTalk network. The APT ComTalk, Tri-Data Systems MaxWay 500E, and Compatible Systems Ether-Route again fared the best, with virtually no increase in file-transfer time for the second client/server pair.
TCP/IP and AppleTalk

Your company's creative services and advertising departments have just installed Macintoshes and have created their own small LocalTalk networks. Creative services, however, occasionally needs files from the advertising department. You can simply connect the cables and create one big, slow network, or you can add these two new networks to your corporate backbone (major institutions, data cable). However, your backbone isn't running LocalTalk — it's running TCP/IP.

No problem — if you use an EtherTalk-to-LocalTalk router with TCP/IP capability. TCP/IP is not a vendor set of protocols, as is AppleTalk, but a protocol standard designed by the joint effort of the government and scientific agencies specifically for large networks — the protocols function efficiently even with 100,000 nodes.

In this LocalTalk-to-TCP/IP-to-LocalTalk example, the only TCP/IP capability you need is the ability to make an IP tunnel. IP tunneling moves AppleTalk data between two routers that can use TCP/IP (such as the Cayman GatorBox and the Shiva FastPath 4) by encapsulating the AppleTalk data.

A tunnel is created when a UNIX-configuration host running TCP/IP executes a process called atalkad (the AppleTalk administration daemon), which provides tunnel information on demand to any router that requests it. The atalkad process uses a file called atalkatab (the AppleTalk administration table) to define the tunnels by giving the IP addresses and the AppleTalk numbers and zone names for the two ends of the tunnel. The network administrator must configure atalkad and atalkatab manually (not an easy task), but once you've gotten the TCP/IP-tunnel information configured and running, it operates transparently.

Our tunnel test platform included a Sun SPARCStation IPC host configured with atalkad and atalkatab files. We had a client Macintosh on one LocalTalk network and a server Macintosh on another network (see Figure A). We then used two routers of the same type to connect each of these two networks to an Ethernet backbone that was running TCP/IP.

Testing was the same as it was in our other trials. We copied large files from the clients to the servers and recorded the time the copying process took to complete. We repeated the tests for one, two, and four client/server pairs — for example, during the four-client/server test, we copied files from four servers on one network to four clients on a separate network. The Shiva FastPath 4 was only slightly faster than the Cayman GatorBox.

Vendors are beginning to add TCP/IP capabilities to their routers, although the level of these capabilities varies among products. For example, if you add GatorShare software ($1,995) to your GatorBox, your company's UNIX host will appear in your Chooser precisely the same way as an AppleShare server does — GatorShare translates UNIX-based NFS (Network File System) to AFP (AppleTalk Filing Protocol). Even if you have no immediate need, you may decide to purchase a router with TCP/IP capability and keep the TCP/IP option open.

Testing

All the routers we tested are AppleTalk Phase 2-compliant. Since Apple introduced Phase 2 in 1989, more and more corporate sites have been taking advantage of its ability to support larger internets, making Phase 2 support an essential feature of state-of-the-art routers (see the "Phase 2, Round 3" sidebar).

EtherTalk-to-LocalTalk routers are used in two primary network configurations: a file, mail, or print server is located on the Ethernet cable, or a separate network. The Shiva FastPath 4 was only slightly faster than the Cayman GatorBox.
server is located on another LocalTalk cable on the other side of an Ethernet cable. Two of our three primary test platforms simulated these scenarios (see Figure 4). We also looked at router performance under multiport LocalTalk routing conditions — routing packets between two different LocalTalk ports on the same router.

We measured router performance by timing file transfers from a Mac IIx running AppleShare server software to another IIx running AppleShare client software. We copied large files from the clients to the servers and recorded the time it took for the copying process to be completed. We repeated the tests for one, two, and four client/server pairs. In the four-client, four-server test, for example, we simultaneously copied files from four servers on one network to four clients on a separate network. To test the software routers, we ran the same tests, using Mac SE/30s with Asante Ethernet cards.

Results
The Tri-Data MaxWay 500E and the APT ComTalk consistently had the best performance of all the routers. However, even though the Tri-Data MaxWay 500E was often slightly faster than the APT ComTalk, we had so many problems with the Tri Data product that we hesitate to recommend it — unless you're a seasoned network manager. In fact, we went through five MaxWay 500Es before we could get two of them to work properly. The setup software, which can be run only from LocalTalk, is also very confusing. For example, the screen in which you enter the network range provides no prompts for what to enter. Because the display allows only a four-digit number, perhaps we should have guessed that a hexadecimal number was required, but we didn't. The APT ComTalk is also difficult to set up, but it has powerful network-management software.

If your LocalTalk-network devices are numerous and concentrated — if, for example, you have 150 Macs on LocalTalk in the same building — then the multiport APT ComTalk is an efficient way of dividing up your internet. If you have only 30 devices per building, on the other hand, your internet is probably simpler and the extra expense of the ComTalk or MaxWay 500E is less likely to pay off.

At the other end of the performance scale, the Shiva EtherGate was consistently the slowest router in the field — and it too is confusing to set up. Its configuration software configures the entire Shiva product line, except for...
the FastPath 4. Although this may at first seem a good strategy, you have to wait a long time for the software to search the network for other members of the Shiva family — NetModems, NetSerials, NetBridges, TeleBridges, and EtherGates — when all you want to do is configure the EtherGate. You also have to move through numerous screens to get to the meat of the EtherGate configuration manager.

If you’re considering just local-area services — you don’t need dial-up access — then Compatible Systems’ Ether•Route is the clear choice. It’s fast and easy to set up and configure. The only thing we didn’t like about the Ether•Route was that you have to disassemble the box to change it from thick to thin Ethernet.

Both of the software routers we tested — Farallon PhoneNET Liaison and Apple AppleTalk Internet Router — were easy to set up and almost equal in speed, with Internet Router having a slight edge. PhoneNET Liaison has more features, such as dial-up-access capability, and it has the benefit of Farallon’s strong technical support. Your dealer must support AppleTalk Internet Router — either wonderful or horrible, depending on your dealer. Also, AppleTalk Internet Router lacks dial-up access.

PhoneNET Liaison is a much more versatile product. You can install it this month in combination with your mail server and then use it next month to provide dial-up access to all those folks who got snowed in over a long weekend. Both software routers have good manuals.

The hottest competition in most people’s minds, however, is between the Shiva FastPath 4 and the Cayman GatorBox. The FastPath 4 is a little faster, but the GatorBox is easier to set up. Technical support is about equal, and both handle TCP/IP equally well. The GatorBox with GatorShare software ($1,995) translates UNIX-based NFS (Network File System) to AFP (AppleTalk Filing Protocol) so that a UNIX host looks just like an AppleShare server. If you want or need this capability, you’ll buy the GatorBox despite its slightly slower performance.

The FastPath 4 does DECnet routing for communicating with VAXes — if you need that feature, you’ll buy the FastPath 4. The GatorBox has a much better manual but can’t recover from a power outage as can the FastPath 4. The GatorBox uses volatile RAM and does not have battery backup, whereas the FastPath 4 uses nonvolatile RAM. When the power comes back on after a failure, the GatorBox needs to access its routing software from the Mac that initially downloaded it — and that Mac may not be turned on.

Making the Route Choice
The good news about EtherTalk-to-LocalTalk routers today is that you have a rich set of choices. The bad news is that the choices are complex. Only after you know what features you need can you begin to narrow your choices. The race then comes down to product-to-product, head-to-head competition. For our picks, see the “Bottom Line” sidebar.

If you want a file- or print-server/router combination, then decide between Farallon PhoneNET Liaison and AppleTalk Internet Router. If you have several LocalTalk networks clustered in the same vicinity, choose between the APT ComTalk and the Tri-Data MaxWay 500E. If you want a moderately priced hardware router and don’t need TCP/IP, the choice is between the Shiva EtherGate and Compatible Systems Ether•Route. If you need a TCP/IP router, choose the FastPath 4 or the GatorBox. For WAN features in a router, there’s the APT ComTalk, Farallon PhoneNET Liaison, or Shiva EtherGate.

Kurt VanderSloot is a MacUser contributing editor and AppleTalk-network educator and consultant. Paul Kent does consulting about AppleTalk networks for Winehouse Computer Co.

The Bottom Line

Routers no longer simply transfer signals from one LocalTalk cable to one Ethernet cable. Their repertoire now includes multiple LocalTalk ports, translation of non-Macintosh networking protocols (such as TCP/IP or DECnet), and dial-up access (wide-area networking). Before choosing a router, plan the shape you want your internet to take and decide which — if any — of these additional capabilities you’ll need. You’ll also want to map out the physical layout of your internet: Do you have a dense grouping of LocalTalk networks on one floor? If so, perhaps one multiport router is a better solution than several single-LocalTalk-port routers. You’ll then want to evaluate a router in terms of functions as well as speed.

For straight EtherTalk-to-LocalTalk routing without any frills, we recommend the Compatible Systems Ether•Route ($1,495). It’s a superior choice if you don’t need TCP/IP capabilities. Its ease of use and solid performance are a pleasant surprise in so young a product.

If you need TCP/IP, choose between the Shiva FastPath 4 ($2,795) and the Cayman GatorBox ($2,795). The FastPath 4 is slightly faster, but the GatorBox has better setup information. The FastPath 4 is the only router to include DECnet compatibility, however, so if you need DECnet, it’s your answer.

Although it is slightly slower than AppleTalk Internet Router ($399), Farallon PhoneNET Liaison ($395) wins our vote for the better of the two software routers, because of its versatility — dial-up access, for example. In general, a software router can be an economical solution if you must combine routing with a print, mail, or file server.

Regarding high-end routers, the APT ComTalk ($3,250) is flexible in configuration, supports wide-area networking, and has good setup and network-management capabilities. Its abilities more than make up for the slight performance edge of the Tri-Data MaxWay 500E ($5,495).

Only one router, the Shiva EtherGate ($2,399), gave a bad showing, consistently coming in last in each of our tests. We don’t recommend it for use as either a local- or wide-area router.
EtherTalk-to-LocalTalk Routers

Criteria

Price (list/street) — The list price is the manufacturer's suggested retail price. The street price is an average actual price charged by dealers around the U.S. in January 1991.

Software — The name and version number of the router's controlling software.

CPU — The internal microprocessor.

Type of router code — Upgrades to the router code must be physically installed in the hardware box if the code is in ROM. Routing software that works in RAM is easier to upgrade — there's no hardware to fiddle with. Volatile RAM should have battery backup.

Configuration protection — A password prevents unauthorized access.

Max. number of LocalTalk networks — If you have many LocalTalk networks in one physical location, multiple LocalTalk connections in a single package can ease setup. The more connections per box, the lower the cost per LocalTalk network. Breaking up large LocalTalk networks into smaller work groups can produce more-efficient internets.

Max. number of EtherTalk networks — The cost of the router should also be analyzed in terms of the number of EtherTalk networks that can be connected to it. The more connections per box, the lower the cost per network.

Ethernet-connector type — Thick, or AUI (attachment-unit interface); thin, or BNC coaxial.

Connector-switch type — An external switch lets you set the router for thick or thin Ethernet cable very easily. Some routers have software switches to perform this function.

Gateway functions — Provides access to another type of protocol, such as TCP/IP or DECnet. True gateway functions in a router let you use a host on another type of network just as if it were an AppleShare volume.

Battery backup — If there's a power outage, router code in volatile RAM will be lost if you do not have battery backup.

Dial-in security — Can the router limit dial-in access to the network?

Wide-area networking — Can the router connect networks that are connected over phone or satellite lines?

Hides resources — Can the network manager set up the router so that only certain zones or devices are available to certain users or work groups?

Modern capabilities — Can router users connect to the network via modem?

Table 1: Features of Software Routers

<table>
<thead>
<tr>
<th>Features</th>
<th>Apple Internet Router</th>
<th>Farallon PhoneNET/Liaison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/street)</td>
<td>$399/$299</td>
<td>$395/$295</td>
</tr>
<tr>
<td>Pros</td>
<td>Fastest software router.</td>
<td>Most versatile, Wide-area networking, dial-in capability.</td>
</tr>
<tr>
<td>Cons</td>
<td>Does not support dial-in access.</td>
<td>Does not support TCP/IP. Slower than a hardware router.</td>
</tr>
<tr>
<td>Version number</td>
<td>2</td>
<td>3.0.1</td>
</tr>
<tr>
<td>Configuration protection</td>
<td>password</td>
<td>password</td>
</tr>
<tr>
<td>Max. number of LocalTalk networks</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Max. number of EtherTalk networks</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Gabling support</td>
<td>thick or thin coaxial, twisted-pair</td>
<td>thick or thin coaxial, twisted-pair</td>
</tr>
<tr>
<td>Gateway functions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase 2 support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mixed Phase 1 and 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Token-ring capability</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCP/IP tunneling</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hides resources</td>
<td>zones only</td>
<td></td>
</tr>
<tr>
<td>Modern capabilities</td>
<td>dial-in, dial-out</td>
<td></td>
</tr>
<tr>
<td>Dial-in security</td>
<td>password, user authentication</td>
<td></td>
</tr>
<tr>
<td>Warranty (media only)</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Technical support</td>
<td>authorized dealer</td>
<td>unlimited, free</td>
</tr>
</tbody>
</table>

Apple Computer, Inc. 20525 Mariani Ave. Cupertino, CA 95014 (800) 538-9696

Farallon Computing 2000 Powell St., Suite 600 Emeryville, CA 94608 (415) 596-9100

*Limited to number of Ethernet cards in host Mac; maximum is six in a Mac II, IIX, or IIFX.
Publish~It! Easy
In Less Than an Hour.

The all-in-one desktop publisher for the rest of us.
Makes your document design fast, easy and fun!

Everything is Included.
Now you can bring words and graphics together to express your ideas like never before! Write a document, check the spelling, mix and match type styles, add graphics, and print it out, all in a few simple steps — all with one easy-to-use program. And get professional-looking results — every time:
- A Fully Integrated Word Processor
- A 240,000-Word Thesaurus
- A 112,000-Word Spell Checker
- Built-in Drawing & Painting Tools
- A Quick-Start Mini-Manual
- 72 Sample Page Layouts

Special “What-if” Design Features.
Experiment with document design all you want. Easy’s “Libraries” and Proxies let you alter page elements instantly — making changes and experimentation easier than ever before. When you’re happy with the results, save it as your final document.

Try stretching or condensing your headline or body copy. Or rotate text for special accents, or make your type textured or shaded. But don’t think all these exciting capabilities are difficult. They aren’t. They’re Easy.

Automatic Everything.
If you’re not sure about which type style is best, Publish It! Easy will automatically select the type for you. Change the shape or size of your text area, and Easy will automatically reflow the text to fit. Automatic headlines and subheads, automatic indentation, book binding margins, page numbering, on-line help. It’s all automatic. You won’t have much to learn or to do!

Publish It! Easy
We make desktop publishing easy. And at $249.95 (Suggested Retail), very affordable. In fact, with our 60-day full money-back guarantee and free 60-day technical telephone support, downright unbeatable!

TIMWORKS
See your favorite Dealer or order direct from Timeworks, 444 Lake Cook Rd., Deerfield, IL 60015. Or call 1-708-948-9206. Fax: 1-708-948-9212.
PUBLISH IT! is a trademark of Timeworks, Inc. © 1991 Timeworks, Inc.
All Rights Reserved. All other trademarks are of their respective companies.
*Not compatible with Macintosh 128K or 512K machines.

Please circle 116 on reader service card.
## Table 2: Features of Hardware Routers

<table>
<thead>
<tr>
<th></th>
<th>APT Communications</th>
<th>Cayman</th>
<th>Compatible Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CamTalk</td>
<td>GatorBox</td>
<td>Ether•Route</td>
</tr>
<tr>
<td>Price (list/street)</td>
<td>$5,500* / $5,000</td>
<td>$2,795 / $1,955</td>
<td>$1,495 / $1,045</td>
</tr>
<tr>
<td>Cons</td>
<td>Software is powerful but difficult to understand.</td>
<td>Only one LocalTalk port. Second-slowest. No battery backup.</td>
<td>Lacks TCP/IP support. Difficult to change cabling-type switch.</td>
</tr>
<tr>
<td>Software</td>
<td>APT Internet Manager 5.0</td>
<td>GatorSystem, GatorKeeper 1.6</td>
<td>Ether•Route Manager 1.7.0</td>
</tr>
<tr>
<td>CPU</td>
<td>68000</td>
<td>68000</td>
<td>80C188</td>
</tr>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of router code</td>
<td>ROM, upgradable</td>
<td>volatile RAM</td>
<td>ROM, upgradable</td>
</tr>
<tr>
<td>Configuration protection</td>
<td>password</td>
<td>none</td>
<td>password</td>
</tr>
<tr>
<td>Max. number of LocalTalk networks</td>
<td>6</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Max. number of EtherTalk networks</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ethernet-connector type</td>
<td>thick</td>
<td>thick or thin coaxial</td>
<td>thick or thin coaxial</td>
</tr>
<tr>
<td>Connector-switch type</td>
<td>NA</td>
<td>software</td>
<td>internal jumper</td>
</tr>
<tr>
<td>Gateway functions</td>
<td>none</td>
<td>TCP/IP, Telnet, KIP/CAP, NFS</td>
<td>none</td>
</tr>
<tr>
<td>Battery backup</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Phase 2 support</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mixed Phase 1 and 2</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Token-ring capability</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>TCP/IP tunneling</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Wide-area networking</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Hides resources</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Modern capabilities</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>Dial-in security</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Warranty</td>
<td>90 days hardware</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Technical support</td>
<td>APT Communications, Inc. 9607 Dr. Perry Road Ijamsville, MD 21754 (301) 831-1162</td>
<td>Cayman Systems 26 Landsdowne St. Cambridge, MA 02139 (617) 494-1999</td>
<td>Compatible Systems Corp. P.O. Box 17220 Boulder, CO 80308 (800) 356-0235 (303) 444-9532</td>
</tr>
</tbody>
</table>

---

*This price is for the model we tested. Many more configurations, ranging from $3,250 – $12,000, are available.

1Adapter available for thin-coaxial connection.

2Additional software (GatorShare, $1,995) required for NFS.

3Can be configured for synchronous communications.
Microsoft® Mail version 3.0 brings you everything you need in an electronic mail system.

For openers, now you can easily build your own personal address book and distribution lists. Afterwards, Mail automatically updates them for you.

You can also send mail with as many files attached as you want. You efficient types can even attach an entire folder of stuff. Just point and click and you’re done.

There’s even click and drag foldering. Which gives you a better, more intuitive way to store and retrieve messages. As well as making it a lot simpler to keep all of your mail organized.

Best of all, Mail lets you send and receive files when you’re right in the middle of something else. Like Aldus’ PageMaker® or Microsoft Excel or Word. This means you don’t have to save—and–quit—and–stop—and–start anymore.

To unleash Microsoft Mail 3.0 in your own office, call (800) 541-1261, Department P21. We’ll fetch you a working model for only $9.95.
### Table 2: Features of Hardware Routers, continued

<table>
<thead>
<tr>
<th>Feature</th>
<th>Shiva EtherGate</th>
<th>Shiva FastPath 4</th>
<th>Tri-Data Systems MaxWay 500E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price (list/street)</td>
<td>$2,399/$1,625</td>
<td>$2,795/$1,899</td>
<td>$5,495/NA</td>
</tr>
<tr>
<td>Pros</td>
<td>Wide-area networking support and dial-in capability. Only router that supports DECnet. Second-fastest, Multiple LocalTalk, EtherTalk nets.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td>Slowest performance. Software not intuitive. Only one LocalTalk port. Doesn't support TCP/IP.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software</td>
<td>Internet Manager 1.6</td>
<td>K-Star 8.0.1</td>
<td>MaxWay 2.7</td>
</tr>
<tr>
<td>CPU</td>
<td>68000</td>
<td>68000</td>
<td>10-MIPS SPARC</td>
</tr>
<tr>
<td>Features</td>
<td>Type of router code</td>
<td>nonvolatile RAM</td>
<td>nonvolatile RAM</td>
</tr>
<tr>
<td></td>
<td>Configuration protection</td>
<td>password</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Max. number of LocalTalk networks</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Max. number of EtherTalk networks</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Ethernet-connector type</td>
<td>thick or thin coaxial</td>
<td>thick or thin coaxial</td>
</tr>
<tr>
<td></td>
<td>Connector-switch type</td>
<td>software</td>
<td>external switch</td>
</tr>
<tr>
<td></td>
<td>Gateway functions</td>
<td>none</td>
<td>DECnet, TCP/IP, KIP/CAP</td>
</tr>
<tr>
<td></td>
<td>Battery backup</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Phase 2 support</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Mixed Phase 1 and 2</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Token-ring capability</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>TCP/IP tunneling</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Wide-area networking</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Hides resources</td>
<td>zones only</td>
<td>zones, printers</td>
</tr>
<tr>
<td></td>
<td>Modern capabilities</td>
<td>yes</td>
<td>NA</td>
</tr>
<tr>
<td></td>
<td>Dial-in security</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Technical support</td>
<td>Shiva Corp. One Cambridge Center Cambridge, MA 02142 (800) 458-3550 (617) 252-6300</td>
<td>Shiva Corp. One Cambridge Center Cambridge, MA 02142 (800) 458-3550 (617) 252-6300</td>
<td>Tri-Data Systems, Inc. 3270 Scott Blvd. Santa Clara, CA 95054 (408) 727-3270</td>
</tr>
</tbody>
</table>
Welcome to the wonderful — and wonderfully easy — new world of CompuServe, where you can now use the power of your Mac while taking advantage of the vast online information and communications resources we have to offer.

CompuServe now features CompuServe Information Manager software, making us friendlier and more helpful than ever. Now, you can utilize a powerful Macintosh interface. And you can do more offline — composing letters or reading answers to Mac support questions, for instance.

And we’re offering you this whole new world of CompuServe for only $39.95, including software and a $25.00 usage credit. Usage charges are as low as 10¢ a minute.

So let us show you how CompuServe can put you on easy street. If you’re already a member, just type GO ORDER. If not, see your computer dealer, or call us today. CompuServe®

800 848-8199

Requirements for Mac version of CompuServe: Mac Plus or later model Macintosh with at least one megabyte of RAM. Mac System 6 or later version: hard disk, one 800K (or higher) floppy drive. Hayes compatible modem recommended.

*Suggested retail price.
"More Mice For"

"Build a better mousetrap and you’ll catch more mice."

Recently, our RM42 SyQuest drive was awarded 4 mice by the editors of MacUser magazine. When Tim Maroushek, our Product Manager, was given the challenge of designing the new M-series line, he didn’t design it with awards in mind. His objective was to build a superior quality drive with the latest technology, and to do it at prices that would represent the best value in the marketplace. After all, as Tim says, "the 4 mice rating is great, but I’d rather make a difference by creating a better value at a lower price."

So how were we able to design so much into our drives and still offer such competitive prices? The answer is our factory-direct strategy. By cutting out the Dealers’ mark-up and the Reps’ commission, we both save money. As always, you have my 30 day “love-it-or-return-it” guarantee. So take advantage of this risk-free opportunity to find out for yourself why our drives deliver more mice for the price. Order Today! Most orders ship the same day, so you could be using your new Mirror drive tomorrow."

Ronald E. Eberstainer
President/CEO

Timothy R. Maroushek
Product Manager

Designed For Editors And Users Alike.

We made over 40 improvements to our M-series drives. We beefed up our cabinet, added features (see diagram), radically updated our disk management utilities, and bundled award winning utilities from CE Software and Microlytics. We did all of this and still lowered our price!

Exclusive! MediaManager™ Software With Every Drive.

MediaManager™, Mirror’s exclusive disk management software, includes a utility to format your drive and a Control Panel device that allows you to customize attributes of each volume, such as password protection and auto-mounting. On fixed drives, MediaManager™ lets you partition your drive into smaller volumes for improved efficiency. And our Drive Spanning feature allows several drives to be viewed as one contiguous volume. In other words, two 650Mb drives can be turned into one 1.3Gb volume!

Exclusive! VolumeBackup™ Software With Every Drive.

VolumeBackup™s sophisticated scripting feature lets you create custom backup procedures that automatically back up your data when it’s most convenient (like while you sleep). Back up to floppies, tape, another drive, or a SyQuest cartridge.

FREE! Award Winning Microlytics and CE Software...A $500 Value!

With every drive, we’re including a collection of over a dozen CE Software utilities that includes QuickKeys Lite, DiskBp (v.3.04), MockPackage, Ask, and LaserStatus. And we’ve included Microlytics’ Gopher*, a high-speed text search and retrieval utility, and Inside Information*, the first hierarchical dictionary for the Macintosh. Several of these wonderful utilities received MacUser Eddy awards and MacGuide Golden Gavel awards.

Our DriveCare Technicians
Repair Our Competitor’s Drives!

Since DriveCare’s introduction in August 1988, our technicians have repaired thousands of drives from almost every one of our competitors. And their data recovery expertise has earned them a place in the hearts of many MIS managers.

All of our drives are covered by generous warranties and come with free lifetime technical support by the same professionals that have made our DriveCare third-party repair service an institution.

* Electronic version of manuals included. Mirror Technologies, VolumeBackup and MediaManager are registered trademarks of Mirror Technologies, Inc. All other trademarks
A Complete Line Of Mass Storage Solutions.

Mirror Technologies helped pioneer Macintosh mass storage back in 1985. Since then we have developed the most comprehensive line of storage and back-up solutions available. We offer internal and external hard drives, 45Mb removable drives, tape and DAT back-up, rewritable, and CD-ROM. Each has benefited from the efforts that earned our RM42 its 4 Mice rating.

M-Series Hard Drives — Externals (full Macintosh line) and Internals (Mac SE, SE30, or Mac II) available in capacities from 20 to 595Mb.

M-20 20Mb $2497
M-30 30Mb $2497
M-40 40Mb $2497
M-45 45Mb $2497
M-60 60Mb $2497
M-80 80Mb $2497
M-100 100Mb $2497
M-120 120Mb $2497
M-150 150Mb $2497
M-180 180Mb $2497
M-200 200Mb $2497
M-290 290Mb $2497
M-380 380Mb $2497
M-500 500Mb $2497
M-595 595Mb $2497
RM42 45Mb $617

choose a better drive at a lower price.

T1200 DAT Drive — packs 1.3Gb on a tiny cartridge. Complete with automated software for unattended back-up.

T150 Tape Drive — backs 150 Mb onto a DC900 cartridge. Complete with automated software for unattended back-up.

CDR10 CD-ROM Drive — gives you access to data and audio. Complete with remote control desk accessory for audio playback.

RM600 Erasable Optical Drive — stores 600 Mb on a removable disk. Impervious to crashed.

TECHNICAL SUPPORT
HOTLINE: (612) 633-2105
Hours: Weekdays 8 a.m. - 6 p.m. CST
Telephone: (612) 633-4450
Fax: (612) 633-3136
2644 Patton Road, Roseville, MN 55113

Call Today! Order Factory-Direct.

1-800-654-5294

and trademarks belong to their respective holders. Price availability subject to change without notice. Not responsible for typographical errors. © 1988, Mirror Technologies, Inc.

Please circle 107 on reader service card.
BY OWEN W. LINZMAYER

MAC TO MAILBOX

Your Mac can help you save on postage and increase your mailing efficiency. Here’s how.

Much to the chagrin of electronic-mail enthusiasts, most Mac users resort to a decidedly low-tech service for disseminating information — the post office. First-class mail is quick, relatively inexpensive, and reliable, and it reaches just about everyone. (Let’s face it, your Aunt Edna probably can’t be reached by E-mail.)

Sure, a pouch of first-class mail lacks the panache of electrons racing toward their E-mail destination. But that doesn’t mean you can’t use the Mac to automate almost every mailing task, from sending occasional personal correspondence all the way to saturating neighborhoods with direct-marketing materials. Regardless of the volume of mail you generate, there’s probably a Mac postal product just right for you. And chances are, you’ve overlooked ways you can use your existing hardware and software to your best advantage. Here’s the lowdown on the many indispensable mailing products currently available plus some tricks that don’t cost a penny.
Mail Management

Address for Success

Most of the large postal-service facilities have OCR (optical character recognition) machines that can "read" addresses at top speeds of 36,000 envelopes per hour. If the OCR machine can comprehend the address information, the envelope is sorted automatically and sent on the fast track toward its destination. Otherwise the envelope is kicked out and sent down another line where mere humans must try to discern your chicken scratchings. By making sure your mail is OCR-friendly, you can help it avoid this fate, which means that it will be delivered up to a full day sooner. Observing the following 14 rules will help (see Figure A for more on how to address envelopes):

1. Type or print addresses. OCR machines aren’t able to read handwritten envelopes, no matter how perfect your penmanship.
2. Use black ink on a white background for the highest contrast.
3. Use a nonornamental, nonproportional, sans serif font such as Monaco. OCR machines must be able to clearly distinguish individual letters, and serifs and run-together cursive fonts such as Los Angeles increase the likelihood of confusion.
4. Don’t place any extraneous text or graphics anywhere near the address block.
5. Use all uppercase letters. OCR machines have a harder time reading lowercase characters.
6. Omit all punctuation. If your address information is correct, OCR machines have no need for punctuation.
7. Maintain a uniform left margin for all address information. Some envelope-printing utilities let you center addresses; don’t use this option.

Reasons to Automate

If you’ve been getting along just fine sending out mail by hand, you may think there’s no reason to automate the process. Nothing could be further from the truth. The Mac can help you save time, money, and face.

By keeping your list of mail recipients in an electronic format — be it a general-purpose database or a dedicated mail-list manager — you can avoid the tedious, time-consuming task of retyping addresses for each mailing. Once this information is in the computer, just follow a few simple rules and you can have your mail racing down the fast track for rapid delivery (see the “Address for Success” and “Pushing the Envelope” sidebars).

Although it might require an initial investment in some dedicated software and hardware, mailing with the Mac is cost-effective in the long run. First of all, using the Mac makes keeping your address list up-to-date much easier and helps reduce the wasted expense of sending out undeliverable mail. Furthermore, you can take advantage of deep postage discounts by sorting your mail before delivering it to the U.S. Postal Service. Mail that is presorted and pre-bar-coded receives the most favorable rates under the new rate structures that should now be in effect (up to a 7¢ discount per piece of first-class mail).

Sorting and bar coding are nearly impossible to do by hand, but a computer can do them in minutes.

Finally, the Mac can help you save face. Beautifully composed letters may slither out of your laser printer in flawless glory, but do you then kiss the professional look good-bye by using either illegible handwriting or a clunky typewriter to address the envelope? Why not address your envelopes with a word processor instead? Not only do printed addresses look better than handwritten ones but you’re also less likely to make embarrassing spelling mistakes.

The Electronic Address Book

The first step toward automating your mail is getting your recipients’ addresses into an electronic format. For all but the most demanding heavy mailers, a standard flat-file database manager (DATABASE, FileMaker Pro, or Microsoft File, for example) or personal information manager (such as Address Book Plus, Dynodex, or Pastel) should work well.

If you’re starting from scratch, you need — at the very least — separate fields for first name, last name, street address, city, state, and ZIP code. (It’s important to leave enough room for ten characters in the ZIP-code field, so
you have space for the ZIP+4 extension. A separate ZIP-code field also lets you presort your list. You can either type the addresses into the computer yourself or get a typing service to do the dirty work. If you buy mailing

lists, request that the data be provided on-disk, not as labels. Most mailing houses are happy to comply with this request, but they'll probably send you an IBM disk, which means you'll need a 1.44-megabyte SuperDrive (or compatible) to transfer the data to your Mac (more on this later).

An alternative to buying mailing lists from mailing houses is to use Lotus Development’s MarketPlace family of products, distributed on CD-ROM. Lotus MarketPlace: Business is essentially an enormous database containing names, addresses, telephone numbers, and marketing data on seven million American businesses. The basic package costs $695; for $150 you receive a year’s worth of quarterly updates; $400 buys 5,000 additional names. By the time you read this, Lotus should also have released a CD-ROM disc with demographic and life-style data on 120 million consumers in 80 million U.S. households.

Lotus MarketPlace lets you target potential customers, analyze markets, and create lists for prospecting and direct marketing (see Figure 1). You can print labels from within MarketPlace or export data for use in other applications. MarketPlace isn’t for everyone, but it’s worth considering if you want instant access to a wealth of prospects and full control of your data management.
Mail Management

Figure 2: With Satori’s Bulk Mailer Plus, you can merge lists containing up to 90,000 records. Its unique Purge feature searches for duplicates and keeps track of “close calls” that you may want to eliminate.

Mailing-List Management

No matter the source of your address database, everything hinges on its accuracy. You should clean it up regularly, weeding out erroneous and duplicate records, especially after merging it with other lists. You can “merge and purge” in several ways.

The most time-consuming housecleaning method is to go through the entire list manually, looking for incomplete and duplicate records. This isn’t too onerous if you have only a few hundred addresses, but for anything bigger, you should find another method.

For example, if you mail newsletters to a large user group or send direct-marketing material to whole towns at a time, you can use a dedicated mail-list manager such as Synex’s MacEnvelope Plus or Satori Software’s Bulk Mailer Plus to clean up your mailing list. Both can handle large databases (100,000 and 90,000 records, respectively), and each comes with unique purge capabilities. MacEnvelope Plus functions just like its sibling, the envelope-printing utility MacEnvelope (see the “Pushing the Envelope” sidebar) and adds features such as flag and comment fields for each record, the ability to generate bulk-mailing reports, and a sophisticated importing feature that can ignore or add default text to individual incoming fields. As lists are merged, the application automatically compares incoming records to the existing file and if it finds an exact duplicate, it places the duplicate in a separate file that you can check manually. Unfortunately, if two records are the same except for a misspelled name, MacEnvelope Plus won’t identify them as duplicates.

Bulk Mailer Plus, on the other hand, can identify and flag “close calls” such as the one just described. As it searches for duplicates, you can ask it to save all close calls for later examination, allowing you to manually delete one, the other, or neither (see Figure 2). It’s a great feature that saves a lot of time, and it’s much more accurate than simply eyeballing the list.

If you’re on a budget and can’t afford a dedicated mail-list manager, there are a few painless ways to clean up your list. Perhaps the easiest is to ask recipients to notify you of any mistakes on their mailing label or prominently place the words Do Not Forward — Address Correction Requested on all your outgoing mail. Instead of forwarding such pieces to recipients who have moved, the U.S. Postal Service returns them to you with the new addresses noted, if available. You pay 30¢ for each piece that is returned.

The ZIP+4 Advantage

The best way to avoid these charges altogether is to take advantage of the U.S. Postal Service’s free — but little-known — ZIP+4 Conversion service. You send your database to the U.S. Postal Service, where it is “sanitized” — the Postal Service corrects any erroneous ZIP codes, misspelled street and city names, and inappropriate abbreviations. Additionally, you can request that the appropriate ZIP+4 code and carrier-route number be added to each record. What you get back is a database that conforms to all official postal regulations (see the “Address for Success” sidebar).

But there’s a catch. You must send your address list as an SDF (standard database format) file on an IBM disk (use a 3.5-inch disk to make transferring the data easier). In an SDF file (also called a fixed ASCII file), each field of each record begins in a particular column and is the same fixed length in each record. Few Mac applications can export this type of file. Instead, tab-delimited files are the norm — the contents of fields are separated by tab characters, and records are separated by carriage returns. To get around this, you need to transfer the tab-delimited file to a 3.5-inch IBM disk, using the Apple File Exchange utility provided with each Mac as part of the System software. For this you’ll need a SuperDrive, also known as an FDHD drive, which is built into all current Macs but is not found in any Mac Pluses or older SEs. Once you’ve gotten the database onto an IBM disk, import it into an IBM database application and then save it as an SDF file that the postal service can process. When the postal service returns your disk, just reverse the steps.

If all this seems like too much work, there is an alternative. Semaphore’s ZP4 is a $499 CD-ROM disc containing a list of more than 27 million valid U.S. postal addresses along with their related ZIP+4 codes and carrier-route numbers. You can look up individual addresses or process entire databases in batch mode. Essentially this gives you the same setup as the U.S. Postal Service’s ZIP+4 Conversion service, but ZP4 is at your disposal around the clock and works on your Mac without requiring any burdensome file translation. Rena Systems plans to release a similar product this year.

Addressing the Mail

Not until you are confident of your database’s integrity should you actually send mail, at which point a whole
host of other problems crop up. Choosing the best option for getting addresses onto each piece of mail depends on what you are sending and how it’s generated. Basically, you have several choices, including using window envelopes, printing addresses directly onto envelopes, or printing mailing labels.

Window Envelopes. Perhaps the easiest way to address letters is to use window envelopes. Most word processors let you create a boilerplate into which you can merge addresses from a database or text file. Just make sure the address block appears in the correct place so that it shows through the window when the letter is folded and inserted into the envelope. Incidentally, if you send a lot of mail, consider investing $299 in an ADI Execufold, a small stand-alone device that automatically folds 8.5-x-11-inch sheets in thirds. With the optional $249 Mailmover II feeder, it can process 100 sheets unattended in less than five minutes.

Envelope-Printing Utilities. Envelope-printing utilities are great for light to medium mailers who want to print directly onto their own envelopes, using standard equipment (see the “Pushing the Envelope” sidebar for a comparison of the more popular utilities). If you want to save money, however, these utilities aren’t vital. Instead, you can use a word processor to create a template containing your return address (and a logo if you want) in the upper left corner and the recipient’s address block indented several inches to the right (see Figure 3). Using trial and error, adjust the Page Setup and document margins so that everything appears in the right place when printed.

Finally, if your word processor features a glossary, use it to store your frequently used addresses. Rather than retyping your landlord’s address when the rent is due each month, for example, you can just retrieve the address from the glossary and print an envelope, using your template. The only disadvantage of this trick is that with a word processor there is no way to print the postal bar codes that can reduce overall delivery time by as much as a couple of days.

Although printing addresses directly onto envelopes provides the cleanest, most-professional-looking results, it’s not without its complications. If the printer creases

Table 1: Meeting Your Mailing Needs

<table>
<thead>
<tr>
<th></th>
<th>Light Maller</th>
<th>Medium Maller</th>
<th>Heavy Maller</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pieces per month</td>
<td>1 - 100</td>
<td>100 - 1,000</td>
<td>1,000+</td>
</tr>
<tr>
<td>Tasks</td>
<td>Personal correspondence, bill paying</td>
<td>Business correspondence, newsletters</td>
<td>Direct marketing, saturation mailing</td>
</tr>
<tr>
<td>Address repository</td>
<td>Personal information manager (Pastel Manager, Address Book Plus, Dynodex)</td>
<td>Flat-file database (FileMaker Pro, Microsoft File)</td>
<td>Flat-file database (FileMaker Pro, Microsoft File)</td>
</tr>
<tr>
<td>List management</td>
<td>Request address correction from postal service</td>
<td>Use postal service’s ZIP+4 Conversion service</td>
<td>ZIP-code database (ZIP4 CD-ROM)</td>
</tr>
<tr>
<td>Addressing mail</td>
<td>Create a word-processor template for letters to use with window envelopes</td>
<td>Print directly onto envelopes, or print mailing labels</td>
<td>Print directly onto envelopes, or print mailing labels</td>
</tr>
<tr>
<td>Software solutions</td>
<td>Word processor, envelope-printing utility (KiwiEnvelopes)</td>
<td>Envelope-printing utility (MacEnvelope), label-printing utility (StickyBusiness)</td>
<td>Envelope-printing utility (MacEnvelope Plus), label-printing utility (StickyBusiness Plus)</td>
</tr>
<tr>
<td>Hardware helpers</td>
<td>One-up label printer (LabelWriter, Smart Label Printer)</td>
<td>Envelope cassette on printer; direct-address printer (AddressWriter)</td>
<td>Multibin feeder (ERGOFEED), continuous-feed envelopes, sheet folder (Execufold), direct-address printer (BOS or Rena Systems)</td>
</tr>
</tbody>
</table>

Regardless of the volume of mail you generate, there’s probably a Mac postal product that’s just right for you. This chart can help you figure out the best products and techniques for your needs.
Mail Management

your envelopes, try cutting a template from magazine stock and placing it inside the envelope before you print. Obviously this trick is appropriate only if you’re not printing lots of envelopes.

Envelope Feeders. Even if your envelopes don’t crease, you’ll certainly tire of inserting them into the printer after a while. There are several ways around this problem. If you have an ImageWriter or other impact dot-matrix printer, you may want to buy continuous-feed envelopes at any well-stocked stationery or computer store. If you use a laser printer, on the other hand, consider buying an optional envelope tray or multibin feeder such as the Ergofeed line ($1,655 to $3,590), from BDT Products, which can hold up to 50 envelopes, in addition to adding selectable on-demand paper trays for letterheads and second sheets.

Direct-Address Printers. For medium-to-high-volume jobs, a direct-address printer (specifically for envelopes) might make economic sense. CoStar recently announced the AddressWriter, an 8-pin dot-matrix printer that...
attaches to the Macintosh via the serial port. It holds up to 100 envelopes and prints graphics, text, and postal bar codes over the entire face of an envelope in just 12 seconds. Bundled with a special version of Synex's MacEnvelope, the AddressWriter will cost around $500.

The AddressWriter makes sense for smaller operations, but if you're dealing with really high-volume mailing, investigate a heavy-duty direct-address printer such as the ones offered by Bryce Office Systems and Rena Systems. The Bryce line of addressing machines runs from $3,695 for the BOS 1200 daisywheel printer (1,200 pieces per hour) to $13,900 for the BOS 10K, which can print 10,000 letter-quality envelopes per hour and uses an inkjet mechanism. The 9-pin Rena DA-300, on the other hand, sells for $3,995 (plus $400 for the serial interface) and can output up to 2,500 envelopes per hour in Draft mode. Rena's top-of-the-line DA-307 64-pin printer spews out 10,000 envelopes per hour — and costs a cool $13,495. You can get a special $465 edition of MacEnvelope Plus to work with the Rena printers.

### QuickEnvelope

Bundled free with GCC's hard-disk drives and printers, QuickEnvelope is also available as a stand-alone product. It lets you enter return and recipient addresses as well as messages. Unfortunately, it can't print either graphics or postal bar codes. QuickEnvelope is suitable for heavy mailings. It can hold up to 1,000 records in its internal database and has a Find command so you can retrieve individual addresses. QuickEnvelope also lets you printmerge from a tab-delimited text file. Unfortunately, you cannot import addresses to or export them from the internal database.

Given its inability to print graphics and postal bar codes, as well as its other shortcomings, I can't recommend QuickEnvelope over other similarly priced full-bodied utilities.

### The Bottom Line

If you need an envelope-printing utility and you print just a few envelopes at once, KiwiEnvelope is a good bet. For heavier mailing, MacEnvelope is the way to go. The first offers simplicity and the second flexibility, and both can print postal bar codes for fast delivery.

---

**Table A: Features of Envelope-Printing Utilities**

<table>
<thead>
<tr>
<th>Features</th>
<th>FastEnvelope 1.03</th>
<th>KiwiEnvelope 3.1</th>
<th>MacEnvelope 5.0</th>
<th>QuickEnvelope 1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comments</td>
<td>Features and flexibility provide power. Bugs and quirks diminish utility.</td>
<td>Simplicity makes one-shot envelopes a specialty. Needs font flexibility.</td>
<td>Mini mail manager does much more than envelopes. Needs font flexibility.</td>
<td>Can't compete without graphics and postal bar codes.</td>
</tr>
<tr>
<td>List Price</td>
<td>$10</td>
<td>$49.95</td>
<td>$89.95</td>
<td>$49</td>
</tr>
<tr>
<td>Implementation</td>
<td>DA</td>
<td>DA</td>
<td>DA and application</td>
<td>DA</td>
</tr>
<tr>
<td>Features</td>
<td>Envelope size</td>
<td>10 predefined, custom</td>
<td>#10 business, #6¾ personal</td>
<td>11 predefined, custom</td>
</tr>
<tr>
<td>Address-list maintenance</td>
<td>unlimited records</td>
<td>unlimited records</td>
<td>1,600 records</td>
<td>1,000 records</td>
</tr>
<tr>
<td>Autopaste</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Full font control</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>WYSIWYG envelope</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Graphics</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Postal bar code</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Sort</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Find</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Import</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Print merge</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Export</td>
<td>•</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>On-line help</td>
<td>Vertical Solutions Beaverton, OR 97075-1150 (800) 222-9052 (503) 671-0790</td>
<td>Kiwi Software, Inc. 6546 Pardall Rd. Santa Barbara, CA 93117-4842 (800) 321-5404 (805) 685-4031</td>
<td>Synex 602 Tenth St. Brooklyn, NY 11215-4052 (800) 447-9639 (718) 499-8283</td>
<td>GCC Technologies 580 Winter St. Waltham, MA 02154-1225 (800) 422-7777 (617) 890-0880</td>
</tr>
</tbody>
</table>

*Plus 150 label templates

**Preview available**
Ironically, the difference between the ColorPoint and the second best has nothing to do with color. Yes, the ColorPoint offers top-notch color. It also offers superior performance in other respects. But the best news of all is the price—$6.999 for the A (letter) size and $9.999 for the B (tabloid) size.

ColorPoint is PANTONE® certified. So it simulates PANTONE colors and greatly simplifies color proofing.

ColorPoint is PANTONE® certified. So it simulates PANTONE colors and greatly simplifies color proofing.

ColorPoints unique roll feed, double cut technology gives you the biggest image size of any comparable printer. Delivered on perfectly trimmed and finished pages. And this same technology also assures you perfect registration every time.
Between the best color printer is little to do with color.

Obviously, color is critical. It's why you're looking at color printers in the first place. So rest assured, ColorPoint PS offers the best color around.

But before you decide on a color printer purely on the basis of color, you should take a look at ColorPoint's other advantages as well. The speed. The PostScript compatibility. The perfect registration. The ability to print a full page, both in A and B sizes—even in transparency form.

Then take a look at the price.

We think you'll find that deciding between ColorPoint and second best is a black and white decision.

To find out more, give us a call at 1-800-873-4561 and ask for department SI-51.
Mail Management

The Bryce and Rena printers operate similarly: The Mac application sends the recipient’s address information as straight ASCII text, and the printer interprets the ZIP code to generate the postal bar codes. You can’t print graphics, and you can’t use Mac fonts.

**Mail Labels.** An alternative to all this is to print addresses on mailing labels. For light mailers, a label printer, such as the CoStar LabelWriter or the Seiko Smart Label Printer, is a good choice. The hardware is identical for both of these $249.95 thermal printers, and each can print a single, self-adhesive label in 25 seconds, using the accompanying DA. The LabelWriter also comes with a Chooser driver so you can access the printer from within any application, giving you full font control and the ability to print graphics (Seiko has a similar driver that should be available now). Because of their speed and the cost of labels (roughly 5¢ apiece), these tiny printers are not economical, but they are convenient.

For big jobs, or if you don’t want to buy a special label printer, you can use your laser printer to print sheets of self-adhesive labels. (Continuous-feed forms are available for dot-matrix printers.) Simply print a bunch of sheets and have a “peel-and-stick” party with a couple of employees or very close friends. Many database applications come with label templates, and you can choose from several dedicated label-printing utilities. For instance, StickyBusiness ($100) is a labeling program that contains hundreds of stock labels. MacLabelPro ($99.95) is essentially a modified version of StickyBusiness that works only with Avery stock. It comes with 60 existing Avery templates that you can’t modify. StickyBusiness Plus ($180), on the other hand, has all the features of StickyBusiness with two important additions: the ability to define a bar code anywhere on a template and an automated postal-formatting feature. It comes with 277 predefined templates, which cover most major label suppliers, and a utility that lets you define new templates as needed.

**Any Questions?**

If you’re using your Mac to create any sort of mail — from personal correspondence to direct-marketing material — there’s no excuse for not using it to help mail those pieces as well. If you’re not sure how to go about starting to automate your mail, see Table 1. One last piece of advice: If you have any questions about automating your mail, contact your local postmaster or get in touch with a U.S. Postal Service account representative. These people are extremely knowledgeable and anxious to assist you in any way that ultimately makes their jobs easier. By relying on your Mac for greater automation, you’re doing your part to hold down the country’s postal-processing costs while simultaneously increasing the U.S. Postal Service’s efficiency and your own.

San Francisco-based writer Owen W. Unzmayer has successfully automated his mail and feels much better for it.

<table>
<thead>
<tr>
<th>Directory</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Envelope Printers and Accessories</strong></td>
</tr>
<tr>
<td>ADI</td>
</tr>
<tr>
<td>Execufold</td>
</tr>
</tbody>
</table>
| **Mailing Labels.** An alternative to all this is to print addresses on mailing labels. For light mailers, a label printer, such as the CoStar LabelWriter or the Seiko Smart Label Printer, is a good choice. The hardware is identical for both of these $249.95 thermal printers, and each can print a single, self-adhesive label in 25 seconds, using the accompanying DA. The LabelWriter also comes with a Chooser driver so you can access the printer from within any application, giving you full font control and the ability to print graphics (Seiko has a similar driver that should be available now). Because of their speed and the cost of labels (roughly 5¢ apiece), these tiny printers are not economical, but they are convenient.

For big jobs, or if you don’t want to buy a special label printer, you can use your laser printer to print sheets of self-adhesive labels. (Continuous-feed forms are available for dot-matrix printers.) Simply print a bunch of sheets and have a “peel-and-stick” party with a couple of employees or very close friends. Many database applications come with label templates, and you can choose from several dedicated label-printing utilities. For instance, StickyBusiness ($100) is a labeling program that contains hundreds of stock labels. MacLabelPro ($99.95) is essentially a modified version of StickyBusiness that works only with Avery stock. It comes with 60 existing Avery templates that you can’t modify. StickyBusiness Plus ($180), on the other hand, has all the features of StickyBusiness with two important additions: the ability to define a bar code anywhere on a template and an automated postal-formatting feature. It comes with 277 predefined templates, which cover most major label suppliers, and a utility that lets you define new templates as needed.

**Any Questions?**

If you’re using your Mac to create any sort of mail — from personal correspondence to direct-marketing material — there’s no excuse for not using it to help mail those pieces as well. If you’re not sure how to go about starting to automate your mail, see Table 1. One last piece of advice: If you have any questions about automating your mail, contact your local postmaster or get in touch with a U.S. Postal Service account representative. These people are extremely knowledgeable and anxious to assist you in any way that ultimately makes their jobs easier. By relying on your Mac for greater automation, you’re doing your part to hold down the country’s postal-processing costs while simultaneously increasing the U.S. Postal Service’s efficiency and your own.

San Francisco-based writer Owen W. Unzmayer has successfully automated his mail and feels much better for it.

---

**Table 1.**

<table>
<thead>
<tr>
<th><strong>Label-Printing Utilities</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Avery Commercial Products Division</td>
</tr>
<tr>
<td>MacLabelPro</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Williams &amp; Macias, Inc.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>3707 S. Godfrey Blvd. Spokane, WA 99204-5753</td>
</tr>
<tr>
<td>StickyBusiness</td>
</tr>
<tr>
<td>StickyBusiness Plus</td>
</tr>
</tbody>
</table>

**Directory**

<table>
<thead>
<tr>
<th><strong>Envelope Printers and Accessories</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>ADI</td>
</tr>
<tr>
<td>Execufold</td>
</tr>
</tbody>
</table>
| **Mailing Labels.** An alternative to all this is to print addresses on mailing labels. For light mailers, a label printer, such as the CoStar LabelWriter or the Seiko Smart Label Printer, is a good choice. The hardware is identical for both of these $249.95 thermal printers, and each can print a single, self-adhesive label in 25 seconds, using the accompanying DA. The LabelWriter also comes with a Chooser driver so you can access the printer from within any application, giving you full font control and the ability to print graphics (Seiko has a similar driver that should be available now). Because of their speed and the cost of labels (roughly 5¢ apiece), these tiny printers are not economical, but they are convenient.

For big jobs, or if you don’t want to buy a special label printer, you can use your laser printer to print sheets of self-adhesive labels. (Continuous-feed forms are available for dot-matrix printers.) Simply print a bunch of sheets and have a “peel-and-stick” party with a couple of employees or very close friends. Many database applications come with label templates, and you can choose from several dedicated label-printing utilities. For instance, StickyBusiness ($100) is a labeling program that contains hundreds of stock labels. MacLabelPro ($99.95) is essentially a modified version of StickyBusiness that works only with Avery stock. It comes with 60 existing Avery templates that you can’t modify. StickyBusiness Plus ($180), on the other hand, has all the features of StickyBusiness with two important additions: the ability to define a bar code anywhere on a template and an automated postal-formatting feature. It comes with 277 predefined templates, which cover most major label suppliers, and a utility that lets you define new templates as needed.

**Any Questions?**

If you’re using your Mac to create any sort of mail — from personal correspondence to direct-marketing material — there’s no excuse for not using it to help mail those pieces as well. If you’re not sure how to go about starting to automate your mail, see Table 1. One last piece of advice: If you have any questions about automating your mail, contact your local postmaster or get in touch with a U.S. Postal Service account representative. These people are extremely knowledgeable and anxious to assist you in any way that ultimately makes their jobs easier. By relying on your Mac for greater automation, you’re doing your part to hold down the country’s postal-processing costs while simultaneously increasing the U.S. Postal Service’s efficiency and your own.

San Francisco-based writer Owen W. Unzmayer has successfully automated his mail and feels much better for it.

---

<table>
<thead>
<tr>
<th><strong>AddressWriter, around $500</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CoStar Corp.</strong></td>
</tr>
<tr>
<td>22 Bridge Street Greenwich, CT 06830-5238</td>
</tr>
<tr>
<td><strong>BOS 1200</strong></td>
</tr>
<tr>
<td><strong>BOS 7600</strong></td>
</tr>
<tr>
<td><strong>BOS 10K</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Bulk Mailing Plus 2.0, $250</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Satori Software</strong></td>
</tr>
<tr>
<td>2815 Second Avenue Suite 500 Seattle, WA 98121-1262</td>
</tr>
<tr>
<td><strong>BOS 3000</strong></td>
</tr>
<tr>
<td><strong>BOS 4000</strong></td>
</tr>
<tr>
<td><strong>BOS 5000</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>ZIP 4 Conversion, free</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>United States Postal Service</strong></td>
</tr>
<tr>
<td>National Address Information Center</td>
</tr>
<tr>
<td><strong>Diskette Processing Services</strong></td>
</tr>
<tr>
<td>6060 Primacy Parkway Suite 101 Memphis, TN 38188-0001</td>
</tr>
</tbody>
</table>

---

**San Francisco-based writer Owen W. Unzmayer has successfully automated his mail and feels much better for it.**
A MacWarehouse Expansion Kit will dramatically increase the power of your Mac. And our fast, reliable overnight service will have your Kit in your hands tomorrow!

MORE BRAIN POWER FOR YOUR MAC
Never again will you have to quit your word processor just to answer a question about a 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. Just open your Mac, slide out the main circuit board and plug in your SIMMs. Our free video will give you step-by-step installation instructions. Every type of Mac is covered and we think we've made it a breeze.

WHAT DO I NEED?
Our helpful sales and technical staff is standing by to answer any questions and take the mystery out of memory upgrades. Memory cards come with one megabyte on each card and are usually sold in pairs - (2 @ $59 ea.).

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, 100ns SIMMs is $59. Please call for the very latest prices and availability. Our sales staff will tell you what you need and help you make your choice an easy one.

SPEED
Do you need 80, 100 or 120 nanosecond (ns) chips? Nanoseconds are billionths of a second, so an 80 ns chip responds faster than a 100 ns chip. The original Mac used relatively slow 150 ns memory chips. The 68020 processor reads 120 ns (or faster) chip, and the 68030 Macs like the speedier model.

OVERNIGHT DELIVERY
Place your order by 12:00 am (EST), 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
Call toll-free
Twenty-four hours a day, seven days a week.
Inquiries: 1-908-367-0440
Fax: 1-908-305-9279
© 1991 Micro Warehouse Inc.

30-DAY MONEY BACK GUARANTEE
If, for any reason, you are dissatisfied with your MacWAREHOUSE Memory Kit, you may return it for a full refund within thirty days of purchase. All you have to do is call us for a return authorization number and return this product, postage paid, in its original condition, with the original packaging and documentation.

ONE YEAR WARRANTY. MacWAREHOUSE also guarantees its Memory Kits against manufacturer defects for one year from the date of purchase. We will repair the item or replace it at our discretion.

SIMMs prices vary. Call for latest information.
** Limited Offer! Free video with purchase of 2 or more SIMMs.
The fifth edition of Steven Boeker's Power User's Tool Kit is now available exclusively to MacWAREHOUSE customers. A hand-picked collection of four powerful programs on one handy disk, the newest Tool Kit includes Doing—a unique desk accessory for organizing and implementing your daily tasks. The newest version of Stuffit Classic, also on the disk, will create freestanding space-saving archives of files that you can expand whenever you need them without having any special decompression software.

The Power User's Tool Kit 5.0 is FREE from MacWAREHOUSE when you order from us. If you would like the disk, please ask for product code number AFA 5001. You pay only $1.50 for shipping and handling. The programs are shareware, so you can try them free of charge. If you wish to continue using them, some authors ask that you pay a fee ($10-$25). All of the details are explained on the disk, which is yours to keep.

FREE CATALOG!
We carry more than 2000 Macintosh products, including all the latest releases and new versions. We pride ourselves on getting new products first. Just fill in the information requested below and mail the coupon. We'll start your free, one-year subscription to the MacWAREHOUSE catalog with the next issue.

PhoneNET Card for Ethernet
(FastIcon)
Enables Mac SE/30 or Mac II family computers to utilize the increased speed and bandwidth of Ethernet. You attach the telephone cable directly to your Mac—no extra external connector or transceiver is needed. The 10BASE-T compatible PhoneNET Card for Ethernet comes with Tumbuktu software, which lets you share screens and transfer files with other Macintoshes running Tumbuktu over any AppleTalk network.

PhoneNET Card for Ethernet 150B$299.
No-Box SE/30 NET0001 $399.
No-Box 10-Pack NET0090 $3499.

NEW! Express Customer Service Number:
1-800-445-9677
(Monday—Friday, 9 a.m.—5 p.m. ET)

FREE CATALOG SUBSCRIPTION MUD1
Free MacWAREHOUSE Catalog Subscription
1690 Oak Street, P.O. Box 3031, Lakewood, NJ 08701
Please enter my free, one-year subscription to the MacWAREHOUSE catalog

Name

Address

City State Zip

(Expect to receive your first issue within 4–6 weeks).
MORE FOR YOUR MONEY...

BUS0034 Full Impact 1.1 SPECIAL 59
Avery

AC0049 MacLabelPro 49
Baseline Publishing

BUS0149 1 Shot Worksheet 59
Gassidy & Greene, Inc

EMS0031 QuickDraw
CE Software

BUS0033 Aligning Events 15
GRA0010 CalendarMaker 3.0 31
Claris

DAT0004 FileMaker Pro 218
BUS0158 MacProject II 2.1 345
BUS0013 SmartForm Designer 289
DeltaPoint, Inc.

BUS0159 DeskGraph 1.5 199
Foxx Software

DAT0018 DeskBase/Mac 2.0 292
Informix

BUS0054 WinColl 2.1 245
JAM Software

DAD0037 Smart Alarms 3.0 (Single User) 84
DAD0033 Smart Alarms 3.0 (5-15 users) 189
DAD0034 Smart Alarms 3.0 (6-8 users) 189
Kxtron

BUS0100 TopDown 2.0 229
Mainstream

GAM0010 MacSchedule 2.5 133
GRA0127 MacSchedule PLUS 215
Microsoft

BUS0014 Excel 2 2 245
BUS0023 Excel 2 2 225
BUS0008 PowerPoint 2.0 292
BUS0008 Microsoft Office 529

Graphix (ICD)

Graphix connects your Mac to any printer with a Centronics-style parallel interface. Graphix emulates the ImageWriter II on most dot matrix printers, using a special cable with the adapter interface built in. No bulky power supplies to drag around.

Great for Mac Portable users. or anyone with the adaptor interface built in. No bulky power supplies to drag around. Great for Mac Portable users. or anyone who travels with a Mac.

INF0095 $82.

BUS0104 Works 2.0 199
Portfolio Systems

BUS0021 Director The Instant Address Book 75
DTP0056 DynaPage 57
Power Up

BUS0016 Address Book Plus 52
BUS0073 Calendar Creator 35
BUS0021 FaxForms 2.0 105
Round Lake Publishing

BUS0007 LetterWorks 59
Satori

BUS0025 Bulk Mailing 3.2 5 75
Softview (Full line available)

BUS0108 Reader's Edge A 3.0 175
USB0023 FAX Expense Reports ea 49
Symantec Corporation

BUS0055 Mail 3.0 265
Symmetry

BUS0055 KeyPlan 245
Syex

BUS0100 MacEnvelope Plus 2.0 150
Timetables

BUS0043 Timetables II 3.0 195
T/Maker

BUS0152 SmartBund 215
Vertical Solutions

BUS0113 Fullscreen 45
BUS0105 FastLabel 2.0 45
Wolfram Research, Inc.

ST0008 Mathematica 346
Zedcor

BUS0118 Desk 3.03 445
0326 Nemesis Deluxe.. ....... .............................. 95.
XOR Corporation
ENT0274 MacGoll Classic
.. 52.
ENT0330 MacSki ..
. ...... .... ........... 40.
ENT0212 NFL Challenge .... ....... ..... .. .... ....... ............ 55.

FONTS & APPPLICATIONS

Atlas MapMaker 4.5
(Strategic Mapping)
A complete desktop mapping system
that leis you quickly display the
relationships in geographic data with
striking color presentation graphics .
Includes everything you need lo map the
U.S. by slate or county. the world by
country and much more . Use the U.S.
Census statistics included with the
program. or choose from a library of data
and map files provided. Also read in Zip
coded name and address files and
display their map locations. or combine
their data into useful information of target
marketing, customer analysis,
distribution planning, and sales-territory
design. GRA0227 $369.

Adobe Systems, Inc.
FON0264 Adobe Type Manager 2.0.
............ 55.
FON0278 Adobe Type Manager Plus Paci< ... .. ...... 109.
Ad obe Type Sel 1 or 2 ..
......... ea. 58.
Adobe TypeSel3 .. ..
..... ........ 129.
Smart Ari I. II, Ill or IV. ... .. ... .... .. .... ea. 59.
DAC0028 TypeAlig n................. .. .. ..... ....... ........ .. .... 59.
FON0295 Adobe Type Reunion
........ .... 38.
Allsys
FON0183 Ari Importer 2.0 ..
........ .... .......... 95.
.......... 275.
FONOOM Fonlographer 3.2 ........
FON0284 Melamorpho sis 1.5 ...
................ 95.
Broderbund
GRAOl 56 TypeSlyler ..
....... .. 11 9.
Dub I-Click
FON008 1 MenuFonts 3.0
........ 31.
Pacific Dara Products
INP0 138 Pacilic MacPage
.. 425.
OMS
UTI0169 UllraScripl
...... 119.
Tactic Software
FON0265 ArlFonts ..
.. 50.
TeleTypesetting
FON0343 T-Scripl.
........... 92.
FON0357 T-Scripl Basic
........................ 55.

Andrew Tobias'
Maaaging Your Money
4.0 (Mcca Software)
NEW! The most
innovative personal
finance package
available for the Mac.
Packed with powerful
features including
REMIND which records
important dates,
appointments and
projects. MONEY, the
heart of the program,
tracks income, writes
and prints checks,
manages credit cards,
create budgets and
more. TAX leads you
easily through every
comer of the lax law
and determines your
final bill. INVEST
handles all stocks,
bonds, options and
mutual funds.
FIN0039 $135.

Sir Tech Software, Inc.
ENT0096 Wizardry ...................................... ............ 35.
ENT0347 Wizardry II: Knight ol Diamonds .
...... 29.
Spectrum HoloByte
FACES. TETRIS, Welllris
....... ea. 25.
The Software Toolworks
ENT0281 Chessmaster 2100 ................................32.
ENT0278 Lile & Dealh ..........................
........... 32.
ENT0269 The Hunt For Red Oclober .
.... 20.
Three-Sixty
ENT0323 Sands ol Fire .....
......... 32.
Toyogo
EIH0270 Go Masler 4.7
................. 45.

MacProor 3.2. l (l.apcr!Ue)
You 'll never get a second chance to make
a first impression! MacProof 3.2. l is
your English proofreader. Without
leaving your document , it proofreads all
text written on your word processor:
business, educational, personal and
professional. MacProof is a desk
accessory for the Macintosh Plus, SE, I!
and llcx. II checks mechanics, word
usage, writing style and structure. You
can customize the usage and spelling
dictionaries lo your specific require­
ments. Compatible with MacWrite II V.
1.0, MacWrite V. 4.6 & 5.0 , Microsoft
Word 4.0, PageMaker 3 .0/3.0113.02, w/
2mg memory, MindWrite V. l
and V.2. SPL0003
$115.

Farallon™ Computing
GRA0221 MediaTracl<s™ .
...... ........ 189.
GRA0222 MediaTracl<s™ Mullimedia Pack .......... 319.
Graphsoft
CAD0024 Blueplinl .... ............................................. 219.
................. .... ...... 595.
CA00030 MiniCADt 3. 0 ..
Innovative Data Design
.............................. 193.
CAD0028 MacDrall 2.0 ..
GRA0104 Dreams 1.1 ......................................... 349.
Letrasel
GRA0151 ColorSlud:o
....... 649.
DTP0019 lma geStuoio 1.5
... 139.
Macro Mind
GRA0140 MacroMind Direclor 2.0 ... ... ........ ...... .. 439.
Metro Image Base
Full line Available ...
ea. 85.
Paracomp
GRA0235 Fi lmMaker............................................ 439.
GRA0233 Swivel 3DProfessional
........ 439.
GRA0234 Swive1Ar1 .........
........ 82.
Praxllel
UTI021 1 Read My Lips
.75.
Preferred Publishers
GRA0239 Masler Color ..
........ 99.
GRA0238 Masler Painl ......... ...................
... 50.
Silicon Beach
GRA0092 Di gi tal Darkr oom2.0 .. .. .. .. .. .......... .. ..... .259.
GRA0131 Super 3D2.1 ...
.. ........................ 339.
HYP0027 SuperCard 1.5 ............. .. ... .................... 205.
GRAOl 12 SupcrPainl 2.0
...... 135.
Solutions, Inc.
DAC0002 SmartScrap & The Cl ipper 2.01
.......... 56.
Strata
GRAOl 76 Strala Vi sion 3D....
.. .. .. 375.

GRAPHICS & MULTIMEDIA
3G Graphics
GRA01 88 Images wilh Impact! Aa:enls & Borders 1 65.
GRAOl 11 Images with lmpaci! Business 1 ...............65.
GRA0089 Images wilh Impact' Graphics ................... 50.
Abraca Data
CAD0032 Design Your Own Home·Archilecture ....... 65.
CAD0033 Design Your Own Home-Inferiors ............ 65.
Adobe Systems, Inc.
DTP0054 llluslralor 3.0(w/ ATM 2.0)
.... . 349.
GRA0125 Slreamline..
. ....................... 11 9.
GRA0191 PholoShop .
.. . 499.
Aldus
GRA0090 Freehand 2.02 ....
....... 329.
Baseline Publishing
GRA0242 Color MacCHEES£ ............
...... 59.
Brighi Star Tech, Inc.
GRA0 161 inlerFACE
... 249.
Claris
CA00029 ClarisCAD 2.0 ......
.... 649.
GRAOl 18 MacDrawII ............
.. .. 289.
GRAOl 17 MacPainl 2.0 .....
......... 92.
Creative Software
GRA0240 Easy Color Painl 2.0
.............. 47.
Deneba Software
GRA0075 Canvas 2.1 ........... ................................. 189.
GAA0187 UllraPainl ..
........ 125.
Dream Maker
GRAO I05 Cliplures Vol 1 Business Images ........•.. 69.
GRAO l24 Cliplures Vol 2 Business Images ............ 69.
GRA02 19 Cliplures Vol 3 Sports ............................. 69.
GAAO I01 MacGallery (Hypercard version) .............. 27.
GRA0102 MacGallery (MacPainl version) ...
... 27.
Electronic Arts
GRA01 06 Sludlo/B
.......... 189.
GRA0231 Siudio/32 ....
............... 449.

Rapport, Drive 2.4, 360 &1200
(Kennect Technology)
Plug Kennect's New 5.25" Drives, Drive
1200 and Drive 360 into Rapport to read,
write & inilalize 1.2 Mb. or 360K MS
DOS 7 Apple II 140K ProDOS. Drive 2.4.
plugged into Rapport, is a 3.5' Diskette
Drive which reads, write & initializes all
Mac & IBM formals expands BOOK
diskettes to 1.2 Mb & High Density
Diskettes to 2.4 Mb. Rapport alone
enable older Macs to read 720K MS-DOS
on the internal floppy drive or read &
write 720K on an external Apple BOOK
Drive. Rapport DRI0140 $199. Drive 2.4
DRI0141 $329. Drive 360 DRI0219
$259. Drive 1200 DRI021B $259.

~. .,. . . . . .!. . . . . .

.......

<] >))

Read My Lips
Attach sounds to documents
you create using popular word
processors, desktop publishing,
and presentation software. Use
pre-recorded sounds or record
your own. Both the built-in
microphones of the new Macs
as well as MacRecorder are
supported . UTI0211 $75.

Smartcom II 3.2
Specially designed to work with
any Hayes modem, Smartcom
II automates communications
with Autopilots while providing
a varielyoferror-free file transfer
options. It holds informations
for later use in a peruse buffer
and stores frequently used in­
structions as programmable
buttons. COM0015 $84.

Moriarty's Revenge
The infamous Dr. Moriarty is
now a ranking leader ofa world­
wide crime organization and
you must track him down .
You'll travel the world puzzling
over clues . Features over 1,000
clues and a computerized
notebook for keeping them or­
ganized. ENT0308 $35.


**MacWarehouse**

1-800-255-6227

**SAT Complete (Queue)**

```
Score: Employment System for the SAT

SAT Complete (Queue) helps college-bound high school and prep school students learn how to take the College Entrance Examination Board's Scholastic Aptitude Test (SAT). No need to tremble before the dreaded exam; you can learn about it in advance. The tutorial section explains each question and the logic behind the correct answer. And before you take the real SAT take the Practice Exam. Covers both the Math and Verbal sections.

EDU0161 $29.
```
Microsoft Excel 2.2 (Microsoft)

Now use the full memory of your Mac—up to 8 Megabytes. Excel 2.2 recalculates 40% faster while empty cells consume no memory at all. Cell annotation lets you add notes to any cell and auditing functions help you trace cell references. The new Search and Replace function makes global changes just 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. Also supports "warm links" to Microsoft Word 4.0, so changes to your spreadsheet data automatically appear in your Microsoft Word documents.

BUS0003 $245.

SmartOne 2400/1200

(68030)

When you need a 2400 baud modem, the SmartOne 2400/1200 provides an economical alternative. For less than the cost of some 1200 bps units, you get a Hayes compatible modem with auto answer/originate, 200-1200, 2400 baud operation, pass-through phone jack, speaker with programmable volume, and a manufacturer's two-year warranty. All user options are stored in non-volatile memory. Includes free QuickLink & communications software, modem, cable, and Compaq Start-Up Kit. For less than $300.

BUS0031 $139.

Microsoft Excel

SAMPLE DOCUMENTS

Are you a Microsoft Word user? If so, try Microsoft Excel for just $50. The full memory of your Mac offers a new level of productivity! Excel recalculates 40% faster while empty cells consume no memory at all. Cell annotation lets you add notes to any cell and auditing functions help you trace cell references. The new Search and Replace function makes global changes just 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. Also supports "warm links" to Microsoft Word 4.0, so changes to your spreadsheet data automatically appear in your Microsoft Word documents.

BUS0003 $245.

SmartOne 2400/1200

(68030)

When you need a 2400 baud modem, the SmartOne 2400/1200 provides an economical alternative. For less than the cost of some 1200 bps units, you get a Hayes compatible modem with auto answer/originate, 200-1200, 2400 baud operation, pass-through phone jack, speaker with programmable volume, and a manufacturer's two-year warranty. All user options are stored in non-volatile memory. Includes free QuickLink & communications software, modem, cable, and Compaq Start-Up Kit. For less than $300.

BUS0031 $139.
ResumExpert (Word 3.0/4.0 venlo)
(A Lasting Impression)
Whether you're seeking an entry-level position or an executive's corner office, the ResumExpert Software Series is the next best thing to knowing the boss. Professionally written and fully-formatted Microsoft Word templates let you easily create eye-catching resumes.

MacUser 10/89 awarded ResumExpert 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 software Programs of 1989.

BUS0087 $49. See llstlna for all 10 ed!!

Mainstay
UTI0073 Capture 3.0 ............................................. 45.
UTI0004 MacFlow 3.1 ............................................. 45.
Microcom
UTI0191 Microcom 911 Utilities ............................................. 89.
Microsoft
UNG0300 QuickBASIC ............................................. 64.
Multi Ad Services
UTIO199 Multi Ad Search ............................................. 125.
Now Software
UTIO181 Novice Utilities 2.0 ............................................. 79.
UTIO168 Screen Locker ............................................. 45.
ON Technology
UTIO142 ON Location ............................................. 75.

FileGuard 2.5 (ASD)
Protect your Hard drives and Partitions from unauthorized access including security bypass with a system diskette, copying and erasure, Applications and Files/Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized users, FileGuard 12/89 awarded FileGuard 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 10/89 awarded FileGuard 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 software Programs of 1989.

FILEGUARD
UTIO142 ON Location ............................................. 75.

FileGuard 2.5 (ASD)
Protect your Hard drives and Partitions from unauthorized access including security bypass with a system diskette, copying and erasure, Applications and Files/Folders (including system folder) from unauthorized access, deletion, and/or illegal copying; Desktop (including system folder) from alterations by unauthorized users, FileGuard 12/89 awarded FileGuard 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 10/89 awarded FileGuard 4 mice and raved about the "excellent manual" that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 software Programs of 1989.

FILEGUARD
UTIO142 ON Location ............................................. 75.

Taste (DeltaPoint)
Combines a powerful word processor with page layout and graphic design. The word processor includes an address book with mail merge, search and replace. The page layout functions in Taste let you format multiple columns, create columns of different widths on the same page, and change layouts from page to page. Taste offers a variety of graphics tools, including rectangles, polygons, Bezier curves, and fills. Wrap text around or inside objects. Also includes a Thesaurus Module so you can find just the word you need at the touch of a button. WRD0032 $85.

Preferred Publishers
UTI0190 Personality ............................................. 152.
UTI0183 ScreenShoi ............................................. 152.
Salient
UNGO037 Inside Out ............................................. 369.
SNA
UTIO207 SNAbit ............................................. 51.
Symantec Corporation
UTIO151 Norton Utilities for the Mac ............................................. 60.
UTIO126 Symantec Utilities for Mac II (SUM) ............................................. 99.
UNG0201 THINK S 4.0 ............................................. 165.
UNG0202 THINKS Pascal 3.0 ............................................. 165.
The HandOH Corporation
UTIO146 HandOH ............................................. 52.
Zenodo
UNGO031 Zenodo ............................................. 99.

WORDPROCESSORS & SPELLING CHECKERS
Ashton-Tate
WRD0009 FullWrite Professional 1.1 .................... SPECIAL $59.
Baseline
SPL0029 Thunder 7 ............................................. 59.
Caere
UTIO164 Omni Draft ............................................. 69.
UTIO100 Omni Page 2.1 ............................................. 485.
UTIO163 Omni Spell ............................................. 69.
Claris
WRD0026 MacWrite II ............................................. 142.
DeltaPoint
WRD0032 Tast ............................................. 85.
Deneba Software
WRD0033 Spelling Coach Pro 3.1 ............................................. 124.
Lexpertise
SPL0003 Mac Proof 3.2.1 ............................................. 115.
Life Tree Software
SP0014 Correct Grammar ............................................. 59.
Microsoft
WRD0032 Word 4.0 ............................................. 245.
RightSoft
WRD0033 RightWriting ............................................. 55.
Sensible Software
WRD0023 BookEnds 1.3 ............................................. 51.
WRD0018 Sensible Grammar ............................................. 51.
SNA, Inc.
WRD0033 Sylph ............................................. 51.
Tactic Software
WRD0033 Magic Typist ............................................. 56.
T/Maker Co.
WRD0018 Writethrough 2.2 ............................................. 119.

Power User™ 2400 baud Modem
Install a new Power User 2400 baud modem and log-on to CompuServe™ or any of the exciting on-line services! This new, full-featured modem comes complete with everything you need to start communicating. It's easy to install and ready to use - all cables and MAC KNOWLEDGE communication software are included. It also has all the features you need in a modem, including Auto Answer, Auto Dial and Advanced Diagnostics for error checking. MOD 0043 Only $99.

Power User™ 2496 Mini Send Fax
New! Send Important documents to complete with everything you need in a modem, including Auto Answer, Auto Dial and Advanced Diagnostics for error checking. MOD 0043 Only $99.

I'm Donna, call me at 1-800-445-9677

Please circle 153 on reader service card.
The cheapest way to add muscle to your Mac is to add more memory. Here’s all you need to know to buy and install the right SIMMs for the best price.

An’s thirst for soda and random-access memory is unquenchable. In his book Odyssey, John Sculley recalls that given unlimited access to discounted cola, “no matter how much Pepsi [our test families] ordered, they would always consume it.” The Pepsi Principle holds for memory as well. The original Mac overflowed with 128K of RAM, but users soon clamored for more. Nowadays, 8 megabytes only whets the appetite of power users.

The waves of the future — System 7.0, voice input, 24-bit color, 3-D graphics, animation, and multimedia — all have one thing in common: a voracious appetite for memory. If you’ve been hankering for a second helping of memory, here’s good news for you. It’s never been easier or cheaper to satisfy your craving.

All Macs since the Plus (with the exception of the Classic and the Portable — see the “RAM to Go” sidebar) are easily upgraded by the simple installation of memory modules called SIMMs (single in-line memory modules). A SIMM is a group of RAM chips mounted on a circuit board that snaps into a socket on the motherboard. The number and size of the SIMMs in your Mac determines how much memory is available to applications. Each Mac accepts slightly different memory configurations (see Table 1). The reasons for the memory mishmash are complicated and can be ignored altogether. If your inquiring mind wants to know, read on. Otherwise trust me; skip the “Whys and Wherefores”; and jump to the next section heading, “Capacity.”
SIMMs

**Whys and Wherefores**

The Mac’s hardware and software conspire to place limitations on how much memory can be used. The CPU configuration determines whether you need to upgrade in increments of two or four SIMMs at a time, and the ROM and System software determine the maximum amount of memory that applications can access.

The CPU in the Mac Plus, SE, and Classic is the Motorola 68000, which has 24-bit address lines. Apple engineers decided, however, to use only a 16-bit data path to RAM. The same is true with the Mac LC, even though it uses the 32-bit 68020 processor. Because SIMMs have 8-bit data paths for these machines, you must add memory in pairs so that the CPU receives 16 bits of data at a time. All other Macs use 68020 or 68030 processors with 32-bit data paths to RAM. To keep the CPU satisfied, data is fed to it 32 bits at a time; with these machines, you must add SIMMs in groups of four. Each group is called a memory bank.

Currently, the Mac Plus, SE, and Classic all top out at 4 megabytes if you put 1-megabyte SIMMs into their four sockets. The ROMs in these machines prevent you from using 4-megabyte SIMMs. All the other Macs have different maximum amounts of RAM that they can contain (see Table 1), but System 6.x limits all of them to approximately 8 megabytes. When it’s running in 32-bit mode, System 7.0 is supposed to remove this barrier for some machines.

Unless you have “32-bit clean” ROMs, you’ll be stuck with running System 7.0 in 24-bit mode with its 8-megabyte limit. The only practical use for 4-megabyte SIMMs in your Mac today is to create a RAM disk with either Connectix’s Maxima or Technology Works’ NanoDISK (see reviews, September ’90, page 92). Both let you use RAM in excess of 8 megabytes as a RAM disk, and Maxima also tricks the System software into allowing applications to access up to 14 megabytes under either System 6.x or 7.0. Both programs require a PMMU (paged memory-management unit) 68851 chip (it’s built in to the 68030 and is an option on the Mac Ilsi).

Connectix’s recently announced Optima software allows 32-bit clean software — such as Photoshop and ColorStudio — to access up to 4 gigabytes of memory under System 6.x (although not with MultiFinder). The 512-megabyte SIMMs required for the maximum configuration aren’t available. Not yet, anyway. The biggest SIMMs currently on the market are Newer Technology’s composite 16-megabyte modules, which cost $1,950 each. Newer Technology sells eight modules bundled with Optima, giving applications access to 128 megabytes as system memory under the Finder.

**Capacity**

Sometimes a memory module’s size is expressed as a particular capacity followed by the letter X and a number, such as 1 MB x 8. That means that the module is composed of eight 1-megabit chips, for a total of 1 megabyte, because there are eight bits to the byte. Technicians may find this fascinating cocktail-party conversation, but all you need to know is the capacity of the module. Who cares how many chips make up a 1-megabyte SIMM — after all, a megabyte is a megabyte to the Mac, right?

The one wrinkle worth noting concerns more-expensive modules containing a ninth parity chip for error correction. These SIMMs are common in the IBM market, but Apple gave optional parity-checking capabilities to the Mac Iici only to satisfy a buying criterion for some government contracts. Provided they’re fast enough, parity SIMMs can be used in all Macs without harm, but only the Mac Iici is available in a special model that implements error correction. Because parity SIMMs are more expensive, you might as well buy normal 8-chip SIMMs instead.

Back in the Mac Plus’ heyday, 256K SIMMs were the standard. Nowadays, 1-megabyte modules are the most common, with 4-megabyte SIMMs coming on strong. And with the introduction of the Mac Ilsi, 2-megabyte SIMMs have appeared. Right now these SIMMs cost dearly, and economies of scale are unlikely to make them more affordable, because they work only with the Ilsi. If you’re thinking about buying memory today, stick with either 1- or 4-megabyte SIMMs, unless you’ve got deep pockets and a need for 16-megabyte monsters.

Unless you donate them to a school for a tax write-off, used 256K SIMMs are virtually worthless — maybe an arts-and-crafty friend can fashion them into bolo ties or earrings. The only other recycling option to consider is a “banana board,” such as the Softstep series from Computer Care. Plug four 256K SIMMs into one of these carrier boards, and use it in a Mac as you would a 1-megabyte SIMM, or combine four 1-megabyte SIMMs into a composite 4-megabyte board. Keep in mind that these boards are much larger than normal; draw more power; and have a greater chance of failure, because of all the extra contacts.

**SIMM Sizes**

If you’ve been reading the fine print in memory advertisements, you may have seen the term *low profile* referring to SIMMs. This doesn’t mean that the boards are in the Federal Witness Protection Program but rather that they’re physically small. This is in contrast to the high-profile SIMMs that were more common a few years ago. It basically comes down to the type of chip used on the board. A low-profile SIMM has small surface-mounted chips typically mounted directly to the front surface of the board, whereas a high-profile SIMM has larger DIP (dual in-line package) chips with leads soldered into holes in the board. However, some composite SIMMs that use surface-mount technology — such as the 16-megabyte ones from Newer Technology — may have high profiles. So what?
RAM to Go

The Mac Portable doesn’t use SIMMs at all. It has 1 megabyte of SRAM (static random-access memory) on the motherboard, and there are two connectors into which memory-expansion devices can be added. One is an expansion slot designed specifically for memory cards, and the other is the PDS (Processor Direct Slot) for a variety of peripherals, including memory cards and internal fax modems. When buying memory cards for the Portable, be sure to ask which slot they go into and whether they block future expansion.

Because the Portable uses static memory, it can retain its data without constant refreshing, so when you put the Portable to sleep, it doesn’t need a lot of power to keep its memory contents intact. The drawback is that SRAM is very expensive.

Some third-party cards keep costs down by using pseudostatic and dynamic memory instead, both of which need periodic refreshing. Pseudostatic chips have refreshing capabilities built in, whereas DRAM chips require external circuitry that’s usually provided on the memory board. Dynamic memory requires the least power in active and standby modes, but static memory consumes the least power in Shut Down mode. Keep in mind that all types of memory consume power whether they’re used or not, so don’t buy too much memory or you’ll drain your battery needlessly.

All Macintoshes can accept both high- and low-profile SIMMs, but all other things being equal, you should buy only low-profile boards. In a Mac SE, high-profile boards might block future expansion plans by interfering with add-in boards. In Macs without fans, high-profile SIMMs block airflow around the motherboard. Finally, in a Mac II or IIx, high-profile SIMMs might prevent you from adding a full-height hard-disk drive. Surface-mounted chips are more reliable in the long run. All this information is well and good but hardly practical: The simple fact is that none of the major memory vendors still sells high-profile SIMMs in the most common 1- and 4-megabyte capacities.

Speed

Although the capacity and size of the SIMMs that go into your Mac may vary, there’s one area in which there’s no leeway: speed. The speed at which data can be retrieved from a SIMM is measured in nanoseconds (ns per ns), or billionths of a second. The lower the nanosecond rating, the faster the SIMM. Most SIMMs have their speed printed right on the chips. Look for the nanosecond rating, and then multiply the last one or two digits by 10 to determine the speed rating. For example, if the number ends in dash 12, it’s a 120-nanosecond module.

The speed you need depends on your Mac. From 150-nanosecond SIMMs for the Plus to 80-nanosecond modules for the IIx. Although it doesn’t hurt to use memory that’s faster than required, it doesn’t help either. If you put 80-nanosecond SIMMs into a Mac Plus, it’s still going to plod along as it normally does, because the speed of the Mac is determined by its processor, not the memory. But if you plan to upgrade to a faster Mac, you’ll be able to take the memory with you. You’d be hard-pressed to find a vendor currently selling anything slower than 80 nanoseconds, so the whole issue of SIMM speed is moot. By the way, feel free to mix speed and brands of SIMMs as long as the minimum speed requirements of the Macintosh are met and you don’t mix speeds within a memory bank.

Price

The first rule when buying memory is to ignore published prices. Because SIMMs are virtually a commodity item, their prices fluctuate daily like the Dow Jones Industrial average. Monthly magazines such as MacUser have a three-month lead time, so the prices in the ads are likely to be severely out of date. Call several companies, ask for their current prices. Don’t hesitate to ask a company if it will match a competitor’s price — many will.

During a recent telephone poll of a dozen mail-order firms, the most expensive vendor was charging 60 percent more than the cheapest one, but generally the prices per SIMM don’t vary by more than a few dollars. At press time, 1-megabyte SIMMs cost an average of $45 each, with 4-megabyte SIMMs running around $230. As you can see, 4-megabyte SIMMs carry about a 28-percent premium over the cost of four 1-megabyte modules. Expect this premium to disappear as demand for the larger chips increases and production facilities realize greater economies of scale.

The Company You Keep

How can some companies get away with charging more money for essentially the same modules? It’s usually a matter of support. Although the chips might not differ, the same can’t be said of the service each company provides.

Because SIMMs either work right away or not at all, after-sale technical support isn’t much of a consideration. It’s important, however, that you speak to a knowledgeable salesperson when placing your order. At the very least, a salesperson should ask what type of computer you own and the kinds of applications you run, which helps determine the appropriate size and speed of the SIMMs you need. If a salesperson is willing to sell you 4-megabyte SIMMs for a Mac Plus, or 150-nanosecond SIMMs for a Mac IIx, you’re talking to the wrong company. (Incidentally, the Mac IIx uses special 64-pin SIMMs that are compatible with the LaserWriter IIINTX, but these SIMMs don’t work in other Macs. The extra pins provide separate input and output lines to reduce data bottlenecks.)

Most vendors offer some sort of money-back guarantee, stating that if you aren’t happy with the product, you can return it for a refund within a specified time period.
which is usually no more than 30 days. Some vendors may also warrant the product's performance. Lifetime warranties sound good, but they're worthless unless the company is going to be around to honor the warranty when the product fails. When you're calling around, ask each company how long it's been in business so you can get an idea about the firm's stability and commitment to the Mac.

Just as warranties may vary, so do replacement policies. Ideally the firm should pay shipping costs both ways if you must return defective SIMMs. And it should send you new — not repaired — parts, without waiting for receipt of your returned package. A potential "gotcha" to ask about is restocking fees on returned parts. As with all the other service policies, get it in writing.

**Physical Fitness**

When shopping around, ask how many layers are in the printed circuit board of each module. More layers typically mean less noise. I'm not talking noise in the same sense as a New Kids on the Block concert but rather electronic noise that can cause sporadic problems in your Mac.

When you receive the SIMMs, inspect each module (holding it by the edges as you would a photograph) to make sure that it's free of all contamination and physical defects including oil, dirt, grease, or board speckling (white dots, delamination, damaged edges or surfaces, exposed copper, bubbles, wrinkling, or scratches).

If you find anything visibly wrong with a module, you should request an immediate exchange. Flaky memory manifests itself in fatal system errors, data corruption, and inexplicable results. After you've installed the memory, turn on your Mac and run RAM Check, a public-domain utility from ProVue Development (available on Zmac and other on-line services).

**Table 1: The Right Memory for Your Mac**

<table>
<thead>
<tr>
<th>Speed (nsec)</th>
<th>Permanent memory</th>
<th>Maximum possible RAM</th>
<th>Sockets</th>
<th>256K SIMMs</th>
<th>1-MB SIMMs</th>
<th>2-MB SIMMs</th>
<th>4-MB SIMMs</th>
<th>16-MB SIMMs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Plus</td>
<td>150 none</td>
<td>4 MB</td>
<td>4</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac SE</td>
<td>150 none</td>
<td>4 MB</td>
<td>4</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac Classic</td>
<td>150 1 MB</td>
<td>4 MB</td>
<td>1*</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac SE/30</td>
<td>120 none</td>
<td>8 MB</td>
<td>8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac LC</td>
<td>120 2 MB</td>
<td>10 MB</td>
<td>2</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac II</td>
<td>120 none</td>
<td>8 MB</td>
<td>8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac IIX</td>
<td>120 none</td>
<td>8 MB</td>
<td>8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac IIXc</td>
<td>120 none</td>
<td>8 MB</td>
<td>8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac IISi</td>
<td>100 1 MB</td>
<td>17 MB</td>
<td>4</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac IICI</td>
<td>80 none</td>
<td>32 MB</td>
<td>8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac IIXc</td>
<td>80 none</td>
<td>128 MB</td>
<td>8</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Mac Portable</td>
<td>100 1 MB</td>
<td>9 MB</td>
<td>2</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

*Optional card adds three sockets.

Installation

SIMMs are simple to install, once you've gained access to the sockets on the motherboard. With the Mac II family, that's a snap. Just pop off the top cover, and remove a few Phillips-head screws. With the "classic" one-piece Macs, this isn't so easy. You need a special Torx T-15 screwdriver, which is often supplied by the memory vendors at little or no cost. Once the Mac is open, you must be wary of static electricity as well as the high-voltage lines near the back of the monitor. This isn't as dangerous as it sounds, but if you're at all wary, have a local dealer install the memory (any fee under $50 is reasonable).

If you decide to do it yourself, make sure you have a detailed installation guide to follow. There are all sorts of Byzantine rules about which banks the modules must go into, depending on their size and the type of Mac. Also, in earlier Macs (including the Mac Plus and SE), you must move a jumper or cut a resistor on the motherboard to specify the amount of memory available (see "The Persistence of Memory," February '89, page 140). All late-model Macs automatically figure out how much memory is present — they are truly plug-and-play when it comes to upgrades.

**The Bottom Line**

It's never been easier or cheaper to add more memory to your Mac — if you follow a few simple rules. Don't buy anything smaller than 1-megabyte modules, and remember to insist on low-profile, 80-nanosecond or faster SIMMs. Shop around for a company that offers a reasonable price, knowledgeable support staff, and generous service policies.

Owen W. Linzmayer is a San Francisco-based free-lance writer who plans to forget everything he learned about memory while preparing this article.

---

Table data for SIMMs:

- Columns indicate the speed of the SIMMs in nanoseconds (nsec), the amount of permanent memory (MB), the maximum possible RAM, the number of sockets, and the availability of 256K, 1-MB, 2-MB, 4-MB, and 16-MB SIMMs.

- Rows list different Mac models, such as Mac Plus, Mac SE, Mac Classic, etc., with their respective specifications and availability checks.
Our sales team of Mac “know it alls.”
Another good reason to go CDA!

Over the last ten years CDA has worked hard to create something unique in the field of computer mail order—a company that could provide customers with the support they would expect from a local computer dealer, along with the convenience and economy of direct-order, by mail, fax or phone. Thus CDA has grown with the computer industry and, in the process, has earned a rock-solid reputation for providing superior-quality service and support.

The real key to our success is our people. CDA's expert sales staff is sensitive to customer needs and knowledgeable in Macintosh and its accompanying vertical markets. If you need assistance selecting a computer system, peripheral or software for your specific needs, we have the people who can help you. For follow up service and support, our technical support staff is here for you too—you'll never be abandoned with only a stack of manuals.

There are lots of good reasons to purchase your Macintosh equipment from CDA; but our people are the best reason of all.

US/Canada 800-526-5313
NJ/Outside US 908-832-9004
For Complete Macintosh Solutions

**Macintosh Portable**
Macintosh Portable w/1 Mb & 40Mb HD ... $3299
Macintosh Portable w/40Mb HD, 2Mbs RAM and the Macintosh Classic CPU ... Call

**Outbound Portable Laptop**
Outbound w/o ROM, 40Mb HD, 2Mbs RAM (use your Plus, SE, or Classic's ROM) ... Call
Outbound/Classic Bundle w/40Mb HD, 2Mbs RAM, and the Macintosh Classic CPU ... Call

**Monitors & Video Cards**
Magnetovex Mac Color 14" RGB ... $459
NEC MacSync 14" Color HC ... $499
Apple High Resolution 15" RGB ... $799
E-Machines ColorHPT168/w/video card ... $2149
E-Machines T15i ... $3089
Radius Pivot i5/i7 ... $1199
Ikegami CT20 20" Trinitron w/8-bit card ... $2799
RasterOps SLG System ... $2789
RasterOps ColorBoard 264 (Mac II) ... $539
RasterOps ColorBoard 364 (Mac II) ... $949
Micron 8-bit Video Card (Mac II, SE/30) ... $349
Micron XCED SE/306 Video Card ... $349

**The Rival 19" Monochrome Display**
MacWorld Magazine rated the Rival the top performing WYSIWYG big screen - outranking dual-page displays costing much more.

**Input / Output Devices**
Key electronics MacPro Plus Extended Keyboard w/Tempo II Software ($99 Value) ... $119
Wacom Graphics Tablets ... Please call
Kurta Tablet (8 1/2" x 11") ... $359

**Connectivity**
Asante FriendlyNet LC ... $269
Farallon PhonetNET StarController 300 ... $859
Farallon PhonetNET StarController EN ... $1599
Farallon PhonetNET Connector (DIN-8) ... $29
Farallon PhonetNET Repeater ... $315
Farallon Timbuktu 3.1 ... $895
Farallon Timbuktu/Remote 1.01 ... $125
Dayna Dos Mounter 2.0 ... $52
DaynaTalk PC ... $219
DaynaTalk Micro Channel ... $289
DaynaTalk Speed Guard Collision Filter ... $52

**Printers & Accessories**
ImageWriter II w/cable ... $459
HP DeskWriter w/cable ... $759
NEC SilentWriter 2 Model 90 w/cable ... $1845
Tl microLaser PS 35 w/cable & toner ... $1099
LaserWriter INT w/cable and toner ... $395
LaserWriter INTX w/cable and toner ... $495
Personal LaserWriter NT w/cable ... $245
Kodak Diconix M150 + w/ATM & cable ... $529
QMS PS-810 w/cable & toner ... $295
QMS PS-410 w/cable & toner ... $219
LaserWriter II Toner ... $109
GoStar Organizer Cart ... $159
GoStar Organizer Cart Jr ... $59
GoStar LabelWriter ... $179

**EtherNet Products from Dayna**
EtherPrint is an easy-to-use, easy-to-afford way to connect your Ethernet network to any LocalTalk compatible printer ... $349
DaynaPORT network interface cards let you connect your Mac to thick and thin twisted pair cable Ethernet based AppleTalk network systems. With the DaynaPORT cards, your Mac can share Ethernet system resources such as printer, modem, electronic mail, file servers and file transferring with other network hosts. DaynaPORT E/30, E2E, or EII ... $289

**Scanners**
DEST PC Scan 3000 w/cable & software ... $1159
Logitech Scanman 32 ... $1159
Thunderware ThunderScan ... $169
Microtek MS-IV w/OmniType OCR ... $839
Microtek MS-500S w/SCI ... $1539
Microtek 3002S w/color & Image Studio ... $1895
XRS SC Transparency/Slide Upgrade ... $1799

**Memory Upgrades**
2 Megabyte Upgrade (Plus/SE) ... $118
4 Megabyte Upgrade (SE/30/Mac II) ... $220
4 Megabyte Upgrade (II) ... $299
16 Megabyte Upgrade (68030) ... $1099
1 Megabyte Upgrade (Mac Classic) ... $109
3 Megabyte Upgrade (Mac Classic) ... $179

**Total Systems Accelerators**
Gemini 300 Accelerator 20 MHz (Mac SE) ... $819
Gemini 300 Accelerator 25 MHz (Mac SE) ... $1179
Gemini 300 Accelerator 33 MHz (Mac SE) ... $1379
Gemini 300 Accelerator 40 MHz (Mac SE) ... $1599
Gemini Plus Kit for Mac 128, 512, & Plus ... $125

All prices subject to change. Apple/Macintosh is a registered trademark of Apple Computer Inc. OIA is not an authorized Apple dealer. Product names are registered trademarks of their respective companies.
Call 1-800-526-5313

MUSICDATA
Call CDA’s Music/MIDI Department to receive a free copy of MUSICDATA, our quarterly Mac/MIDI update.

MIDICOMPUTER

Microtech Hard Drives
All Nova series hard drives include the following:

- DayStar Accelerators for Mac II Family
- Microtech Europa 40 MB External
- Microtech Europa 80 MB External
- Microtech Athena 100 MB External

Price
- Microtech Nova 40 Mb Internal $449
- Microtech Nova 80 Mb Internal $619
- Microtech Nova 105 Mb Internal $679
- Microtech Nova 120 Mb Internal $819
- Microtech Nova 170 Mb Internal $999
- Microtech Nova 200 Mb Internal $1089
- Microtech Nova 320 Mb Internal $1299
- Microtech Nova 400 Mb Internal $1569
- Microtech Nova 650 Mb Internal $2229
- Microtech Nova 1000 Mb Internal $3199
- Microtech Europa 20 Mb External $499
- Microtech Europa 40 Mb External $499
- Microtech Europa 80 Mb External $599
- Microtech Europa 100 Mb External $729
- Microtech Athena 50 Mb External $569
- Microtech Athena 100 Mb External $849

Microtech Hard Drives

DataPak Cartridge Drives
All DataPak drives come with DiskDoubler software, a 45MB cartridge and 2 year warranty.

- DataPak III
- DataPak II Duet
- DataPak II (Mac II, Ilix, IleX footprint) $1499
- DataPak IleX (Mac IleX/IleX footprint) $799

Price
- DataPak (SE footprint) $729
- DataPak Duet $1499
- DataPak II $1899
- DataPak II (Mac II, Ilix, IleX footprint) $859

Accelerators

DayStar Accelerators for Mac II Family

- DayStar Fast Cache Ile $279
- PowerCard 030 25 MHz (Ille, IleX) $699
- PowerCard 030 40 MHz (Ilix, IleX) $799
- PowerCard 050 50 MHz (Ilix, IleX) $1899
- SGS PowerCard 1MB (expandable to 4MB) $1195
- RAM PowerCard 8MB (expands to 64MB) $1195

Price
- Accelerators for Mac 128, 512, & Plus, SE, (See listing at left)
Complete Ready-to-Run Macintosh Systems

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

Ask for Package #9102
CDA $1,599 or $45.26/month**

**Macintosh Classic system above with:**
- 100 Mb Hard Drive ................. $1,799

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

Ask for Package #9110
CDA $3,699 or $87.75/month**

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

Ask for Package #9150
CDA $2,569 or $67.44/month**

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

Ask for Package #9107
CDA $5,869 or $134.64/month**

When you purchase your Macintosh from CDA you will receive the following:
- Knowledgeable sales assistance
- Top quality components
- All systems are upgraded, tested & preformatted before shipping
- Unlimited technical support
- 30 Day Money Back Guarantee
- 1 Year Performance Guarantee

The Magic of Mac, The Power of People

US/Canada
800-526-5313

NJ/Outside US
908-832-9004

Please circle 117 on reader service card.
Truer colors: The debate over competing strategies for color calibration is rapidly filling the void left by the treaty signings of the Font Wars. The major players — Adobe, EFI, Kodak, SuperMac, and Tektronix — agree that a device-independent, system-level solution is needed to ensure reliable, repeatable colors among scanners, monitors, and printers. Unlike its competitors, Electronics for Imaging believes that everyone — not just high-end users — will want WYSIWYG color and that the solution should be inexpensive, universally available, and completely transparent to the user. EFI’s Color Portability technology is being developed under exclusive license from patent-owner MIT. (This exclusivity has been the subject of legal wranglings with Adobe.) EFI’s first commercial products should appear this year. First up: the Firey Controller, a high-performance RIP for the Canon Color Laser Copier that will enhance the CLC’s potential as a short-run press and digital proofer. In addition to speed and PostScript compatibility, the Firey offers true continuous-tone color rather than the halftoning that’s produced by Canon’s controller. EFI also has announced a liaison with Kodak, a major coup that should greatly enhance the viability of Color Portability.

Positive pressure: The latest trend in electronic art is pressure-sensitive tools that can simulate the characteristics of brushes, chalk, and other traditional media. Programs on the bandwagon include Photoshop, Oasis, Studio/32, Digital Darkroom 2.0, PixelPaint Professional 2.0, ColorStudio 1.1, and UltraPaint. Wacom’s pressure-sensitive digitizing styluses and tablets started the movement; now Numonics offers the ZedPEN Plus, a $1,510 tablet and stylus with 512 levels of pressure and adjustable sensitivity. Although the tablet comes in only one size (12 x 17 inches), it is the first digitizing system that lets you use a cursor and stylus simultaneously. For example, you can paint with the stylus and enter commands with the cursor.

Product news: Letraset is shipping DesignStudio 2.0. Besides bug fixes, the major addition is the Separator annex, which supposedly color-separates all graphics files, including PICT2. Despite its recent acquisition by Micrografx, Astral Development is finally shipping the Mac edition of Picture Publisher, an image-retouching program that comes in gray-scale and color versions ($595 and $695 respectively). Its claims to fame are cross-platform capabilities (it’s a PC port) and calibration features for both scanning and printing. MicroMaps’ latest collection, MapArt, offers excellent maps of every region of the world. It costs $79 in paint format; $179 for EPS or PICT files. Additional MapPack collections focus on topics such as U.S. counties and area codes.
For a FREE catalog featuring all Image Club typefaces call 403 262 8008

Buy One Get One Free!
For a Limited Time Only

THE LOWEST FONT PRICES EVER
Purchase a font at our regular price of only $25 and receive a second font of your choice for FREE (minimum order $100). Order now and ship by December 31, 1999.

THE IMAGE CLUB TYPEFACE LIBRARY
We've developed 600 licensed typefaces in Mac and PC Format. All fonts are separated by family and available on diskette or as a complete 600 Font collection on either of our two CD ROM discs. Use Image Club typefaces with any PostScript or non-PostScript printer such as HP LaserJet. For non-PostScript printers, ATMs... Refer to the Adobe Type Manager for full details.

PC FORMAT
Image Club Type for the PC is compatible with Ventura Publisher™, CorelDRAW™, Adobe Type Manager, Aldus PageMaker™, most Windows® applications. Use Image Club typefaces with any PostScript printer or non-PostScript printer such as HP LaserJet. For non-PostScript printers, ATMs... Refer to the Adobe Type Manager for full details.

CD ROM FORMAT
The Art + Type Vendor CD ROM (Mac only) contains every Image Club font and clip art image on your desktop with pay as you go access. To buy fonts from ATMs we sell for $25 and we will give you the money back when you order the fonts from the CD ROM disc. The Art + Type Vendor CD ROM is our entire collection of 600 fonts on one single CD ROM disc, available for the Mac or PC...

PRICES
Individual Fonts $25 - Complete Families Only
LetterPress CD ROM $1999 - includes all 600 fonts
Art + Type Vendor CD $999 - includes 20 fonts & volume of art

HOW TO ORDER
Select the fonts you want at $25 each complete family only.
Select the same number of fonts you want for FREE (complete families only)
Mail order card only available from our Fontline Web Site.

Fontline 800-661-9410
Order online at www.fontline.com

The Art + Type Vendor CD ROM is our entire collection of 600 fonts on one single CD ROM disc, available for the Mac or PC.
Separating UCR and GCR

Do your eyes glaze over when your printer starts talking about UCR, GCR, and dot gain? Here's an overview of these esoteric—but essential—color-separation techniques.

By Keith Baumann

The new generation of color-separation software gives you unprecedented control over much of the production process, but you also face the challenge of having to master many unfamiliar procedures. If you use programs such as Photoshop, ColorStudio, DesignStudio, Aldus PrePrint, SpectrePrint Pro, or PosterWorks, you may have stumbled across the terms UCR, GCR, and dot gain in the manuals and dialog boxes without really understanding their significance. Simply put, these are techniques for adjusting the color density on the plates to compensate for differences in inks, papers, and printing presses.

Fortunately, most applications can handle these adjustments for you automatically. But even if you don't want to tweak the controls yourself, knowing a little bit about UCR (undercolor removal), GCR (gray-component replacement), and dot gain can alleviate some of your color-separation anxieties. Although this isn't a complete tutorial—fine-tuning color separations is a complex process that has many variables and requires significant expertise—this overview should help you talk more intelligently to your printer or prepress house.

Introductory Course

First, let's briefly review the basics of four-color separations and the printing process. All pages containing continuous-tone color art such as photographs are printed with the four-color process. The colors on each page are separated into four plates, one each for the printing inks: cyan, magenta, yellow, and black (CMYK). When a page goes through the

Figure 1: The color at the top is considered a neutral, because it is composed of equal amounts of cyan, magenta, and yellow and should appear as a gray. This color would be affected by both UCR (undercolor removal) and GCR (gray-component replacement). The color at the bottom is not a neutral, because it is composed of different amounts of cyan, magenta, and yellow, but it does contain a 20-percent neutral component. This color would be affected by GCR but not by UCR.
Press controls

Paper stock: Coated
☑ GCR: 60.00 %
Gain compensation: 8.00 %
Total ink coverage: 290.00 %

Press controls

Paper stock: Newsprint
☐ GCR: (UCR only)
Gain compensation: 20.00 %
Total ink coverage: 250.00 %

Figure 2: Aldus PrePrint automatically calculates values for UCR, GCR, dot gain, and ink coverage, based on your paper choice. If you don't like the defaults, you can enter your own. Notice the difference in values between coated stock and newsprint, which have vastly different porosities.

printing press, these inks are printed one on top of the other, each using a different pattern of halftone dots. The combined dot patterns create the illusion of a full-color image (to see how this works, look at any color image from a newspaper or magazine under a magnifying glass).

Theoretically, only cyan, magenta, and yellow inks are needed to create the entire range of printable colors. Equal amounts of these three inks should produce grays (the shade depends on the density of the CMY inks), also called the neutrals, and 100 percent of each should give you black. In reality, however, ink pigments are never completely pure, so the neutrals actually appear as muddy browns and there is no true black. An image printed with CMY inks only appears flat, lacking sharpness and contrast. To overcome this problem, a black plate is added to the separation. The black ink provides solid blacks, boosts the contrast, and drastically improves shadow details.

Unfortunately, combining all four inks can cause excessive ink buildup. Too much ink can literally gum up the works — clogging the press, causing trapping problems, slowing the drying process, and degrading image quality. The maximum value for ink density is 400 percent, or 100 percent each for all four inks, but the maximum ink coverage that most presses can handle is around 300 percent — that is, the combined values for cyan, magenta, yellow, and black cannot total more than 300 percent. Several programs, including Photoshop, use this as the default value when computing CMYK values for color separations. But the upper limit can vary, depending on factors such as the type of press and paper stock (for example, coated paper can accommodate more ink than newsprint can), so be sure to ask your printer what density value to use for your publication.

UCR versus GCR

UCR and GCR are techniques for reducing the total ink density of a color separation. Basically, both UCR and GCR substitute black for percentages of cyan, magenta, and yellow in image areas where all three colors occur. The difference lies in what portions of the image are affected.

UCR swaps black for cyan, magenta, and yellow only in areas that are completely neutral — that is, colors that contain equal components of C, M, and Y and appear gray or black (see Figure 1). As a result, color swapping occurs only in certain portions of the image, usually the shadow areas. In addition to reducing ink buildup, UCR can bring out details that might otherwise be lost in these darker areas.

GCR, on the other hand, affects any color that contains a neutral component. These colors — browns and flesh tones, for example — may not appear gray, but they contain at least a small percentage of all three primaries. The neutral component is equal to the smallest of the CMY percentages. For example, Figure 1 shows...
Undercolor Removal

GCR is selected in Tile Setup.

<table>
<thead>
<tr>
<th>Cyan</th>
<th>Magenta</th>
<th>Yellow</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Input Neutral Density

Output Dot Reduction

Neutral Areas

Highlight

Shadow

Figure 3: For true power users, PosterWorks offers complete control over all aspects of UCR and GCR. In this example, UCR is applied only in deep-shadow and black areas, and the amount of CMY reduction steadily increases as gray turns into black. Note that this dialog box only removes CMY; a separate Black Generation dialog box specifies how much black to add back in.

a color with a value of 20C 40M 85Y; this color has a 20-percent "gray zone." Applying GCR reduces the ink density throughout an entire image, not just in neutral areas, and often makes colors look richer. A GCR setting of 60 percent removes 60 percent of the neutral portion of each of the chromatic colors and replaces it with an equivalent amount of black. This is not a one-for-one substitution, because less black ink is needed to achieve the same color values.

Although UCR and GCR are similar in process, they can produce very different results and it takes experience to decide which will work better on a given image—or even if you need to apply them at all. (Note that you perform either UCR or GCR on a separation, but never both.) The necessity and amount of UCR/GCR varies with the image and the type of printing press, ink, and paper. Always talk to your printers first, because they are experts in these areas and usually know the correct values for your particular job.

User Control

Because of the complexities involved, some color-separation applications don't offer you any choices. They apply UCR or GCR to their separations automatically, using internal tables to determine the correct values. SpectreSep's PM— a color-separation utility for PageMaker documents that's available from Pre-Press Technologies — determines UCR and GCR percentages based on your paper and printing-press choices. Of course, this approach locks you into the values the software developers have chosen (which are usually adequate for most jobs).

Other applications, such as Aldus PrePrint, provide default settings for UCR and GCR but let you turn them on or off or enter your own values (see Figure 2). Letraset's new DesignStudio Separator offers three levels of UCR and six options for GCR. Adobe's Photoshop doesn't let you set UCR/GCR values directly; instead, you select one of five values for "black generation"—the amount of black to generate on the black plate—and the program computes the amount of CMY to remove. The choices range from Light to Maximum, and a Custom option lets you adjust the black density in specific areas of an image.

A few programs offer more-sophisticated controls for UCR and GCR, allowing you to customize the values. Pre-Press Technologies' high-end color-separation program, SpectrePrint Pro, provides interactive controls that let you precisely adjust UCR and GCR. The maximum in user control is the setup offered by PosterWorks. This offbeat poster-making program (from S.H. Pierce & Co.) is actually a color-separation package in disguise. It has separate dialog boxes for UCR and GCR, each of which contains adjustable curves for cyan, magenta, and yellow (see Figure 3). The amount of black generation is also completely user-controllable through another dialog box.
No matter what color-separation program you use, GCR and UCR are actually applied to the separations when the RGB values (the colors you see on-screen) are converted into their CMYK equivalents. In calculating the CMYK values, the program considers not only the UCR/GCR figures but also the settings for paper stock, dot gain, and maximum ink coverage. Thus, the amount of cyan, magenta, yellow, and black placed on each plate can vary, depending on the options selected. For example, if the same photograph is to be printed in both a newspaper and a glossy magazine, it should be separated twice. The separations will have different CMYK values — each optimized for the appropriate paper stock — even though the original RGB colors are identical.

Dot Gain
A final consideration in determining CMYK percentages is dot gain — that is, how much each dot of ink spreads before it dries. The final size of the printed half-tone dots depends on numerous factors, which include temperature, humidity, ink viscosity, and paper type. But in general, the printed dots will be larger than those on the separation plates. Left uncorrected, this dot gain can darken images and oversaturate colors.

To compensate for dot gain, the CMYK values in the separation should be reduced slightly. Some color-separation packages allow you to select a specific percentage for dot gain, which is used to calculate the reduction in CMYK values. Other programs simplify the process by having you choose only the paper type (such as coated or uncoated) and then automatically applying preset compensation curves.

Dot-gain compensation is a fairly simple concept to grasp, but as a technique it can be extremely difficult to master. Again, your printers should be able to supply the correct figure, because they know from experience how the ink and paper will react on their presses.

Understanding basic prepress concepts such as UCR, GCR, and dot gain should help you work with color-separation software, but it takes experience to gain insight into how and when to properly use them. These techniques offer several advantages: better color balance, sharper contrast and enhanced details, improved trapping, fewer press problems, better color consistency over a press run, and reduced ink costs.

Unfortunately, unwise use can lead to disaster. Many applications simplify the process by building in default values that provide satisfactory output under average conditions. However, only a skilled technician can consistently produce high-quality color output. To prevent costly mistakes, always check with your printer before experimenting.

UCR and GCR reduce the ink density of a color separation by substituting black for percentages of C, M, and Y. The difference lies in what areas of the image are affected.

Turn Your Network Into a Work of Art

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

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

DataClub is always available. Thanks to our new virtual server technology, network bottlenecks and down-time are history. No matter how many Macs are running, users can always perform network operations at the same time — with absolutely no waiting!

Files are easy to get to. All shared information is found under a single desktop icon, so no one wastes time searching for files.

Each Mac contributes to the virtual server, offering parallel processing and record performance.

CALL 1.800.733.2822

Please circle 363 on reader service card.
Animas is proud to present its True-Color Hand Scanner bundled with ColorScan MacCheese as the definitive answer to your desktop publishing and multimedia problems. ColorScan MacCheese itself is a versatile paint program. You can paint in different shapes, modify objects, edit colors, even edit the palette. And inside ColorScan MacCheese we have also written specialized features such as: the "Blur" effect, which softens the focus of an image; and the "Sharpen" effect, which improves the clarity of an image. We truly are capturing the universe in 24-bit color!

ColorScan MacCheese also provides you with great flexibility and compatibility. After an image is scanned you have the capability to edit the image directly in the software or transfer the image to other programs; such as, PageMaker 4.0, Quark XPress, Adobe Photoshop, and many others. ColorScan MacCheese will also enhance your use of multimedia presentation applications like: Supercard, Hypercard 2.0, and a multitude of others. The combination of the Animas Color Hand Scanner with ColorScan MacCheese provides the total solution to all your desktop publishing and multimedia presentations. To place your order or for more information call (800) 800-5885.

All names & products mentioned are registered trademarks of their respective owners.
Please circle 418 on reader service card.
Working in front of a big screen can be as exhilarating as it used to be, if you own a Mobius display. ♦ Mobius One Page and Two Page displays come with built-in acceleration. So all your software runs faster—up to 600% faster than on your Mac SE. ♦ Mobius offers exciting, irresistibly priced products for every Macintosh. By selling directly to you, we deliver technology that's every bit as good as (or better than) Apple or Radius, for less than half the price. ♦ All Mobius displays give you compatibility with System 7. Outstanding Zenith quality. One year warranty with free replacement in 48 hours. 30-day money back guarantee. Unlimited toll-free phone support. Major credit cards accepted. To order or request our exciting free catalog, call:

800-669-0556

Mobius Technologies Inc.
5835 Doyle Street, Emeryville, CA 94608. (415) 654-0556. FAX (415) 654-2834.

Please circle 67 on reader service card.
Shading with MacDraw

Yes, you can create sophisticated graphics without using a PostScript drawing program.

By the editors of *Verbun* magazine

PostScript illustration programs are prized for their ability to generate graduated fills automatically, adding the illusion of light, shadow, and volume to otherwise flat art. However, non-PostScript programs such as MacDraw, SuperPaint, and Canvas can also produce artwork with realistic shading—it just requires more effort.

Bill Baker, art director at the Knight-Ridder Tribune NewsGraphicsNetwork, uses MacDraw to produce technical illustrations on subjects ranging from the Space Shuttle to the Batmobile. Because MacDraw can't generate a graduated fill, Baker models curved surfaces—such as those on Batman's famous car—by building up stacks of overlapping shapes, each filled with a different shade of gray. (The "grays" are actually fill patterns of varying dot densities.) To create the Batmobile, Baker traced its basic shapes from a scan and then built up layers of gray to simulate the highlights on the car's black body. The process takes time, but the results are almost as professional as PostScript-generated shading, especially when printed at the low line screens typically used in newspapers.

*Verbun: The Journal of Personal Computer Aesthetics* can be reached at Box 15439, San Diego, CA 92115.

---

**1. Drawing the Basic Shapes**

To render the Batmobile, Baker first uses MacDraw's polygon, oval, and freehand tools to trace the basic shapes, using a scanned image as a template. The template is deleted, and each shape is given a .25-point line and a white fill.

**2. Adding Flat Color**

Nonreflective areas such as tires and vents are given flat colors: Each shape is selected and its fill is changed to an appropriate shade of gray. A gray shadow drawn beneath the car anchors it in space.
3 Defining the Background Shades

The shapes that comprise the shiny parts of the car's body will be the bottom layers for the highlighting process. Depending on the type of shading required, each shape is either filled with solid black or left white.

4 Building a Highlight

The highlights are constructed from layers of gray shapes. On the car's rear bumper, for example, seven overlapping shapes are drawn, each filled with a different shade of gray (shown here in an exploded view, with a black line around the topmost white shape). To save time, the largest shape is drawn first and then copied and pasted to place a copy directly on top of the original. The copy is shrunk slightly; filled with gray; and then copied, pasted, and shrunk again to create the next shape.

5 Adding 3-D Effects

On the front bumper, four strategically placed highlights transform the flat black shape into an object that seems three-dimensional. The highlights are created with the technique described in Figure 4. The largest highlight (over the wheel well) is set off by a star-shaped sparkle, made by drawing thin, tapering polygons filled with white.
The Completed Batmobile

The finished image appears almost lifelike. Before it’s sent to the newspapers, the car is set in a box with a title, caption, and call-outs that describe its features (see opening art). MacDraw is an object-oriented drawing program, so images can be printed at a printer’s best resolution. This image was printed on a 300-dpi LaserWriter directly from the MacDraw file; the relatively low resolution disguises the individual layers and maintains the illusion of smooth blending (but see below).

Converting MacDraw Files to PostScript

Canvas, Illustrator, and FreeHand can automatically convert MacDraw files to PostScript. (FreeHand does this directly; the other programs use conversion utilities.) This image was converted to PostScript with DrawOver 3.0 (part of the Illustrator 3.0 package), placed in PageMaker, and output at 1,270 dpi on a Linotronic 300. Unfortunately, the high resolution may reveal the layering process, shattering the illusion of smoothly shaded surfaces.

Hard disk utilities give you SUM of what you need, Now Utilities 2.0 provides the rest.
Your Ethernet Just Ran Into A Major Obstacle.

You're busy installing your Ethernet network when, WHAM! You run head-on into a major obstacle. Your printer doesn't plug into Ethernet. So you can't use it without spending a couple of thousand dollars more on an Ethernet router.

EtherPrint To The Rescue. $499

This simple “plug and print” product is the first inexpensive Ethernet connection for LocalTalk® printers. It connects any LocalTalk compatible printer to thin Ethernet, thick Ethernet, twisted-pair or fiber optic cable systems. Quickly, easily and anywhere on the network. EtherPrint® supports both Phase 1 and Phase 2 AppleTalk® protocols. No matter how large your network becomes, all your Ethernet users can now have fast, easy access to LocalTalk printers.

So when you're installing Ethernet, don't buy a router just to solve the “printer problem.” Buy EtherPrint instead and save yourself a bundle. For more information, or the dealer nearest you, call (801) 531-0203.

Dayna
We Connect People And The Computers They Use™
Apple has ceded the future development of AppleTalk products for DOS and Windows to Farallon. Apple's current product, PC AppleShare, lets DOS users share printers and AppleShare file servers with Macs on a network. At press time, Farallon had not announced specific product details. Intriguing news, but what I want to know is, Will Farallon also market a DOS/Windows client for Apple's DAL (Data Access Language)? And what about Timbuktu for Windows?

By Henry Bortman

Can Macs and PCs cooperate? It's nice of Farallon to pick up the ball on AppleTalk for the PC, but after you've gotten a file from Mac to DOS (or vice versa), can your software read it? DataViz wants to make sure it can. Its new translation package, PC DataBridge ($199), provides the powerful capabilities of its Mac-to-DOS product, MacLink Plus/PC, for Windows users. If you're looking to share megabytes of data, check out Software Architects' FormatterFive SCSI Driver & Utility ($150). It can format a removable SyQuest cartridge, a read/write optical cartridge, and even a hard-disk drive with both DOS and Mac partitions simultaneously. Available by the time you read this.

Can a PC be a Mac? I'm not talking Windows here. Cupertino-based Hydra Systems plans to ship a coprocessor card that will enable DOS machines to run Mac applications. You'll have to supply the Mac ROMs, though. Product names, pricing, and availability were all mysteries at press time. You're thinking lawsuits? Not to worry: Hydra has licensed technology from — are you ready — Xerox! This is one lawsuit you've gotta see.

Can a Mac be a data server? Maybe, if it's running the multitasking A/UX operating system or if some very clever software developer does some very clever software development. Oracle announced its intentions to be clever last summer, but MacVONK USA beat it to the punch with P•INK SQL, which began shipping last December ($2,275 for the server and five clients; $375 per additional client). "Another database program," you mumble. "What's the big deal?" The big deal is that P•INK SQL does all its data processing on the server instead of shipping mounds of data across the network to be processed on your Mac whenever you do a query or a sort, the way most Mac database programs do. Definite hot-product potential.

Can a Mac manage a network? You'd think the Mac's graphical user interface and plug-and-play networking would make it a natural for this kind of stuff, but it's been a long time coming. Some products are emerging, though. Neon Software, which released NetMinder Ethernet, an AppleTalk network-analysis program, in June 1990, now also offers NetMinder LocalTalk ($395), for the Mac's built-in networking capability. And you can't really call this one network management, but Technology Works, maker of Ethernet cards for the Mac, is shipping GraceLAN, which collects such information about networked Macs as what System software, INITs, and cdevs are running; what SCSI devices are attached; and so on. $395 for 50 users. Both products began shipping in January.
“We're very particular about how type looks. That's why we use QuarkXPress.”

Rick Binger, Computer Designer
Pentagram Design, San Francisco

“Typographic precision is crucial to good design. It doesn't matter if we are working on a brochure, a magazine, or a book. We can't afford to have typographic limitations hold back a design. That's why we use QuarkXPress. Its kerning, tracking, and type handling are great. And having control over the points-per-inch setting gives us the most accurate results possible. In fact, we even used QuarkXPress to produce a book about typographic excellence — TypeWise, by Kit Hinrichs.”

Pentagram is an international design partnership founded in 1972, with offices in San Francisco, London, and New York. The firm offers services in corporate communications, packaging, and environmental, exhibit, architectural, and product design.

If you're particular about type, visit your local dealer for more information.

QuarkXPress®
The Choice for Publishing Software Worldwide
Painless Ethernet Printing

Dayna’s EtherPrint provides a simple, cost-effective way to print from Macs on Ethernet. And it works.

By Henry Bortman

In the beginning, there was LocalTalk. The Mac had it. The LaserWriter had it. To network the two together, all you needed was a couple of $30 LocalTalk or PhoneNet connectors. Life was simple. Networking was simple. Printing was simple.

Then came Ethernet. It was fast. Any Mac could have it — for a small premium. But LaserWriters couldn’t. This meant that if you wanted to print from a Mac on Ethernet to a LaserWriter (or other networked printer), you needed a router. Routers connect networks and mediate the differences between them, such as the speed difference between zippy Ethernet and sluggish LocalTalk (see “Building a Better Network with EtherTalk-to-LocalTalk Routers,” in this issue).

The trouble is that EtherTalk-to-LocalTalk routers are expensive: typically in the $2,000-to-$3,000 range. That’s a lot of money to pay to connect your LaserWriter to your Mac — especially when you can do the job for less than $100 with LocalTalk. Network wiring for printing from Ethernet can add complexity and expense.

Dayna Communications has a solution: the EtherPrint ($495). Although it is not a router — routers maintain special tables of information about AppleTalk network-ID numbers and Chooser zone names, and the EtherPrint doesn’t — the EtherPrint does have an Ethernet port and a LocalTalk port. Attach its Ethernet port to an Ethernet network, attach a printer to its LocalTalk port, turn on the EtherPrint, wait a minute or so, turn on the printer, and you’re done. When you look in the Chooser, the printer appears as a device on the Ethernet network.

Now you can print as you normally would — and it works. No INITs, no configuration software, just print. (The only thing you have to be sure to do is to turn on the EtherPrint before you turn on your printer.) It makes you wonder why nobody thought of it before. (For details on how the EtherPrint works its magic, see the “How It Works” sidebar.)

The EtherPrint does introduce a slight delay in printing. To see how great a delay, the MacUser Labs NetworkShop put the EtherPrint through our standard set of printer-performance tests. We compared its performance with that of straight LocalTalk printing (direct from a Mac to a QMS PS-810 Turbo) and to the performance of printing through a Compatible Systems EtherRoute EtherTalk-to-LocalTalk router. On our PageMaker test file, which included a gray-scale TIFF image and a color EPS image (see...
How It Works

EtherPrint is a crafty hack that tricks AppleTalk's addressing scheme into thinking that a node on a LocalTalk network is really a node on an Ethernet network.

Every device on an AppleTalk network, such as a Mac or a LaserWriter, has a node address (a number between 1 and 254). AppleTalk devices use these node addresses to communicate with each other. Consider your LaserWriter as an example. When you turn it on, one of the first things it does is choose a node address. It then starts broadcasting "enquiry control packets" addressed to the selected node. If another device answers, the LaserWriter realizes that it's chosen a number that's already in use, so it picks another number and tries again. The printer repeats this process until there is no answer and it can have a number.

Your LaserWriter keeps its unique address until it is turned off. (Actually, it remembers the address when it is turned off and tries to use the same one when it is turned back on. Occasionally, though, another device has taken the address in the meantime, so the printer may have to find a new one.)

When you turn on the EtherPrint, it goes through the process described above to acquire an AppleTalk-node address on Ethernet. Then, when you turn on your LocalTalk printer, the EtherPrint tells your printer that all possible LocalTalk addresses are already in use — except one, the address that the EtherPrint has acquired on Ethernet.

Because the node addresses of the EtherPrint and printer match exactly, the EtherPrint becomes "invisible." Instead of appearing as a device on the Ethernet network, it causes the printer to appear as if it were a device connected to Ethernet. When the EtherPrint receives a data packet from a Mac on Ethernet addressed to its node number, it stuffs it into a buffer and then outputs it to the printer attached to its LocalTalk port. When the printer responds, the EtherPrint buffers the data again and rebroadcasts it onto the Ethernet network. Your Mac never knows the difference. All it knows is that it's communicating with an AppleTalk device that behaved exactly like a printer but had a node address on Ethernet.

Figure 1), the EtherPrint is slightly slower than LocalTalk but slightly faster than an EtherTalk-to-LocalTalk router (we used Compatible Systems' EtherRoute, which MacUser Labs rates as one of the fastest routers in its class). On Word and Excel test files, there is no appreciable difference among straight LocalTalk, EtherPrint, and through-a-router print times.

We also put the EtherPrint through a grueling three-week real-world test on a three-Mac Ethernet network, using PageMaker 4.0, FreeHand 2.02, Illustrator 3.0, Word 4.0, and Photoshop 1.0.7. It performed without a single hitch.

Our conclusion: The EtherPrint is a five-mouse winner. Of course, nobody would complain if the price were lowered $100, but even at its current price, it is a reliable and cost-effective solution to a vexing network problem.

As we went to press, Dayna had just begun shipping the EtherPrint Plus. This $899 model — still not a router — supports four LocalTalk devices daisy-chained off its LocalTalk port. EtherPrint owners can upgrade to an EtherPrint Plus for $425 within the one-year warranty period.
And you thought page layout was for someone else.

"I want my documents to look good, but page layout is complicated and hard to learn. I just can't spend the time or money...."

If this sounds familiar, Personal Press™ is for you. In addition to giving you everything you need for quality desktop publishing, Personal Press can automate the process so great-looking documents don't take hours to produce.

Let AutoCreate™ automatically assemble your stories and graphics with a template. Use one of the templates provided, or create your own — any publication can be saved as a template. Or you can design a document, enter the text "on the fly," and scan images directly into the program. Either way, you'll find Personal Press easy to use, with plenty of features and power to grow into.

Personal Press — for people who thought desktop publishing was for someone else!

FEATURING:

- AutoCreate™
- Complete word processing, with thesaurus & spell checker
- Text and graphic file previews
- Free rotation of text and graphics
- Color graphic import and display
- Gray-scale image manipulation
- Spot color separations
- Electronic Posted Notes
- On-line help

Now Shipping!

Suggested Retail Price: US $299

Requires a Macintosh Classic, Plus, SE, SE/30, LC, Portable, or IIsi, with 1MB RAM and one 800K floppy drive or a hard disk and one 800K floppy drive.

Please circle 167 on reader service card.
It’s the only thing Apple left out

Applied Engineering Introduces the First Data/Fax Modem Designed Exclusively for the Macintosh LC

Another first! Applied Engineering announces DataLink LC™, the first data/fax modem for the Macintosh LC. From the company that brought you the first third-party memory card for the Mac Classic, comes the do-everything DataLink LC. It’s the one thing Apple left out. With it, your new Mac LC taps into the world of global communications:

**Fully 100% Hayes-compatible internal** 2400 bps modem saves desktop space without occupying one of the LC’s two serial ports.

**Additional “Mac standard” mini-8 DIN serial port** built into the DataLink LC for the addition of more serial devices.

**AE Send-Fax™** sends any fax document, text or graphics, to any Group 3 fax machine directly from the LC’s screen. Background operation, automatic retry, timer feature, distribution list feature, phonebook and full status reporting. And a Receive-Fax upgrade will be available soon.

**Math co-processor socket** allows for the addition of an enhanced floating point co-processor (optional) to dramatically speed up math-intensive programs. The LC’s motherboard does not provide this socket.

**V.42 bis protocol (optional)** effectively increases transmission speed up to 9600 bps and automatically corrects errors for a fraction of the price of a 9600 bps modem. Automatically falls back to MNP-5 if the remote modem doesn’t support V.42.

**Communications software** included as well as a collection of free introductory memberships and online time for a number of bulletin boards and online services.

And best of all, DataLink LC is made by a company long known and trusted in the industry, Applied Engineering. As one of Apple’s oldest developers, we’ve set the standard for quality Apple peripherals for more than ten years. We’ve done it by offering value — with the best tech support, the most complete features and the longest warranties in the business.

*Five year warranty.*

**Order today!** To order or for more information, see your dealer or call (214) 241-6060 today, 9 am to 11 pm, 7 days.

Please circle 70 on reader service card.
Isolating Network Problems

Apple’s Inter-Poll utility provides an excellent tool — the echo test — for determining the health of your network.

By Kurt VanderSluis

You’ve undoubtedly had the experience of communicating with an AppleShare server and suddenly getting slower network response than usual or losing the connection entirely. How can you tell where the problem is coming from?

The first step I use in locating these kinds of problems is to perform a procedure I call a PET (progressive echo test). I use Apple’s Inter-Poll network-management utility to perform a PET. Inter-Poll contains a simple test, called an echo test, that works as follows: The Mac running the test sends a string of packets to the device being tested, which echoes them back. Inter-Poll records the number of packets returned and the number lost (a measure of the reliability of the network connection between the testing Mac and the echoing Mac) as well as the average time it takes the returned packets to make the round trip.

You can set several Inter-Poll parameters when doing an echo test, choosing short- or long-echo packets, the number of packets to send, the interval between packets, and the time-out value (how long Inter-Poll should wait for an echo response before counting a packet as lost). I typically use 100 long-echo packets at 0.01-second intervals with a 1-second time-out. You record the average round-trip echo time and the reliability of each test. (Note: To use Inter-Poll to maximum advantage, the echoing Mac should have the Responder INIT, which comes with Mac System software, installed in its System Folder.)

The PET procedure involves running the echo test to several different nodes along a suspect network path, recording the reliability and echo time for each test. Look at the network in Figure 1. Suppose that your Mac is the one at the top left of the diagram and that you’re having trouble connecting with the server in the lower right corner. Packets exchanged between these machines must traverse LocalTalk network 1, EtherTalk-to-LocalTalk router 1, the Ethernet backbone, EtherTalk-to-LocalTalk router 2, and finally LocalTalk network 2. To isolate the trouble spot in this hypothetical network, you need to run the echo test to six different locations along the path between your Mac and the server. Although the figure shows echo packets being sent to routers, only certain routers can respond to Inter-Poll’s echo test.

By graphing the results, you can spot any trends in the data. The time value in the echo test (see Figure 2) is a measure of how long a packet takes to get to the distant device and return. The graph should have a positive slope as you test successively distant devices. It’s normal to see a longer echo time through routers than within a single LocalTalk network. What you need to look for is an instance
Record, edit and playback digitally recorded dialog or sound effects with MIDI music.

AUDIOTRAX™
Meet AudioTrax, the first software to combine MIDI and Digital Audio at an affordable price! Record up to 64 tracks of MIDI plus two tracks of digital audio using Farallon's MacRecorder® or an internal sound input device. Add sound effects or dialog to your MIDI composition creating complete sound tracks for desk top presentations. Sing vocals in sync with your music or add sound effects and narration to visual presentations. Bring the powerful impact of music and digital audio to your Macintosh® with AudioTrax!

No Additional DSP Hardware Required!

in which the time jumps significantly. The time difference between test 5 and test 6, for example, is larger than a couple hundredths of a second. This could mean that the server is bogged down. When a server is very busy, it may take longer for it to return an echo packet. It may be running slowly because there are a lot of people logged on to the AppleShare server or because the server is sending or receiving large files. You can check these possibilities by looking at the AppleShare display screen. You can correct this problem by putting a faster hard disk onto your server or using a more powerful Mac as the server.

But even if the server is not busy sending or receiving files, if it has many users logged on, it can be slow to respond to an echo test. A server must exchange "Hello" packets every few seconds with each Mac that's logged on, even if some of the Macs aren't active. You can solve this problem by asking users to log on to the file server only when they're actually using it.

The reliability value in the echo test is affected by wiring issues and link integrity. Performing a PET doesn't necessarily tell you what's causing the problem, but it may suggest where to start looking. If there is a place where the reliability plummets suddenly, that's a good place to look for a problem. If the reliability drops between tests 2 and 3 (see Figure 3), for example, the culprit may be router 1 or it may be on Ethernet. You can determine this by running an echo between two Macs on the Ethernet network without going through a router. If that's where the reliability is bad, then the router is not at fault and you should look at Ethernet's termination and wiring.

As with any testing tool, you should perform a PET when the network is working properly so that you have values to compare with when you're troubleshooting problems later.

When you send 100 echo packets within a single LocalTalk network, you should get 100 back, assuming correct wiring, but it's normal to occasionally lose a packet through two routers. You need to learn what to expect. The time of the echo varies because of many factors, such as what kind of CPU the distant device has, how busy it is, how busy the network is, and so on. By performing a PET at different times under different network-load conditions, you'll know what's normal. If you're using the PET across modem links, you may need to increase the time-out value. Through a modem link, such as two networks connected by Liaison at 9.600 bps, it takes longer than a second for an echo packet to return. Try a nice long value such as five seconds.
When we introduced this product we had to ask ourselves, "What should DesignCAD cost?" To help with our decision we hired accountants. We consulted with industry "movers and shakers". We purchased the finest spreadsheets available. Many people said, "The software should sell for $3,000.00 or more." Others said, "It's good, darn good—sell it for at least $2,000.00." Opinions varied. Finally we said, in the Great American Tradition, "Aw... What the Heck! Let's see the competition beat this $699.00.

DesignCAD has disproved a common misconception about computer software: you don't always have to spend a lot of money to get high-power quality software. DesignCAD for the Mac has features of CAD systems costing thousands of dollars! Yet, DesignCAD is priced at least 50% to 80% BELOW comparable CAD packages... AND DESIGNCAD IS BETTER!

Excellent Software Compatibility!
Along with extensive hardware support, you get software compatibility! DesignCAD comes with (at no extra charge, of course!) file transfer utilities to let you read and write files in other formats such as IGES, DXF, HPGL, XY or XYZ coordinates, ASCII text files, EPS, Postscript and PICT or PICT2. NOW THAT'S COMPATIBILITY!

DesignCAD offers fully integrated 3D geometry!
Need 3D capability? Great! Look at how DesignCAD fully integrates its very powerful 3D mathematical foundation with excellent 2D drafting attributes, which are in a league all of their own, offering first-rate ease of learning and use.

DesignCAD is easy to use!
Tests prove that DesignCAD's user-friendly interface allows you to quickly produce complicated drawings in a fraction of the time required from the competition. Flexibility and power found within DesignCAD means you save time and money! DesignCAD is truly the CAD system that ANYONE can use!

The Power of Intelligence!
only $699
Features Include:
- Floating-Point precision
- Math coprocessor support
- Automatic & Associative Dimensioning
- Tolerance options for Dimensioning
- User defined Arrowheads
- 500 predrawn Symbol Libraries
- 256 Layers
- Cubic Spline Geometry
- Bi-Cubic Surface Geometry
- Trimming
- Related and/or Auto- Update Viewing
- "Real-Time Rotation"
- Automatic Hidden-Line Removal
- Wireframe or Solids
- Perspective or Orthographic Calculations
- Ray Casted shading
- Specular Highlighting
- Unlimited color support
The list goes on and on!
For a closer look, contact your local Apple Authorized Dealer or call us: 918/825-4848
FAX 918/825-6359

Call or write for FREE BROCHURE
DesignCAD, Inc.
327 South Mill • Pryor, OK 74361 • 918/825-4848
Please circle 57 on reader service card.
Planning to use FileMaker Pro? Here are 12 tips and workarounds that you can't afford not to know. You'll save time, and more importantly, you might save your data.

By Craig Danuloff

FileMaker is an extremely popular database program, primarily owing to its straightforward design — almost anyone can create and manage a FileMaker database. Claris' recent FileMaker Pro upgrade introduced several new capabilities, but it also inadvertently created the need for a few workarounds — ironically, because of a file-structure bug that existed in earlier versions of the program but was fixed in this new one.

The tips included here document the most important of these new workarounds and describe some techniques that you might not have discovered while working in FileMaker.

1. Don't upgrade your FileMaker II files simply by opening them in FileMaker Pro.

Apparently, a bug in FileMaker II creates a structural problem in its files. The bug was fixed in FileMaker Pro, but the problem might still be present in your old FileMaker data files and could cause serious problems if you convert them to FileMaker Pro by opening them directly from that program.

The workaround is simple, but Claris didn't include it in the FileMaker Pro documentation. Save a compressed copy of your FileMaker II files by using the Save a Copy command. Then open these compressed copies in FileMaker Pro.

If converted files exhibit any strange behavior — trouble with sorting, for example — use FileMaker Pro's Recover command to attempt to correct the problem.

If problems still exist — which should rarely happen — return to your original FileMaker II file and export all its records to a tab-delimited file. Save an empty copy of your FileMaker II database, using the Save a Copy command; open the empty copy in FileMaker Pro, and then import the data from the tab-delimited file. When using this method, make sure that all fields are lined up...
correctly in FileMaker Pro’s “Specify field order for import” dialog box.

If you’ve already converted your FileMaker II files and haven’t experienced any problems using them in FileMaker Pro, there’s no need to go back and reconvert. You’ll know immediately if you’re going to have any problems caused by the old FileMaker II bug—they don’t appear gradually.

2. Export tab-delimited files instead of SYLK files if you need to use your data in a spreadsheet.

FileMaker Pro exports numeric and calculation fields into SYLK files as text, not as numbers, making it impossible to perform mathematical calculations with this data after you’ve imported it into a spreadsheet. These fields are treated as numbers in tab-delimited files, though, and virtually all spreadsheet programs can import tab-delimited files accurately.

3. Concatenate fields to ensure proper “slide left” and “slide up” operation.

The easiest way to force horizontally arranged fields to slide in layouts is to use the Arrange menu’s Slide Objects command, which is available in the Layout view only. This method sometimes proves unreliable, so you may want to force your fields to slide by using concatenation.

Concatenation requires creating a new field for each record in your database and instructing FileMaker Pro to add the information from several other fields to this new field. To create the name line on an address label, for example, create a new field called NameLine and define it by using the following formula: Salutation & " " & FirstName & " " & LastName (substitute your own field names for Salutation, FirstName, and LastName). Then place the NameLine field instead of the Salutation, FirstName, and LastName fields in your address-label layouts (see Figure 1).

You can use this same trick to ensure that objects slide up: Use a carriage return and the If statement to define multiple lines in a single field. The field definition shown in Figure 2, for example, would place all the necessary data in the MyLabel field, using the Address2 field only if it was not empty.

4. Perform the Find command in one layout, and view data in another.

Often you will want to view a subset of your records in a layout that doesn’t include the fields that define the subset. You may, for example, want to print mailing labels for all clients who have purchased more than $5,000 in goods during the past year. Because the field...
containing your clients’ year-to-date purchases is not on the mailing-label layout, you should execute the Find command in a generic layout and then switch to your mailing-label layout before you print.

This procedure can’t be automated with a single script — FileMaker Pro will fail to execute the Find command, because it requires a field not present in the final layout.

Therefore, you must create three scripts: one that selects the layout containing the necessary field and then performs the find (see Figure 3), one that specifies your mailing-label layout and the required printing options, and a third that runs the first script and then runs the second script by using the “Perform a chain of scripts” option. Do not include the first or second scripts in the menu or assign keyboard shortcuts to them.

5. Take advantage of the Replace command.

Many people don’t understand the Replace command and perform unnecessary data entry as a result. The Replace command lets you enter data into a single field in the current record and have that data copied into all other currently selected records.

Suppose, for example, that you’re renewing your state licenses for all the hazardous chemicals that have been stored in your warehouse under expired permits. After identifying all such materials by using the Find command, printing the required reports, and completing the necessary licensing forms, you can reset all license-expiration dates (assuming they’re all the same) by entering the correct value into the license-expiration-date field of one record and using the Replace command to apply that data to the other currently selected records.

Suppose, for example, that you’re renewing your state licenses for all the hazardous chemicals that have been stored in your warehouse under expired permits. After identifying all such materials by using the Find command, printing the required reports, and completing the necessary licensing forms, you can reset all license-expiration dates (assuming they’re all the same) by entering the correct value into the license-expiration-date field of one record and using the Replace command to apply that data to the other currently selected records. Be certain that you’ve selected the correct subset of records before confirming the replacement — you can’t undo the Replace command.

6. Use Page Setup to adjust the Layout marker.

In the Layout view, FileMaker Pro displays striped lines that represent page borders. These borders’ calculations are based on the current settings in the Page Setup dialog box, so be sure to configure your pages horizontally or vertically and to specify any printing reductions or enlargements before finalizing your layout.

Using reduction is a good way to gain some extra room to fit all required data onto a layout. If you use this technique, create a script that switches to the layout and uses the “Restore the Page Setup options” option so that your reduction is applied every time you use the layout.

7. Hold down the Option key to customize the position of part boundaries.

When you’re defining layouts, the gray lines that define part borders (such as headers and footers) cannot normally be moved past any fields, text, or graphics. If you hold down the Option key while you’re repositioning the part border, however, you can move the border freely.


When FileMaker Pro runs short of memory, the “Out of memory” error message usually appears. In some cases, there’s not even enough memory left to display this dialog box, so you may notice that keyboard equivalents or menu commands suddenly seem to have no effect.

If you’re using MultiFinder, the first step toward correcting this problem is to increase the amount of memory allocated to FileMaker Pro. The 1,024K of RAM that FileMaker Pro normally requests is insufficient in many cases, especially if you’re working with large databases. To change the memory allocation, open the Get Info dialog box and change the “Application Memory Size” option. Provide 1,500K as a minimum — more if you have enough memory available and work with very large databases.

9. To avoid printing duplicates, use a subsummary part.

To create a layout that includes only one occurrence of any duplicate record, define a layout using the “Sub-Summary when sorted by” option in the Define Parts dialog box. When scrolling through the field list to select the field that will determine duplication, be sure to select a field that will be unique for all nonduplicate records. Remove the body part in your layout, and position all required fields within the subsummary part. Sort the database by the field you’ve selected to determine duplication, and choose the “Preview” option from the Select menu. The resulting duplicate-free database is then displayed. Choose the Print command to print this data.

10. Use the “Blank” layout option instead of the “Columnar report” layout option to produce columnar reports that contain repeating fields.

Repeating fields do not slide up properly in columnar-report layouts. If you have an existing columnar-report layout containing repeating fields, copy all its elements and paste them into a new blank-format layout.

Another way to improve the sliding of repeating fields is to choose Field Borders from the Format menu, check the Between Repeating Values box, and make sure all border options are set to None.

11. Use a subsummary part to create running page totals.

To create a running page total for any report, define a “Sub-Summary when sorted by” and place summary field types, that have the “Running total” option, into this part. To force this subsummary to appear at the bottom of every page, determine the number of records that will fit on one page by doing a preview of your report and then select the “Page break after every X occurrences” option and enter this value (see Figure 4).

This method works best if no “slide up” options are used in the report body. If records in your report are of variable length, you must choose the minimum number of records that naturally fit on a single page and use that value in the “Page break after every X occurrences” option.

12. Replace one field with another in layouts without deleting.

If you accidentally place an incorrect field in your layout or just decide that your needs have changed, hold down the Option and Command keys and double-click on the field you want to replace. This allows you to select another field to replace the one you selected previously.
Never before has so much been available to so many for so little.

Now that the new Macintosh you've always wanted is finally within reach, you'll no doubt also want all the software you can get your hands on.

That would be Microsoft® Works. Works comes with a word processor for reports, memos and letters.

There's also a spreadsheet for number-crunching and business graphics. A database for managing lists. Communications capabilities. And, of course, drawing tools (after all, this is a Mac®).

Works is powerful, easy to learn and marvelously affordable. And now it comes with a free Small Business Success Kit—a $120 value. For the dealer nearest you, call (800) 541-1261, Dept. P61.

Then go get that Mac. Get Microsoft Works. And get going.

*Based on suggested retail price of components if purchased separately. Offer void where prohibited by law. Not valid in conjunction with any other offer or on academic or volume purchases. Offer valid only in the 50 United States. Offer good January 1-June 30, 1990. For information only: In the U.S., call (800) 645-1261, Dept. P61. In Canada, call 416/569-3000. Outside North America, call 416/569-6664. © 1990 Microsoft Corporation. All rights reserved. Microsoft and the Microsoft logo are registered trademarks and Making it all make sense is a trademark of Microsoft Corporation. Macintosh and Mac are registered trademarks of Apple Computer, Inc. "Small Business Success" is a registered trademark used with permission of the Goldiebush Group, Inc.
Before engineering the QMS-PS 410, we performed one very important task. We listened. Then we took everything we heard, added a few surprises, and built a revolutionary laser printer with a suggested retail price of just $2795!

You said make it Adobe® PostScript®. So we did. And now you can enjoy the design flexibility only PostScript offers as well as 45 resident typefaces and thousands of PostScript software applications.

You said make it reliable. So we used the Canon® LX print engine manufactured by the undisputed world leader in high-quality, easy-maintenance print engines.

You said make setup easy. So we made it truly and completely plug-and-play. Out of the box, it connects to IBM® PC's and compatibles, Apple® Macintoshes® and mini and mainframe computers.

You said make it flexible. So we added HP® LaserJet® Series II emulation to support non-PostScript printing applications.

You said make it simple. So we gave the QMS-PS 410 the intelligence to actually “think for you” by automatically switching between emulations and interfaces! This printer has ESP (Emulation Sensing Processor), which interprets incoming data and automatically chooses the appropriate printer language. And you can send data simultaneously to its AppleTalk®, serial and parallel interfaces! There’s no need to change switch settings or send complicated software commands.

You said make it fast. So we created a super-fast controller with a 68020 processor and third generation QMS® ASAP™ technology (Advanced Systems Architecture for PostScript), which incorporates the latest in component and controller design.

You said make it expandable. So we made a variety of options available, including an HP-GL® emulation card, Adobe typeface cards, HP compatible font cards, memory upgrades and extended paper handling capabilities.

Call Now and Let the QMS-PS 410 Liberate You! 1-800-523-2696

You see, listening to you gave us the insight to develop a printer that offers real world solutions to real world problems. And the QMS-PS 410 delivers PostScript power to the people by giving you more solutions than any other printer on the market. Affordable. Reliable. Flexible. Solutions that set you free!

Please circle 143 on reader service card.
Lighting the Way

Microsoft chairman Bill Gates expounds on Windows — and looks at some other architectures of the future.

By Michael Swaine

Pointers to the future are most easily grasped by the handles of the past. That’s why writers who wade into deep technical waters sometimes lapse into the folksy, anecdotal style of presentation that Byte and InfoWorld columnist Jerry Pournelle calls “Me and Ed Went Fishin’.” In the broader journalistic world, this style — usually seen in the work of small-town newspaper columnists who spend a lot of time with the boys down at the firehouse — is known as “slipping into one’s anecdote.” This month’s exploration of the future of system software, as mapped by Microsoft chairman Bill Gates, doesn’t dwell on the antics of the cowlicked cartographer, but a couple of stories do slip in.

For starters, there’s the one about the light in the night: It seems there was this Navy cruiser, you see, and late one night, the officer on watch noticed a light in the distance, dead ahead. According to the conventions of navigation, he signaled the other vessel to steer to starboard. A message promptly came back: “You steer to starboard.” The officer huffily fired back a message informing the other vessel that his was a Navy cruiser and that he would make no such move. Time passed with no response, and the watch officer reluctantly woke his ranking officer, an admiral. The admiral lost no time in informing the other vessel of the most relevant fact of the situation, “I am an admiral,” he signaled. The response: “I am a lighthouse.”

I heard that story a few months ago when Bill Gates gave a speech at Comdex. It wasn’t the only time recently that I’d heard Gates speak; these days he’s been lecturing to many different audiences, always centering on a topic he calls “Information at Your Fingertips.” As founder, chairman, CEO, and principal stockholder of Microsoft, Gates can define his own job. At one time, that definition meant writing code, but now it seems to be to appear suddenly in front of large ships of industry with a beacon shining from his forehead. Gates is the unexpected lighthouse.

What he does when he speaks publicly is to prognosticate. Bill Gates’ prognostications are worth listening to, although the audience can’t help but wonder to what extent listening to his predictions helps bring them about. Buyers, sellers, and developers of computer hardware and software have the choice of ignoring Gates’ predictions — at the risk of running aground on the Microsoft shoals — or of helping fulfill them. A purveyor of self-fulfilling prophecy is, I guess, a self-fulfilling prophet, and Gates’ presentations are no doubt both self-fulfilling and profitable.

Gates is most interesting when he is talking about system software, which is what he is usually talking about. Whenever he sketches the possible future capabilities of computers or advises on opportunities for software developers, it’s a good bet that he’s really talking about system software. And what he has to say is as relevant for the future of Mac system software as for DOS-slash-Windows-slash-OS-slash-2, because under the foam, it’s all one archipelago.

Here’s a look at some of the low-lying land
over which Gates has played his light of late. Software developers, Gates claims, have little idea of what to do with the increasing raw horsepower available on the desktop. He sees the desktop computer as “certainly” moving past 10 MIPS (million instructions per second) to 50 or 100 MIPS in the next two years. Developers will need to come up with high-volume software to take credible advantage of that power.

One way to do this is to increase the size and complexity of the information being processed. That’s part of what’s behind the multimedia push: graphics, video, and sound require a lot of storage space and a lot of processing power. But high-end machines already have sufficient power to handle 8-bit-color still images, and DSP chips have already made it possible to do complex audio input and output, text-to-speech and speech-to-text conversion, voice mail, and audio text within applications. We don’t need faster hardware for these things. Even handwriting recognition is turning out to be something that current hardware can handle. Although a graphical user interface and support for graphics applications have become standard and sound input is just about to become standard on current-generation hardware, users have yet to be sold on live video and realistic color depth in images to justify the next generation of hardware.

In talking with developers, Gates emphasizes this opportunity angle, but no matter whom he’s addressing, he soon moves on to a very user-oriented topic — the broad area he calls “Information at Your Fingertips.”

From the user’s perspective, “Information at Your Fingertips” means something like this: You confront the machine to get certain kinds of information, such as schedules, mail, or whatever. The storage model of the machine (and that of any other machines accessible from it) has been transformed so that access to any particular kind of information is simple and intuitive. Of course, all software vendors claim simplicity and intuitiveness for their software; the point here is that access should be simple and intuitive for the particular kind of information you’re interested in — whatever it might be, wherever it might be, and whenever you might be doing it (even if you’re using an application that isn’t designed to work with the kind of information you need, for example).

Gates is obviously not talking about a DOS-style hierarchy of eight-character filenames here, or even about the Mac’s hierarchical file system. He predicts that Microsoft will produce an operating system that works this way in two to three years, and Apple has the same kind of thing in the works, due sometime after the advent of System 7.0. Parts of this approach will be arriving this year and next, however, on Macs and other systems. The file system in System 7.0 will take a big step toward indifference to physical location, although it will still just catalog hierar-
chies of filenames.

This "Information at Your Fingertips" vision requires a few new features in the system software—such as embedding and linking (to use Microsoft terminology) or publish-and-subscribe and AppleEvents (to use Apple's terminology). In either case, the idea is to allow applications to share capabilities, so that if you need to attach a voice annotation to a document you're working on, it doesn't matter whether or not the application's author included voice-recognition features.

The publish-and-subscribe capability of System 7.0 is another example of the promise of shared capabilities: When communicating with another person, sometimes you want to point to a particular object—a spreadsheet, say. Publish-and-subscribe lets you establish a part or all of the spreadsheet as a "publication" to which other documents can "subscribe." Changes in the original document are automatically reflected in the subscribers. The difference between this approach and referring to a copy of the spreadsheet pasted into another document can be extremely important, as, for example, when the data in question involves credit or stock prices. It's the difference between hoping that you're talking about the same thing and knowing that you are.

To make this phase of "Information at Your Fingertips" happen, system-software vendors need to create system-level tools as well as publish and support standard protocols for communication among applications. Then it's up to application developers to take advantage of these tools and protocols. Apple (in System 7.0) and Microsoft have built the tools and started the protocol process moving, and Gates is telling developers of the "huge opportunity" this represents. The developer response to both architectures has been a little slow, but Apple and Microsoft have application-software divisions, with which they can prod the process along.

If the "Information at Your Fingertips" vision is to become real, the second thing that needs to exist at the system level is increased connectivity. Some connectivity—such as point-to-point E-mail—is easy, but sharing information for collaborative work is tricky. The problem is not so much with databases where the level of granularity is the record, which is small and manageable. Collaborative databases are relatively easy to maintain. Things get more difficult when you try to support collaborative work throughout an office across applications or even in a single application such as a spreadsheet program.

If it's hard to imagine doing collaborative work across applications on your network, that's not surprising. We need faster networks, and part of the solution is new hardware. Faster processors will mean more-powerful servers. And it looks as if the transmission bottleneck can be broken, if research done at Spectra Physics is any indication. Although Gates limits himself in his talks to discussing near-term research and development, work in...
BEATING THE SYSTEM

fiber optics at Spectra Physics has produced stable pulses as short as four-trillionths of a second. This translates, theoretically, to the ability to transmit the contents of the Library of Congress in five minutes. Now that's information at your fingertips. Although you can't expect 0.2-LOC-per-minute performance from your network any time soon (to use MacUser technical editor John Rizzo's unit of choice), it does suggest that the physical location of the information you need is going to become progressively less important.

That fact takes on greater significance when we reflect on the shift in the software industry from being "an industry that sells code," as Gates puts it, to an information industry, producing information-rich products such as encyclopedias, catalogs, and demographic databases. Gates foresees a day when the balance will shift from code to information, but he isn't predicting when that day will come. We'll know it, he says, right after it happens.

Implementing "Information at Your Fingertips" will require at least the things I've mentioned, but the most important feature will be the new storage model. The model is object-oriented storage, but Gates is careful to point out that there are at least three broad uses of this "object-oriented" terminology. The most important change will not be the change in the programming languages or even the change to the window/icon user-interface metaphor. The most important change will be the move to an object-oriented storage philosophy. This means access to information based more on content than on external structural conventions such as filenames.

From the users' perspective, the new model may be less an addition than a subtraction. The new storage model that Microsoft and Apple are working on will throw out a lot of unnecessary stuff, such as hierarchies of filenames or even, perhaps, the files themselves. Ted Nelson, who coined the term hypertext, wrote passionately about the tyranny of the file decades ago. With this new storage model, the software industry may finally get its long-needed System Instruction 9.

Let me explain. Last New Year's Eve, I listened to a band called System 9. When the festivities ended, I asked one of the band members where the band's name had come from. It had come from a telephone-company memo, he explained, that had fallen into the band's hands. The memo reminded telephone-company employees that they could throw away memos and other clutter for which they had no obvious use. The justification: System Instruction 9. This magic formula is, evidently, the reverse of Catch-22, an Out rather than a Catch.

What we need in system file storage is a System Instruction 9. It may indeed take Apple until System 9.0 to put this Out in. It's definitely not in System 7.0. But when System Instruction 9 arrives, it will be the most significant development in system software in many years. Gates is not wrong to call it "the new GUI."

If your statistical software is limiting your vision, who knows what you're missing?

Most statistics software makes you look at your data through rose-colored glasses. With procedures so rigid, you're blinded to the odd exception or hidden relationship. But now there's Data Desk® for the Macintosh. Created by Cornell Professor Paul Velleman, Data Desk is the only software that is true to the vision of Exploratory Data Analysis. Data Desk lets you view your data from new perspectives, without any preconceived notions. So you find out what you need to know—not just what your software lets you.

If your IQ is above 132*, you're Mensa material. Take our at-home pre-test to see whether you may qualify to join, or let our brochure tell you if you've already qualified. In Mensa, intellectual stimulation is a mathematical certainty.

Name ____________________________
Address ____________________________
City/State/Zip ____________________________

☐ Send me the Mensa brochure. MENSA
☐ I'll try the at-home pre-test. Enclosed is $12.00 (check or money order in U.S. funds only, please).

Send to: MENSA, Dept. MUNO, 2626 East 14th Street, Brooklyn, NY 11235-3992

*Standard 160 test, Form L-M. See brochure for other...

Please circle 411 on reader service card.

Odesta Corporation
4084 Commercial Ave.
Northbrook, IL 60062

Data Desk®
THE POWER TO EXPLORE
Please circle 148 on reader service card.

Free Demo
Disk Call 800-334-6041
AUX COMPATIBLE

IF YOUR IQ
IS 1/2 OF 1/4 OF 1/10 OF 10,560, READ ON.

IF YOUR IQ MEASURES AT OR ABOVE
132*, YOU'RE MENSAN MATERIAL. TAKE OUR
AT-HOME PRE-TEST TO SEE WHETHER YOU
MAY QUALIFY TO JOIN, OR LET OUR BROUChE
TELL YOU IF YOU'VE ALREADY QUALIFIED.
IN MENSAN, INTELLECTUAL STIMU-
LATION IS A MATHEMATICAL CERTAINTY.

Name ____________________________
Address ____________________________
City/State/Zip ____________________________

☐ Send me the Mensa brochure. MENSAn
☐ I'll try the at-home pre-test. Enclosed is $12.00 (check or money order in U.S. funds only, please).

Send to: MENSAN, Dept. MUNO, 2626 East 14th Street, Brooklyn, NY 11235-3992

*Standard 160 Test, Form L-M. See brochure for other...

Please circle 411 on reader service card.
Introducing M.Y.O.B. 2.0
Incredible Accounting Software!

Incredible Performance
M.Y.O.B. combines a powerful, fully-integrated accounting program with management tools you can't find anywhere else! With just a few clicks, you can control every facet of your business — print your financial reports, reconcile your checkbook, update receivables, reorder inventory, print mailing labels, even call your customers — all with M.Y.O.B.

M.Y.O.B. Features...
General Ledger — Flexible chart of accounts • Analyze profit & loss • Analyze balance sheet • Recurring entries • Budgeting
Checkbook — Print checks • Reconcile accounts • Cash Flow • Recurring checks • Recurring deposits
Accounts Receivable — Item invoices • Service invoices • Statements • Receivables analysis • Sales analysis
Accounts Payable — Purchase order control • Auto-calculate taxes • Auto discounts • Easy posting • Multiple payments • Auto purchase journal
Inventory — Retail items • Service items • Manufacturing items • Auto pricing • Inventory analysis • Auto adjustments
Card File — Track customers • Vendors • Prospects • Employees • Contact log • Mailing labels • Personalized letters
Administration — Business calendar • Receivable alerts • Payable alerts • Order shipment reminders • Auto inventory reorder • Re-contact reminders

M.Y.O.B. 2.0 — Exciting New Features
• Fully Customizable Checks, Invoices, Statements, Purchase Orders, Mailing Labels • Auto-Build Inventory • Expanded Card File • Auto-Reverse Invoices • Expanded To Do List • More Flexible Reporting and much more!

Thousands of users agree with the experts...
“Using M.Y.O.B. is simple and direct.” — MacWorld
“There are several unusual features that make the program easy to set up, easy to learn and easy to use.” — MacWeek
“Setting up the system is really easy.” — MacWorld
“...the best business deal on the Mac.”

NOW AVAILABLE AT YOUR SOFTWARE DEALER!
SUGGESTED RETAIL PRICE $249.00
CALL TODAY! 1-800-322-MYOB

Send me a fully-functional Demo Disk for only $5.00!

Name: ____________________________________________
Address: __________________________________________
Cty: ___________________ State: ______ Zip: ________
Daytime Phone (_________): __________________________
Preferred payment method (check one)
☐ Check or money order enclosed ☐ Visa ☐ MasterCard
Card No.: ___________________ Exp. Date: ___________
Signature: __________________________

Mail to: TELEWARE
22 Hill Road • Persippany, NJ 07054 • 201-334-1154
Please circle 89 on reader service card.

Dow Jones and Market Manager PLUS are trademarks of Dow Jones & Company, Inc. Managing Your Money is a trademark of MEGA Ventures, Inc. TELEWARE and M.Y.O.B. are trademarks of TELEWARE, Inc.
LaserMAX 1000
Personal Typesetter

The LaserMAX 1000 utilizes the same revolutionary TurboRes™ technology to produce incredible 1000 x 1000 TurboRes™ output.

TurboRes™ resolution enhancement technology controls the position and height of the pixels on the printed page and eliminates coarse steps between pixels, otherwise known as jaggies. With output this sharp, you won't need to send out for expensive and time-consuming typeset output.

And, both the LaserMAX 1200 and the LaserMAX 1000 come standard with the LaserMAX 135 Typeface Classics—135 premium typefaces in Type 1 format.

LaserMAX 400
Personal Printer

Who said quality doesn't come cheap? The LaserMAX 400 provides Macintosh users with 400 x 400 TurboRes™ output, 50 premium typefaces in Type 1 format and still sells for less than $2,000. That's a bargain any way you look at it.

The LaserMAX 400 is a powerful PostScript-language compatible laser printer that works with many of your desktop publishing and graphics applications. The 4-page-per-minute printer is based on the same LBP-LX print engine that's used with other personal printers, including Apple's new Personal LaserWriter SC and NT and HP's LaserJet 11P.

LaserMAX 1200
Personal Typesetter II

You knew it was only a matter of time before LaserMAX gave you more. With the introduction of the LaserMAX 1200, Macintosh users are given far more publishing power than ever: 1200 x 800 TurboRes™ output in an 11 x 17-inch format.

At 1200 x 800 TurboRes™ the LaserMAX 1200 provides you with text that's crisp and accurate—even delicate serifs are reproduced with amazing precision.

And the large format gives you the freedom to create two-page spreads and print the entire image as camera-ready art without having to shrink or tile. You can also place crop marks and bleeds, print CAD designs, newsletters and posters in an 11 x 17-inch format.

If you're looking for an extraordinary resolution solution, call LaserMAX today:
(612) 944-9696, Dept. 262.
The Expert’s Pledge

After spending some late nights with his chemistry set, our intrepid columnist discovers that you too can achieve waxed beauty every time you write a sector.

By Thom Hogan

Avid audiophiles have long had a reputation for tweaking their hi-fi systems with abandon. They pour strange concoctions onto connectors and LPs, hunt for cables made from exotic materials, and are never happier than when debating the relative merits of filling speaker stands with sand or small metal pellets.

Perhaps the most audacious tweaks these golden-eared folks have discovered are those involving compact discs. Now, CDs are supposed to be all digital. Bits are bits, right? Why should rubbing Armor-All on a CD make it sound better? You can’t tell me that Armor-All does something to the bits that makes them more musical. And why does painting the outside edge of a CD green make it sound better? What, moreover, are we to make of mounting little rubber rings on our discs or the practice of scratching the inner and outer edges of a disc with sandpaper? But get this — the latest craze is cryogenically freezing discs to make them sound better.

Realistically, of course, because CDs comprise digital information, few of these actions should have any effect on the sound. Digital bits don’t change just because you’ve rubbed some chemical on them or deep-frozen them. But report after report from people whose ears are trusted by thousands tell us that fiddling with a digital disc makes a huge difference in its musical properties.

Is it possible that the same thing holds true for computer disks? There must be some simple tweaks that computer users can employ to make our machines operate better, more smoothly, and more efficiently.

Left with a couple of slack weeks at Christmas, I decided to give it a try. Now, my offices aren’t exactly MacUser Labs, and I don’t have the Labs’ sophisticated testing equipment, but I do have my fair share of electronic toys. Besides, I was looking for effects that are observable and repeatable by anyone. I didn’t care if a line was slightly flatter on an oscilloscope; no, I was looking for things that you and every other reader could use.

Funny thing is, I found one.

Once I got past the silly ideas (such as whether spreading peanut butter on the mouse ball would make it grip the mouse pad better), things started to gel. The first test I tried had such startling results that I had to rethink many of my preconceptions and wonder whether equipment manufacturers are really paying any attention to the engineering side of things.

One of the relics in my closet is a crashed 60-megabyte drive. Long ago I tried virtually every software and hardware tool at my disposal to resurrect it. (Basically, it wouldn’t boot or save new files correctly — every time it wrote to the disk, a new bad sector was introduced, and the boot problem meant that it apparently wasn’t reading the outer tracks of the first platter well either.) I instinctively knew that neither Armor-All nor any of the other wonder products the audiophiles raved about was going to work on this baby — CDs, after all, are made of plastic (which Armor-All is designed...
for), but hard disks use metal platters with a thin coating of magnetic material.

Lacking any technical description of what the magnetic coating of a disk is made of, I decided to experiment. I had only one bad disk drive, but I have hundreds of floppies lying around the office. Reasoning that a floppy's coating must be somewhat similar to a hard disk's, I began treating floppies with a variety of liquids I found around the house.

Sure enough, Coca-Cola did a great job of loosening the material, making it a murky, mushy mess that rubbed off easily with my fingers. (OK, I cheated here. I knew this from previous experience. We used to use Coke to dissolve small portions of audio tracks on new film when we needed to bleep something in a hurry.) After that I tried dishwashing detergent, grape juice, Formula 409, Turtle Wax, Drano (talk about dissolving power — it made a hole in the floppy!), motor oil, and dozens of other chemical combinations.

The winner, of all things, turned out to be Lemon Pledge. A careful application of this liquid gently rubbed onto a floppy not only gave it a nicely polished look and a fresh lemon scent but it also seemed to stiffen the floppy slightly.

Encouraged by my initial visual examination, I stuck the treated floppy into a spare disk drive and tried reading the contents. The files were still all there, and a quick check showed no bad sectors or other damage. Moreover, I noticed that I couldn't hear the disk spinning. Apparently the newly polished surface cut down on surface noise while the disk was being read. (The noise, by the way, doesn't come from the heads touching the surface. It generally comes from the disk portion rubbing against the inside of the plastic case, which contains a protective dust liner.)

With much anticipation, I opened up my crashed hard-disk drive and sprayed Lemon Pledge onto the top platter. Spinning the mechanism carefully, I eventually managed to buff the platter to a bright, reflective sheen. I plugged the drive into the computer and tried starting it up. To my surprise, my formerly deceased drive booted perfectly. The drive had been in the closet so long that it booted System 4.2!

There were still some bad sectors on the disk, but then, I had treated only one of the drive's four platters.

And therein lay a problem: It was easy enough to treat the topmost, first platter, but what about the underside of that platter as well as the ones below it? If you know anything about hard drives, you know that these platters are packed together quite closely, and it's virtually impossible to take them apart without damaging either the platters or the head mechanism. Eventually, with the help of several tongue depressors; some old white cotton gloves; and that old standby, gaffer's tape, I managed to make a "robot" hand with very narrow fingers. I sprayed the contraption and then clamped it down gently as the drive was spinning. It took a while to accomplish, but eventually I'd completely treated the hard disk.

Not all the bad sectors could immediately be reused, which I'd suspected. If the disk error occurs outside a sector's data area (in the header information preceding each sector, for example), that sector will appear bad until you reformat the track it's on. So, with my fingers crossed and my lucky mouse cable wrapped around my forearm, I proceeded to erase and reformat the drive. A quick test showed no bad sectors! In a burst of daring, I tried copying files to it. Still no problems. A full analysis showed absolutely no lingering problems.

I've been using the resurrected disk for several weeks with no complaints. Every day I run a sector tester on it to see if a bad sector has popped up, but so far none have.

By now you're probably shaking your head and thinking that I've joined the leagues of the lobotomized. But wait, there's more.

We go through thousands of floppy disks a month here at Macreations, and, inevitably, we encounter a dozen or so disks every month that fail to initialize. When this happens, we grab the disk, write abg X on the label, and chuck it into a box. When the box fills up, we send the disks to the manufacturer for replacement.

Having just resurrected a hard disk, I began to wonder about that box of unformattable disks. Might some of them be salvageable? Why not find out?

So I grabbed a disk out of the box, stuck it into my machine and tried formatting it. As I'd anticipated, it wouldn't verify and the Mac's formatting routines rejected it as unusable. Out came the Lemon Pledge.

After ten minutes of polishing, I tried the disk again. Bang! It formatted with no complaints. By the end of the afternoon, I'd resurrected 12 out of 15 disks. (We'll just ignore the fact that I'd wasted several hours to get a dozen usable disks, when I could've simply sent them back and gotten new ones for free.)

Despite my success, something nagged at my subconscious. Formatting the treated
disks didn't seem to take as long as it usually did. Was I imagining things? Well, a simple explanation might go like this. The Mac's operating system tries to write information to a disk. When this operation fails, as it does occasionally, it tries again a few times (I think it's five times) before reporting this error to the user. If during one of these retries, the information is written without error, you'll never see an error message, because the Mac considers that it's completed the task successfully. Thus, theoretically, there could be as much as a fivefold difference in the time it takes to format two floppy's, one being perfect and formatting without a single failure and the other being marginal and requiring five attempts before writing each piece of data to the disk.

To format an 800K floppy disk requires writing 80 tracks of information and 1,600 individual sectors. For a 1.4-megabyte disk, it's 2,800 sectors. In all that sector writing, it's hard to imagine a random error or two creeping into the works every now and then. Statistics being what they are, most disks probably take about the same time to format. And because the Mac's operating system sets the number of retries so low, a marginal disk has a high likelihood of producing at least one sector write that produces more than five errors, so the disk fails to format.

That's the theory side of things. How about real life? Well, I couldn't test the formatting process, but I could create a small utility to test random writes to a disk. After several days, I decided to write to every sector of a floppy disk twice: once in sequential order, once in random order. I also hooked into the low-level operating-system routines so that each time the Mac tried to write to a disk, it bumped a counter in my program.

I expected a reasonably low number of errors, and that's what I saw. In the first ten disks I tried, I had error counts of 25, 21, 23, 25, 24, 19, 27, 18, 22, and 24 — that's out of 3,200 possible writes per disk. For the heck of it, I decided to treat these ten disks with Lemon Pledge and see what would happen. If Lemon Pledge was making it easier for the disk drive to do its job, these error numbers should go down significantly. But even I wasn't ready for the results: not a single disk had any errors!

I grabbed three disks that failed to verify their format and tried my little program on them. I got error counts of 157, 495, and 89. Out came the Lemon Pledge. I treated these disks and tried my little utility again. The second disk — the one that had the 495-error count — still looked pretty bad with 311 errors. But the other two disks had none.

Now comes the tough part — explaining just what Lemon Pledge does to disks. The polishing effect should not change anything, because the read/write heads of a disk drive do not actually touch the media. Lemon Pledge does contain ingredients that "pick up" dust, and dust, of course, is a no-no where disk drives are concerned. But does dusting a disk explain the dramatic results I found?

Could Lemon Pledge contain ingredients that enhance magnetic performance directly? (Indeed, is there such a thing?) The label on my can doesn't list any ingredients, although there is a helpful toll-free number, which I called. The representative, although polite, was at a loss to explain my results. She read me a list of ingredients, most of which are unpronounceable poly-syllabic words meaning "oil-based gunk."

I read the list of ingredients to a friend who manufactures disks. He didn't recognize most of them but tentatively identified one as an ingredient he thought was used for some sort of cleaning process.

As a last resort, he suggested I consult a chemist fluent in molecular physics. He also wanted to know what combination of planet alignments had moved me to even try such a thing.

So the Lemon Pledge bit-fixing mystery will simply have to remain a mystery for now. And by the way, you shouldn't just rush right out and Lemon Pledge every disk in sight. All those audiophiles who've treated their CDs with Armor-All have gotten an unpleasant surprise after several months: The Armor-All treatment breaks down and leaves a flaky white residue on the CD, making it virtually unplayable.

So, although the audiophiles believed that their treated CDs got marginally better sound, they also ended up having to buy new copies of the CDs after a couple of months.

Who knows what that Lemon Pledge is doing to the disk-drive heads? Is it possible that the effect will wear off right in the middle of a critical save? Who knows whether the treated disks will remain treated and usable and for how long? Heck, for all I know, all that Lemon Pledge I spilled onto my hands is going to cause skin cancer ten years down the line. In other words, folks, don't try this at home.

Besides, you should be wary of any advice that sounds too far out when you read it in the April issue.
Never before has such a small laser printer offered so much speed and economy—and Adobe® PostScript®, too.

Introducing the 16 ppm microLaser™ XL printer. The perfect partner for your Macintosh® computer!

Now you can afford a 16 ppm laser printer at an 8 ppm price, and create all the graphics the Macintosh is famous for producing. The newest addition to Texas Instruments award-winning microLaser family offers you two affordable Adobe PostScript models, with either 17 or 35 fonts, starting at just $4,144—hundreds less than comparable PostScript printers.

Just the right match for one Mac or many. Whether you use only one Macintosh computer or several, microLaser XL can handle the workload for you or an entire network. You can even switch between HP LaserJet® II emulation and PostScript without turning off the printer.

Superior paper handling.

Save time loading paper—microLaser XL’s paper drawer holds 250 sheets. You’ll save space too, because the drawer slides conveniently inside the printer. An optional, second 500-sheet paper feeder (750 sheets total) and automatic feeder for 70 envelopes are available for your large print jobs and mail-merge applications.

It’s all easy to control, too. That’s because PostScript software lets you choose the right paper tray with simple icons on your Mac screen. Just pick an option with a click of your mouse.

Plus, at only 15.8” wide and 16.6” deep, microLaser XL is the smallest laser printer in its class. So it’s a natural beside your Mac—or in a central location, conveniently tucked away. Powerful printing is a call away. See the power and performance of microLaser XL for yourself. Call for the location of a dealer near you.

1-800-527-3500

$4,144.12 (taxes, duties, and freight included. See your dealer for details.)

microLaser is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Macintosh and AppleTalk are registered trademarks of Apple Computer, Inc. LaserJet is a registered trademark of Hewlett-Packard, Inc.
While everyone else worries about compatibility with System 7.0, wouldn’t you rather be exploiting its powerful new features in your applications? Here’s how and why to write System 7.0-friendly code.

By Kurt W. G. Matthies and Thom Hogan

In Cupertino, Apple systems engineers have been laboring long into the night to bring you their latest and greatest: System 7.0, soon to be showing at a Mac near you.

System 7.0 will play to a captive audience. Although some Mac users will cling to the security of the tried-and-true System 6.0, those on the leading edge will use System 7.0 as their everyday operating system. And whether the pundits praise or pan the new System, developers will increase their market share by crafting applications for users of both versions. We explored this class of applications — those that are capable of running under System 6.0 and 7.0 — in last month’s column.

This month, we take a look at two features exclusive to System 7.0 — outline fonts and high-level events.

Outline Fonts

One of the most visible changes in System 7.0 — outline fonts — involves the Font Manager. Outline fonts produce an effect similar to that produced by Adobe Type Manager. QuickDraw displays text drawn in an outline font, using the maximum available resolution of the output device, so outline fonts can be displayed at any point size without the jagged appearance typical of bit-mapped fonts.

Bit-mapped fonts, also called screen fonts, have been around since the Mac’s inception. You’re probably familiar with how they’re organized. Bit-mapped fonts match the resolution of the screen (72 pixels per inch). Font designers carefully place each pixel for each character in a bit map and define these bit maps in multiple sizes, so when you use such fonts in a defined size, you get high-quality output. If you select a font size that’s not defined in the bit map, the output appears jagged and distorted.

Font publishers ship as many point sizes as they think necessary for their users to do high-quality work. Thom, for example, ships his Palo Alto font in 9-, 10-, 12-, 14-, 16-, 18-, 24-, 36-, 48-, and 72-point sizes. The more point sizes a bit-mapped font contains, the more disk space it consumes. In the Palo Alto font, bitmap information for each character is repeated eight more times, once for each size of the font. The larger point sizes take up the most space: PaloAlto 10 (the file for the 10-point size of the Palo Alto font) is described in 2,420 bytes, whereas PaloAlto 72 uses 30,516 bytes.

Outline fonts take advantage of a classic issue in computer science: trading storage space for computational time. The gist of the space/time trade-off is: If you’re willing to put in some computational effort, then you can generally reduce a program’s storage requirements.

With outline fonts, the information kept for each character is not a bit map but is instead a description that the Font Manager uses to calculate each character’s image. Font designers create a description for each character, called an outline, at a 1-point size. The Font Manager can create fonts of any point size from the 1-point outline, so only one representation per character is needed. This saves space: A typical outline font uses 40K. Not only do you get high-quality images at any font size, but you also get a significant decrease in storage requirements.
size but also the font-size restriction of 127 points is lifted — a benefit for you banner printers.

**Supporting Outline Fonts**

Because System 7.0 implements outline-font support at the Font Manager layer, your application can take advantage of outline fonts without modification. But it’s important to note that bit-mapped fonts have not gone away. System 7.0 supports bit-mapped as well as outline fonts, so in some situations, the system will contain both types of font for a particular family. In these cases, the system will default to the bit-mapped font. If you want to use the outline font, you must tell it to do so by calling `SetOutlinePreferred`, the new Font Manager routine that changes the default mode from Bit Mapped to Outline.

A word of warning: If you use the `SetOutlinePreferred` routine, your application must be running under System 7.0. System 6.0 doesn’t have this call. Calling `SetOutlinePreferred` under System 6.0 treats users to the notorious bomb box. In last month’s column, we warned against making your application System 7.0-dependent. Always check the System version before issuing a call to System-dependent code.

Because the Font Manager produces high-quality outline-font images in any size, you’ll need to add an Other item to your Font menu, if you don’t already have one. The Other selection should produce a dialog box that provides your users with a way to enter any positive font-size value. Apple recommends, via its user-interface guidelines, that you also provide your users with a way to increment and decrement the font size. Two common keyboard equivalents for these actions are Command-+ (plus) and Command-- (minus).

**An Eventful Release**

Although outline fonts may provide the most visible evidence of software changes, the most extensive changes to the new System involve the event-processing subsection. The Event Manager is being revamped in System 7.0 to accommodate IAC (interapplication communication).

Rest assured: Your application will still receive an event whenever the user paws the keyboard or twiddles the mouse button — System 7.0 will not affect those fragments of your existing application’s source code. But IAC brings a new kind of event — the high-level event — to the System’s repertoire.

High-level events are a result of a multiple-application environment: They’re generated by applications for other applications, and they form the basis of IAC. Communication occurs through these high-level events.

If you’ve had any experience with an MBOS (message-based operating system), such as RSX-11 or CTOS, then you should be familiar with the theory behind IAC on the Mac. In the vernacular of MBOS, a communication between two applications is called a message, and on the Macintosh, an application sends a message by posting a high-level event destined for another application running concurrently in the system.

Four terms — client, server, request, and response — form the basic vocabulary of MBOS. The application initiating a communication is called the client; the one targeted to receive the communication is called the server. Messages are classified into requests, which are initiated by the client, and responses, which the server posts in response to a request.

**Receiving High-Level Events**

Your application receives high-level events the same way it receives mouse-down or key-down events: in the main event loop. You probably recall that a Macintosh application receives events by calling `WaitNextEvent` in its main event loop (to jog your memory, see Power Programming, May ’90, page 320). When `WaitNextEvent` returns a valid event record, the event code in the event record’s `what` field identifies the event type. In System 7.0, the `what` field value equals 23 when the application receives a high-level event.

The Event Manager encodes information that identifies the message in the event record. The `message` field of the event record specifies the message class, and the `where` field contains the message ID. Both of these event-record fields are long integers, which the Event Manager uses to pass an `OSType` value, so message-class and ID values are similar application signatures. We expect that Apple will register message classes in the same way as it registers application signatures.

The message class defines the message origin. This uniquely identifies the sender of the message, so if your application’s going to send messages, it’s probably a good idea to use the application signature for this value. The message ID defines the type of message within its message class; we expect to see a range of these message-operation parameters in order to support the operations that each individual application is capable of.

Because of a high-level event’s limited size, all the data associated with it may not be completely contained in the event record. If your application intends to process a high-level event, it should call the new Event Manager routine `AcceptHighLevelEvent`, which retrieves the extra data associated with the event.

How do you know what extra data, if any, will be sent along with the high-level event? If IAC is to live up to its potential, it will require the cooperation of applications — and application developers. After all, if your application doesn’t understand a message format, it can’t take advantage of the data the message contains.

But don’t look for a world in which message formats are shared freely among applications — at least not soon. Major software vendors will initially keep their message formats to themselves. To start with, IAC will consist of private transactions among a vendor’s applications. The only message-format standards we’ll see in the near future will be from Apple, and they’re called AppleEvents.

**AppleEvents**

Apple will publish specifications for high-level events, called AppleEvents, in Volume VI of Inside Macintosh. Certified
The Question Isn't Why Ehman Monitors Cost So Little... It's Why Apple And Radius Charge So Much.

We make no apologies for the pricing of our monochrome monitors. Like all Ehman peripherals they're excellent products and superb values. But it's hard to explain the gap between Ehman monitors and the two leading brands. It's even harder to justify it.

You could buy three Ehman two page monitors for the suggested retail price of one Apple two page monitor. Or you could buy three Ehman full page monitors for the price of one Radius full page monitor.

If you think we've taken short cuts in quality, think again. Ehman monitors feature exceptional resolution, front mounted controls, and our two page monitor has true WYSIWYG resolution and a flicker-free refresh rate higher than Apple or Radius. Prices on the Ehman monochrome monitors include card, a tilt/swivel base, a full one year warranty, and our standard 30 day money-back guarantee. Also, our two page monitors include Stepping Out II software for the Mac II and the SE/30 models. For those who are in the market for monitors there are a couple of choices. If you don't mind spending money on expensive labels, buy your next monitor from Apple or Radius. But, if you prefer saving money, call Ehman.

$499
15" full page monitor/card

$899
19" two page monitor/card

Call 1-800-257-1666 FAX 1-307-789-4656

Please circle 188 on reader service card.
developers have had a peek at what these events tentatively will be; they’re listed in Table 1.

Unfortunately, at this writing, we can’t tell you anything else about AppleEvents and their format; we’re still waiting for information about them. But you can do something now that will aid your effort to support AppleEvents. Apple calls it factoring your code.

Isolating User-Interface Code

The need to factor your code — that is, isolate those lines of code that manage the user interface from those that perform an action — arises from the way AppleEvents and the eventual command-line interface to the Finder will work.

The following example illustrates what we mean. When the System sends your application an open-document AppleEvent, it also sends a list of documents to open. Your application gets the list by calling AcceptHighLevelEvent. There’s no need for your application to put up the SFGetFile dialog box to get file information from the user — the System sends the information that your application needs to open the files. You therefore don’t want to have the call to SFGetFile (which puts up the open-file dialog box) in your application’s file-open routine.

If your application is to support an AppleEvent interface, as we said earlier, you’ll have to isolate the user-interface code from the action routine. The action routine is the code that actually performs the operation. In this example, it’s the code that opens a document.

If you’ve been writing modular code all along, then you’re probably already doing this. But if you have been calling user-interface code in the middle of your action routines, your work’s cut out for you.

The open-document action procedure is particularly instructive, because chances are that your application already supports factoring. Most existing applications can open a document either from a File-menu selection or when the user double-clicks on the document’s icon in the Finder. If you’ve written your open action routine to be called from either of these places in your code, you’ve already factored out the user-interface code.

You can begin factoring your code right now, even without the AppleEvents specifications. Factor out the Open, Print, and Save action routines. When the spec is available, just plug in the code that parses the message data, and you’re off and running in System 7.0.

Note that we recommend that you factor out your Save action procedure, even though Apple hasn’t hinted that System 7.0 will require it.

Factoring is a logical result of modular programming and leads to the best way to implement Undo/Redo in your application. All the action routines in our commercial application, Tycho Table Maker, are factored. The input to Tycho’s action routines is a parameter block, which can be built from the user-interface subsection or from the redo subsection. But that’s the topic for another column . . . .
Until now, it has not been possible to generate a broad-based marketing exposure to some of your most likely customers. The Programmer's Page will provide you with a unique opportunity to build your market share across a horizontal cross-section of Macintosh power users.

Don’t miss out on this new way for you to market your programming package.

Call your ad representative today
1-800-825-4237 or 212-503-5115
Let NewGen satisfy your hunger for high-resolution with an affordable 800 dpi printer!

Add powerful applications like PageMaker®, FreeHand® and Adobe® Type Fonts to produce typeset quality output at your own facility.

The NewGen TurboPS/480 can produce PostScript® language compatible output at 800 x 400 dpi, nearly four times the resolution of other laser printers. And when we say PostScript compatible, we mean it, including Type 1 fonts, special effects and EPS files from all your favorite applications and programs.

The NewGen TurboPS/480 is a complete printer with built-in AppleTalk®, parallel and serial ports. And unlike some printers, it works in mixed Mac-PC environments, and it doesn’t require an internal PC processing board or dedicated server.

To show you how confident we are that you'll be impressed with 800 x 400 dpi output, we printed this page at actual size, including the menu which was output as color separations.

What does all this resolution and compatibility cost? Very little. The TurboPS/480—with 800 x 400 dpi and RISC performance—lists for about 25% to 50% less than its competitors, while our TurboPS/400, TurboPS/360 and TurboPS/300 laser printers cost less than slower 300 and 400 dpi PostScript language printers.

If you have an appetite for high-speed, high-resolution PostScript language printing, call 714/641-8900 today to get your TurboPS evaluation kit.

Dealer inquiries welcome.
QuarkXPress 3.0

QuarkXPress 3.0's in-line-graphics and paragraph-rule capabilities give you an easy way to create real fractions (placed top over bottom, not diagonally as in QuarkFreebies extensions). In-line-text boxes are simple to manipulate.

First create your standard text, leaving markers where you want the fractions to be. Then create a new text box on the pasteboard, making sure that the text inset for this box is set to 0. Create a fraction by typing the numerator, pressing Return, and then typing the denominator. The point size of the fraction should be 1 to 3 points smaller than the body text. Set the alignment to center.

Highlight the first line, and create a paragraph rule (using the Style menu). A hairline rule based on the indents works well with numbers greater than 9, but you can use the text setting for fractions that contain only a single digit top and bottom.

Make sure the text box is as small as possible without losing any type, and then click on the text box with the item-selector tool and copy it.

Using the editing tool, paste this box into the body text where you want the fraction to be. Use the Baseline Shift command in negative increments to bring the fraction down to the level you like. Use the kerning command on the Measurements palette to adjust the word spacing.

For small body text, you may find that the inline text box has too much white space to the right and that even kerning does not help. The only solution is to use the text box as a free-floating graphic. Just make sure that if you edit the body text, you also reposition the fractions, if necessary.

Once you’ve created a fraction this way, you can create others by copying and pasting the original fraction into new positions and changing the numbers.

David Zizza
North Billerica, MA

If you’ve ever wanted to create a word with a large initial letter and the other letters nested inside it, you can do it in QuarkXPress 3.0. The following steps will help you recreate the effect illustrated in Figure 1:

1. Type the first letter (C in the example) in a large font size.
2. Type the rest of the word (in this case, cats)
in a smaller point size.
3. Select the *ats*, and move the baseline up until it is in the middle of the opening of the C.
4. Select the C and the *ats*.
5. Select the *ats*, and reset the tracking to 0.

Although you can achieve the same effect by using two text boxes and placing one inside the other, this method is easier, because you don’t have to worry about grouping text boxes or making boxes transparent. It’s also a lot easier to rearrange and copy.

Alan Sopczak
Calgary, Alberta
Canada

PageMaker 4.0
In order to set professional-looking fractions in PageMaker 4.0, change the option for subscript position (on the Type menu) from 33.33 percent to 0 percent. To set a fraction, all you need do is type the numbers and change the numerator to superscript and the denominator to subscript. No more calculating and changing the size of your denominator — it will be perfect every time.

Margaret Lund
Appleton, WI

After Dark 2.0
Even After Dark 2.0’s extensive collection of modules can fail to stimulate after a while. But the screen saver’s MultiModule allows an amazing amount of customization without your having any programming knowledge whatsoever. One of my favorites is Stormy Skyline. To turn Stormy Skyline into one hell of an electrical storm (see Figure 2), simply follow these instructions:

1. Duplicate the Zot! module twice while you’re at the desktop, renaming the copies Zot!2 and Zot!3.
2. Open the MultiModule to Stormy Skyline (a predefined combination of Stormy Skyline and Zot!), and click on the Edit button. Add Zot!2 and Zot!3 to this MultiModule, making them transparent instead of opaque. You should now have all three of the Zot! modules and the Stormy Skyline module combined.
3. Resize and reposition the Zot!s — it looks better to have them different sizes.
4. Close the edited MultiModule, but first rename it something like Really Stormy Skyline.
5. Open the individual Zot! modules, and edit the kinkiness, delay of each, and set user level to 2.

Apple Installer
When using Apple’s Installer under MultiFinder to create startup disks, you normally have to put up with a lot of disk swapping — especially if you’re working from a hard disk and your system has only one floppy drive. You can reduce the number of disk swaps by increasing the amount of memory allocated to the Installer program, so that each of the four System disks needs to be inserted only once to obtain the necessary information. Here’s what to do:

Select the Installer icon, and choose Get Info from the File menu (or press Command-I). Increase the amount of memory allocated to the Installer in the Application Memory Size box. Give the Installer at least 1 megabyte of RAM to work with.

Using the same method, you can increase the amount of memory allocated to Font/DA Mover. This will reduce the number of system crashes when you’re copying or deleting large font or DA files.

Ward Barnett
Minnetonka, MN

HyperCard
I finally got tired of typing set userlevel to 5 and set userlevel to 2 when developing applications in HyperTalk. So I wrote the following and put it into my Home-stack script:

```
on u x
set userlevel to param(1)
end`
```

Now I just type `u 6 or u 1` in the message box.

Paul Clatworthy
Redondo Beach, CA
Word 4.0

Underlining equations with subscripts or superscripts can be hard in Word 4.0. The underline style (Command-Shift-U) places separate underlines under the subscripted or superscripted numbers. Here's how to get a solid underline under equations, whether the format is displayed or in-line:

1. Choose the Show Paragraph command from the Edit menu (or type Command-Y).
2. Press Command-Option-
   This is the preparatory command for doing mathematical typesetting.
3. Enter the letter-typesetting code—in this case, X (for the Box command).
4. Press Command-Option-
   again, followed by BO for the bottom border of the box.
5. Type in the arguments, and enclose them in parentheses. Apply superscript and subscript formatting where necessary.
6. To view the formula, select Hide Paragraphs. Word's typesetting code draws a solid line under the equation and won't interfere with the rest of the paragraph's formatting (see Figure 3).

David J. Siegel
Northridge, CA

MultiFinder 6.0x

Ever wondered what kind of people programmed your Mac? If you're running MultiFinder 1.0, hold down Control-Option-Command and select About MultiFinder from the Apple menu. Alas, in more recent versions, this humorous box seems to have been removed. But don't despair, the Mac spirit lives on! For an example, use ResEdit to examine STR# ID = -127 in MultiFinder 6.0.x (see Figure 4).

Peter Maloney
Toronto, Ontario
Canada
that you might be able to save work that was open when your system crashed? That you don’t have to hold down Command-Option-Plus to add an item to the Microsoft Word “Work” Menu? That you can print double-sided pages from any application? That you can add frequently used filenames to the Word menu bar? Lon Poole has selected the best from his Quick Tips column in Macworld magazine and combined them with nifty ideas from software publishers, equipment manufacturers, and user groups in a book that’s both useful and fun. Lon Poole’s BIG BOOK OF AMAZING MAC FACTS is available wherever better computer books are sold, or you can order directly from Microsoft Press. Now you know! $24.95

To order, call

1-800-MSPRESS
Refer to ad AMA.
Microsoft Press
One Microsoft Way
Redmond, WA 98052-6399

The Authorized Editions

Please circle 40 on reader service card.
Word Memo Magic

Q. Some years ago, I watched a colleague do something with Microsoft Word that no one at either my local user group or at Microsoft tech support has been able to duplicate. He selected an item named Memo Template from the Work menu, and after working through a series of dialog boxes (asking who the memo’s from, whom it goes to, the date, subject, and so on)—hey, presto!—he had a customized memo ready to go.

Can you offer any guidance on how to duplicate this? Maybe the computer consultant who adapted my colleague’s Word program knows something we don’t.

F. Gury Bivings
Washington, DC

Andy: I’m faced with two options here, F. Either I admit defeat and say I dunno how the Zarquon he did it, or I can claim that the computer consultant made some wacky, illegal modifications to Word (I’m sure that if you give the Phd Medical Center’s name to Microsoft, they’ll send you a free T-shirt or something).

No, but seriously, you can duplicate 99.44 percent of your colleague’s memo template pretty simply. Believe it or not, Word actually has a built-in mechanism for generating dialog boxes and collecting data from users! It’s called the ASK command, and it’s part of Word’s Print Merge feature. The command goes like this:

<<ASK fieldname=?Message to be shown in dialog box>>.

So let’s get to work. Create a memo template the same way you’d create a mail-merge document, with field names (<RECIPIENT>, <<REGARDING>>, and the like) representing the stuff that’ll change from memo to memo. Then at the beginning of the document, just write an ASK statement for each field, viz:

<<ASK RECIPIENT=?So who’s this going to, Doc?>> (see Figure 1).

And that’s all there is to it. To generate a memo, open the template, select Print Merge, and click on the New Document button in the Print Merge dialog box. Word then throws dialog boxes onto the screen, asking for the info for each field and merging it into the new memo document. Move the memo template into the Work menu, and you’ve duplicated 99 percent of the Evil Consultant’s magic-memo trick.

For the remaining 0.56 percent, we have to get the Print Merge dialog box and the associated dialog boxes to come up after selection of the template without a manually entered Merge command and whatnot. We can, of course, do this very easily with a macro (Microsoft Word includes a macro maker).

Figure 1: Go ahead and customize those memos: Dialog boxes using the ASK command in Microsoft Word’s Print Merge function make it easy.

Got a question that’s so simple you’re embarrassed even to ask? The only stupid questions are the questions you don’t ask, so send ’em in! If you think it’s too embarrassing, we’ll say it was written by a deceased English poet laureate, so hop to it!

Q. Is there any real difference between the printer port and the modem port? I want to add a second printer to my Mac and thought I could just plug the second printer into the modem port, but my dealer says it won’t work and I’ll have to buy LocalTalk. Is he just trying to sell me a bunch of hardware I don’t need? Will I burn out the modem port?

Versificator Regis (1216 – 1272)
Palos Verdes, CA

Andy: Well, Versificator, if you’re reading this in your dealer’s store, run, Divx for the car and peel out of there in a spray of gravel, because your dealer is dead wrong.

Simple answer first. The only difference between the two ports is that the modem port does not support LocalTalk. You can go nuts and plug a modem into the printer port and vice versa. The only catch is that your software will expect modems and printers to be attached to their proper connectors, so you’ll probably have to change the default settings for the software you’re using (use the Chooser for printers and your communications software for modems). Lots of folks use the printer port for LocalTalk and have an ImageWriter hooked up to the modem port. That way, they can print draft copies without having to queue up to use the office LaserWriter.

In the Pursuit of Truth, I have to tell you that the two ports aren’t exactly identical, at least not in the sense that the Landers-Van Buren sisters are identical; the modem port has a few things that make it more suitable for telecommunications than the printer port. This doesn’t mean that you can’t—or shouldn’t—use a modem with the printer port. This is America, and subject to state legislation, you can put your modem wherever you want.

By Bob LeVitus

and Andy Ihnatko
Um... well, I've been working at this problem for almost four hours now, and I have to admit that I'm stumped. Calling a macro from within a Word menu command appears to be impossible. But because this is America, we're allowed to fake it. Instead of trying to make Word call a macro, have a macro call Word. Just record a macro that selects the template from the Work menu and performs the merge commands.

Bob: I've been using Word for years but even didn't know you could do that! Very cool, Andy. Of course, it's in the Word manual, under "Forn Letters." Why didn't I think of that...?

Andy: It just goes to prove that it's very important to read the manual, even though it really makes you look like a wimp in front of the other guys and of course you'd never catch me doing it.

How Much RAM?

Q. I have a Mac Plus with 2.5 megabytes of RAM. However, my DiskTop DA seems to be unable to recognize the amount of memory I'm using when I run under MultiFinder. As you can see by the attached screen dump (see Figure 2), DiskTop says I have 29K out of 324K free, but About the Macintosh Finder says that I have 2,560K of total memory and an unused block of 1,530K. What gives?

Jerry O'Neil
Polaski, NY

Andy: Before we go any further, I should say, in Jerry's defense, that the screen shot actually came from my system, not his! Now that we've got that out of the way, the discrepancy you've noticed has to do with the way MultiFinder handles DAs. When you use the regular Finder, you have one application sitting in a 2.5-megabyte "box" of memory (well, OK, I'm simplifying things here). It's really 2.5 megabytes minus your INITs, the System file, and a whole lot of other things. When you open a DA, the System throws that DA into the same box as the application, memory permitting.

Under MultiFinder, however, the 2.5-megabyte memory box gets chopped up into a lot of little boxes — one for each program being run. This keeps memory nice and tidy — Microsoft Word stays in its 1-megabyte box and doesn't 'tore into Tetris' 512K playpen. But what happens when you open a DA? Should MultiFinder steal some memory from Microsoft Word and throw the DA into its own box or memory?

No, no, that wouldn't do at all. Instead, MultiFinder gives all the DAs a 324K memory box of their own. So when you ask DiskTop how much memory it can "see," it looks at the size of its box and figures that you have a total of 324K of memory.

You're certain to get a correct memory reading when you ask the Finder. The Finder is God. It sees all and knows all. In fact, those bars you see in the About the Macintosh Finder dialog box represent the programs currently in memory and the size of their boxes.

Bob: And speaking of more memory, here's a tip on getting recalcitrant DAs to work when the 324K that MultiFinder allocates them just isn't enough. To apply this tip, you must first allocate additional memory to the application (the tip also works with the Finder) that you plan to use when you access the memory-hungry DA. To do this, select the application’s or the Finder’s icon and then choose Get Info from the File menu (or type Command-I). Type a number that's at least 325K larger than the suggested memory size into the little box that says Application Memory Size (K). Once you've done that, launch the application and then hold down the Option key when you select your greedy DA from the Apple menu. Instead of loading into MultiFinder's DA Handler, the DA now loads into the "memory box," as Andy refers to it, for the application. Because you have allocated additional memory to the application, the DA has more room to do its thing than if you had chosen it without holding down the Option key.

Plus Obsolete?

Q. Now that all the new Macs are on the market, I wonder what will happen to all of us "old"-Mac owners. Two weeks before the Classic was introduced, I bought a Mac Plus, an HP DeskWriter, and a 35-megabyte hard-disk drive for around $2,100 (I was unable to resist such a great price on the world's finest computer). I am incredibly happy with my purchases, but I'm wondering if I made a bad decision. How many Mac Pluses have been sold, and now that the Plus has been discontinued,
CheckFree: The Fastest Way To Pay Bills And Handle Finances

CheckFree®
Electronically Pays All Your Bills And Automates Your Recordkeeping. No Checks, No Stamps, No Paperwork.

Specially Designed for The Macintosh.®
For the first time, Macintosh users can experience the speed, convenience, and simplicity of paying bills the CheckFree way. Now you'll discover that CheckFree is the superior bill-paying solution.

It Couldn't Be Easier.
All you do is enter payment information, and CheckFree software automatically categorizes, and sends the information to the CheckFree Processing Center via modem. Payments are then processed through the Federal Reserve System—the same system that banks use to clear your checks today. Fixed, recurring payments (such as mortgages) can be made automatically once they're set up. You never have to bother with them again.

Pay Anyone Through Any Bank.
You can pay anyone with CheckFree because the CheckFree Processing Center utilizes electronic transfers as well as laser printed checks to make payments. If a company or individual you are paying is not set up for electronic payment, the CheckFree Processing Center will print and mail a laser printed check for you. Because of its universal payment processing technology, CheckFree can process payments to anyone in the U.S. through the checking account you already have at any bank, credit union, or savings and loan.

No Loss Of Float.
You tell the CheckFree software when you want your bills paid and the CheckFree system pays them on the dates you specify. All we need is a few days advance notice to make sure your payments get processed on time.

Saves Time, Paperwork, And Money.
Your bill paying and other routine financial activities can be reduced to just a few minutes. Paperwork becomes virtually non-existent. Plus the CheckFree service is only $9.00 per month—not much when you consider the savings in postage, bank charges, and late fees.

Organizes Your Finances.
CheckFree gives you a completely automated checking account register that's updated automatically with each transaction. You can also record deposits or other non-CheckFree transactions. Checkbook reconciliation is virtually automatic. There's even an easy-to-use package of income, expense, and budget reports that keeps you constantly aware of what's coming in and what's going out. Plus, you can export CheckFree data to Excel® and MacIntTax®.

Completely Secure.
CheckFree is more secure than conventional check writing. Payments are processed through the Federal Reserve System, so CheckFree never requires actual access to your account. Only you have access to your funds and only you authorize payments.

Backed By The Nation's Leader In Electronic Payment Services.
CheckFree has been the leader in electronic payment processing since 1981, with current payment volume exceeding $1,000,000,000 annually.

Used By Thousands All Over The U.S.
See what experts have to say:

"The CheckFree electronic bill paying service belongs to that rare class of products that is forward-looking, universally useful, and available today."

PC Magazine, Best of 1989 Awards: January 16, 1990 issue

CheckFree makes bill paying a quick, painless task rather than a monthly ritual to be dreaded ...

CheckFree Corporation has been handling commercial electronic payments for companies such as CompuServe® for years, and its experience and professionalism showed in all aspects of my dealings with it.

PC Magazine

"...CheckFree did not fail me. When my banking statement arrived the first thing to catch my eye was a CheckFree check...this laser-printed paper check was reassurance that someone else could be trusted to pay my bills..."

Robert Cullen, Home Office Computing

Now that you know all about CheckFree, why would you pay your bills and handle your finances any other way? Why would you burden yourself with checks, stamps, and paperwork while your Macintosh sits idly by? Besides, when you order by phone or mail, CheckFree comes with a money back guarantee. If you're not completely satisfied with CheckFree software, simply return it within 30 days of purchase for a full refund. You've got nothing to lose.

So order today. Call 1-800-882-5280 (Monday through Friday from 9AM to 7PM EST) or send $29.95 (plus $4 shipping and handling) to CheckFree Software P.O. Box 507 Columbus, OH 43216

CheckFree is also available at leading retailers including Egghead Discount Software®, Electronics Boutique®, Babbage's®, Waldensoftware®, Software Etc., and Soft Warehouse®

CheckFree®
Client Support: Free access via Email. Hardware Requirements: Macintosh® 312KE or higher 5.25 drive and a Hayes® compatible modem. *Limitations: Over 20 monthly transactions involve a nominal surcharge ($5 per ten payments or portion thereof).

CheckFree® is a registered trademark of CheckFree Corporation. All other trademarks are the property of their respective corporations.
help folder

MacUser

You got a pretty good deal — a ware developed for the Classic comparison of full-page monitors? be compatible with the Plus? Classic, SE, and Plus all use for less than Plus, a printer, and a hard drive Plus with no hard drive or have to worry about old-Mac been so old, bu!

"Picture-Perfect Portraits: Full­support the Plus (and the SE) shouldn't have many problems. Finally, MacUser Labs re­ported on full-page displays a couple of months ago (see "Picture-Perfect Portraits: Full-Page Displays," February '91, page 176).

Andy: I guess it's Plus Pride Month! You won't regret your purchase, Paul. A few of the Classic's major improvements over the Plus: The logic board is about half the size of the Plus' and has a more efficient design; instead of the old 800K disk drive, there's a 1.4-megabyte SuperDrive; there's a standard ADB port instead of the old phone-cord keyboard cable; and the notoriously wonky Plus power supply has been taken out and shot and replaced with a nice, stable, fan-cooled unit.

As you might guess, most software out there couldn't care less about all that stuff, so you shouldn't have many problems. Frankly, I'm hard-pressed to think of any software that would run on a Classic but not on a similarly equipped Plus. The Classic has four times the ROM capacity of the Plus, but 358K is taken up by "diskless server" code that (hypothetically) lets the Classic connect to and use AppleShare file servers without any additional software. This leaves only a 26K discrepancy, the exact size of the freeware game Duck Hunt. Coincidence? Maybe.

There are some hazards involved in owning a Plus, however. There's the possibility that one day Apple will run out of replacement Plus compo­nents (especially power supply!), and then we won't be able to get our machines repaired. I don't think that's a cause for concern; after all, you can still go somewhere to get an eight-year-old Lisa fixed, so I wouldn't be too worried about the Plus. Then there's the threat that eventually The Industry will abandon 800K disks and ship software exclusively on 1.4-megabyte floppies. If it happens (and I don't think it will for another few years yet), you'll just have to blow $300 on an external 1.4-megabyte drive — that's all.

The final hazard is the scorn and decision of clothed-eared louts with 24-bit-color IIfx systems. Just remember that (a) whatever doesn't kill you makes you stronger and (b) according to current U.S. Postal Service regulations, it's not illegal to mail, to a domestic addressee, a package containing rotting fish parts.

Trashing INITs
Q. I have a Mac Plus with a 45-megabyte hard-drive disk. After loading SuperLaser­SPOOL, I was surprised to see how much memory it required and decided to remove it from my System Folder. I tried to drag it into the trash but was told that the application was locked or busy and that the trash couldn't be emptied. I tried holding down the Option key while dragging the file to the trash, which should have done the job, but I got the same message. Eventually, after many attempts and different combinations of trashing and reboots, I was able to get rid of the file, but I had to com­pletely power down twice before the file would leave me alone.

The same thing happened later that day when I installed Adobe Type Manager. Basi­cally, I'm confused. I have only a few INITs and only one System Folder (as prescribed by Dr. Macintosh!), so I can see no reason for this problem.

Paul Croteau

Denton, TX

Bob: You again, Paul? Well, because you're new to the Mac and this is a good question, we'll answer this one too. The problem is that the INITs (SuperLaserSPOOL and Adobe Type Manager) really were busy. If an INIT is in the System Folder at startup time, it will be activated. Many INITs, such as the two you've had your problem with, cannot be removed while they're active. There are several ways you could deactivate them and then trashed them. The easiest is to boot from a floppy disk with a System Folder on it and then drag the INIT from the System Folder on your hard disk to the trash. Another way is to use an INIT manager, such as INITPicker or Aaak. Turn the INIT off, reboot, and then drag it into the trash. Finally, you can move the INIT out of your System Folder and onto the desktop (or into another folder) and restart your Macintosh. Because an INIT won't activate unless it's in your System Folder at boot time, you can then trash it without any problem.

Andy: Just remember, Paul, within any one Help Folder, only the first two answers are free of charge. One more question, and we'll have to start charging you.

More Problems

More Problems

Q. I'm having a problem trying to move and trash a couple of files. When I try to move them or to send them to the Great Trash Icon in the Corner, the following alert comes up: "Cannot be duplicated or moved."

I have tried the lock and unlock routines to no avail. How can I trash these two rascals?

William R. Gallagher

Magadore, OH

Andy: I suggest you contact your local user group and ask for Apple Technical Notes #4482: "Stuff We Put in Just to Make Life Hard for Our Users."

When a file won't budge, it's

Figure 3: A whole wheelbarrowful of attributes, huh? SUM 2.0 lets you edit a file's attributes so that (among other things) you can trash it more easily.
usually because its File Protected or File Busy flag has been checked. (File Protected means that the file cannot be copied or deleted; File Busy means it’s currently being used by some application, such as MultiFinder or AppleShare.) To change a file’s attributes, you need a program such as SUM, DiskTop, or ResEdit 2.0. Figure 3 shows what SUM’s Edit File Attributes dialog box looks like.

If the File Protected or the File Busy flag is set, try turning it off (after you’ve made a note of which attributes were turned on before you started monkeying around). A document generally has just its Inited flag set; an application usually has its Inited and its Bundle bits set. Use a little caution at first; maybe another application really is using that file, and trashing it could ruin your whole day. For safety’s sake, turn off MultiFinder and remove the Mac from any file-sharing networks.

Still can’t trash the file? Maybe there’s an INIT that’s struggling to keep the file open, such as Suitcase II or a networking INIT. Disable all your INITs, and try again.

I should mention that all of the above is hardly a polite way to interact with your Mac. Ideally, file attributes should be modified only by the System, the Finder, and other programs that know what they’re doing: that way, if something gets terminally screwed up, it won’t be your fault and you’ll have somebody to sue.

If you’d like to learn more about what exactly all those file attributes do, your best bet is probably to pound your head against a wall over and over again until the desire passes.

**Transferring Fonts from PCs to Macs**

**Q.** Friends with PCs have modems and I don’t, so in my ignorance I have to ask: Can font files (including the resource forks) be received by PCs and then successfully transferred via TOPS to a Mac?

**Name and address withheld**

**Andy:** In today’s society of technological brotherhood and unity, anything’s possible, Name and. Downloading a Mac file from a bulletin board to a PC is a piece of cake, and TOPSing the downloaded files from the PC to your Mac is as easy as pie.

It’d all be so perfect if it weren’t for the fact that none of the files will actually be usable. All the downloaded files — fonts, applications, graphics files, whatever — will appear on the Mac desktop as generic documents, and any attempts to open the docs will result in the Mac’s ever-so-helpful “Application busy or missing” error message.

The problem lies in how a Mac file is stored on-disk. As you mentioned, a Mac file (be it a document, an application, or whatever) actually consists of two separate forks: a resource fork and a data fork. (You can think of them as two subsifiles if it’ll help; we programmers just like to work the word fork into polite conversation whenever we get the opportunity.) The resource fork contains Mac resources, such as actual program code, prefabs, icons, windows, menus, sounds, little snippets of text, and the like. The data fork — and this is a direct quote from an official Apple Glossary — “Contains non-resource information.” Thanks, guys! So, as an example, if you examine an application that prints a 20-page user manual when run, you’ll probably find its menus, windows, icons, and the actual code itself in the resource fork and the 20 pages of text in the data fork. (OK, OK, that was kind of a long diversion, but was it all that much trouble to read?)

This is perfectly spiffy way of storing data, but it’s unique to the Mac. Almost all other computers store their files in one big, wobbly mound of data, and this causes problems. Somehow the Mac’s two forks have to be crammed together before the file can be put onto a PC.

Fortunately, those Apple guys think of everything. We have a solution in the form of the MacBinary protocol, used by the vast majority of Macintosh communications software. It’s nothing more than a standardized fork-cramming scheme. When a Mac file is electronically sent somewhere, the MacBinary protocol merges its two forks into one stream of data and puts a “header” at the top of the file. When a Mac receives a MacBinary-encoded file, it uses the information supplied in the header to separate the data back into its original two-fork format.

Finally, we get to the meat of the matter: IBM PCs don’t support MacBinary, and neither does TOPS. This means that the crammed-together file isn’t restored when the PC downloads it, and it isn’t restored when TOPS moves it to your Mac. But fret not, you can fix the file yourself, with a shareware Apple File Exchange translator called MacBinary to Mac (available on Zmac and from other shareware sources). This translator can read the MacBinary header and turn that generic document into a double-clickable application; a working font file; or if you’re lucky, a 256-color PICT of Kim Basinger.

By the way, you get the same problems when you download a Mac file to a DOS disk and then use your Mac’s SuperDrive to try to read the file. You’ll be able to copy the file to your hard drive, but you’ll need to use a MacBinary translator before you can use the file.

**Bob** (who was recently quoted in the *New York Times* as saying, “Touching a PC makes me feel crawling inside”):

I don’t do DOS. I’ll defer to Andy on this.

**Environmental Shipping**

**Q.** Most manufacturers ship their products with anti-environmental products, such as Styrofoam and plastic. Suppose these same manufacturers offered prepaid return postage on the box with the foam molds so that they could reuse them? I wouldn’t mind getting an old box as long as I got a new product.

**Chuck Watkins**

**Chelsea, AL**

**Andy:** Sounds like a good idea to me, Chuck. Why not write a few letters to your favorite companies and suggest it? One by one, corporations are realizing that becoming environmentally aware isn’t just hip, it’s profitable. If enough folks write in asking for environmentally study packaging, we’re sure to see a real change.

But until the industrial complex knuckles under, why not recycle that stuff yourself? The environment aside, it’s a good idea to hold on to all the packing material your hardware came in, because you may need to ship the unit back to the manufacturer for service one day, and many companies actually demand that you ship it in its original packing. Plus, that custom packing is the next safest thing to a hard-shell case. Believe it or not, I once checked my Mac Plus (in its original box) on an airline flight as luggage and it came through without a scratch (the Mac, not the box).

As for those packing peanuts and whatnot, toss ‘em in a bag. There’ll be one less thing for baby seals to munch on, and you’ll always be prepared when you have to send off a package.

**Bob:** I try to do business only with companies that are, as Andy so eloquently puts it, “environmentally study.” A tip of the hat to mail-order vendors such as MacConnection.
The votes have been counted and *MacUser* editors have chosen these Macintosh products as the best of the best in their categories.

Congratulations to the companies who have put considerable time and effort and forethought into raising the standards of excellence for Macintosh products. So go with the winners—the 1990 Eddy Award winners!
Congratulations To The 1990 Eddy Award Winners

Global Village Communication Teleport A300
Best Communications Product
The first AOB-compatible personal modem for the Macintosh
Teleport A300 DP/137301
Sugg. Ret. $225

Graphsoft MiniCad+ 3.0
Best CAD Software
A competitively priced, 2-D CAD system with project-cost spreadsheet
MiniCad 3.0 DP/191202
Sugg. Ret. $695

Symantec THINK Pascal 3.0
Best Development Tool
Provides extensive support for object-oriented programming
THINK Pascal 3.0 DP/232128
Sugg. Ret. $249

Timeworks Publish It! Easy 2.0
Best Page-Design Program
The all-in-one desktop publishing program
Easy 2.0 DP/277021
Sugg. Ret. $249.95

Dynaaware DynaPerspective 2.0
Best Modeling/Rendering Package
Brings new perspective to 3-D modeling
DynaPerspective 2.0 DP/165204
Sugg. Ret. $995

Symantec Norton Utilities 1.0
Best Utility
An ideal combination of data recovery and disk utilities
Norton Utilities 1.0
DP/290050
Sugg. Ret. $129

Brøderbund TypeStyler 1.5
Best Typographic Program
An amazing range of effects lets users put their best font forward
TypeStyler 1.5 DP/121178
Sugg. Ret. $199.95

Paracomp FilMaker 1.0
Best Animation Program
Powerful animation and presentation program with dramatic special effects
FilmMaker 1.0 DP/290516
Sugg. Ret. $995

Digidesign Deck
Best Music Product
(Two Awards)
Multitrack digital recording with auto-mixing and MIDI playback
Deck DP/177204
Sugg. Ret. $349

Symantec MORE 3.0
Best Presentation Product
Creates presentations and documents quickly and easily
MORE 3.0 DP/252116
Sugg. Ret. $395

Dayna Communications EtherPrint
Best Connectivity Hardware
Affordable Ethernet connection for LocalTalk network printers
EtherPrint DP/150743
Sugg. Ret. $499

Sigma Designs L—*View Multi-Mode
Best Display Product
A breakthrough in Macintosh display technology
L—*View Multi-Mode
DP/232192
Sugg. Ret. $1,999

Letraset ColorStudio 1.1
Best Color Prepress Program
Brings professional-quality color capabilities to the Mac
ColorStudio DP/242137
Sugg. Ret. $995

Farallon Timbuktu 3.1
Best Connectivity Software
Lets users transfer or exchange files and communicate with other users
Timbuktu 3.1 DP/185139
Sugg. Ret. $149

MicroNet Technology SBT-1288NP
Best Storage Product
1.3 Gigabyte hard disk subsystem with 6 ms access time
SBT-1288NP DP/254476
Sugg. Ret. $12,990

Honorable Mention
Clara Clara FreeMaker Pro 1.0/Data Management Product
DP/222050
Sugg. Ret. $299
• Adobe Systems Illustrator 3.0/Graphics Program
DP/305204
Sugg. Ret. $595
• Adobe Systems Illustrator 3.0/Graphics Program
DP/222046
Sugg. Ret. $199.95
• Adobe Systems Illustrator 3.0/Graphics Program
DP/127508
Suggest Ret. $499.95
• Adobe Systems Illustrator 3.0/Graphics Program
DP/101095
Suggest Ret. $295

“Leading The Way in Worldwide Distribution”
1 (800) 456-8000
*This is a partial list of 1990 Eddy Award winners. For complete and up-to-date information, please visit the Eddy Award website. © 1991 Ingram Micro Inc. All rights reserved.

Please circle 407 on reader service card.
Your data is your data. And to keep it that way Kensington introduces PassProof™ — the first complete data protection system for the Macintosh.

First, the hardware.
A rugged cylindrical lock keeps your disk drive safe from intruders. Two sturdy metal plates with tamper-proof screws block both rear-floppy and SCSI ports.

Next, the software.
As the master user you assign yourself a master password. From then on, you use the password as your key to unlock the system. You can add or delete additional users whenever you want. And PassProof’s User Log keeps track of every attempt to use your Mac.

Want to “lock up” in a hurry? Quick Cover™ is PassProof’s screen-locking program that lets you secure your Mac on command.

Best of all PassProof is user friendly. Unless, of course, the user is unauthorized. Ask your dealer about other Kensington accessories including cable and lock systems for all Apple and Macintosh computers, including the Mac Portable and the LaserWriter® II. Or call for a free brochure at 800-535-4242. Outside the U.S., call 212-475-5200.

Please circle 387 on reader service card.
Uncovering the Trash

Q. When running an application under MultiFinder that has a window that covers the screen and that cannot be closed without quitting out of the application, how do you trash a file?

K. Millhone
Santa Barbara, CA

Andy: The first thing you need to do is call the manufacturer and give it a savage tongue-lashing for violating Apple's user-interface guidelines. If you live nearby, you may opt to kick over the firm's garbage cans.

As for a practical solution: If all you want to do is delete a file, you can do it with a DA such as DiskTop or DiskTools, which duplicates most of the Finder's functions. If you're dead set on using the Finder, get a copy of AltWDEF, a shareware cdev that "iconizes" a window, shrinking it out of the way when you're not using it (see Figure 4). I consider it Standard Operating Equipment for MultiFinder, where you often have a whole mess of overlapping windows.

AltWDEF is available on Zmac or from your local user group.

Bob: I don't care for AltWDEF because it leaves a nice, friendly icon behind instead of a big, ugly stripe across your screen. But then again, I've never been quoted in the Times . . .

and Mac's Place who have forsaken packing peanuts for environmentally sound materials such as newspaper and popcorn. I hope other businesses will take the hint and start doing the same.
Suitcase II: A Matter of Being In the Right Face At the Right Time

Suitcase II is the award-winning software that gives you unlimited access to all your fonts and desk accessories, all the time. Without having to use Font/DA Mover to install and uninstall them. Without cluttering up your system file.

Suitcase II lets you view an unlimited number of fonts in their own typefaces at any moment, so you can pick the right face at the right time, without breaking stride. You'll never have to reboot your Macintosh to install a new font, or search through a cluttered System File to find what you need. Font ID conflicts are a thing of the past with Suitcase II.

And you'll never have to restart your system to install a Desk Accessory, because whatever you need will be right in your face, whenever you need it!

So why spend your time juggling fonts and DAs any longer? Now is the time to put Suitcase II on your Macintosh!
That Darned WDEF Virus

Q. Although I frequently scan my entire hard drive and all floppy drives with the antiviral programs SAM and Virex, I am plagued by a recurring warning that a strain of the WDEF virus has been found in the Desktop file of my drive. I have tried both deleting and repairing this file as well as scanning my hard disk after booting it from another disk. Still, every few days the strain appears again.

Andrea Martinez, Diamond Bar, CA

Bob: It sounds as though you've got an infected floppy disk somewhere, and every time you insert it, it infects your hard disk. Frequent scanning with SAM or Virex won't prevent you from getting reinfected; you'll also need to install SAM Intercept or the Virex INIT (one or the other). First use the SAM or Virex program to eradicate the virus. Then install either SAM Intercept or Virex INIT, and make sure it's set to automatically scan all floppy disks on insertion. That should keep you from getting reinfected.

The WDEF virus is the most virulent strain around. In fact, it's not even necessary to launch a program file for the infection to spread — merely inserting an infected disk is enough to infect all other mounted disks. It infects only the invisible Desktop file, and it rapidly spreads from disk to disk. Fortunately, you can eradicate the WDEF virus by rebuilding your desktop.

To do this, hold down the Command and Option keys when starting your Mac. Keep holding them down until you see the dialog box asking if you really want to rebuild the desktop. Click on OK. If you have more than one hard disk or multiple partitions, keep holding the Command and Option keys down until you've seen the dialog box for each drive.

Andy: WDEF (not to be confused with the AltWDEF cdev, of course!) is a wasp at all right. In my opinion, however, the auto-scan INITs are the only reason to choose a commercial virus-whopper over the shareware product Disinfector (available from Zmac, etc.). Disinfector's INIT automatically scans the System file at startup, but it doesn't automatically scan individual files, because it's designed to sense the activity (not the presence) of known viruses and block them from actually following through with their unholy machinations. Compared with commercial scanning INITs, Disinfector's INIT is faster, less obtrusive, and just as effective in preventing infection.

You didn't say whether your Mac was part of a network or not, but I'll pass on a warning anyway. If someone on the network has mounted your hard disk as a remote volume, it's possible that your disk has become infected by a virus on that guy's hard disk, transmitted through the network. For this reason, any attempt at virus protection has to be applied to all the Macs on the network in order to be effective. Of course, if you install an auto-scan INIT on every networked Mac, you'll eliminate the problem entirely.

---

You'll get your data back fast with SUM II. New SUM II recovers crashed hard disks and accidentally thrown away files so effectively, MacWEEK magazine calls it "the best set of utilities available for file and disk recovery." SUM II protects data, speeds up hard disks, and even includes a complete backup program. It's the best-selling, highest-rated data protection and recovery program for the Macintosh. Imagine what it can do for you.

Get SUM II today! See Your Dealer Or Call (800) 228-4122 Ext. 688F for information.
Adapt to Changing Environments With Microtek's Color/Gray Scanner.

At last, a scanner that adapts to your changing needs.

The Microtek MSF-300Z Color/Gray scanner reproduces everything from 24 bit color to 8 bit gray-scale to black and white line art. All at 300 dpi. Making it the one image capturing device that's ideal for desktop publishing, multimedia projects, presentations, even pre-press work.

And at just $2,695, it's ideal for limited budgets, too. Especially when you consider it includes some of today's most sophisticated color and gray-scale image editing software.

What's more, you can work in the operating environment of choice. Whether it's with the MSF-300Z for your IBM PC or PS/2. Or the MSF-300ZS for the Macintosh.

Call 800-654-4160 or in California, 213-321-2121 for all the details. And get the one scanner that adapts to whatever you're trying to capture.

Please circle 190 on reader service card.
For many of you, mail order is your primary means of purchasing Macintosh products and services. That's why MacUser has put together the following special section.

It's what you've been demanding—a convenient place to quickly find the products you need from the vendors you want to buy from. MacUser's Direct Line to products is just one more reason to turn to MacUser for relevant information aimed at the serious user.

To Place your Order, Call Toll-Free
1-800-327-7234

Applied Engineering
DataLink/Mac (MacII) ....... $181
w/MNP-5 or SendFax ...... $212
w/MNP and Send Fax ....... $229
DL/Mac Portable
(w/MNP-5 & SendFax) ..... $181
QuadriLink (MacII) ......... $181
3.5” 800k drive ............. $189
3.5” 1.44 meg SuperDrive .... $229
Mac IIc/Ex ext. drive cable..... $19
MacRam Classic 0k .......... $75
1 meg ................................ $129
5 meg ................................ $269
Altsys
Fontographer .................. $299
Metamorphosis ............. $99
Aldus
PageMaker 4.0 .............. $499

For the Best price on Macintosh Products, Technical Support, or Customer Service, please call:
1-214/484-5464

Send mail orders to: P.O. Box 815828, Dallas, Texas 75381
We accept MasterCard, Visa and COD orders. Tx residents add 7.25% tax. School and Government Purchase orders accepted.

HARD DRIVES

There's nothing remarkable about finding great quality, prices and service. Unless you're buying your hard drive somewhere else.

- 48 hr. burn in
- Name brands
- Multiple case options
- Formatted drives
- Free test software
- Full line of storage options
- Fast drives – 11msec & up

- Toll-free assistance
- Factory support
- Instant replacement policy
- Knowledgeable salespeople
- Huge inventory
- Application engineering
- Same day shipping

Maxtor

Maxtor External Half Height
40MB 17msec $369
80MB 17msec $519
200MB 15msec $849
340MB 15msec $1,489

Maxtor External Full Height
150MB 16msec $959
360MB 14.5msec $1,429
616MB 16.5msec $1,769
675MB 16.5msec $2,049

External Syquest
Removable Media Hard Drive
44MB 25msec $489
cartridges $72

External Tape Backup
With Software & Tape
60MB $519
120MB $599

Maxtor Tahiti
External Read/Write Optical
1 GByte $3,899
cartridges $249

March Special
Maxtor Internal Classic Kits
40MB 17msec $349
80MB 17msec $449

1-800-338-4273
4657 MacArthur Lane
Boulder, CO 80303

Please circle 16 on reader service card.
You get more than you expect from Third Wave.

It's fun to open a box from Third Wave. Whether it's an Optical disk drive or a SCSI cable, you always get something extra, from 12 megabytes of shareware on your pre-formatted hard disk, to a toll-free support line.

Every Third Wave hard disk is loaded with lots of useful software, including full-featured partitioning and protection utilities. All removable or tape drives come with a free tape or cartridge. Best of all, every product that Third Wave sells is backed with excellent customer support provided by experienced Mac professionals. If you only shop for the lowest price, you can miss the extras that make a product superior. MacWorld Magazine has this to say about Third Wave hard drives: "...Especially quiet...the quietest of the 64 drives tested...fast—3 of the fastest 12 tested were Third Wave's,...a good bargain." Quality doesn't just happen. Reliable components and quality control make our products faster, quieter—better.

Speed of delivery is also paramount for most buyers. Our merchandise is shipped via Federal Express because we feel it is the fastest and most reliable way to insure prompt delivery. Call the Third Wave professionals today and surprise yourself!
The E's Have It
With Macs Too!

E-MACHINES T16
The ultimate workstation. $1,995

E-MACHINES TX
Affordable two page system. $2,695

T19 The finest two page system. $3,795

E-MACHINES Color Displays & Mac Systems At ERI DIRECT Prices.

DEALTIME

Macintosh Systems
- Mac IIci 2mb RAM / 40HD . . . . . . . . $2,749
- Mac IIci 5mb RAM / 80HD . . . . . . . . $3,299
- Mac 11ci 4mb RAM . . . . . . . . . . . . . $4,095
- Mac IIci 4mb RAM / 80HD . . . . . . . . $4,649
- Mac IIfx 4mb RAM . . . . . . . . . . . . . $6,249

E-Machines Extras
- Quickview Studio . . . . . . . . . . . . . $1,995
- Take another $500 off all display prices when you TRADE-IN a working Apple 13" Color Display.

"ERI DIRECT has become a terrific source for Macintosh products. I give them a 5-mice rating!"
Joe Salinger, Scholastic, Inc.

"The winner and still champion. We simply couldn't find a flaw in this razor sharp 16-inch Trinitron."
MacUser LABS, May 1990

1801 West Larchmont Ave.
Chicago, Illinois 60613 USA
312.549.0030
FAX 312.549.6447

Call Today! 800-535-3252
Try It For 21 Days At NO Risk!

Please circle 359 on reader service card.
**Software**

**ABRACADATA**
Design your own Home Landscape, Architecture or Interiors ........................................... 59

**ADOBIE SYSTEMS**
Adobe Illustrator 3.0 ................................................................. 339
Adobe Type Manager ................................................................. 55
Adobe TypeSet 1-2 ................................................................. 59
Adobe Type Align ................................................................. 59
Streamline Photoshop ......................................................... 489
Photoshop ................................................................. CALL

**ANDROMEDA**
Type On Call ................................................................. 49

**ASHTON TATE**
ALLADIN ................................................................. 24

**ASO**

**BRODERBUND**

**CEOM**

**CEQ SOFTWARE**
QuickMail 10 User ......................................................... 298
QuickKeys ................................................................. 66
DiskTop 4.0 ................................................................. 64

**CHIPSOFT**
TurboTax Personal/1040 .................................................. 48

**CLARIS**
MacWrite II ................................................................. 129
FileMaker Pro ................................................................. 259
MacDraw II ................................................................. 275
ClipCad ................................................................. 525
SmartForm Designer ......................................................... 279

**CUSTOM APPLICATIONS**

**DELTA POINT**

**DEST**

**DREAMAMAKER SOFTWARE**
Clipures Vol 1, 2, or 3 ......................................................... 68

**DYNAWARE**

**FARALION**

**FRANKLIN SOFTWARE**

**FULLWRITE**

**MacDraw**

**PAGEMAKER**

**PERSONAL SERVICES**

**MICROSOFT**

**POWERPOINT**

**REALITY TECHNOLOGIES**

**RPT**

**SOFTWARE BRIDGE**

**SOFTHOUSE**

**T-JAM**

**THE CURATOR**

**TIMBUKTU**

**TMON**

**VIDEOPAIN**

**WINاءUS**

**WORLDPERFECT CORP.**

**WORLDPERFECT PROFESSIONAL™ WITH MACRENDERMAN™** ........................................ $1,715

**WIRED**

**XEROX**

**ZEPHYR**

Super SIMMS $49 Call for Classic Memory Sale! 80 nanoseconds

Corporate Medical Plans: • Open an account within 24 hours • Volume discount pricing • School purchase orders accepted

Please circle 161 on reader service card.
Takes Care of You!

Hardware

Apple

Mac Systems - Lowest Pricing CALL

Interfot Fax-modern 24/96 $335

356 Grey Scale Scanner +Int. 1269

Color II. JFX. SE30 .... 2569

Color Printers PRICES

2400 Baud Ext. MNP 155

TOTAL SYSTEMS

Gemini 20MHz 030 9800 LOWEST PRICES

Gemini 25MHz 030 9800 LOWEST PRICES

2400 Baud Ext. MNP 155

UMAX Scanner 1675

UMAX Scanner for the LOWEST mail order prices call (818) 501-3760

WACOM

Depoting Tablets CALL

6"x9" Tablet CALL

12"x12" Electrocal CALL

12"x12" Standard Surface CALL

Dr. MAC

14542 Ventura Blvd., Suite 200
Sherman Oaks, CA 91403

(818) 377-9581

Federal/US 95-11931969

Policy:

Visa. Mastercard & Amex accepted.

Credit card is not charged until order is shipped.

California residents add 8.75% sales tax

Hawaii: Mail-In 9:30-11 EST

Sat. 11-5 EST

Call (818) 501-3760.

Compatibility not guaranteed.

All prices & policies subject to change without notice.

Shipping:

All Airborne Overnight continental US.

Hardware over 10 lbs will be shipped ground.

Same day shipping.

Returns:

Call for R.A. number before return Restocking fee may apply.

Money Back Guarantee:

Most products have a 30-day money back guarantee. Please inquire when you order.

Intemetl'Reseller Program:

We ship regularly to 65 countries worldwide. Call about our special pricing.
### THIS MONTH'S SPECIALS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microtek 300ZS</td>
<td>$1,679</td>
</tr>
<tr>
<td>QMS-PS* 410</td>
<td>$1,999</td>
</tr>
<tr>
<td>Quantum 105 Internal</td>
<td>$399</td>
</tr>
<tr>
<td>Qume ScripTEN</td>
<td>$1,649</td>
</tr>
<tr>
<td>RasterOps ColorBoard 264*</td>
<td>$389</td>
</tr>
<tr>
<td>RasterOps ColorBoard 364*</td>
<td>$679</td>
</tr>
<tr>
<td>Radius 19&quot; Two Page Display</td>
<td>$1,299</td>
</tr>
<tr>
<td>SIMMS</td>
<td>$45</td>
</tr>
<tr>
<td>SyQuest Cartridges</td>
<td>$65</td>
</tr>
<tr>
<td>SyQuest Removable Drive</td>
<td>$439</td>
</tr>
<tr>
<td>TI Microlaser PS 17</td>
<td>$1,499</td>
</tr>
<tr>
<td>TI Microlaser PS 35</td>
<td>$1,699</td>
</tr>
</tbody>
</table>

### ACCELERATORS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>DayStar Digital</td>
<td>$269</td>
</tr>
<tr>
<td>Fast Cache Icli</td>
<td>$489</td>
</tr>
<tr>
<td>PowerCache Icli 40 Mhz</td>
<td>$1,599</td>
</tr>
<tr>
<td>Radius</td>
<td></td>
</tr>
<tr>
<td>Accelerator 16 for +, SE</td>
<td>$549</td>
</tr>
<tr>
<td>Accelerator 25 for SE</td>
<td>$699</td>
</tr>
</tbody>
</table>

### FAX MODEMS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abaton</td>
<td>$299</td>
</tr>
<tr>
<td>Dove</td>
<td>$289</td>
</tr>
</tbody>
</table>

### HARD DISK DRIVES

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imprimis</td>
<td></td>
</tr>
<tr>
<td>Mac Wren 300</td>
<td>$1,249/$1,449</td>
</tr>
<tr>
<td>Mac Wren 330 Runner</td>
<td>$1,497/$1,579</td>
</tr>
<tr>
<td>Mac Wren 600</td>
<td>$1,799/$1,899</td>
</tr>
<tr>
<td>Mac Wren 1.2 Gig.</td>
<td>$2,799/$2,899</td>
</tr>
<tr>
<td>Quantum</td>
<td></td>
</tr>
<tr>
<td>Quantum 40</td>
<td>$289/$389</td>
</tr>
<tr>
<td>Quantum 105</td>
<td>$399/$459</td>
</tr>
<tr>
<td>Quantum 170</td>
<td>$659/$739</td>
</tr>
<tr>
<td>Quantum 210</td>
<td>$849/$959</td>
</tr>
</tbody>
</table>

### MONITORS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnavox</td>
<td></td>
</tr>
<tr>
<td>TWO YEAR WARRANTY</td>
<td></td>
</tr>
<tr>
<td>14&quot; Color Monitor</td>
<td>$429</td>
</tr>
<tr>
<td>NEC</td>
<td></td>
</tr>
<tr>
<td>MacSync 14&quot; Color Monitor</td>
<td>$435</td>
</tr>
<tr>
<td>Seiko</td>
<td></td>
</tr>
<tr>
<td>14&quot; Color Monitor</td>
<td>$589</td>
</tr>
</tbody>
</table>

### MEMORY

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMM SALE $49</td>
<td></td>
</tr>
<tr>
<td>FREE Installation/Manual Included!</td>
<td></td>
</tr>
</tbody>
</table>

### MONITOR SYSTEMS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnavox</td>
<td></td>
</tr>
<tr>
<td>14&quot; Color Monitor with 8 bit Video Interface Mac II family</td>
<td>$699</td>
</tr>
<tr>
<td>14&quot; Color Monitor with 24 bit Video Interface Mac II family</td>
<td>$799</td>
</tr>
<tr>
<td>14&quot; Color Monitor with 8 bit Video Interface Mac II family</td>
<td>$799</td>
</tr>
<tr>
<td>Nubus adapter</td>
<td>$95</td>
</tr>
</tbody>
</table>

### PRINTERS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kodak</td>
<td>$1,169</td>
</tr>
<tr>
<td>Diconix Color 4 Printer</td>
<td></td>
</tr>
<tr>
<td>NEC</td>
<td>$1,699</td>
</tr>
<tr>
<td>SlientWriter 2 Model 90</td>
<td></td>
</tr>
<tr>
<td>QMS QMS-PS* 410 PostScript</td>
<td>$1,999</td>
</tr>
<tr>
<td>Qume</td>
<td></td>
</tr>
<tr>
<td>CrystalPrint Publisher I</td>
<td>$1,899</td>
</tr>
<tr>
<td>CrystalPrint Publisher II</td>
<td>$2,399</td>
</tr>
<tr>
<td>ScripTEN PostScript</td>
<td>$1,649</td>
</tr>
<tr>
<td>Seiko</td>
<td>$199</td>
</tr>
<tr>
<td>Smart Label Printer</td>
<td></td>
</tr>
<tr>
<td>Texas Instruments</td>
<td></td>
</tr>
<tr>
<td>PS 17 Microlaser with interface</td>
<td>$1,499</td>
</tr>
<tr>
<td>PS 35 Microlaser with interface</td>
<td>$1,699</td>
</tr>
</tbody>
</table>

### REMOVABLE DISK DRIVES

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest 42 Removable</td>
<td>$439</td>
</tr>
<tr>
<td>cartridge not included</td>
<td></td>
</tr>
<tr>
<td>Cartridges $65</td>
<td></td>
</tr>
</tbody>
</table>

### SCANNERS

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microtek 300GS</td>
<td>$1,249</td>
</tr>
<tr>
<td>300ZS</td>
<td>$1,679</td>
</tr>
</tbody>
</table>

**Please circle 192 on reader service card.**

**1-800-888-8779**

24 Hour Fax Line 602-897-1921

4747 East Elliot Road, #29-461 • Phoenix, AZ 85044

All prices subject to change without notice. All products subject to availability.
VisionPro Monitor Systems

When purchasing Systems, compare the options and features. VisiPro Color Graphic cards are manufactured under license for Macintosh Technology and support Macintosh graphical needs now and in the future.

Video Graphic Systems

8-Bit Business System
8-bit Video Card non-Upgradeable, 20" iMacintosh (1120) $75 Hz $2795

8-Bit SystemPro 20", VisiPro VideoCard, 20" iMacintosh (C120) $75 Hz $3249

8-Bit SystemPro Sony 19", VisiPro VideoCard, 19" SonyTrinitron (CDM-1950) $75 Hz $3625

24-bit VisionPro Interface Upgrade Kit w/ purchase of any system $600

All VisionPRO Interface cards have multi-monitor support (Sony 19" & ikegami 20"), support BlockMode transfer & acceleration Upgradeable 16-bit to 24-bit cards, Pan/Zoom 2X & 4X and virtual desktop. Business system video card offers Pan/Zoom 2X & 4X and virtual desktop.

Video Interface/cards

8-Bit Vision ST 813 for 13" or 14" Monitors $5275

24-bit Vision ST 2413 for 13" or 14" Monitors $5375

Vision ST Upgrade Kit (8 - 24 Bit) $135

VisionPro 2 - 24 Bit Upgrade Kit $700

Macintosh CPU and Systems

- Mac Classic (fully loaded)
- Mac SE/30
- Mac II
- Mac IIcx
- Mac IIci
- Mac IIx
- NEW"Backlit Mac Portable
- LaserWriter II NT, NTX and Personal LaserWriter's
- Also fax/call for quote on complete Apple Macintosh product line and competitive pricing
- Government + Universities + Corporations (on approval) - bids requested

INDEX Memory Modules

- 1 Mb $43
- 1 Mb FX and LaserWriter II SIMM 70/80 $44
- 2 Mb SIMM 70/80 $159
- 4 Mb SIMM with Mac $209

All INDEX SIMMS have gold contacts and traces
- Lifetime Warranty
- CALL FOR CURRENT PRICING

NEW! 1 Mb Ti MicroLaser PS 17&35 memory upgrade $139

Complete Memory packages for PS3, Compaq 386, Zenith, Sun ...

Hardware

MacTel Extended Keyboards: English $99
French $119

Golden Triangle: DiskTwin - CALL

Syquest Technology

SQ 400 $69

"Call for quantity discounts" (work with all Syquest drives)

Texas Instruments

MicroLaser PS-17 w/2MB $1599
MicroLaser PS-35 w/35 MB $1899
1Mb Ti MicroLaser PS Card XL $139
MicroLaser XL $149

Receive $40 off the price of a 1Mb INDEX memory module for the TI microLaser when you purchase a PS17 or PS35 printer from MacTel!

Ordering information:

No surcharge for Visa or MasterCard. Your credit card will not be charged until your order is shipped. International orders call for details. European banking service available. Further orders accepted from university, government, military, NET 30 and corporate customers (on approval). MasterCard allows 10 days for personal and company checks to clear. Internal merchandise must be returned to expedite process. Call 512/451-2600 for Visa number. All prices subject to change and error. 

Shipping and handling charges not refunded. (Prices subject to change without notice and all products subject to availability.)

Switzerland: 042/36 44 33
Australia: 0014 800/125 880
United Kingdom: 0800/89 14 28
Europe: 041/46 05 029
France: 0033/80/73 83 21

MacTel carries hundreds of professional Mac peripherals (not listed) and the entire Macintosh line. Call or Fax for a complete catalog.

Please circle 39 on reader service card.

1-800-950-8411

Professional Solutions For Today's Macintosh Professional.
## Affordable Macintosh Systems

### Special on MAC IIi
- Macintosh IIi CPU, 2mb RAM, 40mb hard drive, 14.4mb FDDHD, Apple Standard Keyboard, 12" Monochrome Monitor.
- **You Pay:** $3,049

### Mac IIx System
- Macintosh IIx CPU, Apple 40 hard drive, 4mb RAM, MacPo Extended Keyboard, 8 bit color, NEC 14" MacSync HC.
- **You Pay:** $7,269

### Mac IIci System
- Macintosh IIci CPU, Apple 40 hard drive, 5mb RAM, MacPo Extended Keyboard, 8 bit color, NEC 14" MacSync HC.
- **You Pay:** $4,955

### Mac IIle System
- Macintosh LC, 2mb RAM, Apple 40 hard drive, Standard Keyboard, Seiko 14" Color Display. (Call for Available)
- **You Pay:** $2,379

## Solutions that make Sense...

### Display Solutions
- **Express 24 bit 20" Trinitron:** $359
- **RasterOps 24s NEW!** $539
- **RasterOps 24si** $799
- **Radius Privot/GS** $1,195
- **RasterOps 24L 19" System** $1,459
- **RasterOps Accelerator** $1,330
- **Ikegami 20" Trinitron** $1,859
- **Apple RGB 13" High Res** $690
- **Seiko 14" CM-1445 Color** $559
- **MacSync 14" Color Monitor** $425

### Sale on Mac Printers
- **QMS 410 Laser** $2,015
- **TI MicroLaser/PS35** $1,799
- **TI MicroLaser/PS17** $1,689
- **NEC SilentWriter II Model 10** $1,195
- **QMS ColorScript 100** $749
- **Apple LaserWriter PNT** $2,200
- **Express Phone Net Connector** $20

### Multi Media

#### Portable Hard Drives
- Power supply inside drive case.
- "For user's looking for portability, we recommend the small, fast, lightweight Liberty Drives.”
- **40 Quantum:** 649.00
- **80 Quantum:** 899.00
- **105 Quantum:** 999.00
- **170 Quantum:** 1,199.00
- **210 Quantum:** 1,399.00
- **250 Hitachi:** 1,799.00
- **425 Quantum:** 2,299.00
- **International Power:** 50.00
- **Carrying Case:** 29.00

#### Pricing
- **Liberty Systems:** 425 MB

Call us today for your free 30-day trial. (608) 983-1127

Please circle 176 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 storms, theft, fire, accidental damage, and more! Full replacement of hardware, media and purchased software.

<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>$49</td>
</tr>
<tr>
<td>$2,000 - $5,000</td>
<td>$69</td>
</tr>
<tr>
<td>$5,000 - $10,000</td>
<td>$89</td>
</tr>
<tr>
<td>$10,000 - $15,000</td>
<td>$109</td>
</tr>
<tr>
<td>$15,000 - $20,000</td>
<td>$129</td>
</tr>
</tbody>
</table>

Subject to underwriting and availability by state. For immediate coverage info and rates on higher covers, call 1-800-848-3469

Specializes in SAVER for Apple, Macintosh, IBM, and others. Please circle 150 on reader service card.
STOP!
...here for the BEST PRICES!!
FREE SHIPPING!
On Orders Over $500. Under 15 Pounds

1-800-274-7747
FOR ORDERS

SUPER SAVERS!
SCANNERS & DIGITIZERS
Ikegami, 30055 ....... $1,669

DIAGNOSTIC
Computer Eyes Color ....... $1,320
Koala Technology MacVision 3.0 Digitizers ....... $1,240
Logitech
Scanner ....... $187

CLARE
OCR TYPIST Handheld Scanner ....... $469

New Wave Executive
Mac Traveler Extended Keyboard ....... $169
Mac Hucy/Mac Traveler Deluxe ....... $249
Monitor Carrying Cases ....... $19

MONITORS & VIDEO CARDS
Sama Monitors 10" Trinitron ....... $169
E-Machines 116 16" Monitor Color ....... $1,095
NEC MacEye 14" color monitor ....... $1,459

GrayScale/NEC 24 bit bundle ....... $952
MAGNAVox 14" Color ....... $485

PRINTERS
Apple ImageWriter II ....... $2,299
ImageWriter Personal NT ....... $2,299
GCC RIP LS ....... $2,699
Seki-Oshima ImageWriter Compatible ....... $2,225
KODAK
Toner, 5150 PPS Portable Printer ....... $1,515

QMS/App Compatible, UNCONDITIONAL GUARANTEED
Without Exchange ....... $99.95
Without Exchange ....... $99.95

MODERN & faxmodems
LOGICIDE
QuickTil 4800 Sendas and Modem ....... $112

Radar
Victorian 4150 PPS Portable Printer ....... $112

Toner
QMS/App Compatible, UNCONDITIONAL GUARANTEED
Without Exchange ....... $99.95
Without Exchange ....... $99.95

TOP SELLING SOFTWARE
Carlos Express 3.0 ....... $49

All 9 Peogmkr 4.0 ....... $169
Maxiford Ward ....... $245
Clara MacFlow II ..... $155
Tops Internet Mac Bundle ....... $185
Adobe Illustrator 3.0 ....... $346
Microsoft Excel 2.2 ....... $245
Adobe Acrobat ....... $346
ToolS For Opening Your Mac ....... $25.95

MEMORY
1 MB SIMMS-80NS ....... $45.90

SUPER SAVERS!

IKEGAMI

19" Trinitron display includes a video card, zoom and pan, modes and its swiveled stand.

MEGAGRAPHICS

MEGAA Graphics with interface for /Mac/ST/ES/30 ....... $1,099
Gray Scale for Mac II Series ....... $1,129
Gray ale for Mac SE/30 ....... $1,159

RestorOp Monitors
CALL for pricing on the complete RestorOp Line!
Color Card 15 For MAC II family ....... $139
Gray 24/24 bit color card for MAC II family ....... $1,065

EMAC

Light quality at a dot matrix price!
DESKEWRITER Printer for Macintosh ....... $99

HEWLETT PACKARD

Power System!
Mac IIc-4MB RAM, 170MB Hard Drive, NEC 14" High-Resolution COLOR Monitor, Extended Keyboard ....... $5,999

Apple Macintosh

19" professional display offers 75 WYSIWYG, with 1024 x 768 pixels and 75 Hz refresh rate. Includes tilt/swivel stand.

WVACHT!

ADVANCE BUSINESS CENTER
1801 Pacific Coast Hwy., Ste. A • Lomita, CA 90717
(213) 325-1422 • Fax (213) 325-4073
(800) 345-1645 • (800) 274-7747

Adobe Illustrator 3.0 ....... $328
Photoshop ....... $549
Adobe Typefaces ....... $219

Adobe Systems

Color 24 bit scanner can handle grayscale, color, line art and text with Adobe Photoshop ..... $1,599

UMAX

Power System!
Mac IIc-4MB RAM, 170MB Hard Drive, NEC 14" High-Resolution COLOR Monitor, Extended Keyboard ....... $5,999

POWER SYSTEM!

MAC TEXT HL/DIGITAL BARKRUD, SCAN DA ....... $299
IBM PC HURT PE/PANTHER ON PCI, PDU, PECUB ....... $1,079

APPLE MACINTOSH

TexaS Instruments
Power System!
Mac IIc-4MB RAM, 170MB Hard Drive, NEC 14" High-Resolution COLOR Monitor, Extended Keyboard ....... $5,999

Color 24 bit scanner can handle grayscale, color, line art and text with Adobe Photoshop ..... $1,599

Here are the BEST PRICES!!
### Magic Hard Drives

### Magic 45R Removable
- Portable, fast, and affordable removable media. Special mechanism. 2 year warranty. 45 MB removable drive. $529. 8MB capacity. $69.

### Magic Tape Backup
- Magic Tape 60: $679.
- Magic Tape 1.3 gig/2.4 gig: $1899/$2099.

### Magic Video
- 14" NEC MacSync with/without: $149.
- 19" Color TintSync Monitor: $2099.

### Magic Scanners
- MagicScan 256bi/300 DPI grayscale scanner w/ImageStudio Software: $1099.

### Macintosh CPU’s
- Mac Classic 2/40: $1299. 36 month lease $44.
- New Mac LC: $1099. 36 month lease $64.
- Mac IIc 2/20: $2799. 8 month lease $94.
- Mac Iia 5/80: $3399. 36 month lease $115.
- Mac Iic: $4399. 36 month lease $140.
- Mac IIx: $6299. 36 month lease $210.

### Magic Networking
- Magic EtherNet Thin Thick: $249.
- Magic EtherNet Thick/Thin BaseT: $249.

### ACCELERATORS
- Dual IDE Expansion Card: $499. 36 month lease $44.
- Dual IDE/SCSI: $649. 36 month lease $60.
- Dual Serial/SCSI: $499. 36 month lease $44.

### Connectors & Network
- Floppy Disk Drive: $269. 36 month lease $23.
- Apple V.22bis: $269. 36 month lease $23.
- Apple l/fax: $269. 36 month lease $23.
- Apple l/fax/Modem: $229. 36 month lease $20.

### SOFTWARE
- Magic Mac 45R Removable Portable, fast, and affordable removable media. Special mechanism. 2 year warranty. 45 MB removable drive. $529. 8MB capacity. $69.

### STORAGE
- 4MB 1.2 gig drive: $2745. 36 month lease $25.
- 8MB 1.2 gig drive: $2795. 36 month lease $25.
- 16MB 2.1 gig drive: $2845. 36 month lease $25.
- 32MB 4.2 gig drive: $2895. 36 month lease $25.

### ACERATORS, DISKS, RIBBONS
- Dual IDE Expansion Card: $499. 36 month lease $44.
- Dual IDE/SCSI: $649. 36 month lease $60.
- Dual Serial/SCSI: $499. 36 month lease $44.
- Apple V.22bis: $269. 36 month lease $23.
- Apple l/fax: $269. 36 month lease $23.
- Apple l/fax/Modem: $229. 36 month lease $20.

### CONNECTORS & NETWORK
- Floppy Disk Drive: $269. 36 month lease $65.
- Apple V.22bis: $269. 36 month lease $65.
- Apple l/fax: $269. 36 month lease $65.
- Apple l/fax Modems: $229. 36 month lease $65.
- Apple MNP-5: $229. 36 month lease $65.

### PRINTERS
- Apple Laserwriter IIL: $429.
- Apple Laserwriter II/II Plus: $89.
- Apple Laserwriter II/II Plus: $89.
- Apple Laserwriter II/II Plus: $89.
- Apple Laserwriter II/II Plus: $89.

### ACCS, DISKS, RIBBONS
- Dual IDE Expansion Card: $499. 36 month lease $44.
- Dual IDE/SCSI: $649. 36 month lease $60.
- Dual Serial/SCSI: $499. 36 month lease $44.
- Apple V.22bis: $269. 36 month lease $23.
- Apple l/fax: $269. 36 month lease $23.
- Apple l/fax/Modem: $229. 36 month lease $20.

### ACCELERATORS, SOFTWARE & DISKS
- Dual IDE Expansion Card: $499. 36 month lease $44.
- Dual IDE/SCSI: $649. 36 month lease $60.
- Dual Serial/SCSI: $499. 36 month lease $44.
- Apple V.22bis: $269. 36 month lease $23.
- Apple l/fax: $269. 36 month lease $23.
- Apple l/fax/Modem: $229. 36 month lease $20.

### STORAGE
- 4MB 1.2 gig drive: $2745. 36 month lease $25.
- 8MB 1.2 gig drive: $2795. 36 month lease $25.
- 16MB 2.1 gig drive: $2845. 36 month lease $25.
- 32MB 4.2 gig drive: $2895. 36 month lease $25.

### ACCELERATORS, DISKS, RIBBONS
- Dual IDE Expansion Card: $499. 36 month lease $44.
- Dual IDE/SCSI: $649. 36 month lease $60.
- Dual Serial/SCSI: $499. 36 month lease $44.
- Apple V.22bis: $269. 36 month lease $23.
- Apple l/fax: $269. 36 month lease $23.
- Apple l/fax/Modem: $229. 36 month lease $20.

### CONNECTORS & NETWORK
- Floppy Disk Drive: $269. 36 month lease $65.
- Apple V.22bis: $269. 36 month lease $65.
- Apple l/fax: $269. 36 month lease $65.
- Apple l/fax Modems: $229. 36 month lease $65.
- Apple MNP-5: $229. 36 month lease $65.

### PRINTERS
- Apple Laserwriter IIL: $429.
- Apple Laserwriter II/II Plus: $89.
- Apple Laserwriter II/II Plus: $89.
- Apple Laserwriter II/II Plus: $89.
- Apple Laserwriter II/II Plus: $89.

### ACCS, DISKS, RIBBONS
- Dual IDE Expansion Card: $499. 36 month lease $44.
- Dual IDE/SCSI: $649. 36 month lease $60.
- Dual Serial/SCSI: $499. 36 month lease $44.
- Apple V.22bis: $269. 36 month lease $23.
- Apple l/fax: $269. 36 month lease $23.
- Apple l/fax/Modem: $229. 36 month lease $20.

### STORAGE
- 4MB 1.2 gig drive: $2745. 36 month lease $25.
- 8MB 1.2 gig drive: $2795. 36 month lease $25.
- 16MB 2.1 gig drive: $2845. 36 month lease $25.
- 32MB 4.2 gig drive: $2895. 36 month lease $25.
WE GUARANTEE THE LOWEST PRICES ON MAC SYSTEMS

To make your Mac more affordable, we offer leasing plans to fit your budget. To make your Mac more cost-effective, we offer custom system configurations, so every bundled system is just the way you want it.

FREE! A $31.99 value with every new system.

- FINANCING
- CUSTOM SYSTEM CONFIGURATIONS
- TOLL-FREE TECHNICAL SUPPORT
- 30-DAY MONEY-BACK GUARANTEE
- ONE YEAR WARRANTY
- ONE TO FIVE YEAR LEASING
- NO SURCHARGE ON VISA/MC/AMEX/DISCOVER

MAC II fx
14x, 4MB RAM, 170 MB Quantum, RasterOps 19" Color Monitor, 8-Bit Color, DaLaDesk Switchboard
$11,499/$259/mo.

MAC Ilci
48x, 8MB RAM, 170 MB Quantum, NEC 14" MacSync, RasterOps 264 24-Bit Color, Keytronic 105 Keyboard
$6,129/$138/mo.

MAC SE/30
SE/30, 4MB RAM, 40 MB Quantum, Keytronic 105 Keyboard
$3,125/$70/mo.

MAC Ilsi
48x, 5MB RAM, 80 MB Quantum, Apple RGB 13" Color Monitor, 8-Bit Color, Keytronic 105 Keyboard
$4,249/$995/mo.

MAC Classic*
Classic SE/30, 4MB RAM, Hard Drive, FDHD, Classic Keyboard
$1,259
(subject to availability)

PRINTERS

OMS PS-410/810
QMS ColorScript 100
Hewlett Packard Deskwriter
Kodak Dicolor InkJet Printer
Kodak Dicolor Color 4
NEC Silentwriter 2 290
NEC Silentwriter 2 90
Selikosha ImageWriter II Clone
Oume Crystal Print Publisher II
Oume Crystal Print Express
Ti Micro Laser PS 173/75
$2099/2999
$7659
$699
$499
$1199
$2379
$1825
$199
$2350
$3499
$1599/1899

MAC Ilci
Ilci, 4MB RAM, 170 MB Quantum, RasterOps 19" Color Monitor, 8-Bit Color, DaLaDesk Switchboard
$11,499/$259/mo.

MAC Ilci
Ilci, 8MB RAM, 170 MB Quantum, NEC 14" MacSync, RasterOps 264 24-Bit Color, Keytronic 105 Keyboard
$6,129/$138/mo.

MAC SE/30
SE/30, 4MB RAM, 40 MB Quantum, Keytronic 105 Keyboard
$3,125/$70/mo.

MAC Ilsi
Ilsi, 5MB RAM, 80 MB Quantum, Apple RGB 13" Color Monitor, 8-Bit Color, Keytronic 105 Keyboard
$4,249/$995/mo.

MAC Classic*
Classic SE/30, 4MB RAM, Hard Drive, FDHD, Classic Keyboard
$1,259
(subject to availability)

SCANNERS

Microtek 300 SE (w/ ColorStudio)
Microtek 300GS
Microtek 400GS
Abaton Scan/Color
$1575
$1529
$2639
$1364

MONITORS

NEC MacSync 14"
RasterOps 264/364 Color/Card
RasterOps 241 19"w/ 24-bit color
RastarOps 241 19"w/ 24-bit color
Ilkegan CN-20 19" 8-bit color
Ilkegan CN-20 19" 24-bit color
Hitachi 14 MVX 14" Hi-Res Monitor
Sony 1304 14" Color Monitor
$439
$459/$634
$429
$5159
$2479
$5995
$539
$679

HARD DRIVES

QUANTUM PROSERIES
40 MB
105 MB
170 MB
210 MB
Ilsi 2MB
Ilui 105MB
$290
$499
$490
$860
$339
$550
$279
$1960
$1960
$1929

THE CORK 30™
Upgrades your 512KE, Plus, or SE to a lici. Totally Mac compatible.

Advance orders taken now.
$2,999

MAC Ilci
Ilci, 4MB RAM, 105 MB Quantum, Apple RGB 13" Color Monitor, 8-Bit Color, Keytronic 105 Keyboard
$5,499/$125/mo.

FREE! A $31.99 value with every new system.

- FINANCING
- CUSTOM SYSTEM CONFIGURATIONS
- TOLL-FREE TECHNICAL SUPPORT
- 30-DAY MONEY-BACK GUARANTEE
- ONE YEAR WARRANTY
- ONE TO FIVE YEAR LEASING
- NO SURCHARGE ON VISA/MC/AMEX/DISCOVER

1-800-MAC-STUF
### HARD WORKING
- Super fast 14ms - 28ms access time.
- No less than 30,000 hours MTBF.
- Compatible with MacII, Ile, Ilci, SE, SE/30, Plus & fx.
- Your choice of brand name hard drives.

### HARD CORE
- Whisper-quiet fan.
- 24 hour burn-in testing.
- 50-pin connectors to daisy-chain.
- Power surge protection.
- Steel case for low heat & support.

### HARD TO BEAT
- Designed & engineered by experts at Hard Drives International.
- Hundreds of thousands of customers.
- Lifetime Toll-free technical support.
- 30-day "Worry-Free" Guarantee.
- 1 & 2 Year Replacement Policies.

### At prices that are
- We buy quality components in huge volume & pass the savings to you!

### It's easy to see why
- POWERDrives are

### HARD TO RESIST

#### Table: POWERDrive Specifications

<table>
<thead>
<tr>
<th>Mbytes</th>
<th>Mechanism</th>
<th>Access</th>
<th>Int.</th>
<th>Ext.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>Seagate</td>
<td>28ms</td>
<td>$249</td>
<td>$295</td>
</tr>
<tr>
<td>30</td>
<td>Seagate</td>
<td>28</td>
<td>$269</td>
<td>$319</td>
</tr>
<tr>
<td>40</td>
<td>Quantum</td>
<td>19</td>
<td>$259</td>
<td>$319</td>
</tr>
<tr>
<td>45</td>
<td>Seagate</td>
<td>28</td>
<td>$299</td>
<td>$359</td>
</tr>
<tr>
<td>60</td>
<td>Seagate</td>
<td>28</td>
<td>NA</td>
<td>389</td>
</tr>
<tr>
<td>80</td>
<td>Seagate</td>
<td>28</td>
<td>NA</td>
<td>439</td>
</tr>
<tr>
<td>80</td>
<td>Quantum*</td>
<td>19</td>
<td>379</td>
<td>439</td>
</tr>
<tr>
<td>105</td>
<td>Quantum*</td>
<td>19</td>
<td>349</td>
<td>399</td>
</tr>
<tr>
<td>105</td>
<td>Toshiba</td>
<td>20</td>
<td>479</td>
<td>549</td>
</tr>
<tr>
<td>200</td>
<td>Maxtor</td>
<td>15</td>
<td>929</td>
<td>979</td>
</tr>
<tr>
<td>210</td>
<td>Quantum*</td>
<td>16</td>
<td>769</td>
<td>819</td>
</tr>
<tr>
<td>320(HD)</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>1449</td>
</tr>
<tr>
<td>320(HD)</td>
<td>Imprimis</td>
<td>16</td>
<td>NA</td>
<td>1449</td>
</tr>
<tr>
<td>600(HD)</td>
<td>Imprimis</td>
<td>16</td>
<td>NA</td>
<td>1899</td>
</tr>
<tr>
<td>660(HD)</td>
<td>Micropolis</td>
<td>16</td>
<td>NA</td>
<td>2099</td>
</tr>
<tr>
<td>1050(HD)</td>
<td>Imprimis</td>
<td>16</td>
<td>NA</td>
<td>2999</td>
</tr>
<tr>
<td>1050(HD)</td>
<td>Micropolis</td>
<td>14</td>
<td>NA</td>
<td>3299</td>
</tr>
</tbody>
</table>

#### Removable SyQuest

#### CD/ROM
- External optical storage unit. 350ms access time.
- Use Toshiba or Chinon mechanism - your choice.

#### Memory Upgrades
- 1MB* (1x8-80ns) $46
- 4MB* (4x8-80ns) $299

* For MacII, Ile, Ilci, SE, SE/30. Plus, Classic & II.

#### Teac Tape Backup (w/tape) $599

---

**POWERDrives**

800-776-DISK

Hard Drives International • 1912 W. Fourth St. • Tempe, AZ 85281

Sales: (602) 931-5129 • FAX: (602) 931-9193 • INTL: (002) 350-1144

www.harddrives.com • email: info@harddrives.com • phone: 800-776-DISK

Copyright (c) 1992 Hard Drives International. All rights reserved.

*The SyQuest cartridge O.E.M. is not included.*
Check Our Low Prices. Most Of Our Prices Are
The Lowest In This Magazine. If We Don't
Already Have The Lowest Price, We Will Try
To Match And Beat Any Advertised Price!

Policies:
1. Visa, MasterCard or
Discover accepted. No surcharge
will be charged unless otherwise
indicated. Checks must be drawn
on a U.S. bank.
2. All sales subject to approval.
3. All items subject to availability
and subject to withdrawal at any
time without notice.
4. For the reasons stated above, we
accept Visa, MasterCard, or
discover. Checks must be drawn
on a U.S. bank.
5. COD maximum $1,000, cash or
certified check. COD orders ship
via UPS Blue Label unless UPS
Ground delivery within 48 hours.
6. No COD outside of the United
States. No COD on electronics.
7. All shipments insured at no
cost, subject to availability, and
subject to withdrawal at any
time without notice.
8. Shipping & Handling charges
are subject to change without
notice. All items subject to
availability.
9. We Do Not Accept
Discover. No COD on
electronics.
10. We Do Not Accept
Discover. No COD on
electronics.
11. We Do Not Accept
Discover. No COD on
electronics.
12. We Do Not Accept
Discover. No COD on
electronics.
13. We Do Not Accept
Discover. No COD on
electronics.
14. We Do Not Accept
Discover. No COD on
electronics.
15. We Do Not Accept
Discover. No COD on
electronics.
16. We Do Not Accept
Discover. No COD on
electronics.
17. We Do Not Accept
Discover. No COD on
electronics.
18. We Do Not Accept
Discover. No COD on
electronics.
19. We Do Not Accept
Discover. No COD on
electronics.
20. We Do Not Accept
Discover. No COD on
electronics.
21. We Do Not Accept
Discover. No COD on
electronics.
22. We Do Not Accept
Discover. No COD on
electronics.
23. We Do Not Accept
Discover. No COD on
electronics.
24. We Do Not Accept
Discover. No COD on
electronics.
25. We Do Not Accept
Discover. No COD on
electronics.
26. We Do Not Accept
Discover. No COD on
electronics.
27. We Do Not Accept
Discover. No COD on
electronics.
28. We Do Not Accept
Discover. No COD on
electronics.
29. We Do Not Accept
Discover. No COD on
electronics.
30. We Do Not Accept
Discover. No COD on
electronics.
31. We Do Not Accept
Discover. No COD on
electronics.
32. We Do Not Accept
Discover. No COD on
electronics.
33. We Do Not Accept
Discover. No COD on
electronics.
34. We Do Not Accept
Discover. No COD on
electronics.
35. We Do Not Accept
Discover. No COD on
electronics.
36. We Do Not Accept
Discover. No COD on
electronics.
37. We Do Not Accept
Discover. No COD on
electronics.
38. We Do Not Accept
Discover. No COD on
electronics.
39. We Do Not Accept
Discover. No COD on
electronics.
40. We Do Not Accept
Discover. No COD on
electronics.
41. We Do Not Accept
Discover. No COD on
electronics.
42. We Do Not Accept
Discover. No COD on
electronics.
43. We Do Not Accept
Discover. No COD on
electronics.
44. We Do Not Accept
Discover. No COD on
electronics.
45. We Do Not Accept
Discover. No COD on
electronics.
46. We Do Not Accept
Discover. No COD on
electronics.
47. We Do Not Accept
Discover. No COD on
electronics.
48. We Do Not Accept
Discover. No COD on
electronics.
49. We Do Not Accept
Discover. No COD on
electronics.
50. We Do Not Accept
Discover. No COD on
electronics.
51. We Do Not Accept
Discover. No COD on
electronics.
52. We Do Not Accept
Discover. No COD on
electronics.
53. We Do Not Accept
Discover. No COD on
electronics.
54. We Do Not Accept
Discover. No COD on
electronics.
55. We Do Not Accept
Discover. No COD on
electronics.
56. We Do Not Accept
Discover. No COD on
electronics.
57. We Do Not Accept
Discover. No COD on
electronics.
58. We Do Not Accept
Discover. No COD on
electronics.
59. We Do Not Accept
Discover. No COD on
electronics.
60. We Do Not Accept
Discover. No COD on
electronics.
61. We Do Not Accept
Discover. No COD on
electronics.
62. We Do Not Accept
Discover. No COD on
electronics.
63. We Do Not Accept
Discover. No COD on
electronics.
64. We Do Not Accept
Discover. No COD on
electronics.
65. We Do Not Accept
Discover. No COD on
electronics.
66. We Do Not Accept
Discover. No COD on
electronics.
67. We Do Not Accept
Discover. No COD on
electronics.
68. We Do Not Accept
Discover. No COD on
electronics.
69. We Do Not Accept
Discover. No COD on
electronics.
70. We Do Not Accept
Discover. No COD on
electronics.
71. We Do Not Accept
Discover. No COD on
electronics.
72. We Do Not Accept
Discover. No COD on
electronics.
73. We Do Not Accept
Discover. No COD on
electronics.
74. We Do Not Accept
Discover. No COD on
electronics.
75. We Do Not Accept
Discover. No COD on
electronics.
76. We Do Not Accept
Discover. No COD on
electronics.
77. We Do Not Accept
Discover. No COD on
electronics.
78. We Do Not Accept
Discover. No COD on
electronics.
79. We Do Not Accept
Discover. No COD on
electronics.
80. We Do Not Accept
Discover. No COD on
electronics.
81. We Do Not Accept
Discover. No COD on
electronics.
82. We Do Not Accept
Discover. No COD on
electronics.
83. We Do Not Accept
Discover. No COD on
electronics.
84. We Do Not Accept
Discover. No COD on
electronics.
85. We Do Not Accept
Discover. No COD on
electronics.
86. We Do Not Accept
Discover. No COD on
electronics.
87. We Do Not Accept
Discover. No COD on
electronics.
PREMIUM BRAND-NAME PRODUCTS AND A NEW, AFFORDABLE OPTION: REALTECH™

"I only sell names you can trust: RasterOps, Ikegami, Microtek, Texas Instruments, Seiko, Sharp, and others. And now there's RealTech™ (my "house brand") ... premium quality at an affordable price.

I PERSONALLY GUARANTEE you'll be pleased with the power, performance, and competitive price of RealTech products. They're:

• 40-60% LESS than the comparable Apple product. (Designed to Apple specifications, and compatible with all Apple equipment.)
• Backed by a ONE-YEAR WARRANTY with an optional two-year add-on.
• Backed by my personal guarantee and return shipping policy: Try your RealTech product for 30 days. If you're not absolutely satisfied, give me a call. I'll gladly refund the purchase price... and I'll even pay the return shipping costs."

RealTech Full Page Display
At this price, you can't afford not to have one of these incredible eyesavers! Quality, flicker-free images at a price that lets you experience the convenience of large-screen viewing.

• 15" portrait display
• 870 x 640 resolution, 80 dpi
• Vertical refresh rate of 74 Hz
• Full gray scale capability
• Flat CRT, P4 phosphorus, polished screen
• One-year warranty

<table>
<thead>
<tr>
<th>CPU</th>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac II, IIcx, IIIc</td>
<td>Mono</td>
<td>$579</td>
</tr>
<tr>
<td>IIX, IIIx, SE, SE30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mac II, IIcx, IIIc</td>
<td>GS 256</td>
<td>$1079</td>
</tr>
<tr>
<td>IIIx, IIIx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mac II, IIcx, IIIc</td>
<td>GS 16</td>
<td>$495</td>
</tr>
<tr>
<td>Mac Portable</td>
<td>Mono</td>
<td>$849</td>
</tr>
</tbody>
</table>

RealTech Dual Page 21" Display
No more squinting and scrolling! Seeing two pages at once will save you hours of time. The latest in flicker-free monochrome technology provides true WYSIWYG! 21" landscape display with 1152 x 870 resolution, 72 dpi. Vertical refresh rate of 75 Hz, full gray scale capability, and flat CRT (P4 phosphorus, polished screen). One-year warranty.

<table>
<thead>
<tr>
<th>CPU</th>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac SE</td>
<td>Mono</td>
<td>$995</td>
</tr>
<tr>
<td>IIx, IIcx, SE30</td>
<td>GS 256</td>
<td>$1479</td>
</tr>
<tr>
<td>Mac II</td>
<td>Mono</td>
<td>$1059</td>
</tr>
<tr>
<td>Mac Portable</td>
<td>Mono</td>
<td>$1249</td>
</tr>
</tbody>
</table>

XL PS 17
Call for price!

Ti microLaser™ XL PS 17
16 pgs./min.; 13 resident fonts; 25,000 pgs./mo. duty cycle

$1449
PS 17

Ti microLaser™ PS 17
6 pgs./min.; 17 resident fonts; 3,000 pgs./mo. duty cycle

$579
Our buying power gives you your buying power!

$619
Seiko 14" Trinitron

Amazing color. High-resolution Trinitron tube makes it possible to view 16 million shades of color!
- 640 x 480 resolution
- 14" display, 72 dpi
- integrated tilt & swivel base
43% brighter than the leading competitor!

$1619
RasterOps ClearVue/GS (Grayscale Monitor)

Unmatched image quality! Flicker-free images in 256 shades of gray for accurate proofing. Includes Virtual Desktop and Pan/Zoom features for maximum productivity!
- 1024 x 768 resolution
- 19" display, 72 dpi
- paper-white phosphor
- integrated tilt & swivel base
- 75 Hz vertical refresh rate
Zoom in to check details!

An incredible price for the latest technology in large-screen color viewing!

Ikegami 19" Trinitron Color Systems!
New generation Trinitron technology...superior to other Trinitrons currently available. Ikegami—the market leader in gray scale monitors—introduces the undisputed champ in color reproduction. Each system comes with an integrated tilt/swivel stand, and auto and manual degaussing. Full antiglare coating, 75 Hz vertical refresh rate, and flicker-free images reduce eye strain and improve user comfort. Coupled with a high resolution 1024 x 768 video card, this combination is the top-of-the-line color solution available today. The right solution for every budget!

<table>
<thead>
<tr>
<th>System</th>
<th>Colors</th>
<th>Upgradeable to 24-Bit Color</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entry Level</td>
<td>256</td>
<td>No</td>
<td>$2895</td>
</tr>
<tr>
<td>Professional</td>
<td>256</td>
<td>Yes</td>
<td>$3295</td>
</tr>
<tr>
<td>Master's</td>
<td>16 Million</td>
<td>N/A</td>
<td>$3895</td>
</tr>
</tbody>
</table>

FREE CONSULTATION to help you answer these 3 questions and determine the ideal combination of hardware for your exact needs.
1. What combination of CPU, HD, monitor & video card best fits your needs?
2. How much RAM will be enough?
3. 8-bit vs. 24-bit, which is for me?

MONITORS w/Cards
- Magnavox 14" w/8-bit ........................................ 918
- NEC Macsync 14" w/8-bit ................................ 828
- Sony Trinitron 1304 14" w/8-bit ...................... 1108

Other monitors available! Please call.
Guaranteed: If you don’t like it
Affordable options to enhance your system.

**SCANNERS**
- Microtek MS II .................. 1129
- Microtek MS 300GS (256GS) .. 1329
- Microtek MS 300ZS .......... 1895
- Microtek MS 400GS (256GS) .. 2859
- Microtek Transparency Conv. .. 1895
- XRS Transparency Scanner... 3950
- ScanMan M32 ................... 369

**PERIPHERAL LAND**
- 1.44 Mb Floppy .................. 329
- Infinity Turbo 40 .............. 799
- Infinity Dual Turbo 40 ........ 1850
- PL 200 Int ...................... 1465
- PL 250 Int ...................... 1765

**ACC & OTHER PERIPHERALS**
- Kurta 12 x 12 Tablet ............ 399
- Kurta 17 x 12 Tablet ........... 659
- MacFlip (80 diskettes) ......... 18
- Mac 101 Keyboard .............. 149
- Switchboard .................... 195

**CDC HARD DRIVES**
- Int 325 Mb ...................... 1749
- Int 330 Mb (Wren Runner) .... 2150
- Int 650 Mb ...................... 2295
- Ext 325 Mb ...................... 1699
- Ext 650 Mb ...................... 2589

**REALTECH HARD DRIVES**
- Reliable drives at a reasonabe price. We exclusively use Quantum mechanisms for maximum performance. Backed by a 2-year warranty.
- Internal Hard Drives
  - 40Q ......................... 339
  - 80Q ......................... 519
  - 105Q ....................... 599
  - 170Q ...................... 799
- External Hard Drives
  - 40Q ......................... 439
  - 80Q ......................... 619
  - 105Q ....................... 699
  - 170Q ...................... 899

**UNINTERRUPTIBLE POWER SUPPLIES**
- 450 AT ......................... 375
- AP 110 SE ..................... 229
- AP 360 XT .................... 279
- MinuteMan 300 ............... 429
- MinuteMan 600 ............... 695

**TARGUS PREMIUM CASES**
- IV II Case ..................... 49
- Mac Plus Case ................. 59
- SE Extended KB Case ......... 75

**EVEREX**
- EMAC 150T Tape Back-up ...... 865

**ZOOM MODEMS**
- All with software included.
  - Zoom 2400 ................... 99
  - Zoom 2400 w/sendfax ....... 119
  - Zoom V.42bis .............. 179

**PERIPHERAL LAND**
- EMAC 60T (Tape Back-up) .... 665

**EQUIPMENT & OTHER PERIPHERALS**
- Kurta 12 x 12 Tablet ......... 399
- Kurta 17 x 12 Tablet ........... 659
- MacFlip (80 diskettes) ....... 18
- Mac 101 Keyboard ............ 149
- Switchboard .................. 195

**DAYSTAR ACCELERATORS**
- Mac II, Mac IIX
  - 25 Mhz ...................... 1095
  - 40 Mhz ...................... 1389
  - 50 Mhz ..................... 1899
- Mac IIX (w/Shpg. & Install.)
  - 25 Mhz ..................... 1719
  - 40 Mhz ...................... 1999
  - 50 Mhz ..................... 2519
- Mac Iici
  - 40 Mhz .................... 949
  - 50 Mhz .................... 1689
- Fast Cache Iici ............. 279
- RAM Powercard ............... 729
- SCSI Powercard .............. 1095
- 1 Megabyte SIMMS ............ Call
- 4 Megabyte SIMMS ............ Call
- Classic Memory .............. Call

**DAYSTAR ACCELERATORS**
- Mac II, Mac IIX
  - 25 Mhz ...................... 1095
  - 40 Mhz ...................... 1389
  - 50 Mhz ..................... 1899
- Mac IIX (w/Shpg. & Install.)
  - 25 Mhz ..................... 1719
  - 40 Mhz ...................... 1999
  - 50 Mhz ..................... 2519
- Mac Iici
  - 40 Mhz .................... 949
  - 50 Mhz .................... 1689
- Fast Cache Iici ............. 279
- RAM Powercard ............... 729
- SCSI Powercard .............. 1095
- 1 Megabyte SIMMS ............ Call
- 4 Megabyte SIMMS ............ Call
- Classic Memory .............. Call
SERVING MACINTOSH USERS FOR OVER 3 YEARS!

MacUser Labs examines 11 different servers across various platforms, including Appleshare, Intel- and UNIX-based systems.

CACHING AND CARRYING

The Labs looks at different Cache Cards that make your IIci faster than your FX. Inexpensively!

INVESTING IN CDS

Comparing 7 CD-ROM drives, with recommendations on the best to buy.

AD CLOSE:

Wednesday, March 27

MACINTOSH SYSTEMS

and everything For-A-Mac

SALE on MAC IIci

Macintosh IIci, 5 megabytes of Fast Apple RAM, 8cmy-15mb Quick Access Maxtor Hard Drive, 1.4mb Apple SuperDrive, Mouse, Keytronic MacPro Extended Keyboard, 15" NEC MacSync High Resolution Color Monitor 1 Year Warranty. Only... $3699

MAC IIfx System

Macintosh IIfx, 4 megabytes of Fast Apple RAM, 105mb-12ms Pro Series Quantum Hard Drive, 1.4mb Apple SuperDrive, Mouse, Keytronic MacPro Extended Keyboard, 14" NEC MacSync High Resolution Color Monitor 1 Year Warranty. Only... $5079

FOR-YOUR-MAC Video Solutions

RasterOps 24s ........ $530
RasterOps 24s .......... $730
RasterOps 264/SE30 ...... $950
RasterOps FreeView II LC ... $1249
RasterOps FreeView IIIISI ... $1499
RasterOps 19.4 24-L System ........................................... $549
Begamii 20" - 24-bit Color System .................................. $349

We Offer Discounts on Any Complete System

Mac IIc 2/40 ................... $1849
Mac Classic 2/40 .......... $1279
Mac Classic 16mhz Accelerator .................. $199
Mac Classic 3mb Upgrade ............... $199

We Carry Apple's Complete Line

Call for Pricing and Information.

FOR-YOUR-MAC

Laser Printers

SilentWriter II Model 90 PostScript! .................. $1595
QMS 410 .................. $2039
TI MicroLaser/PS35 ........ $1819
DeskLaser 30dpi Laser Printer ............. $1045

Call for Pricing on Any Other Products!

1-800-367-2622 • 1-800-FOR-A-MAC

MacSource™ Serving Macintosh Users for Over 3 Years.

480 Medical Parkway, Suite 105
Austin, Texas 78746 • (512) 467-9502
Fax (512) 219-1916

Visa & MasterCard Accepted with No Surcharge!
Warehouse 54 brings you the highest quality hard drives available at the lowest prices in the industry.

**External drives include:**
- zero-footprint solid metal case
- dual SCSI ports for daisy-chaining
- external LED
- SCSI cable
- power cable
- ONTRACK formatting/partitioning software

**Internal drives include:**
- mounting brackets
- SCSI cable
- ONTRACK formatting/partitioning software

---

**Quantum**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40Mb</td>
<td>$255</td>
<td>$309</td>
</tr>
<tr>
<td>80Mb</td>
<td>$379</td>
<td>$429</td>
</tr>
<tr>
<td>105Mb</td>
<td>$349</td>
<td>$399</td>
</tr>
<tr>
<td>210Mb</td>
<td>$759</td>
<td>$799</td>
</tr>
</tbody>
</table>

*Our Quantum drives are all state-of-the-art Pro series half-height drives.*

---

**Seagate**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>20Mb</td>
<td>$249</td>
<td>$299</td>
</tr>
<tr>
<td>30Mb</td>
<td>$249</td>
<td>$299</td>
</tr>
<tr>
<td>45Mb</td>
<td>$299</td>
<td>$349</td>
</tr>
<tr>
<td>80Mb</td>
<td>n/a</td>
<td>$389</td>
</tr>
</tbody>
</table>

---

**SyQuest**

44Mb removable drive with cartridge: $499

---

**MICROPOLIS**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
</tr>
</thead>
<tbody>
<tr>
<td>320Mb</td>
<td>$1219</td>
</tr>
<tr>
<td>600Mb</td>
<td>$1749</td>
</tr>
<tr>
<td>1.2gig</td>
<td>$2699</td>
</tr>
</tbody>
</table>

---

**Warehouse 54**

800-955-0054

Mailing Address:
520 S. 52nd St., Ste 204
Tempe, AZ 85281
FAX: (602) 350-1191

*Policy: Prices, terms & availability subject to change without notice. All products carry a manufacturer's warranty. No returns on opened software. TERMS: No surcharge for MasterCard/VISA. Shipping: UPS or Fedex only. APO/FPO orders accepted. PO's accepted. Some restrictions apply. DDA equipment immediately replaced upon return. Product must be undamaged & in original packaging and condition. Personal checks will delay shipping 10 days.*
WE CARRY OVER 1,600 PRODUCTS
PLEASE CALL FOR UNLISTED ITEMS.

WHY SHOULD WE WASTE MONEY ON MULTIPAGE ADS WHEN WE CAN PASS THE MONEY ON TO YOU AS SAVINGS?

ACCESSIONS

GRAPHICS

PRODUCTIVITY

UTILITIES

HARDWARE

1. font options 12.00
2. font effects 12.00
3. font styles 12.00
4.AUlCMETALl 12.00
5. font size 12.00
6. font size 12.00
7. font size 12.00
8. font size 12.00
9. font size 12.00
10. font size 12.00
11. font size 12.00
12. font size 12.00

IKEGAMI™ Monitor with the National Semiconductor™ Video Card

New Products

MegaGraphics

OUR POLICIES

HP DESKWRITER

300 DOTS PER INCH

GET A PAINTWRITER XL AT A GREAT PRICE

NOW ONLY $699

1-800-222-2808
4451-B REDONDO BEACH BLVD. LAWNLAND, CA 90260
MAIL ORDERS AND P.O.S PLEASE CALL FOR MOST CURRENT PRICES.
Canada Toll-Free: 1-800-548-2512

MAC DEPOT

Scanners

2. Adobe Reader 11. Colorwave
4. Adobe Illustrator 13. Macromedia FreeHand
6. Acrobat 15. Macromedia FreeHand
7. Adobe Illustrator 16. Macromedia FreeHand

300 DOTS PER INCH RESOLUTION.

SUPPORTS APPLE TALK AND SERIAL.

NOW ONLY $699

NEW PRODUCTS

GET A PAINTWRITER XL AT A GREAT PRICE

NOW ONLY $699

Fujitsu 300 Drive

PriceList

MegaGraphics

Unparalleled price and performance make these monitors the first choice of knowledgeable buyers.

THE 19" PROFESSIONAL DISPLAY OFFERS:

- 1680 x 1050 RESOLUTION
- 1360 x 768 RESOLUTION
- 1024 x 768 RESOLUTION

Mac SE, SE/30, 3, 4

GrayScale for Mac SE/30...

$199

GrayScale for Mac SE/30...

$196

NEW PRODUCTS

- 300 DOTS PER INCH RESOLUTION.
- SUPPORTS APPLETALK AND SERIAL.

NOW ONLY $699

OUR POLICIES

G.S.E. ORDERS ADD 8% G.S.T. ON ORDER VALUE, NO DUTY OR CANADIAN TAX CHARGES.

INTERNATIONAL ORDERING POLICIES INCLUDE:

- A minimum order of $500.00 USD, subject to change, is required for international orders.
- All prices are subject to change without notice.
- Payment in U.S. dollars or equivalent in foreign currency.
- No returns, no refunds, all sales final.
- Payment by credit card.

FEDERAL EXPRESS

Please circle 379 on reader service card.
I WANT IT NOW!

SAME DAY DELIVERY AVAILABLE IN SELECT U.S. CITIES.
FROM BOTTOM LINE DISTRIBUTION

BOTTOM LINE DISTRIBUTION

1-900-420-3737

Available only in select metropolitan areas. Delivery charges vary with warehouse vicinity. Offer does not apply to some hardware and software items. Call Bottom Line for details.
With A Top Ten List Like This, Who Needs David Letterman?

1. Illegum CT-20
   27 V Inky Color Toner
   $1795

2. Microtek 3002S
   24-Bit Color Scanner
   With ColorCalc & ImagingTools
   $1699

3. PLI Infinity-45MB
   Removable HD
   MacWin Fully Assembled Model
   $699

4. HP DeskWriter
   3010Laxed printer
   $629

5. NEC MacSync HC
   600/800 High RES monitor
   $420

6. TI microLaser PS35
   3001F Duplex laser printer
   $1699

7. Abaton Interface 24/96
   200-960 baud modem
   $315

8. Suquest Cartridge
   Single with cartridge
   $65

9. Quark XPress 3.0
   12 month ISP software
   $449

10. Macintosh LC
   Desktop color monitor
   $1715

**Systems**

- MacClassic
- Mac II
- Mac LC
- Mac III/50
- Mac IIci
- Mac IIx
- NEW Macintosh Portable
- Macintosh Portable

**Hardware**

- RasterOps 364
- RasterOps 24 25V
- RasterOps 24/1
- RasterOps 24S
- RasterOps all products available
- Call
- SIMMs: all types

**Software**

- 6.1 miaol.aser PS35
- Fax:

**Drives & Tapes**

- Ti microLaser PS17
- Suquest 44MB Mechanism
- Suquest 44MB Cartridge

**Drivers & Tapes**

- Berlouli all models

**JetFill**

The clean, inexpensive solution for replacing HP DeskWriter cartridges. Permanent ink, colors available.

- $10.95

**How to Order**

Visit Motorola, Discover our scanners, check, and CODs. $5,000 minimum on CODs. Tax: Texas residents only add 8% sales tax. Prices and items subject to change and availability.

**International**

5% surcharge on international orders. Mail Info: Orders accepted with a $10 surcharge. Terms: You are not charged until your order is shipped. Phone charges cannot be refunded. Shipping: minimum $5-

**UPS Ground, Blue, Red, Federal Express, EDI, Airborne:** "Returns must be in new condition and package seal must not be opened on software. Returns may be subject to a restocking fee. Ask for details when ordering. Bottom Line Distribution cannot be responsible for errors in typographical or photography.
<table>
<thead>
<tr>
<th>RS#</th>
<th>ADVERTISER PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>61</td>
<td>Abaton 4</td>
</tr>
<tr>
<td>129</td>
<td>Abbott Systems, Inc. 4</td>
</tr>
<tr>
<td>375</td>
<td>Abra MacDabra Software Co. 287</td>
</tr>
<tr>
<td>84</td>
<td>Add On America 267</td>
</tr>
<tr>
<td>88</td>
<td>Advance Business Center 269</td>
</tr>
<tr>
<td>100</td>
<td>AEC Management Systems BG27</td>
</tr>
<tr>
<td>127</td>
<td>Aetna 287</td>
</tr>
<tr>
<td>192</td>
<td>Alliance Peripheral Systems BG12-13</td>
</tr>
<tr>
<td>229</td>
<td>Alliance Peripheral Systems 293-295</td>
</tr>
<tr>
<td>71</td>
<td>ALSof f, Inc. BG21</td>
</tr>
<tr>
<td>418</td>
<td>Altron 209</td>
</tr>
<tr>
<td>70</td>
<td>Applied Engineering 220</td>
</tr>
<tr>
<td>90</td>
<td>Articulate Systems BG61</td>
</tr>
<tr>
<td>37</td>
<td>Asante 37</td>
</tr>
<tr>
<td>13</td>
<td>Avery 257</td>
</tr>
<tr>
<td>N/A</td>
<td>Bottom Line Distribution 282-283</td>
</tr>
<tr>
<td>21</td>
<td>Caere Corporation C5</td>
</tr>
<tr>
<td>359</td>
<td>Cambridge Computer (ENI Direct) 283</td>
</tr>
<tr>
<td>420</td>
<td>Careville Networks Corp. 222</td>
</tr>
<tr>
<td>117</td>
<td>CDAC Computer Sales 199-202</td>
</tr>
<tr>
<td>99</td>
<td>CE Software 44</td>
</tr>
<tr>
<td>151</td>
<td>Central Point Software BG33</td>
</tr>
<tr>
<td>N/A</td>
<td>CheckFree 251</td>
</tr>
<tr>
<td>400</td>
<td>Chimon America, Inc. 21</td>
</tr>
<tr>
<td>N/A</td>
<td>Claris N/A</td>
</tr>
<tr>
<td>120</td>
<td>CompuServe 171</td>
</tr>
<tr>
<td>64</td>
<td>Computer Friends 42</td>
</tr>
<tr>
<td>22</td>
<td>CoStar Corporation 23</td>
</tr>
<tr>
<td>23</td>
<td>CoStar Corporation 23</td>
</tr>
<tr>
<td>376</td>
<td>Curtis Manufacturing 12</td>
</tr>
<tr>
<td>N/A</td>
<td>Custom Applications, Inc. 16</td>
</tr>
<tr>
<td>135</td>
<td>Dantz Disk Tools 21</td>
</tr>
<tr>
<td>146</td>
<td>DataViz BG41</td>
</tr>
<tr>
<td>122</td>
<td>Dayna 214</td>
</tr>
<tr>
<td>159</td>
<td>Daystar Digital 39</td>
</tr>
<tr>
<td>160</td>
<td>Daystar Digital 39</td>
</tr>
<tr>
<td>186</td>
<td>Delphi Software 253</td>
</tr>
<tr>
<td>368</td>
<td>DesignCAD, Inc. 23</td>
</tr>
<tr>
<td>17</td>
<td>Digital Vision, Inc. 147</td>
</tr>
<tr>
<td>91</td>
<td>Diskette Connection N/A</td>
</tr>
<tr>
<td>405</td>
<td>Dove Computer Corporation BG51</td>
</tr>
<tr>
<td>161</td>
<td>Dr. Mac 264-265</td>
</tr>
<tr>
<td>306</td>
<td>Dubl in 501</td>
</tr>
<tr>
<td>170</td>
<td>Dynaware USA, Inc. 295</td>
</tr>
<tr>
<td>168</td>
<td>Eastman Kodak 40</td>
</tr>
<tr>
<td>188</td>
<td>Eihman 241</td>
</tr>
<tr>
<td>188</td>
<td>Eihman 241</td>
</tr>
<tr>
<td>154</td>
<td>EMAC 5</td>
</tr>
<tr>
<td>178</td>
<td>Farallon 46</td>
</tr>
<tr>
<td>157</td>
<td>Fifth Generation 195</td>
</tr>
<tr>
<td>156</td>
<td>Fifth Generation 195</td>
</tr>
<tr>
<td>158</td>
<td>Fifth Generation 195</td>
</tr>
<tr>
<td>199</td>
<td>Fifth Generation BG59</td>
</tr>
<tr>
<td>91</td>
<td>FCC Technologies 57</td>
</tr>
<tr>
<td>92</td>
<td>FCC Technologies 57</td>
</tr>
<tr>
<td>93</td>
<td>FCC Technologies 59</td>
</tr>
<tr>
<td>15</td>
<td>Golden Triangle 286</td>
</tr>
<tr>
<td>82</td>
<td>GraphSoft 28</td>
</tr>
<tr>
<td>N/A</td>
<td>Hard Drives International 27</td>
</tr>
<tr>
<td>373</td>
<td>Hardware Express 268</td>
</tr>
<tr>
<td>N/A</td>
<td>Hewlett-Packard 76-77</td>
</tr>
<tr>
<td>N/A</td>
<td>Hewlett-Packard 76-77</td>
</tr>
<tr>
<td>N/A</td>
<td>Hewlett-Packard 76-77</td>
</tr>
<tr>
<td>79</td>
<td>IBS Livingston Technology BG29</td>
</tr>
<tr>
<td>N/A</td>
<td>Image Craft Graphics, Inc. 204</td>
</tr>
<tr>
<td>407</td>
<td>Ingram Micro 254-255</td>
</tr>
<tr>
<td>155</td>
<td>Ignition Solutions, Inc. 82</td>
</tr>
<tr>
<td>147</td>
<td>Integraph 241</td>
</tr>
<tr>
<td>363</td>
<td>International Business Software 208</td>
</tr>
<tr>
<td>114</td>
<td>IOMEGA BG25</td>
</tr>
<tr>
<td>145</td>
<td>Jasmine Technologies BG6-3</td>
</tr>
<tr>
<td>286</td>
<td>Kensington Microvance 256</td>
</tr>
<tr>
<td>414</td>
<td>LaCie 246-47</td>
</tr>
<tr>
<td>416</td>
<td>LaCie 247</td>
</tr>
<tr>
<td>N/A</td>
<td>LaserMAX Systems 284</td>
</tr>
<tr>
<td>176</td>
<td>Liberty Systems 128</td>
</tr>
<tr>
<td>N/A</td>
<td>Lifetree Software 14</td>
</tr>
</tbody>
</table>

**AD INDEX**

MacUser and MacWEEK In combination.

<table>
<thead>
<tr>
<th>RS#</th>
<th>ADVERTISER PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>364</td>
<td>Mac and More BG35-40</td>
</tr>
<tr>
<td>N/A</td>
<td>MacAvenue BG35-40</td>
</tr>
<tr>
<td>77</td>
<td>MacCenter 77</td>
</tr>
<tr>
<td>N/A</td>
<td>MacConnection N/A</td>
</tr>
<tr>
<td>275</td>
<td>MacDepot 281</td>
</tr>
<tr>
<td>113</td>
<td>MacFriends 83</td>
</tr>
<tr>
<td>111</td>
<td>MacFriends 83</td>
</tr>
<tr>
<td>108</td>
<td>MacFriends 206</td>
</tr>
<tr>
<td>109</td>
<td>MacFriends 207</td>
</tr>
<tr>
<td>51</td>
<td>MacLand 288-291</td>
</tr>
<tr>
<td>135</td>
<td>Max Software USA 78</td>
</tr>
<tr>
<td>134</td>
<td>MacProducts USA BG31</td>
</tr>
<tr>
<td>46</td>
<td>MacSavings 273</td>
</tr>
<tr>
<td>257</td>
<td>MacSource 279</td>
</tr>
<tr>
<td>39</td>
<td>M cel Technology Corp. 267</td>
</tr>
<tr>
<td>16</td>
<td>Ma cTown 261</td>
</tr>
<tr>
<td>153</td>
<td>MacWarehouse 185-193</td>
</tr>
<tr>
<td>N/A</td>
<td>MacZone N/A</td>
</tr>
<tr>
<td>356</td>
<td>Magnum Software Corp. 294</td>
</tr>
<tr>
<td>165</td>
<td>Mainstay 10</td>
</tr>
<tr>
<td>45</td>
<td>MEGA Software, Inc. 155</td>
</tr>
<tr>
<td>141</td>
<td>MENG Software, Inc. 232</td>
</tr>
<tr>
<td>123</td>
<td>Microcom Software Division 242</td>
</tr>
<tr>
<td>450</td>
<td>MicroMac Technology, Inc. 294</td>
</tr>
<tr>
<td>33</td>
<td>MicroNet Technology, Inc. BG19</td>
</tr>
<tr>
<td>N/A</td>
<td>Microsoft N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>Microsoft N/A</td>
</tr>
<tr>
<td>N/A</td>
<td>Microsoft N/A</td>
</tr>
<tr>
<td>408</td>
<td>Microsoft Press 248</td>
</tr>
<tr>
<td>127</td>
<td>Microtech International BG23</td>
</tr>
<tr>
<td>190</td>
<td>Microtek Lab, Inc. 260</td>
</tr>
<tr>
<td>107</td>
<td>Mirror Technologies 172-173</td>
</tr>
<tr>
<td>67</td>
<td>Mobius Tegem 270</td>
</tr>
<tr>
<td>54</td>
<td>NewGen Systems Corp. 244</td>
</tr>
<tr>
<td>58</td>
<td>NewGen Systems Corp. 244</td>
</tr>
<tr>
<td>55</td>
<td>Nova Development 29</td>
</tr>
<tr>
<td>26</td>
<td>OMS Technologies 213</td>
</tr>
<tr>
<td>168</td>
<td>Onda Corporation 232</td>
</tr>
<tr>
<td>137</td>
<td>Ontrack Computer Systems 297</td>
</tr>
<tr>
<td>124</td>
<td>Opcode 276</td>
</tr>
<tr>
<td>N/A</td>
<td>Oracle N/A</td>
</tr>
<tr>
<td>58</td>
<td>Orange Micro 26</td>
</tr>
<tr>
<td>58</td>
<td>Passport 22</td>
</tr>
<tr>
<td>63</td>
<td>Peripheral Vision 8</td>
</tr>
<tr>
<td>81</td>
<td>Personal Training 17</td>
</tr>
<tr>
<td>68</td>
<td>PLS BG65</td>
</tr>
<tr>
<td>174</td>
<td>Proman Products, Inc. 261</td>
</tr>
<tr>
<td>143</td>
<td>PROMOBUS BG33</td>
</tr>
<tr>
<td>410</td>
<td>Quark, Inc. 216</td>
</tr>
<tr>
<td>150</td>
<td>RasterOps 150</td>
</tr>
<tr>
<td>54</td>
<td>Safeware 265</td>
</tr>
<tr>
<td>46</td>
<td>ScanCo 46</td>
</tr>
<tr>
<td>N/A</td>
<td>Seiko Instruments 182-183</td>
</tr>
<tr>
<td>367</td>
<td>Shiva 204</td>
</tr>
<tr>
<td>390</td>
<td>Sigma Designs 15</td>
</tr>
<tr>
<td>167</td>
<td>Silicon Beach 219</td>
</tr>
<tr>
<td>182</td>
<td>Software That Fits 219</td>
</tr>
<tr>
<td>166</td>
<td>Storage Dimensions BG17</td>
</tr>
<tr>
<td>139</td>
<td>Symantec BG52-53</td>
</tr>
<tr>
<td>N/A</td>
<td>Symantec N/A</td>
</tr>
<tr>
<td>98</td>
<td>Symantec 257</td>
</tr>
<tr>
<td>41</td>
<td>Symantec/Peter Norton BG63</td>
</tr>
<tr>
<td>131</td>
<td>Symmetry Corporation BG27</td>
</tr>
<tr>
<td>188</td>
<td>SYNEX 18</td>
</tr>
<tr>
<td>87</td>
<td>T-Maker 87</td>
</tr>
<tr>
<td>75</td>
<td>TELEWARE 75</td>
</tr>
<tr>
<td>85</td>
<td>Tenon Interconnects 233</td>
</tr>
<tr>
<td>247</td>
<td>Texas Instruments 238</td>
</tr>
<tr>
<td>173</td>
<td>Texas M cStuf 271</td>
</tr>
<tr>
<td>101</td>
<td>Third Wave Computing 262</td>
</tr>
<tr>
<td>122</td>
<td>Timeslips Corporation 18</td>
</tr>
<tr>
<td>116</td>
<td>Timeworks, Inc. 167</td>
</tr>
<tr>
<td>192</td>
<td>US. Computer Merchants 266</td>
</tr>
<tr>
<td>N/A</td>
<td>Warehouse 54 286</td>
</tr>
<tr>
<td>245</td>
<td>WordPerfect Corporation 288</td>
</tr>
<tr>
<td>341</td>
<td>XANTE Corporation 29</td>
</tr>
</tbody>
</table>

BG denotes Buyer's Guide.
1. Please indicate which of the following computers you currently use in your company or organization:
   □ a) Mac Plus □ b) Mac SE □ c) Other □ d) IBM PC □ e) Other
2. For how many microcomputers do you buy products?
   □ f) 1-4 □ g) $49 □ h) 50+
3. Your primary job function is: (check one)
4. For which of the following products are you involved in selecting brands/models to be bought by your company or organization? (Check all that apply)
5. Are you involved in the purchasing of microcomputer equipment at your company?
   □ z) Yes □ a) No
6. If so, what function do you serve in the buying process?
   □ b) Evaluations/Specification □ c) Recommendation □ d) Buyer/Purchaser

PLEASE PRINT CLEARLY

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

4. □ Please send me a one-year subscription to MacUser for $19.97. Offer valid in U.S. only.

Bonded in Wisconsin
Made in the U.S.A.
HOW TO STAY ON TOP OF WHAT'S IN THE MAC MARKET

USE THIS CARD TO OBTAIN FREE INFORMATION ABOUT MACINTOSH PRODUCTS AND SERVICES IN THIS ISSUE

(SEE OTHER SIDE)
Mac & MORE Inc.
Your Super Store!
11266 W. HILLSBOROUGH AVE
TAMPA, FLORIDA USA
M-F 9:AM-9:PM~ SAT 9:AM-5:PM

Please circle 364 on reader service card.

TERMS AND CONDITIONS: Mac& MORE gladly accepts VISA, MasterCard, American Express, C.O.D., and authorized Corporate Purchase Orders. AMEX, please add 3%. We get hit, you get hit.

Mac& MORE WARRANTY: We warranty all products for 1 year. Satisfaction Guaranteed. This company is run by Mac enthusiasts for Mac enthusiasts. (...and we still love Steve Jobs)

All Prices subject to change without notice. We are not responsible for typographical errors.
Laser Printer Sale

ScripTEN PostScript® Laser Printer
$1,649
- 10 Pages per minute
- 11 Font Families (35 typefaces)
- 3 megs of RAM
- Solid Blacks for graphics
- Letter, Legal and transparencies

CrystalPrint Publisher I Laser Printer
$1,899
- 8 Pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Solid Blacks for graphics
- Letter, Legal and transparencies

CrystalPrint Publisher II Laser Printer
$2,395
- 8 Pages per minute
- 11 Font Families (39 typefaces)
- 3 megs of RAM
- Adobe type one support
- Solid Blacks for graphics
- Auto switching between Macintosh and IBM

PS17 Microlaser PostScript® Laser Printer
$1,499
- 1.5 Megabytes of RAM
- 6 pages per minute
- 17 typefaces
- Letter, Legal, and transparencies

PS35 Microlaser PostScript® Laser Printer
$1,799
- 1.5 Megabytes of RAM
- 6 pages per minute
- 35 typefaces

QMS-PS® 410 PostScript Laser Printer
$1,999
- 2 Megabytes of RAM
- 4 pages per minute
- Auto switching between Macintosh and IBM.

PostScript® is a registered trademark of Adobe Systems Incorporated.

Visa, MasterCard, and American Express accepted NO surcharge. Your Credit Card will not be charged until your order is shipped. We accept COD orders, additional $5.00 charge. AZ residents add 6.5%. All shipments made by Federal Express

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 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.

---

**Hard Disk Drives**

**Quantum**

Quantum drives have a 2 year warranty!

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quantum 40 19ms</td>
<td>$299</td>
<td>$399</td>
</tr>
<tr>
<td>Quantum 105 19ms</td>
<td>$399</td>
<td>$459</td>
</tr>
<tr>
<td>Quantum 120 15ms</td>
<td>$589</td>
<td>$689</td>
</tr>
<tr>
<td>Quantum 170 15ms</td>
<td>$679</td>
<td>$779</td>
</tr>
<tr>
<td>Quantum 210 15ms</td>
<td>$849</td>
<td>$959</td>
</tr>
</tbody>
</table>

**Imprimis Drives Now Have a TWO Year Warranty!**

Effective on all Imprimis drives purchased after 3/1/91

<table>
<thead>
<tr>
<th>Model</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imprimis MacWren 300 16ms</td>
<td>$1,349</td>
<td>$1,449</td>
</tr>
<tr>
<td>Imprimis MacWren Runner 330 10.7ms</td>
<td>$1,499</td>
<td>$1,599</td>
</tr>
<tr>
<td>Imprimis MacWren 600 16ms</td>
<td>$1,799</td>
<td>$1,899</td>
</tr>
<tr>
<td>Imprimis MacWren 1.2 Gigabyte 16ms</td>
<td>$2,799</td>
<td>$2,899</td>
</tr>
</tbody>
</table>

**SyQuest**

42 Megabyte Removable Hard Disk Drives

**$439**

Cartridge not included

**SyQuest Removable Cartridges** **$68**

Will fit ANY 44 Removable Hard Disk Drive

**Cartridge 10 Pak now only $660**

---

**30 DAY MONEY BACK GUARANTEE**

ON ALL IMPRIMIS, QUANTUM AND SYQUEST HARD DISK DRIVES

For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)

4685 South Ash Avenue, Suite H-5, Tempe, Arizona 85282 (602) 820-5802
New for Mac Ilsi and Ilic
Full Page GrayScale Monitor
PageView GS.................................$629

Portrait Monitors
PageView SE .................................$799
PageView SE/30 ..............................$799
PageView II ...................................$799

19" Two Page Displays
L-View 19" Multimode for Mac II family & SE/30 ... $1,349

19" Two Page G/S Displays
SilverView 21" Monochrome for Mac II ..................$1,499
SilverView 21" GrayScale for Mac II .....................$1,799

Fax Modems
Abaton 24/96 $289
Dove 24/96 $279

Monitors
NEC MacSync 14" $439
Magnavox 14" Two Year Warranty $439
Seiko 14" $589

Samsung 15" Full Page Display with Video Interface $449
Mac Plus, SE, SE/30, Mac II, IIX, IICX, and IIC $549

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.
For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)

DayStar DIGITAL

Scanners

Microtek
300ZS Color Scanner ................ $1,699
300GS Scanner ......................... $1,249

Abaton
300GS Scanner ........................ $1,199

Caere
The Typist ............................. $459

Articulate Systems
Voice Navigator ....................... $599

NEC
SlientWriter 2
Model 90 ................................ $1,699

CD ROM

NEC
Portable CD W/Interface ............... $449
Toshiba
External CD W/Interface .............. $499

Modems

CMS 2400 Baud ........................ $109
Anchor 2400 Baud ...................... $159

Keyboards

MacPro ................................... $119
DataDesk 101 ........................... $125

Uninterruptable Power Supplies

Safe Power Systems
Safe 250 ................................ $189
Safe 400S ................................ $369

Input Devices

Mouse Systems
ADB Track Ball ........................ $65
Little Mouse ADB ...................... $70
Little Mouse Plus ...................... $70
PageBrush Mouse/Scanner ........... Call

Upgrade your Mac's Memory

SIMM SALE

$49

FREE! Included with your Simm order is our 22 page, step by step easy installation guide.

For Ordering and Technical Support Call 1-800-333-3353 (FAX #602-345-2217)

4685 South Ash Avenue, Suite H-5, Tempe, Arizona 85282 (602) 820-5802

Please circle 51 on reader service card.
Five Simple Reasons:

1. **Quality:** While our products may not be fancy, our cases are all domestically manufactured, none of those light-weight imported knock-offs. They utilize the best auto-switching digital power supplies and quiet, high capacity fans. Our connectors are all name brands of the finest quality. Our drive mechanisms speak for themselves. Quantum, WREN, Maxtor, Conner, Syquest, Teac... Industry standards... the best available.

2. **Knowledge:** Our helpful, knowledgeable sales associates will help you determine what is the best drive for your needs (not just the most expensive). They'll help you navigate those thorny termination issues, and help you decide the right drive for your particular hardware configuration.

3. **Support:** Our trained technical associates will help you address any questions you might have about an APS drive. Are you running into conflicts when you use certain combinations of hardware and software? Our technical associates can help you sort through the kinds of problems that plague both the novice and the power user.

4. **Service:** Absolutely the best in the industry! If we tell you we have it, WE DO! We'll ship your drive when we promise, as we promise. We never charge your credit card until after your order has shipped from our factory. In the unlikely event that you have a problem with your drive, our exclusive "30 day performance guarantee" goes immediately into effect. We'll ship you a new drive over night* and have the suspect drive picked up at our expense. After the first 30 days, our warranty turn-around time is 48 hours (often 24). We'll ship back to you via overnight air* - our expense. Our one and two year warranties include a thirty day money-back guarantee. Your toll-free phone call to either sales or technical support is answered by a real person 24 hours a day, none of those frustrating voice mail mazes that you find other places. Our goal is to care for you better and faster than the dealer down the street.

5. **Economy:** Our prices speak for themselves! APS consistently offers the lowest prices on immediately available inventory in the business. Our pricing is based on assembled, formatted* products with everything you need to plug-n-play. Our external drives are available in externally terminated (with terminator) or internally terminated units - your choice. Need a Mac to SCSI, or daisy-chain cable? Take your pick, - no extra charge. Need multiple units? Don't pay for the same piece of bundled software three times, buy them only if you need 'em*. We have outstanding values on several "industry standard" drive utility products at as much as 80% off retail prices!

*Some limitations may apply.
## Quantum 10 - 12ms Access

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>40mb</td>
<td>$299</td>
<td>$389</td>
</tr>
<tr>
<td>52</td>
<td>329</td>
<td>429</td>
</tr>
<tr>
<td>105</td>
<td>399</td>
<td>499</td>
</tr>
<tr>
<td>105LPS</td>
<td>509</td>
<td>609</td>
</tr>
<tr>
<td>120</td>
<td>599</td>
<td>699</td>
</tr>
<tr>
<td>170</td>
<td>729</td>
<td>829</td>
</tr>
<tr>
<td>210</td>
<td>859</td>
<td>959</td>
</tr>
</tbody>
</table>

## MAXTOR 15 - 17ms Access

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Prof. fts. LC, Classic &amp; Si-tool</td>
<td>$299</td>
<td>$399</td>
</tr>
<tr>
<td>Low Prof. fts. LC, Classic &amp; Si-tool</td>
<td>429</td>
<td>529</td>
</tr>
<tr>
<td>Low Prof. fts. LC, Classic &amp; Si-tool</td>
<td>859</td>
<td>959</td>
</tr>
</tbody>
</table>

## Conner 25ms Access

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Internal Configurations Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Prof. fts. LC, Classic &amp; Si-tool</td>
<td>$319</td>
</tr>
</tbody>
</table>

## Syquest Syquest

- 45 meg Removable
- Dual 45 Meg

- All Include one cartridge + $72 per cartridge for additional cartridges

## Teac 155mb Tape

- Include Retrospect

- All Include one cassette

- All SyQuest Combo’s Include one Cartridge

**ASK ABOUT OUR OTHER COMBOs, SUN & IBM SCSI DRIVES**

---

All Drive products carry a 30 day Money-back guarantee. Quantum and Syquest Drives carry a two year “parts & labor” disk-for-disk replacement warranty. WREN, Maxtor, Teac, WangDAT and Syquest Cartridges carry a one year “parts & labor” disk-for-disk replacement warranty. All Hard Drives include all brackets, cables and cords and LED’s required for operation. All Hard Drives come pre-formatted with Apple’s latest stable System software, 16MB of Publicly Distributable software from the BMUG Library, and the ALLIANCE POWER TOOL/P SBSI formatter Partitioner. If your drive fails to perform properly in the first 30 days and our technical support staff can’t solve the problem over the phone, we’ll ship you a replacement drive overnight and have your defective drive picked up at our expense. Offer is subject to some limitations. Product being returned for credit and international orders do not apply.

**Alliance Peripheral Systems**

2900 S. 291 Hwy • Lower H • Independence, MO 64057 • (816) 478-8300

**1-800-233-7550**

Toll Free U.S. and Canada

VISA/MC, Corp., Gov., Univ. PO’s, NO SURCHARGE

AMEX ACCEPTED

International Orders Call (913) 478-8300

9:30am - 7:00pm Central Time

fax: (816) 478-4896 24hrs.
Your window to hot new products in the Macintosh industry. A unique section displaying new advertisers and their products.
The place to turn first for this month’s latest.

For special rates and details contact your local MacUser sales representative.

Give Your SE a Facelift!

Update your Mac SE or SE/30:
• Save desktop space with small footprint beraless Macintosh
• Increase productivity with full page monochrome display
• Colorize your SE/30 with 8 or 24-bit color
• Transport your Mac easily in state-of-the-art slimline enclosure
• Reduce noise by eliminating fan

The MicroMac Upgrade System comes complete with display, video card, all cables, components, software and documentation.
Upgrading is as easy as changing memory.

Introductory offer: MicroMac SE with half page display $885;
MicroMac SE/30 monochrome with full page display $1075;
MicroMac SE/30 color $875 (color monitor additional).
Ask about SE accelerator and MicroMac Plus Upgrade System.

Call today for a complete information package!

MicroMac Technology Inc.
9 Sorbonne, Laguna Niguel, CA 92677
(714) 363-9915 FAX: (714) 363-0755

Voice Mail that can grow with you...

Only $495

No reason to miss phone calls, inquiries or sales. Magnum’s TFLXvm system handles incoming voice and touchtone input for as many individual mailboxes as you want. Naturally, messages can be accessed anytime from any phone.
The basic TFLXvm, at $495.00, also has multi-level branching—a great business tool. Offer Menus for Info Centers/Product News, etc., which callers may access 24 hrs a day.
• Network & MultiFinder friendly
• Records, sends, saves, edits, videophone pictures
• Picture Programming requires no programming skills
When your needs grow, just order other functions...
• Dial out capability to call beepers, other phones
• Database & variable capability for order taking, making appointments, etc.
• Voice Merge sound files
• Have E-mail text read in a natural voice
• Fax on demand

TFLXvm is the personal version of the professional TFLX. Both are hardware and software systems. How good is TFLX? Well, for 2 years most Bell telephone companies have ordered and re-ordered because of its power and picture programming ease. Min: Macintosh Plus, HD; 1 Mb RAM. Call for an on-line demo, or information.

Magnum Software Corporation
21115 Devonshire St., #337 • Chatsworth, CA 91311 • 818-701-5051

Please circle 450 on reader service card.

Please circle 355 on reader service card.
Versatile and elegant.

The future lies in image management.

Keith Brock
Executive Creative Director
Lundor Associates

3D Conceptual Design
- Complete modeling tools
- Extensive Library Part Set
- DXF import and export

Rendering
- Render as you design
- 24-bit color support
- Anti-aliasing
- MacRenderman™ Compatible

Animation
- Turn your design into a 5 minute Animated Presentation
- Play back lengthy animations from your hard drive
- Animations play at up to 30 frames per second

System Requirements: System 6.0.3 or later / 32-bit Color Quick Draw™ / 2 Megs RAM (minimum) / Color Graphic Board (8-Bit or more) / Hard Disk Drive DynaPerspective™ is a trademark of Dynaware USA, Inc. MacRenderman is a registered trademark of Pixar.

©1990 Dynaware USA, Inc. 950 Tower Lane, Suite 1150, Foster City, CA 94404 TEL: 415-349-5700 FAX: 415-349-3879

1-800-445-DYNA

For A Video Call 1-800-445-DYNA

DYNAPERSPECTIVE

DynaWare USA, Inc.

Please circle 170 on reader service card.
If you hate to back up, don’t.

Introducing DiskTwin: A Revolution In Macintosh Backup.

Your Macintosh is only as useful as the data that’s stored on your disk. Unfortunately, it’s not a matter of if, but when, your disk will crash. STOP WORRYING about losing data or time when a hard disk fails. While other backup systems can only take periodic “snapshots” of your disk to a tape or a floppy, DiskTwin runs continuously, making an up-to-the-instant backup of your primary disk on a second disk. When your primary disk fails, you have a complete backup that comes online automatically, so FORGET ABOUT DOWNTIME. Whenever your Macintosh saves data to disk, DiskTwin simultaneously saves to a twin disk. And DiskTwin WON’T SLOW YOUR MACINTOSH DOWN.

With removable media like erasable optical, SyQuest, or Bernoulli drives, DISKTWIN GIVES YOU ARCHIVAL STORAGE. DISKTWIN IS PERFECT FOR APPLESHARE file servers because it runs transparently, without degrading performance, while AppleShare is running. And DiskTwin maintains all user and group privileges. If you hate to backup, YOU’LL LOVE DISKTWIN.

For Macintosh II family or SE/30 computers.
Install your Large Hard Drive with a Click of Your Mouse.

Installation of virtually any SCSI drive is easy and only minutes away with Ontrack's Disk Manager - Mac Hard Disk Installation Utility for Macintosh.

Ontrack, the world leader in disk management software, gives Macintosh users added hard drive options with Disk Manager - Mac. Select the SCSI drive of your choice, and create a Macintosh that is easier to use and less expensive to upgrade.

- Install any SCSI drive
- Create customized partitions
- Complete with utilities to manage and secure your data - including password protection and a removable drive option
- Available with or without a hardware installation kit

FREE TECHNICAL SUPPORT!
Technical Support: 612-937-2121

1-800-752-1333
International: 612-937-1107 • Fax: 612-937-5815

ONTRACK
Computers Systems Inc.

Please circle 358 on reader service card.

Changing your mailing address?

It's a simple procedure to ensure that your next issue of MacUser will catch up with you as soon as you move. Please send your NEW address PLUS your current mailing label to:

MacUser
P.O. Box 56986
Boulder, Colorado
80322-6986

Please allow up to 60 days for change of address to take place.

$1099 FaxPro (for AppleTalk, EtherTalk, and Dial-up)
$1199 with FaxProShare™

FaxPro - The Network Fax Modem!

FaxPro puts the power of fax into every Mac on your network. Lowers costs and eliminates the headaches of multiple phone lines and fax boards. Uses your existing AppleTalk, EtherTalk or Phonenet. Rated BEST by PCWeek (5/28/90).

Features: Background operation - no dedicated Mac • Unlimited users on one phone line • Automatic cover sheets • Phonebook DA • Mailing lists • Custom overseas dialing • Centralized call accounting • Available now!

(800) 292-7771
(408) 746-1590 • FAX (408) 746-1593

Please circle 84 on reader service card.
# Marketplace

<table>
<thead>
<tr>
<th>HARDWARE</th>
<th>299-308</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCELERATOR BOARDS</td>
<td>299</td>
</tr>
<tr>
<td>BAR CODE</td>
<td>299</td>
</tr>
<tr>
<td>COMPUTER SYSTEMS</td>
<td>299-301</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>301</td>
</tr>
<tr>
<td>DATA RECOVERY SERVICES</td>
<td>302</td>
</tr>
<tr>
<td>DISK DRIVES</td>
<td>302-303</td>
</tr>
<tr>
<td>DISKETTES</td>
<td>303</td>
</tr>
<tr>
<td>GENERAL</td>
<td>304-306</td>
</tr>
<tr>
<td>INSURANCE</td>
<td>306</td>
</tr>
<tr>
<td>MEMORY UPGRADES</td>
<td>306-307</td>
</tr>
<tr>
<td>PERIPHERALS</td>
<td>307-308</td>
</tr>
<tr>
<td>PRINTERS</td>
<td>308</td>
</tr>
<tr>
<td>SCANNERS</td>
<td>308</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOFTWARE</th>
<th>308-314</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCOUNTING</td>
<td>308</td>
</tr>
<tr>
<td>BAR CODE</td>
<td>308</td>
</tr>
<tr>
<td>BUSINESS</td>
<td>309</td>
</tr>
<tr>
<td>BUSINESS TIME MANAGEMENT</td>
<td>309</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>309-310</td>
</tr>
<tr>
<td>DESKTOP PUBLISHING</td>
<td>310-311</td>
</tr>
<tr>
<td>EDUCATIONAL</td>
<td>311</td>
</tr>
<tr>
<td>EMULATION</td>
<td>311</td>
</tr>
<tr>
<td>ENGINEERING</td>
<td>312</td>
</tr>
<tr>
<td>ENTERTAINMENT/GAMES</td>
<td>312</td>
</tr>
<tr>
<td>FONTS</td>
<td>312</td>
</tr>
<tr>
<td>GENEALOGY</td>
<td>312</td>
</tr>
<tr>
<td>GRAPHICS</td>
<td>312</td>
</tr>
<tr>
<td>LANGUAGE TOOLS</td>
<td>313</td>
</tr>
<tr>
<td>LOTTERY</td>
<td>313</td>
</tr>
<tr>
<td>MEDICAL/DENTAL</td>
<td>313</td>
</tr>
<tr>
<td>MUSIC/MIDI</td>
<td>313</td>
</tr>
<tr>
<td>PRINT DRIVERS/SPOOLERS</td>
<td>313</td>
</tr>
<tr>
<td>PUBLIC DOMAIN</td>
<td>313</td>
</tr>
<tr>
<td>RELIGION</td>
<td>314</td>
</tr>
<tr>
<td>SHAREWARE</td>
<td>314</td>
</tr>
<tr>
<td>STACKWARE</td>
<td>314</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MISCELLANEOUS</th>
<th>314-317</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCESSORIES</td>
<td>314-315</td>
</tr>
<tr>
<td>BOOKS/CATALOGUES/PUBLICATIONS</td>
<td>315</td>
</tr>
<tr>
<td>DATA CONVERSION SERVICES</td>
<td>315</td>
</tr>
<tr>
<td>DESKTOP PUBLISHING SERVICES</td>
<td>315-316</td>
</tr>
<tr>
<td>DISKETTE COPY SERVICES</td>
<td>316</td>
</tr>
<tr>
<td>INSURANCE</td>
<td>316</td>
</tr>
<tr>
<td>SERVICES</td>
<td>316</td>
</tr>
<tr>
<td>SLIDE IMAGING SERVICES</td>
<td>316</td>
</tr>
<tr>
<td>SUPPLIES</td>
<td>317</td>
</tr>
</tbody>
</table>

## Advertising Rates and Information

MacUser Marketplace is a special economical section for product and service listings.

Advertisements are grouped by category and sold by column inches. Second color option available.

Standard Directory Listings are also available for a minimum of 3 issues at $415.00 per issue ($1,245.00 total).

For additional information call 212-503-5115.

## Classified Advertising Staff

One Park Avenue, New York, NY 10016
(212) 503-5115 or (800) 825-4ADS

<table>
<thead>
<tr>
<th>Director, Classified Sales</th>
<th>Sales Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paul Stafford</td>
<td>Paul A. Fusco</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group Advertising Director</th>
<th>Advertising Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kathryn J. Cumberlander</td>
<td>Wanda D. Brown</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Production Director</th>
<th>Advertising Support Manager</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anne R. Brockinton</td>
<td>Monica Dixon</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Production Manager</th>
<th>Production Supervisor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carolyn Bingham</td>
<td>Bessi Dion</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Production Coordinator</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chris Meyer</td>
<td></td>
</tr>
</tbody>
</table>

## Account Managers

KAREN CASTORINO (212) 503-5140
AZ, CA (213, 619, 714, 818), DC, DE, HI, MD, NH, NB, NV, PA, SC, TN, UT, VA, WI, WV, CANADA and Overseas

THOMAS KOLETAS (212) 503-5136
AL, FL, GA, MA, ME, MI, MO, ME, NJ, NC, NY, RI, TX, and VT

DENNIS LEAVEY (212) 503-5111
AK, AR, CA (209, 408, 415, 707, 805, 916), CO, CT, IA, ID, IL, IN, KS, KY, LA, MN, MT, ND, NM, OH, OR, OK, SD, WA, and WY
BAR CODE

BAR CODE & MAGNETIC STRIPE READERS FOR MACINTOSH PLUS, SE & II
Connects on keyboard or ADB
Requires no additional program or port
Does not affect keyboard or mouse
Industrial quality, heavy-duty units
Also available:
SmartCard encoder reader
Magnetic encoder
Code & 39 UPC Printing Software
Portable Bar Code Reader

TPS Electronics
4047 Transport Street
Palo Alto, CA 94303
415-856-6832 1-800-526-5920
Fax: 415-856-3843

CIRCLE 202 ON READER SERVICE CARD

EZBarcode®

Bar Code Reader for Macintosh, Mac Plus, SE, II
PC-WEDGE II including
plastic wand
$309
Metal Wand ............ add $60
Mag Stripe Reader ........ Add $100
• Works with any program—no software required
• Connects to ADB port or between keyboard and computer
• Features bar code type automatically
• Reads all standard bar code types
• Supports full ASCII, check digits, bar codes, precision, fonts, macros, and more
• Automatic strip from bar code menu
• 2-year warranty

TimeKeeping Systems, Inc.
1306-S East 55th Street
Cleveland, OH 44103
Phone: (216) 361-9995 Fax: (216) 361-0350

CIRCLE 203 ON READER SERVICE CARD

COMPUTER SYSTEMS

Computer Design & Graphic Systems™
"Only Graphical Systems by the Graphic Specialists"

Over 2000 specialty priced products for the Graphics User
Call for free catalogue & product literature

Macintosh

$309

Laserwriter Plus, Hnt., Ntx
Call Sigma for 19" w/ card

Color Laser, Mac Plus, SE
Call

Textwriter 140 page HD
Call

Arts 

Call for catalog!

1-800-741-MAC1 (6221)

CIRCLE 204 ON READER SERVICE CARD

CRA Systems In.
300 SOUTH UNIVERSITY PARKS DR.
WACO, TX 76707

CPU's (5e, Scl, Sl, Hi, Os, X, Cl, Fs)
Apple Laser Writer Plus, Hst, Ntx
Apple Color & Monochrome
Apple Scanner 300dpi 16 GS
Sharp AX-500 11x17 24-bit scanner
HP Scan Jet 500dpi 16 GS
Quark 2.1 $30 Upgrade to 3.0

CALL (817) 754-2345
(817) 754-2345

We Buy and Sell New and Used Systems Any Quantity

Call us for a quote on your mac

Sigma L/View mono 19" w/card $1295
Best Flatbed scanner w/shuttlebed $1495
Roland 140 page HD $665
Mitsubishi 140 color w/card $1595
Sony 13", 14", 19" Trinitron Call
RasterOps and Radius Call
Call for Software List Call

CIRCLE 205 ON READER SERVICE CARD

CRA Systems Inc.
300 SOUTH UNIVERSITY PARKS DR.
WACO, TX 76707

CPU's (5e, Scl, Sl, Hi, Os, X, Cl, Fs)
Apple Laser Writer Plus, Hst, Ntx
Apple Color & Monochrome
Apple Scanner 300dpi 16 GS
Sharp AX-500 11x17 24-bit scanner
HP Scan Jet 500dpi 16 GS
Quark 2.1 $30 Upgrade to 3.0

CALL (817) 754-2345
(817) 754-2345

We Buy and Sell New and Used Systems Any Quantity

Call us for a quote on your mac

Sigma L/View mono 19" w/card $1295
Best Flatbed scanner w/shuttlebed $1495
Roland 140 page HD $665
Mitsubishi 140 color w/card $1595
Sony 13", 14", 19" Trinitron Call
RasterOps and Radius Call
Call for Software List Call

CIRCLE 206 ON READER SERVICE CARD

COMPUTER SYSTEMS

ELITE
COMPUTERS & SOFTWARE
BUY • SELL • TRADE • LEASE

Don't buy or sell any new or used equipment until you talk to us. We deal exclusively in Macintosh equipment. Call today for the best deals anywhere!

800-227-3971 FAX 318-865-2006

CIRCLE 207 ON READER SERVICE CARD

Shreve Systems
3804 Karen Lane
Bossier City, La. 71112

Mac IIci $3090.
Systems? Call us! We Buy and Sell!

800-227-3971 Call for catalog!

CIRCLE 208 ON READER SERVICE CARD

COMPUTER SYSTEMS

Category continued on the next page.
Small Ad. Big Deal.

You taught MacInStock a lesson.

In 1990, we ran ads of all sizes, types, and colors, but you didn’t care. On your quest for the very best combination of price, service, and quality peripherals, you called us last, big or small.

This is going to save us a bundle.

Now, we can spend more on tech support and customer service (although we already devote more phone time per customer than any other mail-order Mac dealer). And one other thing. We can also cut prices. That’s going to save you a bundle.

Mac Expertise • Toll-Free Tech Support • Free Warranty Repair • Rock-Bottom Prices

Ask a veteran where to buy your Mac.

There are at least 15 mail-order Macintosh dealers in this magazine. We all say we’re the best -- so get customer references. Ask about reliability. Ask how support was handled. Then buy yourself a Mac.

For great prices and expert service on new Macintosh computers and the best quality Macintosh peripherals, call us fast.

MacInStock® 800-633-1538
Fax:213-322-1486 • International:213-322-1455

"Apple", "Macintosh" and "Mac" are trademarks of Apple Computer, Inc. "MacInStock" is a registered trademark of 2M Group, Inc.
### MARKETPLACE

#### COMPUTER SYSTEMS

<table>
<thead>
<tr>
<th>System Type</th>
<th>Model</th>
<th>RAM</th>
<th>HDD</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Classic</td>
<td>2Mb/40</td>
<td>2Mb</td>
<td>80Mb</td>
<td>$3295</td>
</tr>
<tr>
<td>Mac IIci</td>
<td>5Mb/105</td>
<td>5Mb</td>
<td>80Mb</td>
<td>$2695</td>
</tr>
<tr>
<td>Mac LC 40/2Mb</td>
<td>2Mb</td>
<td>40Mb</td>
<td>$call</td>
<td></td>
</tr>
<tr>
<td>Mac Classic</td>
<td>40/2Mb</td>
<td>2Mb</td>
<td>40Mb</td>
<td>$2695</td>
</tr>
<tr>
<td>Laserwriter IINT</td>
<td>8Mb</td>
<td>80Mb</td>
<td>$3175</td>
<td></td>
</tr>
<tr>
<td>Laserwriter IINTX</td>
<td>16Mb</td>
<td>80Mb</td>
<td>$4195</td>
<td></td>
</tr>
<tr>
<td>HP Deskwriter</td>
<td>8Mb</td>
<td>80Mb</td>
<td>$725</td>
<td></td>
</tr>
<tr>
<td>Personal Laser NT</td>
<td>8Mb</td>
<td>80Mb</td>
<td>$2295</td>
<td></td>
</tr>
</tbody>
</table>

### RENTALS

- **$189 per mo.**

### DATA

#### Computer Center

- **Mac Plus** $795
- **Mac SE/30** $1795
- **Mac SE/30 32Mb Ram 40HD** $2099
- **Mac SE/30 32Mb Ram 105HD** $3175
- **Mac IIx 8Mb Ram 40HD** $435
- **Mac IIx 8Mb Ram 80HD** $725
- **Mac IIx 8Mb Ram 160HD** $795
- **Mac IIx 8Mb Ram 330HD** $985
- **ImageWriter II** $299
- **ImageWriter NT** $399
- **ImageWriter NTX** $499
- **Sharp JX 300 color scanner** $895
- **Microru 300G/300Z** $1695
- **Laserwriter IINTX** $399
- **Extended Keyboard for Mac..** $299

### Macintosh

- **Next Day Delivery**
- **Now Only** $188

### CD-ROM

- **FLOPPY DRIVES**
  - **Genuine Sony CD-ROM Replacement** $218

### PC Computer Rental

- **Call Toll-Free** 800-765-4727

### BUILD YOUR OWN MAC

- **Mac SE** $579
- **Mac SE Dual Floppy** $949
- **Mac SE-20** $1345
- **Mac SE-20 (all models)** $1345
- **Mac SE-20 32Mb Ram 40HD** $1795
- **Mac SE-20 32Mb Ram 105HD** $2499
- **ImageWriter I** $279
- **ImageWriter II** $379
- **LaserWriter** $1200
- **LaserWriter Plus** $1599
- **LaserWriter External Drive** 20Mb $259

### SPECIALS & UPDATES

- **Call Now On Sale**

### EXCEL DIRECT

- **1-800-624-2001**
- **In NY: 716-272-8770**
- **Refurbished Macs!**

### MAC% SE POWER SUPPLY

- **2.5 MB MEMORY**
- **Installed Only** $999

### MacUser

- **April 1991**
- **301**

---

**All items refurbished with new Macs, Visa, MC/Credit, C.O.D. accepted.**

---

**Mac User, April 1991, 301**
DATA RECOVERY SERVICES

ONTRACK DATA RECOVERY

Ontrack Data Recovery specializes in recapturing data from any network, microcomputer hard drive or floppy diskette.

- 95% success rate
- Fast turn around
- Expertise with Macintosh/DOS Novell OS/2
- Unix XENIX Bernoulli and more!

Find out why we are the leaders in data recovery - call an Ontrack Data Recovery representative today for more information.

Keeping you in business is our business.

1-800-872-2599

DATA Recovery Specialists
Lost Data from a Quantum, Wren or Seagate Drive? STOP!
Do nothing more until you call us!
We can probably recover your data from non-working drives. Free estimates, no obligation rates, fast turn-around. Don't make it worse...
Give us a call
(816) 478-3999

DRIVESAVERS
WE CAN SAVE IT!
Repair & Recover & Upgrade

DISK DRIVES

External SCSI Hard Drives

Quantum
40MB $339

Seagate
20MB $299

Conner
40MB $339

One Year Warranty

60MB External Drive $399

VC
FULL COLOR PRINT KIT for Deskjet/Deskwriter
by Inktron Ink... $44
Single Color 2-Refill Kits.. $19.50

60MB External Drive $399

600.626.MEGS

ORDER (800) 447-6350

Syquest 45 MB

Removable Hard Disk
$499 with Cartridge
$72 per Cartridge
$690 Pack of 10 Cartridges

MEMORY

1MB x 8 SIMM $43
1MB II FX SIMM $44
3MB Classic Upgrade $79
3MB Classic Upgrade $159
Internal Hard Drive Kit $109
External Hard Drive Kit $109
Ontrack Disk Manager $49

DISK DRIVES

Category continued on the next page.
### Fujitsu 3.5" Drives

**3 Year Warranty. 50,000 Hours MTBF**

<table>
<thead>
<tr>
<th></th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>45 MB 3.5&quot;</td>
<td>$268</td>
<td>$328</td>
</tr>
<tr>
<td>90 MB 3.5&quot;</td>
<td>$408</td>
<td>$468</td>
</tr>
<tr>
<td>135 MB 3.5&quot;</td>
<td>$468</td>
<td>$568</td>
</tr>
<tr>
<td>185 MB 3.5&quot;</td>
<td>$648</td>
<td>$748</td>
</tr>
</tbody>
</table>

### Fujitsu 5.25" Drives

**5 Year Warranty! 200,000 Hours MTBF!**

<table>
<thead>
<tr>
<th></th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>357 MB 5.25&quot; Full Hght 16ms</td>
<td>$1348</td>
<td>$1448</td>
</tr>
<tr>
<td>680 MB 5.25&quot; Full Hght 16ms</td>
<td>$1748</td>
<td>$1848</td>
</tr>
<tr>
<td>1.2 Gig 5.25&quot; Full Hght 14ms</td>
<td>$2848</td>
<td>$2948</td>
</tr>
</tbody>
</table>

*Mean Time Between Failure is the average life expectancy of a drive. 24 hour factory replacement available for 5.25" drives for additional fee.*

### Siemens 525 MB Tape Backup

- Use two tapes for 1 gigabyte
- Fast network and unattended backup capabilities

**$998**

### Wang Dat Tape Backup

- 1.2 Gig
- Fast network and unattended backup capabilities

**$1698**

### Ricoh Optical

- Read/write reliable storage

**$2698**

### 800K Mac Floppy Drive

- The Fujitsu External floppy drives have a one year warranty. These are the same drives that retail for $259!
- Only $99

### Fujitsu 3.5" Drives Details

- All 3.5" Drives are available in zero footprint or micro cabinets as well as internal for tall Mac's.
- All 5.25" Drives are available in zero footprint external or as internals for the Mac II, IIX, and IIFX.

### Fujitsu 5.25" Drives Details

- Fujitsu is one of the world's largest manufacturers of hard drives for a good reason: They make the most reliable products available. Hard drives with an incredible mean time between failure that are warranted for up to five years. All featuring the "zero defect" reliability Fujitsu Mainframe and Super computers are famous for. At MacDirect, we ship hundreds of Fujitsu's 5.25" and 3.5" special Macintosh-version drives every month. So don't let your drive get you down. Order a Fujitsu from MacDirect today.

---

**FUJITSU**

"The world's most reliable drives"

Fujitsu is one of the world's largest manufacturers of hard drives for a good reason: They make the most reliable products available. Hard drives with an incredible mean time between failure that are warranted for up to five years. All featuring the "zero defect" reliability Fujitsu Mainframe and Super computers are famous for. At MacDirect, we ship hundreds of Fujitsu's 5.25" and 3.5" special Macintosh-version drives every month. So don't let your drive get you down. Order a Fujitsu from MacDirect today.

---

**800-621-8461**

Hours: 8:30 - 7:00 CST, Saturdays 10:00 - 4:00

---

**DB'EIC'T**

60 East Chestnut · 145, Chicago, IL 60611
Visa, Mastercard, COD, Telecheck Approved Checks, Gov., Corp., Univ., P.O.s welcome/ New Drives, Factory warranty, / Bracket, cables and software included/ 30 Day MBG
DISKETTES

DUPLICATION FROM $.99 HIGHEST QUALITY MEDIA
Macintosh 3.5" DS/DD duplication starts at just $.99. Prices go even lower as you continue to order!
• Duplication + 100% Verification
• Custom Labels/Slips/Envelopes
• Custom Packaging & Assembly
• Colored Media Available
• Special Rates For Demo Software & Software Licensing
• Educational Discounts Available
• 24 Hour Turn-Around
• Guaranteed Products

800-255-3142
Diversified Systems Group, Inc.
PO Box 1114, Issaquah WA 98027
CIRCLE 227 ON READER SERVICE CARD

GENERAL

APPLE II & MACINTOSH SYSTEMS PARTS EXCHANGE REPAIRS
WE BUY and SELL
• DISK DRIVES • LOGIC BOARDS • POWER SUPPLIES
Call for a Catalog...
800-274-5343 Int’l: 617-891-6851 Fax: 617-891-3556

PRE-OWNED ELECTRONICS, INC.
205 Burlington Road • Bedford, MA 01730

LOOK AHEAD!

MacUser Marketplace continues to be essential for advertisers to reach the Macintosh Brand Specifiers that rely on the product information for their purchasing needs, every issue.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Closing</th>
<th>On Sale</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>3/18</td>
<td>5/14</td>
</tr>
<tr>
<td>July</td>
<td>4/15</td>
<td>6/11</td>
</tr>
<tr>
<td>August</td>
<td>5/20</td>
<td>7/16</td>
</tr>
<tr>
<td>September</td>
<td>6/14</td>
<td>8/13</td>
</tr>
<tr>
<td>October</td>
<td>7/15</td>
<td>9/10</td>
</tr>
<tr>
<td>November</td>
<td>8/16</td>
<td>10/15</td>
</tr>
<tr>
<td>December</td>
<td>9/16</td>
<td>11/12</td>
</tr>
</tbody>
</table>

Call Your Account Manager Today
1-800-825-42347
OR
212-503-5115

Great Performances

Demand an Encore

Let us take your article to its highest level of marketing potential with a reprint!

To find out how you can have your article or review elegantly reprinted** on 80 lb. paper stock, in 4-color, 2-color or 1-color, call or write today:

Claudia Hardison—Reprints Manager;
Ziff-Davis Publishing Company,
One Park Avenue, New York, NY 10016, 212-503-5447.

**Minimum quantity 500 reprints.
Modems

**Denon DRD 253**
- $629
- With Wake-Up Cable and Deluxe Copy
- 144k & Quick Link 3

**MicroCom MacModem**
- $679
- 32 MB with Wake-Up Cable, Deluxe Copy, Mac 8 - 9 and Quick Link 3

**External Modems**
- $629
- Mac Modem II 32 MB RAM w/ 105mb HD - $945
- 200MB HD - $995
- Dayton Digital 50 Mb PowerCard Inc. - $995

**Software**
- $179
- Microphone II 5.0
- $169
- Maya Modem
- $199
- MacModem
- $199
- SuperModem
- $199
- Teleport Modems - $199

**Music**
- $199
- Software: 3 Disk Bundle
- $199
- Maya Modem II 1.0 - $199
- SuperModem II 1.0 - $199
- Advanced 386-64 Sound System - $199
- Advanced 386-64 Sound System - $199

**General**
- $199
- MacModem II 32 MB RAM w/ 105mb HD - $945
- 200MB HD - $995
- Dayton Digital 50 Mb PowerCard Inc. - $995

**Sound**
- $199
- MacModem II 32 MB RAM w/ 105mb HD - $945
- 200MB HD - $995
- Dayton Digital 50 Mb PowerCard Inc. - $995

**Bargain Corner**
- $199
- Mac Modem II 32 MB RAM w/ 105mb HD - $945
- 200MB HD - $995
- Dayton Digital 50 Mb PowerCard Inc. - $995

**CD ROM Drives**
- $649
- MicroDrive
- $649
- Pioneer Drive w/ MD Option
- $649

**Tax Software**
- $199
- MicroCom CA, NY, L., 80% OFF, Turbo Tax
- $199

**Apple Software**
- $199
- HyperCard 1.2
- System 5.5
- AppleShare 1.1

**Optical Drives**
- $99
- Erasable 2 MB RAM w/ 105mb HD - $99
- 200MB HD - $99
- Dayton Digital 50 Mb PowerCard Inc. - $99

**Why Buy a Used Macintosh from Maya?**
- 1 Year parts and labor warranty
- $39.95 No Hassle return
- Tact Free technical support
- Expert professional repairs
- High quality Mac tested performance software
- The best technology at an affordable price
- Save money without sacrificing performance

**Here’s the Difference**

**We use what we sell, which means we know what technology will fit your needs.**
- All new products will be found at a great price.
- You will be happy with the product you receive.
- Maya will carry with your product a 1 year parts and labor warranty.
- You can count on Maya to have the best selection of Mac products at the most competitive price.

**Sound Products:***
- Articulate
- Voice Interface
- Waves 1000 Series
- Casio
- Yamaha
- Roland
- Tascam
- Electro Harmonix
- Korg
- Peavey
- Yamaha
- Canong
- Sony
- Panasonic
- JVC
- Panasonic
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Sony
- Panasonic
- JVC
- Technics
- Marantz
- Nakamichi
- Technics
- JVC
- Son...
Cheap Mac's

Macs from $295
Mac Plus from $695. Mac SE from $995.

FULL 100% WARRANTY

Now you can buy Macintosh systems and peripherals for up to 50% off new prices. All come with a 3-month 100% warranty and a no-questions-asked 30-day money-back guarantee. Reconditioned and guaranteed by Sun Remarketing, America's foremost Macintosh remarketer. For complete catalog or to order, call anytime. Operators available 24 hrs.

1-800-821-3221 or write to: Sun Remarketing
P.O. Box 4059, Logan, UT 84321

MAC USER
Technology Works
4030 Braker Lane West
Suite 350
Austin, Texas 78759
512-794-8533

CALL OR FAX
1-800-688-7466
OR INQUIRY!
FAX# 512-794-8520

INSURANCE

INSURE YOUR COMPUTER
SAFEWARE provides full replacement of hardware, media, and purchased software. As low as $50 a year provides comprehensive coverage. Theft, fire, power surge, storms, and more. No lists of equipment are needed. One call does it all! Call 8am to 10pm ET (Sat. 9 to 5).
SAFEWARE, THE INSURANCE AGENCY INC.
2909 N. High Street, P.O. Box 0221
Columbus, OH 43202
(800) 848-3469 (NAI) or
(614) 362-6559 (OH)

Computer Insurance PLUS
Insure in one easy step! Computerinsurance PLUS replaces your computer after fire, theft, power surge, natural disasters, including earthquake. Call NOW to receive comprehensive coverage and full replacement. The Computer Insurance Agency, Inc.
6150 Old Millersport Rd., NE
Pleasantville, OH 43148
(800) 722-6385
(614) 362-6699

FREE CATALOG
MC • VISA • PPD
APPROVED PPS

CIRCLE 233 ON READER SERVICE CARD

MEMORY UPGRADERS

MAC MEMORY

• 1 MEG Modules
• 4 MEG Modules
• Ilfx Modules
• NTX Modules
• SuperStatic 3 Portable Modules MacUser Rated
• New 2 MEG Ilisi/ci Modules
• Lifetime Warranty
• 30 Day Money-Back Guarantee!

CALL OR FAX
1-800-688-7466
OR INQUIRY!
FAX# 512-794-8520

INSURING YOUR COMPUTER
SAFEWARE provides full replacement of hardware, media and purchased software. As low as $50 a year provides comprehensive coverage. Theft, fire, power surge, storms and more. No lists of equipment are needed. One call does it all! Call 8am to 10pm ET (Sat. 9 to 5).
SAFEWARE, THE INSURANCE AGENCY INC.
2909 N. High Street, P.O. Box 0221
Columbus, OH 43202
(800) 848-3469 (NAI) or
(614) 362-6559 (OH)

Computer Insurance PLUS
Insure in one easy step! Computerinsurance PLUS replaces your computer after fire, theft, power surge, natural disasters, including earthquake. Call NOW to receive comprehensive coverage and full replacement. The Computer Insurance Agency, Inc.
6150 Old Millersport Rd., NE
Pleasantville, OH 43148
(800) 722-6385
(614) 362-6699

FREE CATALOG
MC • VISA • PPD
APPROVED PPS

CIRCLE 233 ON READER SERVICE CARD

MEMORY/HARD DRIVES

Syquest Removable

Mac II FX

INTEGRAL EXTERNAL

SEAGATE 20 MB $259 $333
SEAGATE 30 MB $285 $369
QUANTUM 40 MB $333 $429
QUANTUM 60 MB $505 $599
TP 105 MB $545 $639
QUANTUM 170 MB $829 $929
QUANTUM 2 yrs. SEAGATE 1 yr Warranty
Simms - Lifetime Warranty

FREE CATALOG
MC • VISA • PPD
APPROVED PPS

CIRCLE 233 ON READER SERVICE CARD

SIMMS

CALL FOR LOWEST PRICE ON ALL MAC MEMORY

256K, 1MB, 4MB, FX, NTX,
256 DIPS, 1 MB DIPS,
MAC II VIDEO RAMS

LIFETIME WARRANTY
MASTERCARD AND VISA
1-800-662-7466
FAX 506-975-5232

FREE CATALOG
MC • VISA • PPD
APPROVED PPS

CIRCLE 233 ON READER SERVICE CARD

Tell Your Source!
I Found it in
MacUser Marketplace

MacUser Marketplace
To place your ad call
(212) 503-5115
or (800) 825-4ADS
MEMORY UPGRADES

BEST PRICES!

<table>
<thead>
<tr>
<th>4 Meg SIMMs</th>
<th>1 Meg SIMMs</th>
<th>Mac IIfx SIMMs</th>
<th>Mac Portable Ram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Classic Boards</td>
<td>Video Ram</td>
<td>HP Laserjet Boards</td>
<td>Mac IIc Cache Cards</td>
</tr>
</tbody>
</table>

UPGRADES!

- 512Ke-Plus $295
- 512K-Plus $575
- 128K-Plus $599

(best prices! user-installable!)

800-332-6581

PERIPHERAL OUTLET
314 S. Bdwy • Ada, OK 74820
405-332-6581 • Fax 405-436-2245

Prices subject to change/Visa & MC okay (add 3%)
**Marketplace**

**Peripherals**

**Call for New Product Info**

Toll Free (800) 622-6885
Bay Area (415) 623-8890
Canada (800) 633-6698

RasterOps 1960H Business System/8 Bit $2995
RasterOps NEW ClearVue/Classic CALL
RasterOps NEW ClearVue/LC CALL
RasterOps 6250 Hi Acclaim, 24 Bit for 14" Monitor CALL
RasterOps 224 24 Bit Color Board for 19" $799
RasterOps 364 & NEW 24STV Video Color Board CALL
RasterOps NEW 21" Monochrome ClearVue/XL CALL
RasterOps 24s 24 Bit Color Board for 14" CALL
Super Mac Spectrum 24/series III CALL
Super Mac Spectrum 24 PDQ CALL
Super Mac Spectrum 8 III CALL
Super Mac Platinum Display 21" CALL

9-Track Tape Subsystem For the Macintosh

Exchange data files between your Macintosh and any mainframe or mini-computer using IBM compatible 1600 or 6250 BPI 9-track tape. Unit can also be used for disk backup. Transfer rate is up to 1 megabyte per minute via your SCSI interface. Subsystem includes, tape drive, software, and complete documentation. For more information, call us today!

**Printers**

APPLE DAISYWHEEL PRINTER

Crisp, office typewriter print quality on all Mac's & Apple III's. Fast 40 char/sec speed on 6-part forms. Fixed & proportional spaced fonts incl. legal & foreign language signs on one wheel. Boldface, 198 columns. NEW $490

RECORD $349 includes easy MAC print-5-click printer resource & cable. Auto sheetfeeder $49. Commercial grade with 50 year guarantee.

Quality Discount Computers, Inc.
155 Art St Ave W
Wellington, NV 89444
(702)465-2473 (415)487-8148

**Scanners**

Looking for a TRUE Color Scanner?

JX-450 We have the solution!! JX-600

A complete line of SHARP color scanners.

We offer: Support, Service & Fast Delivery.

Special Offer: JX-300 Bundle w/GPIB Interf. for Mac, IBM or PS-2: our price only - $1977

A.I.P. - Allied International Purchasing
Sales and Distribution of Computers and Peripherals
Tel. (818) 882-7034 Fax. (818) 882-7503

**Software/Accounting**

POINT OF SALE/OFFER ENTRY

North America's #1 Mac POS software. "Shopkeeper" -5 now links with "atOnce"-

Handles all sales/order entry & billing functions, inventory control, A/R, cust. data, packing slips, cash drawer control, bundles, flow plans, labels & informative reports. Canadian GST version available now. Train your staff in 15 minutes! Single user $196.00 Multiuser $785

Demo $10

SHOPKEEPER PUBLISHING INTL., INC.
631 E. Call St. Suite #412
Tallahassee, FL 32301
(800) 324-0046 (USA)
(900) 345-2932 (Canada)

Accounting/Time Management

All NEW Profitability Professional, a fully integrated, double entry bookkeeping system. Easy to use, with complete checkbook, profit and loss, inventory control, customized invoicing, receivables, payables, payroll, and client data base. Price $349, Demo $40 + S&H To order or for more info call or write:

Weedz & Co., Inc.
147 East Rocks Road
Norwalk, CT 06851
(800) 635-7681 or ext. #91

**Bar Code**

New! Version 3

- Code 39
- UPC/EAN
- Interleaved 2 of 5
- PostNet
- fonts on ImageWriter, LaserWriter, Magnetojets
- Bar code readers starting at $396

Phone 916-622-4640 FAX 916-622-4775

Bear Rock
6089 Enterprise Drive, Diamond Springs, CA 95619

**Tell Your Source!**

I Found it in MacUser Marketplace
SMART ALARMS™
& APPOINTMENT DIARIES™
Personal & Office Scheduling Systems

Announcing version 3 !!!
The most widely used reminder & calendar system is now easier to use than ever!

- Self Installing INIT
- Auto Backup
- Turn off Alarms during user selected applications
- Snooze to 3 hours
- Import, Export, & Merge Reminders
- Launch Macros
- Add different sounds for each Reminder
- Set multiple Reminders from Diary

MultiUser Diaries works with TOPS, AppleShare, allShare, or PSN

JAM Software
Voice (415) 663-1041 FAX (415) 663-8217
Int’l Sales: Australia (612) 799-1888 • FAX (612) 799-4042

Whatever team you’re on, MacUser Marketplace provides the advantage!

Buyers - Quality Products at Good Prices
Advertisers - Reach knowledgeable Buyers Ready to Buy!
For More Information Call (212) 503-5115 or (800) 825-4ADS
EDUCORP STOCKS THE LARGEST SELECTION OF CD-ROM TITLES!

CD-ROM Titles

Buy 4 CD-ROM titles (a pack is one title) and we'll give you a 4th cd for free! #199.

1644 CMC: 3-Pack
Birds of America (w/sound), Shakespeare, and Sherlock Holmes on Disc. Regularly $298. Limited time offer.

1653 About Cover
25.00

1336 Art & Type Vendor: ImageClub 59.95

1327 Beethoven's Symphony 9... 75.95

1338 Beethoven String Quartet #14 59.95

1567 Classic Art Business v.1... 349.00

1618 ClassRoom
49.95

Educational software divided into 3 categories: 9 yr and younger, 9 yrs to 13 yrs, and 13 yrs thru high-school.

1339 Cosmic Osmo
50.00

1389 Desktop Publishing CD
79.95

Over 150 laser fonts, 1500 EPS clip art files, 12 programs related to desktop publishing, 22 demos, DTP DBs and utilities, many commerical clip art files, and much more!

1566 Dictionary of the Living World 295.00
An encyclopeda about the natural world with color and sound. The first CD-ROM with full motion video. A must!

1547 Down To Earth
129.95

1325 ECOORDIC
249.95

1300 EDUCORP CD-ROM 5.0...
199.00

2 CD set, over 770 megs of the finest Shareware. Upgrades available.

1247 Nuclear-ROS.0.9 (MAC & PC)
19.95

Over 150 exotic paintings in brilliant color (24-bit & 8-bit), and grayscale. Upgrades available. Avail. on floppy.

1612 Full Page Images: ARTBEATS... 379.00

1611 GameRoom
49.95

1561 International Graphics Library 299.00

Commercial quality images created by Emmy Award winning designers. Over 200 business-oriented 24-bit color & grayscale TIFs.

1604 Letterpress: Imagiclub...
299.00

1358 Linguar-ROOM
499.00

Speak Russian, French, Spanish, German, Japanese, Italian, and Chinese. 25 of HyperGlic's language tutors with sound.

1560 Lotus Market Place: Business 549.00

1306 Manhole
39.95

1380 MediaTracks Multimedia
349.00

1337 Microsoft Office
599.00

1570 Oceanarium (Introductory disk)
249.95

1610 NEC Photo Gallery...
99.95

Over 100 scanned photos covering wa- ter sports, scencic ocean views and landscape panoramas. 24-bit color & grayscale TIFs.

1561 PIMD Discovery CD...
149.00

1562 Sound FX
199.00

Over 240 high-quality sound effects, from birds singing to telephones ringing. Includes 8-bit and 16-bit sounds.

1340 USA Fact Book
99.95

1381 Virtual Valley
79.95

1348 Voyager CD Audio Stack
79.95

Wayzata 2-CD Sets
1596 Front Page News/World Fact Bk 120.00

1597 Disc Tracy/All of MacTutor
199.00

1305 Xiphias: Time Table of Science...
99.00

1002 Xiphias: Time Table of Business...
99.00

1546 EPA - Complete 9 digit codes...
499.00

1553 Pack of 5 CD Caddies
39.95

1593 Zebra Lady II Mouse Pad
18.95

1604 Panther Lady Mouse Pad
18.95

DESKTOP PUBLISHING

Don't Let Your Buyers Down!

Be There For Them Every Issue:

Issue Closing Dates For:

June 1991...
March 18

July 1991...
April 15

August 1991...
May 20

Call Your Account Managers Today!
DESKTOP PUBLISHING

Bypasses LAN! Speeds production!
Not a spooler! No background printing!

Does moving large graphic files over your local area network slow it down?

Does sending large files to the typesetter slow the local area network and tie up your computer workstation, making it impossible to move to the next task while the file is typesetting?

Digital Technology solves both problems.

- With SpeedNet, multiple users can store and receive large graphic files at SCSI speeds.
- With SpeedDriver, sending a large file to the typesetter is as fast as saving it to your local hard disk. No more waiting!
- Speed up production with SpeedNet and SpeedDriver.

Call for details and literature. Find out more about DT's many time-saving publishing systems.

Call for details and literature. Find out more about DT's many time-saving publishing systems.

CIRCLE 253 ON READER SERVICE CARD
**ENGLISH**

**ENGINEERING**

**McCAD EDS**

The leader in Integrated Electronic Design
Schematics Simulations PCB Layout Autorouting
Call or write for free demos.
VAMP Inc. 6753 Selma Los Angeles, CA 90028 213-486-5533

**MacUser Marketplace**

To place your ad call (212) 503-5115 or (800) 825-4ADS

**Genealogy**

**REUNION**

The family tree software

Call, write, or FAX for more information.
LEISTER PRODUCTIONS
14 Hill Blvd., Mechanicsburg, PA 17055
717-697-1378 — FAX 717-697-4373

**Entertainment/Games**

**McHOROSCOPE**

Be your own astrologer, for fun or profit.

Produce amazing astrological reports for friends and family. $199.50

McHorscope, your computer-generated personal reports feature beautiful Natal charts plus 15-17 page interpretations. Professional astrologers charge $50.00 and more for similar reports. Excellent study guide for students and great fun for parties and get-togethers.

- Astrology for the Macintosh from Time Cycles Research
  - Write or call for free brochure

**Tropic Systems**

Electronic Symbol Library for Canvas™, 2.0, 2.1 or MacDraw™ II

Over 1300 symbols, all symbols created to conform to the IEEE 315 & 315A standards. Also available for MacDraw™ II the TTL Symbol Library. Includes Logic Symbols and Pin Diagrams for specific individual IC's. Each library $59.00 plus $5.00 shipping. Order or send money order or check to:

Toyogo, Inc.
800 Toyogo-9

**Graphics**

**Military Art**

NEW! Defense graphics library designed for military and industry professions. Call for FREE brochure. VM'S POS COO. P.S. — PAINT — HYPERCARD — PICT - EPSF

302-234-1098

NOVA Cube 14 Jarrell Farms, Newark, DE 19711

**FONTS**

All world alphabets, custom dvpt.: Type-1 PostScript Fonts

- All-European IPA
- Vietnamese
- Russian
- Georgian
- Armenian
- Hindi Sanskrit
- Bengali
- Malayalam
- Tamil
- Thai
- Burmese
- Armenian
- Cherokee
- Arabic
- Persian
- Pashto
- Mongol
- Chinese
- Japanese
- Korean

**Maps!**

Presentation Quality Clip Art

World, Continents, Countries, USA by County
EPS, PICT, MacPaint, Hypercard, PICT, EPSF

800-334-4291

MacIntosh Software, 3 Church St., PO Box 77, Monterey, NJ 08738
tel (609) 393-2820, fax (609) 393-7157

**Tell Your Source!**

I found it in MacUserMarketplace
**MARKETPLACE**

### LANGUAGE TOOLS

**NEW!!**

68000, COP800, PIC16Cxx versions!

µASM™ Cross Assemblers for the Macintosh™

- TEXT EDITOR CROSS MAC ASSMbler AND COMMUNICATIONS FACILITY IN A COMPLETE INTEGRATED DEVELOPMENT ENVIRONMENT
- SOFTWARE FILE OUTPUT DOWNLOADS TO MOST EPP PROGRAMMERS

AVAILABLE FOR MOST 8 BIT MICROPROCESSORS AND IBM PC/XT CALL OR WRITE FOR TECHNICAL BULLETIN 26 DAY MONEY BACK GUARANTEE. MICRO DIALECTS, INC

$149.95 ea
plus S/H

CIRCLE 265 ON READER SERVICE CARD

### MUSIC/MIDI

**Digital Audio for your Mac II!**

Audiomedia $699
MacProteus $699
Deck $275
StudioVision $749

1-800-465-MIDI

In Canada 1-416-928-MIDI

Now you can give your Mac II 16-bit, CD-quality stereo sound with these powerful new production tools from Digidesign & Opcode. Call for details!

CALL NOW...Special Pricing on Digidesign, Coda, Dr. T's, Mark of the Unicorn, Opcode, Passport, Roland Instruments, & more...FREE CATALOG!

1-800-MAC-BEAT 1-505-888-1710

CIRCLE 266 ON READER SERVICE CARD

### PUBLIC DOMAIN

**SOFTSHOPPE, INC.**

- Selected Programs
- Latest Versions
- As Low as $2.50

FREE CATALOG

MAC PD/SHAREWARE

PCB 3678, Ann Arbor, MI 48106

Call 800-829-BEST (2378) or 313-761-7638
Fax 313-761-7639

CIRCLE 270 ON READER SERVICE CARD

### LOTTERY

**MacLotto**

$115.5 Million Dollar Lotto JACKPOT was CRACKED!!

Introducing...

**MacJet**

- From the company that invented the QuickDraw LaserPrinter
- Use any HP (or compatible) laser printer with the Macintosh!
- Convert TYPE 1 Fonts into HP SoftFonts
- Prints faster than Apple's LaserWriter
- Print COLOR as Grayscale

$99.95

COMPUTER APPLICATIONS, INC. (919) 846-1411

CIRCLE 269 ON READER SERVICE CARD

### PRINT DRIVERS/

**SPOOLERS**

**PRINT DRIVERS/ SPOOLERS**

**A BARGAIN?**

Let Your Source Know
You Found it in

MacUser Marketplace

### MEDICAL/DENTAL

**MediSearch™**

Communications/research software to access NLM's MEDLINE directly with a powerful Mac interface that saves time and money. Easy to learn features for both new and sophisticated Medline users. Formats retrieved for word processors, EndNote™, and FileMaker™. $149.95

Call 1-800-825-4237

CIRCLE 276 ON READER SERVICE CARD

### MUSIC/MIDI

**PRACTICA MUSICA**

- MacUser Magazine, August 1990
- •Teaches intervals, chords, melody, rhythm
- •Interactive staff notation • Saves scores
- •High quality sound • MIDI compatible
- •Historical & computer-generated melodies
- •Custom ear training melodies
- •Includes textbook • Beginners to advanced

$125.00 • Call Toll Free 800-445-4966

CIRCLE 277 ON READER SERVICE CARD

### FOUND A BARGAIN?

Don't Let Your Buyers Down!

Be There For Them
Every Issue:
Issue Closing Dates For:
June 1991 March 18
July 1991 April 15
August 1991 May 20
Call Your Account Managers Today!

MacUser Marketplace

Stand out in a crowd!
Take advantage of MacUser's new second and third color options.

Call 1-800-825-4237
**RELIGION**

**Study English, Greek, and Hebrew at the same time!**

Introducing macBible.

The comprehensive Bible research software for the Apple Macintosh.

- Speed, accuracy, flexibility, thoroughness: macBible is a revolutionary tool for Bible study. Only macBible offers all these as individual modules, or in any combination:
  - New International Version
  - Revised Standard Version
  - Greek New Testament
  - King James Version
  - LXX
  - NRSV
  - NRSV Apocrypha
  - Hebrew
  - AND, OR, NOT, XOR, logic and proximity searches

For complete ordering information call 1-800-727-7759.

Full featured demo, $40. Order today by calling 1-800-622-3574

And don't forget about macFlash Cards get you to the intermediate vocabulary level

**SHAREWARE**

FREE - 6 DISKS FULL OF SOFTWARE!

TRY US! Get our best selling NO VIRUS software for MACINTOSH® COMPUTERS.

Graphics - Business - Education - Utilities Games - Finance - and Desktop publishing

PAY ONLY $5.00 SHIPPA/HANDLING SATISFACTION GUARANTEED

SMC SOFTWARE PUBLISHERS

619 981-8111

CIRCLE 271 ON READER SERVICE CARD

**STACKWARE**

**EXPAND YOUR VOCABULARY IN:**

**CZECH FRENCH SPANISH GERMAN RUSSIAN LATIN**

Over 2000 words/1000 foreign synonyms. Complete, accurate translations and thousands of English synonyms! MacFlash Cards get you to the intermediate vocabulary level.

Compare our prices and SAVE! German I/II, French I, Spanish I/II, Russian I/II, Czech I, Latin I: $25 each, S&H $3, CA Res add 7.00% tax. Call or send for additional information. Order today by calling 1-800-622-3574

The Language Quest Software Company

101 First Street, Suite 428, Los Altos, CA 94022

Next Day Shipping

2 Days to your door!

**MAC FREIGHTERS**

The Best Deluxe Shipping Cases

"Super Strong" made of steel, aluminum & ABS.

The Ultimate airline check in or shipping container

WHOLESALE PRICES

FLAT RATE - same day shipping

Custom cases made to order

Accept VISA, Mastercard, Company PO's

MicroOvertone Inc. For more information call: 1-800-226-7042

CIRCLE 275 ON READER SERVICE CARD

**ACCESSORIES**

Category continued on the next page.

**TELL YOUR SOURCE!**

I Found it in MacUser Marketplace
ACCESSORIES

PACK YOUR MAC IN SECONDS!

Nuvu Magnify Your Monitor Screen Up to 3X!

- Distortion-free lens by 3M
- Designs to fit all monitors up to 16 inches
- Available with Polaroid anti-glare filter

THE SINGLE SOLUTION TO THE PROBLEMS OF RADIATION DANGER AND VISION IMPAIRMENT!

For a dealer near you or for more info call:
600-872-1051
Lend Clau's Inc.
Box 5006
Rheinbeck, N.Y. 12572
CIRCLE 278 ON READER SERVICE CARD

DATA CONVERSION SERVICES

WE CAN CONVERT DATAFILES
TO/PROM OVER 1,500 SYSTEMS
IN VIRTUALLY ANY FORMAT:
— ON DISKS OR TAPES!

 Systems like:
- MacWrite
- MicroPro Word Processing
- Microsoft Word
- WordPerfect
- Envision
- 4D/1000

*Typically for separate processing costs

Computers Translators, Inc.
3245 Whittier Blvd., Ste. 407
Los Angeles, CA 90010
800-825-8251 • 213-387-4477
CIRCLE 281 ON READER SERVICE CARD

BOOKS/CATALOGUES/PUBLICATIONS

THE BEAT CASE SCENARIO
Airline Checl-in or Local Use
Zero Halliburton Aluminum Mac Cases:
Lightweight, Durable, Distinctive Styling
CLASSIC/Plus/SE llcx/llgs/lllx
PORTABLE ATTACHES
MONITOR & PRINTER CASES
from $299.95 1-800-548-0053
West Ridge Designs
170 N W. Head, Portland, OR 97209
CIRCLE 282 ON READER SERVICE CARD

DESKTOP PUBLISHING SERVICES

SLIDE IMAGING

All major Mac/PC packages!

POSTSCRIPT SLIDES!

Canon Color Laser Copies Now Available!

Overheads, Prints, Dupes, 4x5 Transparencies, Scanning, Imagesetting

Slidemasters, Inc.
800/969-6228 Voice Phone
800/486-9998 Mac Modem
CIRCLE 283 ON READER SERVICE CARD

COLOUR POSTERS

- PC Mac Unix etc.
- Postscript formats
- Most vector & raster
- 42 in. X 12 ft., 400 dpi
- 24 hr.19.2k Baud BBS
- Large illustrations
- Large renderings
- Courtroom displays
- Signage, Murals
- Architectural

digital prism inc.
636 El Camino Real
San Carlos, CA 94070
(415) 508-8800
CIRCLE 285 ON READER SERVICE CARD

FIND A BARGAIN?
Let Your Source Know You Found it in MacUser Marketplace
**Mac User Marketplace**

is a special economical section for product and service listings.

---

**Desktop Publishing Services**

- **Newsletters Brochures and other Printing**
- **Disk & Modem**
  - We will output your file directly to 1693 DPI printing plates on our Unimatic 3000 & 4-page newsletters folded to 8 1/2 x 11 printed on high quality enamel stock
  - $158/4-page Call for Quotes
  - Call for quotes on all your printing and design needs: MAILING, drop shipping, high resolution scanning, custom templates, 2 & 4 color printing, and use of 500 Adobe fonts.

**Diskette Copy Services**

- **Mac Disk Duplicator**
  - Mac and IBM 3 1/2 disk copying using a Mac, & our Desktop Autoloader for high-speed unattended operation.
  - $3380

**Magic Upgrades**

- **Mac II to Mac FX**
  - $3288
- **Mac SE to SE 30**
  - $1988

**Media Graphics**

- **314-449-0002**
  - 1116 Witten • Columbia, Missouri 65201

**Mac Repair**

- **Apple™ Certified Technicians**
- **One-Day Service Turnaround**
- **Hard Disk Repair & Data Recovery**
- **Up to 75% below Dealer Rates**
- **Component-Level Repairs**
- **Advice and Price Quotes by Phone**
- **Power Supplies & Logic Boards**
- **Fix-it-Once Lifetime Repair Warranty**

**SLIDE IMAGING SERVICES**

**Slides From Your MAC**

- **Try Us Free!**

**Insurance**

- **What happens after the warranty runs out?**
  - Simple. You're the one that pays for repairs. Unless you have extra cash to repair or replace your computer system, you need SAFEWARE FIXIT. Be insured for mechanical breakdown (wear and tear) as well as external losses (theft, fire, power surges, natural disasters and more).

**PostScript Output: Reflex or Film**

- FREE quality control sheet. Lowest Prices in USA. 24 Hr. Auto Modem Service or send Disk or HO $6.95 to $2.20 pp for 1800 DPI, discounts on 2nd page — Film add $3, Graphics or Text same $. 150 LIPS perfect. We also do color separations, color scans & corrections with Computalk Forms, Office hrs. 9am to 11pm.

**EnterGraphics**

- RR1 356A Salt Pt. Tumpike
  - Poughkeepsie, NY 12601
  - (800) 473-4168, modem (914) 473-5719

---

**MacUser Marketplace**

To place your ad call (212) 503-5115 or (800) 825-4ADS.

---

**website image: Pict, Pict 2, 33-bit Pict, Tit, 100% Adobe PostScript**

**$5 Slides**

- **The original** Mac $5 imaging service
- **32 Slides, Overheads Color Prints**

**Slide Imagers**

- **Slides Overheads Color Prints**
- **All Major Mac and PC Packages**
- **24-Hour Turnaround**
- **Free Technical Support**
- **4K Resolution**
- **Volume Discounts**
- **Free Fed-X (25 Slides Min.)**

---

**We represent: MasterCard, American Express, Corporate Accounts**

**1-800-232-5411**

---

**Accent Presentations, Inc.**

1780 High Bluff Drive, Ste. 250 • San Diego, CA 92130

---

**We offer the best service available. Experts in Persuasion, PowerPoint and others, on staff to serve you. Free Federal Express shipping. Toll-free Customer Service. And if your program makes a mistake, we'll reshoot your slides, free. Call today, and say ‘I'd like to try your service. Free.”**

**1-800-222-2592**

---

**CIRCLE 390 ON READER SERVICE CARD**
Never buy another ribbon!
Over 150,000 sold!

$45.00

MacInker™, the Automatic Ribbon Re-inker, re-inks any printer ribbon (black & color) for 5 c. Lubricating ink cools printhead, extends its life and yields better-than-new printout. Average re-inkings per cartridge: 60-100.

Universal MacInker (opjet printer) $75. Imagewriter I/I1 $45. Adapters available for multicolor cartridge, $40. Complete range of black, color, heat transfer, special ink cartridges. Satisfaction or 30 day refund. Free key-beeper/flashlight for orders >$100.00. Order toll free or call to get full information.

(800)547-3303

MacInker Marketplace
To place your ad call
(212) 503-5115
or
(800) 825-4ADS

MacUser Marketplace gives you the versatility you need to get your product the most attention. Our options include:

- Second and third color options
- A choice of display format or directory listings
- Frequent and advance payment discounts that let you get the most from ad dollars
Agnosiaphobia

A secret society of videophobes is conspiring to ‘protect’ you from the hidden hazards of your Mac.

Bill Safire’s got nothing on me. In fact, here’s a term he’s probably doesn’t know: video agnosia /vid-e-o ag-no-zhə/. n. Pertaining to a condition whereby an individual cannot understand information displayed on a video device. The ailment is possibly genetic in origin. [Lat. vide to see + [Lat.-Gk. agnosia, ignorance]

And obscure as it sounds, this term describes a condition that affects us all.

Doctors say that video agnosia reflects deeper brain disorders that sometimes appear as other forms of agnosia, such as rock-and-roll agnosia, sexual agnosia, political agnosia, or the dreaded general agnosia — the inability to understand what the heck is going on at all.

You know, the people who are zoned out and wander around in a daze.

While researching this little-known but, I suspect, common ailment, I happened upon a secret society known as the FYI (Friends of Yuri Ivanovitch). Ivanovitch was the first person fired from a job because of video agnosia. In 1956 he was working for Honeywell, monitoring computer activity on an old CRT (cathode-ray tube), and he kept seeing images of Czar Nicholas on-screen.

Paul Trudeau and John Collins, of St. Paul, Minnesota, both knew Ivanovitch, and coincidentally, both also suffered from this peculiar inability to see what is actually on a CRT. They determined that if the general public found out about this, the video agnosiacs would be ridiculed. That was in 1957, and that was when they formed the FYI.

Appropriately, the FYI membership had secretly grown to 10,000 when Collins and Trudeau discovered an older group of general agnosiacs with a membership of 100,000 in Orange County, California. The older group, known only as The Club, had been formed around the turn of the century by the illustrious Blackjack Constable, a famous San Francisco gambling cheat who was on the lam. Constable knew that a segment of the population, like himself, had no understanding of what was going on. Every day some new technology — things such as asbestos, for example — would frighten him.

Constable knew that the way to keep this handicap a secret was to form a group of like-minded associates — fellow agnosiacs. This group would work as a team and permeate all levels of decision making in both government and private industry.

After the two organizations became aware of each other, the FYI was incorporated into The Club as an SDG (special-disinterest group).

The FYI, DMV, and VDT

Agnosiacs have a special handshake or something — this hasn’t been revealed to me — so they can identify each other. In this way they can promote each other to increasingly higher positions of authority. Once they’ve achieved authority, then it is up to them to resist all change.

An unnamed member of the FYI told me that most school boards, public-utility commissions, and publishing companies have been taken over by agnosiacs recently. “The auto industry was taken over a long time ago,” he told me. “And never, never, whatever you do, trust anyone who belongs to a club.” Then he hinted that, in California, the agnosiac central committee works within the structure of the Department of Motor Vehicles.

In order to work at all, agnosiacs must protect their identities. After discovering the existence of these underground organizations, I made it a point to identify characteristics of agnosiacs to perhaps ferret out a few.

Agnosia can’t be cured. People with one form of agnosia are likely to exhibit other aberrations. Bad judgment crops up a lot. If a member of Congress is investigated for taking bribes, you’ll notice that something else usually turns up, such as a penchant for enjoying the company of young goats.

Agnosiacs generally do not like technology. They’ll never have a computer anywhere around their desks. They claim that this is some sort of executive decision — it’s demeaning to have a terminal on the desk. It’s a coverup for agnosia. Be on the lookout.

Agnosiacs have no sense of humor. If they laugh at something, it’s usually because they’ve practiced. Agnosiacs get together to decide something is funny, and then all of them pretend to laugh at it in public to allay suspicion. Don’t be fooled by this ploy. Toss a one-liner at them and see how they react. Any attempt at ad-libbing a laugh will be preceded by a long pause of contemplation.

Agnosiacs stick together. This is their strength. It’s up to normal people like you and me to stop creeping agnosia, eliminate agnosiacs from all positions of authority, and put them back where they belong — writing articles and legislation about the dangers of VDT screens.
The Typist works just like your very own personal assistant. One capable of typing 500 words per minute. That includes any text or numbers, no matter what style font, font size or column format.

With the Typist you can enter your data directly into any Macintosh® or PC compatible word processor, spreadsheet or database, just like you were typing it yourself, only faster.

The Typist is more than other hand scanners, which are generally suited to scan graphic images, but limited when it comes to text. As the world's most personal scanner, the Typist is a sleek, ergonomically designed peripheral that requires no special training or expertise. Fully simulating your keyboard in every way, the Typist lets you scan up to 2 column inches per second while staying fully aligned — even when you scan rows and columns sideways.

Think of the possibilities.

Use the Typist as your very own personal assistant.
Enter rows and columns of numbers from business journals or periodicals, directly into your most critical documents — including spreadsheets. Develop business reports, presentations, legal contracts, or desktop published documents in a fraction of the time. With the world's most personal scanner you will immediately become more productive, whatever the assignment.

To learn more about the Typist and how it can be of assistance to you, contact one of Caere's authorized dealers. Caere, the Complete Recognition Company.
Five reasons to take an alternate router.

NEW PhoneNET LIAISON™ 3.0 SOFTWARE ROUTER

Click, and relieve your network traffic jams. The PhoneNET LIAISON™ 3.0 software router helps you improve LocalTalk performance by splitting one overloaded network into two uncongested networks.

Click, and let users dial-in from anywhere. Remote users can dial with Liaisonet, creating a personal bridge to a remote network through a Macintosh running Liaison. When away from their office, they can read e-mail or access file servers as if they never left. Liaisonet is included with Liaison and can be distributed royalty-free.

Click, and connect Ethernet to LocalTalk. Liaison 3.0 gives Ethernet "power" users access to LocalTalk printers, and lets LocalTalk users get files from Ethernet servers.

Click, and integrate all your cabling systems. Liaison 3.0 connects LocalTalk, EtherTalk, TokenTalk and every other "Talk". And Liaison has an automatic "transition bridge" that makes the migration from AppleTalk Phase 1 to Phase 2 protocols painless.

Click, and you can dial-in and bridge remote networks. Attach a modem to a Macintosh running Liaison, and you can connect two LANs hundreds of miles apart, regardless of the local cabling. To dial-out to another Liaison-equipped Macintosh, just point and click in the Chooser. Local users will see remote users as if they were in the same building. Plus, the password protection features of Liaison can restrict users to a node, zone or grant them access to the entire remote network.

Liaison 3.0 is a valuable alternative to a hardware router because it's more flexible and easier to upgrade. Plus, you can configure Liaison 3.0 to run on any Macintosh. So take an alternate route by calling Customer Service at (415) 596-9000. Ask for a Liaison data sheet. Dealers call our Reseller Hotline at 1 (800) 344-7489 in U.S. and Canada.

Please circle 178 on reader service card.