BIG SCREENS! LOW PRICES!

Get the right color display for your Mac

MAC MEMORY: A one-minute guide on what to buy

THE ULTIMATE PRINTER: Are high-resolution printers worth the cost? Ten top contenders tested
After all, we think you're only as good as the people you work with.

When it came to designing new Microsoft® Word 5.0, we listened to you. After all, you know what you want.

And you told us. In your letters. Your faxes. Your post cards. To sum things up: you want a Word that will make doing your everyday work even easier.

So we came up with the Ribbon—think of it as easy access to powerful features. With it you can create columns, access fonts, change formats and use Word's new drawing tool. All with a single mouse click. You'll even be able to move text anywhere on your document with nothing more than a speedy drag and drop. Then there's our kinder, gentler print merge. It reduces a complicated process down to a few simple steps.

We are also introducing word processing's first built-in grammar checker. A find file feature that can locate documents based on dates, keywords or the author. An auto-save reminder. And more. Did we mention we fully support System 7.0? Including Publish and Subscribe?

Current users of Mac Word interested in upgrading for $129* should call (800) 645-WORD, Department X07, or see their nearest reseller.

So please call as soon as you can. We can't wait to hear from you.
Introducing new Microsoft Word. Of the people. By the people. And for the people.
WE LISTENED TO THOUSANDS OF MAC® USERS, LIKE GUNNAR, TODD AND CHARLYN.
YOU CAN TAKE OUR WORD FOR IT.
High-resolution picture-perfect printers.

Before you buy that PowerBook, check out the Outbound Notebook 2030.

Get an instant education on the whats and whys of Macintosh memory.

When lightning strikes, will your Mac be prepared?

Features

Everyday Databases
BY SHARON ZARDETTO AKER
Four flat-file-database managers — RecordHolder Plus, DAtabase, Panorama II, and FileMaker Pro — go head to head.

Publishing Your Data
BY ERIC TAUB
Turn your arduously collected data into a publication with one of five database-publishing methods.

Staying in Contact
BY TOM PETACCIA
Maintaining sales leads with contact-management software is easy if you choose the right program.

Is There a Pen in Your Future?
BY HENRY BORTMAN
The next technological leap in interface design — pen-based computing — is close at hand.

Big Screens for Small Macs:
Mac LC and Ilisi Color Display Systems
BY MARK FROST AND THE MACUSER LABS STAFF
For your viewing pleasure, MacUser Labs unveils the big picture on eleven 8-bit-color display systems.

Practically Perfect Printing:
High-Resolution PostScript Printers
BY BRUCE FRAZER, PAUL YI, AND THE MACUSER LABS STAFF
Can high-res PostScript printers replace imagesetters? MacUser Labs finds out.

When Lightning Strikes:
Power Protection
BY ANDREW EISNER AND THE MACUSER LABS STAFF
Surge suppressors and uninterruptible power supplies can protect your data.

Departments

Jon Zilber
Use it or lose it.

Guy Kawasaki
Who's in charge here: you or your Mac?

Michael Swaine
Simulated-science savants.

John C. Dvorak
Will Apple flunk out in schools?

Letters
Readers stomp Excel, puncture balloons, and more.

Advertiser Index

Marketplace
Claris goes to Hollywood, Silicon Valley turns green, spreadsheets avoid gridlock, plus LCD meets MTV, and more. ................................................................. 43

Techniques
Publishing on the Mac doesn't have to be a solitary pursuit. A whole crop of new publication-management tools turns electronic publishing into a collaborative effort. ................................................................. 209

Step by Step
Modern art takes on a new definition with electronic collage techniques. ................................................................................................................................. 227

Network Management
Inter•Poll and other traffic cops make it easy to simplify network maintenance. ......................................................................................................................... 231

Trouble Shots
Which AppleTalk router is telling the truth? Thankfully, you don't have to hold hearings to find out. ................................................................. 251

Personal Best
Steven Bobker tells why the ugliest word processor can also be the best. ................................................................. 253

Shopping List
Ten things to keep in mind when buying memory. ................................................................................................................................. 259

Power Tools
Demystifying System 7's publish-and-subscribe. ................................................................................................................................. 261

Beating the System
System 7's Apple events: upcoming and ongoing. ................................................................................................................................. 265

Power Programming
Danny Goodman helps you get a handle on HyperTalk handlers. ................................................................................................................................. 271

Tip Sheet
3.0-something: mastering QuarkXPress 3.0, FreeHand 3.0, Adobe Illustrator 3.0, Excel 3.0, and more. ................................................................................................................................. 275

Help Folder
Why can't Mac users issue commands such as Erase C:*.doc (and who would want to)? What does TeachText teach? Answers to these questions and more. ................................................................................................................................. 279

Reviews
Outbound Notebook 2030
Does Outbound's latest portable manage to top Apple's PowerBooks? ................................................................................................................................. 46

GreatWorks
Eight applications for $299 is a bargain, but don't call it integrated software. ................................................................................................................................. 48

PageBrush Professional
This free-form gray-scale hand-held scanner works like magic — sloopow magic. ................................................................................................................................. 54

Personal Label Printer, LabelWriter II, and Smart Label Printer Plus
Three specialty printers address the perennial problem of printing labels. ................................................................................................................................. 56

Easy4D and 4thRight! Professional
Two 4th Dimension shells take aim at simplifying database development. ................................................................................................................................. 60

Painter
This innovative painting program simulates natural brush dynamics and expression. ................................................................................................................................. 62

CompileIt! 2.0
Extending HyperCard's capabilities is quick and easy with this intuitive compiler. ................................................................................................................................. 74

Dynodex 2.0, Address Book Plus 2.0, and QuickDEX II
Get instant access to vital statistics with three second-generation personal-address-book managers. ................................................................................................................................. 78

WordScan Plus
Accurate and feature-packed, this OCR package saves retyping chores. ................................................................................................................................. 84

Quicken 3.0
The latest version of this best-selling checkbook and personal-finance package adds welcome new options and an interface lift. ................................................................................................................................. 89

Quick Clicks

"Flat-file databases are a lot like alligators — they’ve survived because they fit their niche perfectly.“ 110
TouchBASE is the personal contacts database that's loaded with powerful features, yet very easy to learn and use. Guy says it's the most functional piece of Macintosh software he's seen. But he's not the only one who's sold. Here's what others say:

"TouchBASE is the first product I've seen that is actually easier to use than the good old, reliable Rolodex."

Don Crabbs, Byte

"TouchBASE version 2.0 is the top of the heap for contacts management software."

Steve Bobker, MacUser and Computer Shopper

"TouchBASE lets you easily enter, store, sort, search through and print reports, fax cover sheets, labels, and envelopes from the addresses in the database."  

Philip Robinson, San Jose Mercury News

"Attention to detail shows everywhere in this well implemented program."

Becky Waring, MacWeek

"At last, everything I wanted: multiple-function printing, multiple-user capabilities, phone dialing and powerful sorting...all in a desk accessory."

Ken Gruberman, MacUser Review

New System 7 savvy TouchBASE 2.0 has over 20 major, new features! At just $125, it's a major bargain. 1.0 owners, upgrade for $25. Try our free demo. You'll be hooked, too.

Get the free demo.
818-730-3081
ANTICIPATION.
THE LAST THING YOU WANT IN A MAC.

For those of you who have been waiting for fast, reliable accelerator cards at affordable prices, the wait is over. With 12 years experience accelerating Apple products, Applied Engineering now introduces the TransWarp line of Macintosh accelerators. At prices that will quicken your pulse.

Our accelerators boost the Macintosh SE, SE/30, LC, Ilsi and Ilci to unrivaled levels of performance. We've designed around Motorola 68030 and 68040 processors to combine speed and guaranteed compatibility with all Macintosh hardware and software, including System 7 and A/UX. And at clock speeds from 25 to 50 MHz, your Mac won't get caught in the processing bottleneck. We back our products with a 30-day money back guarantee*, full one-year warranty and free 24-hour bulletin board support.

For fast, reliable accelerator cards at affordable prices, don't wait. Visit an authorized Applied Engineering Dealer today (over 2000 nationwide) or call toll-free for a complete product catalog. And anticipate life in the fast lane.

*Through participating dealers.

©1991 Applied Engineering, 3210 Reihline Road, Dallas, TX 75234, (214) 241-6060, Fax (214) 484-1365. All product names are the trademarks of their respective holders. Permission granted by H. J. Heinz Co.
FastTrack Resource allows you to allocate, assign, track and manage your:

- People
- Rooms
- Equipment
- Managers
- Facilities
- Computers
- Services
- Activities
- Time

With FastTrack Resource, you now have the power to choose the best resources to successfully complete activities.

Please call to order your $10 demo kit, or free information kit now! (800) 346-9413 or (703) 450-1980.

Circle 100 on reader service card.
The Display Card or the Display?

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

Lapis has a full line of Apple-compatible, fixed and programmable, display cards.

Unparalleled Service and Technical Support • One-Year Warranty • Dealer Inquiries Welcome
©1991 Lapis Technologies, Inc. All rights reserved. Lapis and the Lapis logo are trademarks of Lapis Technologies, Inc. Apple and Macintosh are trademarks of Apple Computer, Inc.
CIRCLE 132 ON READER SERVICE CARD.
One look and Apple Chairman and CEO John Sculley called it "a spectacular product." And that's just for starters.

This isn't just another version of Lotus* 1-2-3; it's a spreadsheet that really grabs hold of the full computing power of Macintosh. So, everything you've come to love about Mac* computing is now available in 1-2-3.

**A full-fledged, no-holds-barred Mac spreadsheet**

Because it was designed and built just for Macintosh, Mac users will feel right at home with the menus, tools and the entire working environment of 1-2-3 for Macintosh. It includes features that push the capabilities of System 7 and everything that comes with it to the limit. Like Publish and Subscribe, Apple Events and Data Access Manager, to name a few.

Its innovative "user interface" makes working with data, text and graphics not only fast and easy, but fun. Like In-Cell Editing, which lets you double click on a cell and then type and edit directly in it. Or the Unified Work Environment, which allows you to manipulate data, text and graphics all in the same file with one set of menus. Change the color of your data the same way you change the color of your graphics. And directly manipulate data, graphs, drawn objects and scanned images.

1-2-3 for Macintosh delivers the graphing capabilities Macintosh was made for in a way that's incredibly flexible. You get superior graphing.

---

**Output That Stands Out—Bring your presentations and reports to life with an array of colors, borders, Adobe® type styles, and images.**

---

© Copyright 1981 Lotus Development Corporation. All rights reserved. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Classic is a registered trademark licensed to Lotus Development Corporation. Macintosh and Mac are registered trademarks and Apple Events is a trademark of Apple Computer, Inc. Microsoft is a registered trademark of Microsoft Corporation. Adobe and the Adobe logo are registered trademarks in the United States of Adobe Systems, Incorporated. The Apple logo is a registered trademark of Apple Computer, Inc. and under license. *The Boston Globe, 9-4-91.*
sheet is all 1-2-3
ght down to the core.

Unified Work
Environment—The menu
never changes and all
information resides in one file.

Publish and Subscribe—
Change your data and that
data will be automatically
updated across your
network.

publishing and graphing functions including a rich variety of fonts
and color choices. And with print preview, you see exactly what your
output will look like, instantly, so you avoid surprises at the printer.

True 1-2-3 Compatibility

1-2-3 for Macintosh
is compatible with other
versions of 1-2-3, giving
you direct access to the
spreadsheet used by
over 15 million people.
It even reads and writes
Microsoft® Excel files.
So you can make the
switch to 1-2-3 and
never look back. And
never look better.

Nothing delivers on the capabilities of Macintosh like
1-2-3. Maybe that’s why the world’s best selling spreadsheet
is the world’s best choice for Macintosh.

Now what are you waiting for?

But don’t take our word for it. See 1-2-3 for Macintosh for
yourself. Lotus is offering a no-risk proposition for 1-2-3 for
Macintosh. Just buy a copy from your
favorite dealer and try it for 60 days
with a full money-back guarantee
direct from Lotus (Excel users can even upgrade at a special price). Or, call
us today for a free demo video at
1-800-TRADEUP, ext. 6429.

Introducing 1-2-3 for Macintosh
Now, get the powerhouse you need for design, publishing or spreadsheets. We deliver versatility and real gains in daily productivity.

**DualPort Ilcsi.** The best way to get a PDS slot or a math chip. It allows you to use both a PDS card and one of our cache cards in the same Mac Ilsi. So if you're planning video or Ethernet, start with the versatile DualPort.

**FastCache Ilsi.** Get a 30% boost in all applications. This is the same 64K cache card we use in the powerful Mac Ilici. Includes the DualPort Ilsi.

**Universal PowerCache.** Accelerate everything to the highest levels of productivity. This is the card that MacWEEK magazine calls, "a powerful enhancement for the Mac... We highly recommend this product." Guaranteed 100% compatible!

So go ahead, expand your horizons... you can't go wrong with DayStar Digital.

**Come join us. 1-800-962-2077**

Available through your favorite dealer

---

**About MacUser**

New products, new alliances, new technologies — it all adds up to a New World Order for the Macintosh. As the threads begin to interweave themselves, a pattern of issues and concerns emerges that is not unlike that of society at large: more global awareness, more environmental consciousness, and more sensitivity to the pinch of an increasingly tight economy.

Take, for example, the movement among Mac developers to port their applications to Windows. Aldus, Farallon, MacroMind, and now even Apple's own Claris (with its purchase of a Windows presentation package formerly distributed by none other than IBM [see page 45]) have joined the cosmopolitan multiplatform community. Perhaps Claris was pulled by the same inevitable and irresistible forces that drew Great Britain into the European Economic Community. As a MacUser Labs T-shirt slogan reminds us, “No Mac Is An Island,” especially in the world of cross-platform computing.

Take, for example, Apple's abandonment of its classy white packaging in favor of boring brown (but environmentally correct) recycled cardboard. Apple has also announced a campaign for recycling and disposing of Portable and PowerBook batteries, and Hewlett-Packard continues to aggressively recycle laser-printer cartridges (see page 43). The recent burst of fonts-on-call discs points to a whole new direction of minimally packaged electronic software dissemination that has the added plus of rapid delivery. Simply call for an access code, and get the goods instantly (see page 209). To further this environmentally conscious trend, associate editor Mark Frost, along with the MacUser Labs staff, is compiling an expanded list of criteria for judging products, among which is environmental responsibility in packaging. Mark also spearheaded two lab reports this month: one concerns color display systems for the LC and the Ilsi (see page 156), and the other focuses on uninterruptible power supplies and surge suppressors, which can protect your investments in time and money (see page 190). The monitors lab report also includes recommendations on how to protect yourself from another potential environmental hazard: radiation emissions.

Take, for example, the attention the manufacturers of those color displays are paying to pricing in today's market. Steve Bobker has been tracking this phenomenon, resulting in this month's column (see page 253) for budget-conscious buyers. Meanwhile, answer man Andy Ilmakko (see page 279) puts prices in proper perspective, pointing out that nowadays "full-blown word-processing programs... sell for as much as a good CD player."

What's the world coming to? Start reading, and find out.
Neither will the guys who make MacTools Deluxe. After all, the ordinary defraggers they bundle with other products just can’t be expected to compete against the revolutionary, new ALSoft DiskExpress II—the only truly personalized disk optimizer which optimizes the way you use your Mac. Only ALSoft DiskExpress II has all the intelligence, safety, control and unbridled speed you need to make your Mac run its absolute fastest. Even if your Mac is brand new! Which should be something you like a lot—even if our competitors don’t.

### COMPARISON OF WHAT’S VITAL TO YOU IN OPTIMIZERS

<table>
<thead>
<tr>
<th></th>
<th>ALSoft DiskExpress II 2.10</th>
<th>Norton Utilities Mac Speed Disk 1.1</th>
<th>MacTools Deluxe Optimizer 1.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faster than new speed and maximum performance of your Mac by intelligently monitoring your actual file usage and grouping frequently used files together plus defragments them</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Safely optimize any disk, regardless of the amount of fragmentation, without causing directory damage and lost data</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Clicking the program’s STOP button always halts optimization safely, without causing directory damage and lost data</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Verifies the accuracy of what it reads and writes during optimization by double-checking your data using technology that works on all hard disks—even those from Apple</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Adeptly optimizes any disk containing bad blocks spared by System 7, Norton Utilities, MacTools Deluxe or Sector Collector without the hassle of having to reformat your entire disk</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Conveniently optimizes even the busiest AppleShare™, FileShare™ and TOPS™ file servers without interrupting productivity and without taking file servers off-line</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

See us at MacWorld Expo, Booth #1228, for our show specials.

ASoft

- FAX 713/353-9868
- INTERNATIONAL SALES 713/353-4090
- USA SALES 1-800-257-6381 or 1-800-ALSOFT

ALSoft and DiskExpress are trademarks of ASoft, Inc. All other trademarks acknowledged. © 1991 ASoft, Inc., All rights reserved.

CIRCLE 170 ON READER SERVICE CARD.
Get more done in less time with HAND-Off™, the productivity tool that makes file access a snap. As MacWEEK said, "It's so good that Apple should have included it in System software."

**OPEN FILES INSTANTLY USING THE CUSTOM POP-UP LAUNCH MENU**

The HAND-Off II launch menu lets you open any file or group of files with a single mouse stroke from anywhere. It's the most convenient way to launch documents. You can organize files and applications your own way. For example, you can open all of the letters, charts, spreadsheets and files associated with a project simultaneously with just a click.

**SUBSTITUTE PROGRAMS FOR MISSING APPLICATIONS**

Say goodbye forever to the annoying "Application Not Found" message. If the application you need is missing, HAND-Off II will automatically launch a compatible substitute program. You can also pre-assign substitutions (even for DOS files) and open them with your preferred application.

**AUTOMATIC COLOR SWITCHING**

Get the color depth and sound level you want for any application. It's simple with HAND-Off II. Run your Mac in full color when you use your favorite graphics programs. Then HAND-Off II will automatically change to faster black and white mode when you switch to a word processing or spreadsheet program.

**ELIMINATE WINDOW CLUTTER**

Moving through a maze of overlapping windows can be confusing and wastes time. Your Mac will be easier to use when you pair HAND-Off II's new AutoHide™ feature with System 7.0. AutoHide automatically hides all windows except the ones that your current application is using. By only showing active windows, AutoHide makes your desktop clean, fast, and more productive.

**FREE PRODUCT OFFER**

For a limited time, when you buy HAND-Off you'll get a copy of TrashMaster™ free. It's the new Macintosh utility by Fred Hollander, the author of HAND-Off.

A $69.95 value, this unique productivity tool lets you completely erase confidential files so they can't be recovered. Under System 7.0, it lets you manage files by selecting which items you want trashed and when.

TrashMaster can even empty the trash automatically. You'll free up precious disk space and get desktop security that meets Department of Defense specifications.

HAND-Off II and TrashMaster would normally cost well over $150. Now you can get them both when you buy HAND-Off (typically priced at less than $70).

Get HAND-Off II, the proven file launching tool that MacUser rates five mice. And, for a limited time, get a copy of TrashMaster at no additional charge.

Contact your supplier or Connectix: 415/571-5100 Fax: 571-5195 • 2655 Campus Dr. • San Mateo, CA 94403.

©1992 Connectix Corporation. SuperMenu and AutoHide are trademarks of Connectix Corp. HAND-Off II is a trademark of the Hand-Off Corp. All other trademarks or registered trademarks are the property of their respective holders.

CIRCLE 62 ON READER SERVICE CARD.
LETTERS

Graphic Details

Your November ‘91 Step by Step article (“Skill and Special Effects,” page 177) on how David Burwinkel created his PixelPaint Art Competition winner was informative. It should be pointed out, however, that he could only have done it with version 1.0 of PixelPaint Professional. For some idiotic reason, you can no longer import PostScript graphics with the new version, 2.0!

Ray Anderson
Manhattan Beach, CA

Burwinkel created a rough sketch in Illustrator and then imported the EPS file into PixelPaint Professional 1.0. The initial tracing could easily have been created in a variety of other drawing programs, saved as a PICT file, and brought into PixelPaint. SuperMac eliminated EPS support in version 2.0 in favor of improved 24-bit PICT features such as mesh warp and paste controls. — AA

The Multi-er the Merrier

As a Panasonic dealer and dedicated Mac-systems house, we’re delighted with the positive comments about the Panasonic LF-7010 Multifunction Optical Storage drive (“Double Duty Drives: Multifunction Optical Storage,” November ‘91, page 108). I’d like to add a few points to your report. The LF-7010 read and write times can be further improved by use of a Ten X OCU-150S hardware driver. Many of our customers use this unit for continuous recording/playback of 44-kilohertz digital music. In addition, the OCU-150S lets the LF-7010 operate in UNIX, DOS, or the Mac OS without software drivers. Multiple operating systems can even coexist on a single disk. That’s a true multifunction drive.

Mark Heyer
Heyertech
Palo Alto, CA

On the Personal Side

I congratulate MacUser for introducing the Personal Macintosh section (November ‘91, page 203). It seems that Steven Bobker had the most fundamental Mac user in mind when he was writing “Beginner’s Bucks” (page 205). I heeded his advice to add memory and am now reaping the benefits of my super-improved Mac Classic with System 7. I didn’t expect his “basic” tips to make a big difference, but the way I work has improved tremendously.

Sonny Saulo
Van Nuys, CA

Dear Mr. Sculley...

How about those new PowerBooks? They fulfilled many items on the wish lists readers sent us after we asked you back in May ‘91 what they wanted in a real laptop. Now that they’re here, are you ready to replace your desktop computer?

Speak Up:
Can a PowerBook take the place of a desktop Mac?

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

Usually we get letters to Mr. Sculley that address several topics. This month, however, the letter writers dropped all else to focus on the Apple/IBM alliance.

M. Steven McClanahan, of Redding, California, in pondering what might become of Apple, asked Mr. Sculley a question of his own: “Did the big bad wolf look out for the welfare of Little Red Riding Hood? The one thing IBM has that Apple doesn’t is money. It has a history of buying up and consuming companies larger than Apple — anybody remember Rolm? All this garbage about cross-platform operating systems is just a ruse to hide the fact that IBM is going to take the best elements of the Macintosh OS, graft them onto IBM’s usual inferior product, and sell it to the public as being ‘as good as a Mac.’”

Monte P. Buzzard, of San Luis Obispo, California, responded with a doomsday prediction: “I certainly hope I’m wrong, but I believe that the alliance will be the demise of Apple, although the diversified IBM will continue to exist. Apple and IBM won’t be able to compete with small companies in sales of personal computers.”

Equally disappointed, Laura Caron, of Raymond, New Hampshire, said, “You have no idea how this news of Apple’s getting together with IBM depresses me. Apple is being bought out by the makers of the computers all Mac users swear they’ll never use. I feel cheated. Don’t turn into one of those executive lemmings you showed us in your early anti-IBM advertising.”

Having witnessed the joining of several large car companies, Lynn Ellsworth, of Albany, New York, doesn’t feel so gloomy. “Watching two great companies join together for strength and the sharing of abilities is a marvelous event to witness. It’s more fun reading in Fortune magazine about companies joining together than it is reading in the National Enquirer about movie stars joining together. Thank you, Mr. Sculley and Mr. Cannavino, for the entertainment.”

Let’s see: Frank and Rita, Joe and Marilyn, Sean and Madonna... Sculley and Cannavino? This could be tougher than we thought.

Dear Mr. Sculley...
The easiest way to create stunning charts and diagrams

Don't spend hours making charts and diagrams using a typical drawing program. The newest TopDown, version 3.0, lets you create great-looking flowcharts, organization charts, procedure diagrams and training materials more quickly and easily than ever before.

Instantly draw and update your diagrams. Connect symbols with just two mouse clicks. Connecting lines automatically re-route whenever you revise your organization charts, procedure diagrams and training levels. TopDown has 110 different charting tools, including 12 ANSI symbols and a custom symbol creation capability. Color, text import, notecards, and on-line help make TopDown exceptionally powerful, yet easy-to-use.

Discover for yourself how easy it is to create great-looking charts and diagrams with System 7.0 compatible TopDown 3.0. Order a demo package for only $10.00, or call us at (713) 890-3434 today.

TopDown® 3.0
new version!

I appreciated Steven Bobker's condemnation of software piracy but was disappointed later when he condemned voicing the warranty on your Mac by putting your own memory in and saying that your dealer should be expected to respect the voided warranty. If we're going to play by the rules, we should play by all of them.

John R. Nyquist
Itasca, IL

There's a big difference. Software piracy is theft, pure and simple. Every Mac since the IICx has been designed for user access. The prohibition against installing SIMMs is possibly a reaction to this country's rashious product-liability laws — and a legalistic attempt on Apple's part to void warranties. — SB

Adams' Apple

I've purchased your magazine since January '91 but for some reason have never made the move to buy a year's subscription. Bob LeVitus, Andy Hnatko, and Guy Kawasaki are all pluses. (By the way, I would prepar for a ten-year subscription to MacUser sans Dvorak!) But seeing Douglas Adams ("Under-the-Desk Publishing," page 213) in your November '91 issue tipped the balance in your favor.

Vincent Paquin
Two-Mountains, Quebec
Canada

We were truly amused by Douglas Adams' portrayal of the Typist in his article "Under-the-Desktop Publishing." Perhaps our new Typist Plus Graphics will bring back some of the magic he had anticipated when he first received the Typist.

Concerning your discussion about Typist in the beginning of the Personal Macintosh section (page 203), we'd like to point out an error.

As mentioned, the original Typist could be installed only at the end of a SCSI chain when a standard SCSI cable was used. However, when the Typist SCSI interface is connected with a SCSI T-Cable (which we are now including with the Typist Plus Graphics), the device can reside anywhere in a chain. This cable is most conveniently used at the beginning of the SCSI chain, because of the dual 50-pin connector that provides the T intersection, but it isn't limited to that location. The use of appropriate cable adapters and/or terminators in conjunction with other SCSI devices allows users to install the SCSI interface box in the middle, end, or beginning.

Dan Real
Product Marketing Manager
Caere Corp.
Los Gatos, CA

When Caere demonstrated the Typist Plus Graphics for us last September, the SCSI T-Cable was not included. We're glad to see that Typist users will now have SCSI freedom of choice. — JB

Less Than Excel-lent

Although Microsoft Excel 3.0 is a powerful, convenient, and relatively straightforward application, its pitifully primitive header and footer capabilities continually frustrate me.

To use the meager functionality of Excel's headers and footers, you must enter arcane, DOS-like symbols such as 

&f 

&d 

&f 

to insert page numbers, dates, titles, and so forth. Excel would be even better if users could reposition headers and footers; have more than one line available for each; have a selection of fonts; and have an intuitive, graphical interface for headers and footers. This shouldn't be too much to ask of the publisher of Word, which has excellent header and footer capabilities.

Michael H. Kriegl
Woodland Hills, CA

Microsoft's product manager for Excel, Michael Pinckney, says: "We recognize the need to improve Excel's headers and footers, and a future version will make them as easy as the rest of the program. "The comparison with Word is a natural one. On a technical level, however, implementing headers and footers is more complicated in a spreadsheet program, because it doesn't have the base of text-manipulation code that a word processor does. Because headers and footers are a more basic requirement in a word processor, they were addressed sooner in Word."

"Please call our new Excel Wish Line (206) 926-9474" with any suggestions, which we'll consider for future releases."

Unclear Image

The 4½ mouse rating you gave DIGIMATIC ("Quick Clicks," November '91, page 92) led us to some whooping here in our office. We'd like to correct two small errors, though. Although the review was correct in stating that DIGIMATIC doesn't include tools for cleaning up a digitized chart or graph, it didn't mention that the omission is because DIGIMATIC works on "dirty" images without need for erasure.
UNLEASH THE AWESOME POWER OF CANVAS 3. 

Fasten your seat belt and get ready to take the incredible new Canvas 3.0 for a spin. Its exceptional performance and nimble handling make Canvas 3.0 the hottest precision drawing program on the market. And its formidable list of major enhancements puts it miles ahead of anything else on the road.

CRUISE INTO THE FUTURE TODAY. Canvas 3.0 is System 7 Savvy with all of the features Apple® wants to see in System 7 graphics applications. Publish & Subscribe, Balloon Help™, AppleEvents™, and 32-bit memory are fully supported. What's more, Canvas 3.0's breakthrough Open Architecture technology lets you add new tools, effects and file translators with ease, at any time.

IT WILL LEAVE YOU SPEECHLESS. Canvas 3.0 offers a wide range of professional text handling features. Fractional leading and kerning. Tab support within text blocks (left, right, center, decimal). Subscript and superscript text. You can even bind text to any curve. Wrap text around or encrust it within irregular shaped objects. Fully justify and slant text margins. Apply character by character font scaling. And convert TrueType™ and PostScript® Type-1 fonts into their Bézier curve outlines.

NOTHING HANDLES CURVES BETTER. While other drawing programs make you draw Bézier curves by "connecting the dots", Canvas 3.0's freehand tool lets you create any curve by simply drawing it. And it gives you unparalleled Bézier curve editing power -- from multi-point selection and editing to automatic object conversions, combinations, and blends.

You even get centerline auto tracing of scanned images.

GO WHEREVER YOU WANT. With enhanced color capabilities, including a built-in process (CMYK) color separator, PANTONE® color support, and automatic gradient fills and blends, Canvas 3.0 is blowing the doors off the competition. But it doesn't stop there. You'll also find technical features like custom hatching, parallel lines and curves, and dashed lines, curves and borders. Automatic dimension lines. And a Smart Mouse™ drawing aide for precise alignments. What's more, there are new built-in file translators for important multi-platform formats like EPSF, TIFF, CGM, DXF™, IGES, and Illustrator®.

TAKE THE CHECKERED FLAG. Why drive some sedate sedan when you can own the road with the new Canvas 3.0? It's incredibly easy to use -- and the list price of just $399.00 simply adds to the thrill. So, take a deep breath. Buckle up. Double click. And unleash the awesome power of Canvas 3.0. You're in for the ride of your life.

THERE OF YOUR OLD SEDATE SEDAN?

Well, trade-in any used model of MacDraw®, MacDraft®, Illustrator® or Freehand™ for a brand new Canvas 3.0 dream machine for only $149.00. Mail your original program disk with payment to our main address below. Include your MC, VISA or Amex card number, account name and expiration date, or a check in US dollars drawn on a US bank. Add $10.00 shipping. Offer valid in the United States and Canada. Expires on 12/31/91. Please allow four to six weeks for delivery.

See us at MacWorld Booth #229, Moscone Center

PRECISION DRAWING POWER FROM Denebo SOFTWARE

For more information or the name of your nearest dealer call (305) 594-6965 or Fax: (305) 477-5794, Denebo Software, 3305 Northwest 74th Avenue, Miami, Florida 33122.

©1991 Denebo Systems, Inc. Canvas™ and Smart Mouse™ are trademarks of Denebo Systems, Inc. MacDraft™ is a registered trademark of Claris Corporation. RealType™, Balloon Help™ and AppleEvents™ are trademarks of Apple Computer Inc. PostScript® and Illustrator® are registered trademarks of Adobe Systems Incorporated. MacDraw® is a registered trademark of Innovative Data Design, Inc. FreeHand® is a trademark of Macromedia, Inc. PANTONE® is a registered trademark of Pantone, Inc., DXF is a trademark of AutoDesk Inc. The F-40 illustration was created and color separated using Canvas 3.0. We welcome environmentally sound ideas on what to do with tons of thousands of pre-owned master disks.
Documenting procedures just got easier

The fastest way to communicate a process or procedure is to show it in an easy-to-understand flowchart. FlowChart Express is the simple-to-use tool designed specifically for creating great looking flowcharts.

You'll find a set of standard flowcharting symbols that can be quickly placed where you want. Highlight important steps by adding shades or colors to your drawing.

You can connect symbols with just two mouse clicks. Choose from 10 different line paths. Your connecting lines automatically redraw when you move a symbol. Updating your drawings is a snap.

FlowChart Express will let you create drawings from a single page to the size of a wall. It's System 7.0 compatible and is ideal for PowerBook users.

Discover the new easy-to-use FlowChart Express. Order a demo package for only $10.00, or call us at (713) 890-3434 to order your copy today.

FlowChart Express

Also, the price is $229 rather than $249.

Gary S. Huvard, President
Famous Engineer Brand
Software Company
Richmond, VA

The Big Bad Wolfsbane

After reading the comment (“New on the Menu,” November ’91, page 55) about protecting oneself from ELFs (extremely low frequencies) by using wolfsbane or holy water, I felt it necessary to warn your readers about the potentially disastrous inaccuracy of that statement. Although wolfsbane lends off werewolves and holy water defeats vampires, the best protection against the ley folk is cold iron. So unless you’re cornered by a malevolent, blood-sucking were-ELF, a trusty broadband should do the trick.

Andrew Platter
Toronto, Ontario
Canada

Seventh Seal of Approval

If I didn’t know better, I’d think there was an underground movement of Apple bashers working with the press to generate bad news about System 7. I’ve been in computer stores and observed “knowledgeable” salespeople advising customers not to upgrade, because of “severe and serious” compatibility problems. I’ve read letter after letter in Mac-related publications from users with the same complaints.

I’m willing to bet that in most cases, the real problems are just above the keyboard — you know, the carbon-based unit that usually mucks up the computer.

All in all, I’ve seen more than 150 people successfully upgrade to System 7, and invariably they love it. System 7 works!

Marvin L. Price
La Verne, CA

The first thing I did when I began my system update to System 7 was run the Compatibility Checker. The second thing I did was trash the Checker and proceed with life. Most of my applications run fine. Yes, I admit, I miss the little clock that somehow turned into a balloon. Now I’m forced to look at my wrist — what sacrifices we must make!

John Schwab
Baraboo, WI

Burst My Balloons

First of all, why did Apple decide that the Mac was so user-unfriendly that it had to create Balloon Help? And second, why are so many people applauding this move?

System 7 is a great piece of work (publish-and-subscribe, virtual memory), but let’s face it, Balloon Help is little more than a huge monster disguised as a computer toy. From what I’ve seen, Balloon Help is a complete waste for most programs. Not only is it a memory and hard-disk hog but it’s also an insult to many professional users. How many people using PageMaker need to have a little balloon tell them that the Type pull-down menu refers to the use and manipulation of text?

Gary Sawatsky
Dartmouth, Nova Scotia
Canada

If Balloon Help insults you, by all means, turn it off, but please, leave it for the rest of us. Balloon Help is not meant to be something you keep on all the time but rather something to prevent you from running to the manual every time you forget what “convert extrusion factor” means. — JR

Double Back

Will Double Helix ever be recognized as a multiuser client/server database program that outperforms all others in that mode and runs on a Mac or VAX? Contrary to your report (“The Client/Server Revolution,” November ‘91, page 185), the capability to use a Mac as a server has been available for sometime. Double Helix has client/server software for the Mac and VMS.

The article also says that the technology won’t progress until the software is as easy to use as FileMaker Pro, although Double Helix is far easier to set up as multiuser on a Mac or VAX than any of the network file-server applications.

Len MacDonell
Santa Cruz, CA

You’re correct: Double Helix (which came out on top in the speed tests in our June ‘90 database roundup, “The Data Duellists,” page 88) has always had an elementary client/server capability. Because of an editing error, however, a reference stating as much was omitted from David Beaver’s article. Look for more on Double Helix in MacUser Labs’ upcoming article on multiuser database programs. — VvB

Grasping Grappler

The May ’91 article “Printing from Mac to LaserJet” (page 120) had several editorial oversights. The Grapper Series printer interfaces were inadvertently
Tiles™
PROTECTION FROM THE LITTLE ELVES WHO INVADE YOUR MAC AND HIDE THINGS WHILE YOU SLEEP.

A BETTER WAY TO ORGANIZE YOUR WORK.

Some mornings it seems like someone’s come in and hidden your work, doesn’t it? If so, get Tiles protection.
Tiles puts everything you need to work at your fingertips, so you spend less time getting back to work and more time getting work done. Tiles tracks the applications and documents you use as you work, and creates easy-to-use icons called “Tiles.” So when you need to get back to work, just click a Tile — no need to search through mazes of folders, launch a myriad of applications located on different servers, or try and gather all the pieces of that big project together again. Tiles remembers what you work on and where it is — just double-click.

If you share a Mac, you’ll never have to worry where your “Macmate” may have filed things.
The Tiles you use most often reside on your desktop in neat, organized windows. You can even create Tiles for your favorite QuickKeys® and launch your most complex tasks with a double-click!

INSTALL IN MINUTES—SAVE HOURS.

Set up Tiles once and never think about it again. It runs automatically and transparently in the background, and gives you the easiest way to automate and organize your work. Simply specify how many Tiles you want, where they go, how long to keep them around — even what size to make them.

Face it, occasional catastrophes are nothing compared to the daily time lost from little things that go astray. If you knew how much time you lost daily just getting organized, you’d be amazed.

TRY TILES FREE.

We’re so sure you’ll be delighted with Tiles, we’ll send you a free demo. Take five minutes to find out how easy it is to save hours. Call today.

1-800-523-7638
Ask for Dept CE39

CE SOFTWARE INC
Connecting people and productivity.
FORGET ABOUT DISK CRASHES

DiskTwin 2.0
100% HARD DISK PROTECTION

DiskTwin™ 2.0 makes an up-to-the-instant backup of one disk to another. The backup comes online instantly, eliminating downtime when disks crash.

EFFORTLESS: Set it up and forget it! Your backup is ready-to-use — there's nothing to restore!

IDEAL FOR SERVERS: Fully compatible with AppleShare® and E-mail servers.

ELIMINATES DOWNTIME: Detects a disk crash and seamlessly switches over to the backup disk!

NO SLOWDOWN: Doesn't slow your Macintosh down. You won't even know it's running.

UNIVERSAL: Works with all models of SCSI disks, even from different makers. No need to reformat your current disks.

800/326-1858
See us at MacWorld Booth #5807 Brooks Hall

GOLDEN TRIANGLE
4849 Rosson Court
San Diego, CA 92111 USA

CIRCLE 67 ON READER SERVICE CARD.

misidentified. The Grappler LS is the inexpensive, serial version, similar to the plain serial-cable configuration of its competitors, MacPrint and JetLink. They have a maximum data-transmission speed of 19.2K. The substantially faster and most popular model, the Grappler LX, uses a hardware-based 57.6K serial-to-parallel converter. The parallel-conversion technique significantly reduces the transmission time of the bit-mapped graphics data to the Hewlett-Packard LaserJet printer.

On the issue of fonts, the Grappler Series supports TrueType fonts, which are licensed from Apple and supplied with Grappler software. By avoiding the custom bit-mapped fonts used by other printer-interface manufacturers, the Grappler conserves disk space.

With regard to your limited benchmarks, we suggest that in the future, print samples include a wider variety of fonts, styles, and graphic pictures in multipage documents. Inclusion of these elements would more accurately reflect the traditional DTP Mac user environment, one in which the Grappler excels.

Arthur F. Scotten, President Orange Micro, Inc. Anaheim, CA

Breaking the Silence

After frustrating hours spent trying to find my hard drive on my computer, I called my dealer to ask if I was in fact losing my mind. When I told the people there that I had a Sony drive, they informed me that Apple had issued a "silent recall" on some of the drives, identifiable by the serial number. After identifying my drive as one of the recalls, my computer store replaced it with a new drive from Apple. Quite frankly, the Quantum drive Apple supplied is a piece of junk. My formerly silent SE/30 now sounds as if it's going to fall apart every time it boots up. Apple is blaming Sony, Sony is blaming Apple. Which of these two giants is going to stand up and take some responsibility?

Evan M. London Hastings-on-Hudson, NY

Silent recall isn't quite the right term. Not all the Sony drives are expected to fail, which is why they're not actually being recalled. To qualify for Apple's Hard Drive Repair Extension Program, the drive must (1) be less than four years old, (2) be experiencing stickiness problems (the platter doesn't spin up after the drive has been powered down for a period of time) or head crashes (the drive may or may not mount, and data may be corrupted), and (3) match a specific model and serial number. Any Mac store can check the number for you, or you can access a table of the numbers on Zmac, our on-line service hosted by CompaServe.

Download the file SONYDR.TXT in Library 7 (Reference) of the Download and Support Forum. If you need to know more, call the Apple Customer Assistance Center, at (800) 776-2333. — NP

Driver's Ed

The cover of your November '91 issue promises "32 Hard Drives — tough tests, easy choices" ("Searching for Storage Perfection: 100-Megabyte Hard Drives," November '91, page 124). Total hogwash! Perhaps it should have been "Quantum LP105S — which case do you like?" You should have tested all the available drive mechanisms, from which there are many more to choose.

Power-supply quality probably has more to do with how long that plastic box will function than any other factor. Let's face it — many of these drives were designed (I use that term loosely) by marketing people who used the cheapest power supply they could get. After all, it doesn't show up on the spec sheet — why spend more money? Let's hear about the things that aren't on the spec sheet!

George Paight Santa Cruz, CA

Beginning this year, our lab reports on storage devices are emphasizing reliability and vendor support as much as performance benchmarks (see last month's report on magnetic-cartridge drives for an example). Future hard-drive reports will be based on more than 40 criteria. We'll do just what you suggested: open the drives and examine the power supplies for surge suppressors, fuses, correct power rating, shielding, and use of toroids. All the criteria will be compared against price to give you a good idea of where vendors are putting their money. — MF

Wife with Meaning

We wives, female ones included, are always pleased when one of our own is able to educate the public on our plight and share with them the rewards of wifedom. I always enjoy Guy's column, but I loved "My Life As a Wife" (October '91, page 29).

Chris Mayou
Onalaska, WI
CoStar's new ergonomically designed trackball beats the competition hands down.

A few years ago trackballs were a big idea. They provided more speed and precision than a mouse and took up less desk space. Unfortunately, over time they also felt big. And heavy. And uncomfortable.

Well, now there's a smaller, much more comfortable idea. The Stingray ergonomic trackball from CoStar.

The Stingray was carefully designed to work with the human hand. Its low profile offers a natural position, reducing strain on the hand, wrist, and forearm. The ball is 75% smaller and lighter. And the jumbo size buttons mean that no matter where your hand rests on the Stingray, it's resting on a button.

So, if you'd like all the advantages of a trackball with all the comfort of a mouse, give us a call. When you compare the Stingray to the pointing device you're now using we think you'll agree, there's just no competition.

Stingray lists for $129. For more information on the Stingray ergonomic trackball or the dealer nearest you, call 1-800-4-COSTAR. In CT and outside the U.S., call 1-203-661-9700.
Hang on! At 17 pages per minute, the new HP LaserJet IIISi printer for the Macintosh runs full tilt. With a high-speed engine, more standard memory (5MB, expandable up to 17MB), and a RISC-based formatter, this printer can have your work finished faster than you can shout "the HP LaserJet IIISi for the Macintosh."

Designed specifically for high-volume printing, this machine comes with two 500-sheet input trays, a 500-sheet output capacity, and a 50,000-page-per-month duty cycle. In addition to quick turnarounds, you gain paper-handling versatility with job offset and a tray-full sensor. And for even greater flexibility, you have the option of adding two-sided printing and an envelope feeder.

What's more, our printer has true Adobe® PostScript® built in. Which means this machine whips through PostScript printing, while others may keep you
Others aren't so obvious.
Introducing the LaserJet IIISi for the Macintosh.

Works with LocalTalk and EtherTalk.

waiting. So whether your workgroups are networked by LocalTalk, EtherTalk, or sharing files between both, simply plug in and they're ready to roll.

Perhaps the best news of all is the price. The HP LaserJet IIISi for the Macintosh is only $6,995.*

So if you're interested in affordable, express printing with the service and reliability you've come to expect from Hewlett-Packard, call 1-800-752-0900, Ext. 2607 for the name of your nearest authorized HP dealer.† And discover the printer that will take your breath away.

LaserJet Printers
When it's important to you.

There's no better way to communicate than PersonToPerson.

Asante®, the leader in Macintosh networking introduces an array of messaging tools that bring the personal touch back to inter-office communication.

Tools that make this the only sure way to get your message delivered.

With PersonToPerson™ software, you can now send voice mail messages across the network, check whether a co-worker is in or out of the office, or use the electronic Post-it™ Note window to leave someone a message. You also get a built-in calendar with timed reminders for appointments. And the personalized screensaver lets you leave messages on your screen while you’re away from your desk.

It's all done without the added expense of a dedicated Macintosh® server, automatically sends messages when you attach your Macintosh to the network, it's a great tool for PowerBook users who create and send messages when out in the field.

And our simple, one-button installation loads the program as an INIT.

And because PersonToPerson

So now your company or departmental work group can interact the best way there is—PersonToPerson.

Resellers: Asante products are available from Ingram Micro, Tech Data and Macamerica.
What's the Use?

When archaeologists of the future begin to explore the late 20th century, three baffling puzzles will leave them mystified and will keep dozens of grad students busily employed for decades: (1) How come, as late as the 1990s, radios were still sold with analog tuning, when digital technology was more reliable, cheaper to manufacture, and easier to operate? (2) How come VCRs came loaded with incredible features that neither the salesperson nor the manual nor, least of all, the front control panel was able to explain? (3) How come the Mac interface interpreted the same action — dragging something into the Trash — as either a command to delete a file or a request to eject a disk, even after the much ballyhooed System 7?

There will be other questions as well. Why did the inefficient QWERTY keyboard layout (designed to slow down the speed of data entry to prevent early typewriters from jamming) persist long after the typewriter went the way of the dodo, the Edsel, and The Bay City Rollers?

Why didn't software companies ever use the "splash" screen — the box that comes up when you launch an application — to provide useful information, such as the tech-support phone number or tips on the most misunderstood or underutilized features of a program, instead of a legalistic disclaimer or a shameless plug for the company?

Why didn't software companies ever use the computer to help them better understand and better serve users? That is, why didn't the software of the 1990s automatically watch your usage habits for a while and adjust your preferences and defaults automatically? Why didn't the hardware and software keep track of the tasks you were doing and volunteer information about features you weren't using that could make your job easier?

If any of you archaeologists happen to dig up this column, I'll make your life simpler. The answer to all these questions is the same: In the computer industry, marketing takes a backseat to technology.

If you've just picked up this issue from your mailbox filled with fliers, product information, and catalogs from your local computer superstores, you might wonder how anybody who suggests that computer companies don't do more than their fair share of marketing has managed to avoid all the junk mail you're subjected to. Sure, there's plenty of marketing going on. Even this magazine is filled with ads, and it comes with postpaid postcards for requesting even more information from product vendors.

But that's just the output side of marketing. On the input side, it's the engineers and technologists who call the shots. They're the ones who decide what product to create next. They're the ones who decide what features to include and which features will die on the cutting-room floor. They're the real power brokers of the computer industry.

These technologists who are calling the shots in Silicon Valley don't care much about the little things that make you miserable and unproductive. Technologists rarely go for the simple solution anyway. Awkward keyboard layout slowing you down? Get an accelerator. And, hey, you can change that splash screen in just a few minutes, using ResEdit or MacApp.

Technologists tend to use technology to fix the problems of technology. The trick of good marketing, on the other hand, is to find out what your customers want and to deliver it. (The trick of bad marketing, on yet another hand, is to find out what your customers want and to tell them that you have it until they believe you. But that's another story.)

Technology is rarely a good tool for fixing technology; instead, it begins to perpetuate itself for its own sake. One recent study shows that, on average, computers in manufacturing environments actually decrease productivity; they take more time to set up, run, and maintain than it takes to do the tasks they are supposedly intended to simplify.

In a similar vein, social critic Jerry Mander observes in his book In the Absence of the Sacred (Sierra Club Books, 1991), "If you include the time needed to earn money to pay for and repair all the expensive 'time-saving' gadgets in our lives, modern technology actually deprives us of time."

But the tide is finally beginning to turn in 1992. That's the year future historians will cite as the start of The Great Usability Revolution.

Buzzword du Jour

Usability is the word in the computer industry today. Just read the ads or go talk to your computer dealer. "Our software is more usable than their software." "Our hard drive offers maximum usability." "Our magazine delivers more usable reviews evaluating the usability of hardware and software for the Mac, the computer rated highest for usability."

Say goodbye to intrapreneuring, the one-
Put a Networked PC Inside Your Mac

... With Unparalleled Network Compatibility
It isn't easy being a Macintosh user with PC clones networked all about you. Especially if you must run an MS-DOS® based program whose data files are controlled by a network. However, with an Orange386 card inside your Mac, you can directly connect to any PC dominated network with complete compatibility.

How? Simply put an Ethernet, Token Ring, Arcnet card, etc., into a PC/AT slot located on the Orange386, and run your networked PC program. The Orange386 provides the ideal connection to the network, and its built-in Intel® 80386 processor and on-board RAM ensure that your MS-DOS programs run properly.

... Run Your Critical PC Software
The Orange386 is actually a second computer functioning independently inside your Macintosh. In VGA mode for example, you could be running an MS-DOS® based program such as MS-Windows®, while simultaneously executing a Mac program. A 'hot key' moves you back and forth between platforms in a true dual processing environment.

... With Superior Hardware Performance
With Orange386 your choices are: 16 or 20 mhz SX processor, up to 16 MB RAM, optional Intel 80387 math coprocessor, PC serial port, PC parallel port, PC floppy disk port, and two PC/AT expansion slots for VGA, network cards, etc. The Orange386 offers virtually unlimited hardware flexibility. But more importantly, your MS-DOS software will execute up to 10 times faster with the hardware based Orange386 as compared to PC software emulation packages.

The best way to understand what usability is to understand how usability is used. There are three steps in creating a certifiably usable product:

1. Listen to the people who are going to be using your product (also called customers) to find out what they want. (Has anybody ever heard of your product? Does anybody have the problem your product solves?)

2. Observe customers in the act of using your product to see how well they like it. (Were they able to figure out how to get the thing turned on?)

3. Come up with a way to solve the problems you observed in step 2, and go back to step 1 to see if it worked. (Beware in mind that for a solution to work, it must both solve the problem and communicate that fact to the customer.)

'The customer is always right' has always played second fiddle to 'Technology is king.'

Optimizing software for usability usually involves fairly simple changes. Labeling commands more clearly so users are more inclined to discover and use all the power your product has to offer, placing palettes so they don’t hamper smooth operation of the software, providing appropriate shortcuts to automate the most-commonly-performed functions.

In Search of Usability
There’s nothing new here; time-and-motion studies on worker productivity have been around since the rise of the “efficiency expert” a century ago. This approach has been used to help design consumer goods for ages, long before Proctor met Gamble, Sears met Roebuck, or Ben met Jerry. This is Survival 101 for anyone who hopes to exist longer than a K mart blue-light special.

In the computer marketplace, however, the axiom “The customer is always right” has always played second fiddle to “Technology is king.” Who has time to find out what customers want or think, when the engineers have some new magic to show you?

Of course, not every lesson from the land of consumer products is relevant to computers. Some computer companies have a knack for studying the consumer-product marketplace for insight and wind

© Orange Micro Inc. 1991

CIRCLE 58 ON READER SERVICE CARD.

24 February 1992 MacUser
Power Up Your PowerBook

And run some real applications.

You've just purchased one of the most sought after notebook computers ever made—Apple's new PowerBook. You bought it for the freedom it affords you, but you're frustrated by its limitations. Although equipped with powerful System 7, the PowerBook's storage and memory configuration barely allows you to do anything beyond booting up.

Don't despair. Now you can achieve the maximum power today's advanced technology offers, with Microtech's new Roadrunner internal hard drives and Coyote memory expansion kits.

Roadrunner 40i and 80i internal drives feature state-of-the-art 2.5" disk technology with 19ms access times. Coyote memory upgrades, designed with low power pseudo-static RAM, are available in 2, 4, and 6MB configurations.

Power without dependability is no power at all. Since 1985, Microtech's Commitment to Quality has meant reliable products backed by the longest warranties in the industry. Our dedicated service and support teams are winners of Macworld Magazine's Service Hero Awards and ensure your satisfaction – guaranteed.

When you need the latest technology today with the confidence you will be supported tomorrow, call Microtech International and Power Up.

For your nearest dealer call: 800-325-1895
International inquiries: 203-468-6223/Fax 203-467-8124

MICROTECH INTERNATIONAL, INC.

©1991 Microtech International, Inc. 154 Commerce Street, East Haven, CT 06512. All trademarks or registered trademarks are the property of their respective owners. Microtech reserves the right to change specifications without notice.

CIRCLE 160 ON READER SERVICE CARD.
Find More Customers.

Guaranteed.

There's simply no easier, faster, or more cost-effective way to find more business-to-business prospects than with MarketPlace Business. MarketPlace is so effective that if you don't find more customers in 60 days, we'll give you your money back.

MarketPlace Business is a CD-ROM-based product that puts more than seven million U.S. businesses right on your desktop. You get information like business name, annual sales and number of employees, plus contact name and title, address and telephone number—the kind of information that helps you turn perfect strangers into perfect customers.

With MarketPlace, you can target prospects and create lists using criteria you set yourself—like geographic area, annual sales volume and number of employees. You can target specific industries using the most detailed business classifications available—8-digit SIC codes. (Even the U.S. government can't give you more specific business definitions.) And your dollar goes even further with MarketPlace lists because you can reuse any list as often as you want for one year—at no extra charge.

There's more: On-screen list preview. Market analysis. Instant list counts. One-step data exporting. Quarterly information updates. But don't just take our word for it. Call us today at 617-894-4100 (x3122) and ask for your FREE MarketPlace demo diskette.

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

Send me a MarketPlace information kit including a MarketPlace demo disk.

Name ____________________________
Company ____________________________
Address ____________________________
City/State/Zip ____________________________
Tel: ____________________________

Mail to: MarketPlace Information Corporation
3 University Office Park, Waltham, MA 02154
Fax: 617-894-1656 Phone: 617-894-4100 x3122

CIRCLE 61 ON READER SERVICE CARD.
Ultimate Power

For the Ultimate Machines.

Microtech's new **Nova N900i** is the largest capacity internal drive now available for the Macintosh in a 3.5" form factor. With an 11ms access time, the N900i is complete with Norton Utilities for the Macintosh, LifeGuard by Visionary Software, and a five year limited warranty, is the ultimate internal drive for the Macintosh Quadra 700.

Customize your Macintosh Quadra 900 by choosing high performance solutions from Microtech's new line of internal mass storage devices, like the 120MB OR120i rewritable optical drive or the CD600i CD-ROM drive. Or choose the T2000i 2GB DAT tape backup system with network compatible RunningBACK archival software. The R50i removable drive provides unlimited storage capabilities plus Mac and DOS file sharing through TransPORT. And optimize your internal storage capacities to 1.6GB with the new **Nova N1600i**.

As a power user, you can also count on Microtech to bring you the latest technology in memory solutions. With both economical 16MB composite modules and low profile 16MB SIMMs featuring 16Mb DRAMs, you can maximize your Quadra 900 to 256MB of RAM!

Power without dependability is no power at all. Since 1985, Microtech's Commitment to Quality has meant reliable products backed by the longest warranties in the industry. Our dedicated service and support teams are winners of Macworld Magazine's Service Hero Awards and ensure your satisfaction - guaranteed.

When you need the latest technology today with the confidence that you will be supported tomorrow, call Microtech International for Ultimate Power.

For your nearest dealer call: **800-325-1895**

International inquiries: 203-468-6223/Fax 203-467-8124

©1991 Microtech International, Inc. 158 Commerce St., East Haven, CT 06512. All trademarks are the property of their respective owners. The five year warranty is offered on drives sold, delivered, and used in the U.S. and Canada. Certain restrictions apply. Microtech reserves the right to change specifications without notice.

**CIRCLE 159 ON READER SERVICE CARD.**
they mean something users might be interested in.

- Direct manipulation of data: In Project, you can grab and stretch time lines. In Excel, dialog boxes for formatting charts appear when you click on the element you’re trying to format. Word 5’s drag-and-drop feature, which lets you move a word or sentence from point A to point B just by highlighting and clicking (instead of highlighting, cutting, clicking, and pasting), saves only a couple of mouse motions or keystrokes, but the difference is like night and day.

- Acknowledge the competition: If your archival product is the de facto standard in the marketplace, your product had better import and export files seamlessly with it. If your predominant competitor has established a command vocabulary or a particular jargon that’s widely understood, use it (or at least offer a lexicon of translations). That’s why Microsoft’s Excel has a special help feature aimed at Lotus 1-2-3 users. In the same spirit, a forthcoming version of Excel will let you run 1-2-3 macros. (Acknowledging competition from within, Lotus has provided an option in the Mac version of Lotus 1-2-3 that makes the interface look exactly like the DOS version of the program, for those who’re comfortable that way.)

Microsoft employs another tactic in its quest for usability: Technical-support calls for each product are charged against that product’s bottom line. That gives a product’s developers a clear incentive to do whatever they can to make sure users will never need to call tech support.

Microsof t is by no means alone in the quest for usability. DataViz, for example, has incorporated some of the features on the wish list I cited earlier: The latest version of its MacLinkPlus file-translation software sets the defaults by observing your usage patterns. Its splash screen and even its packaging are filled with concise information to help you get started with the software. DataViz’s goal for MacLinkPlus is what every software company should strive for: to make the software so natural and transparent that you can focus on your work, not on the product.

Another product with a nifty usability-inspired feature is First Things First, from Visionary Software. The icon for this little activity-list manager is an attractive calendar/clock that sits on your desktop and expands into a to-do list when you double-click on it. Because you’re always going to have this icon taking up valuable desktop space, it should at least earn its keep by letting you know the time and day.

One reason for the push for usability is that technology has advanced more rapidly than consumers’ ability to fully embrace it. It’s easier to sell customers on something they already know they need than to create a demand for something they’ve never heard of.

Now, if only Microsoft, DataViz, or Visionary Software would get into the VCR business . . . .
If you want the best color for the Macintosh, you have to be a NIT picker. Because NITs are a scientific measurement of brightness* and quite simply, Seiko Instruments’ CM 1445 gives you more of them.

The 13” CM 1445 blazes with 100 NITs of brilliant color, a full 30 NITs more than the Apple® MAC II® RGB monitor’s maximum of 70 NITs. Scientifically speaking, that’s 43% brighter. On every Macintosh II, even the new LC.

That means you get 43% more punch out of passion pink. 43% more freeze in glacier blue. Your jalapeño green will be 43% spicier. In fact, for every one of the 16 million possible shades, our razor sharp Trinitron® high resolution tube delivers colors that are 43% more brilliant. So your bright ideas will look even brighter.

If you’re picky about color, just use your eyes. You’ll see that Seiko Instruments is the brightest choice you can make.

Call 1-800-888-0817 for our free Monitor Comparison Checklist and for more information on our full line of color monitors, color printers, and other peripherals.
Anything else is just work.
For a cool, crisp $99 you can trade up from Microsoft Works. Call 1-800-544-8554, ext. 57, to cash in.*

This is exactly the way you wanted Macintosh to be.
The power to effortlessly create documents with words, graphics, spreadsheets, and charts. Without running your mouse through a maze of modules.

Finally, all this functionality is immediately available on the screen in one application. Rather than a bunch of mini-applications, thinly glued together.

A level of integration you could justifiably call a genuine breakthrough.

It's an arrangement that, unlike anything else, produces more with far fewer moves.

Not only are ClarisWorks tools always within easy reach, they're amazingly easy to grasp and handle. It's like getting our greatest hits—the most popular features of our leading MacWrite®, MacDraw®, FileMaker®, and Resolve® programs.

ClarisWorks also doesn't hog RAM. Remaining nimble and quick on Classics and LCs and keeping portables, portable.

It's even remarkably simple to share anything you create. With our XTND technology, ClarisWorks can read and write to dozens of popular file formats, like AppleWorks™, PICT, MacWrite II, and Microsoft Works.

Last, but certainly not least, ClarisWorks is a program you can build on. The menus and commands in each ClarisWorks environment mirror those in our best-selling specialized programs. Enabling you to move to any one of them without starting over at square one. Which makes ClarisWorks the only integrated program with a true growth path.

So call to trade up from Microsoft Works for just a mere $99.

Or check out ClarisWorks at your authorized Claris dealer. And get the only works that isn't.

Simply powerful software.*
If you think the only way to avoid running out of memory is to avoid running a couple of your favorite applications, think again.

Think about all those memory-hogging fonts and sounds you've got stuffed into that bulging System File.

Then do what over 200,000 resourceful Mac users do every day.

Instead of closing your applications, open a Suitcase. Suitcase is the award-winning utility that lets you park your growing collection of fonts, DAs, FKEYs and sounds outside the System File.

Thereby giving you the maximum amount of memory for running more applications, building bigger documents and doing other useful things.

What's more, Suitcase compresses your screen font and sound files by up to 60%.

Thereby giving you that much more precious disk space to work with.

It even lets you put your screen and printer fonts on a server for all to share.

Thereby making each disk on the network that much more spacious.

The more resources you have—and the more organized you are—the more memory and disk space you'll save.

But whether your dividends are measured in megs or merely in Ks, Suitcase is guaranteed to save you gigabytes of aggravation.

Even if you're operating in System 7. Because System 7 still stuffs your resources into your System File.

And System 7 still makes you close down all your applications and restart your Mac each time you install a new font.

Which is a real pain in the, uh, system.

Suitcase, on the other hand, gives you unlimited access to all your resources.

And total control over how you organize them.

Each suitcase can pack up to 800 fonts, 64 DAs, and any number of FKEYs and sounds.

You can group suitcases into sets, then summon all the luggage that belongs with a particular project at the click of a mouse.

Tips are optional. But here's one for those of you who find font ID conflicts even more irritating than running out of memory:

Get Suitcase. It eliminates them.

Call us at 1-800-666-2904. We'll tell you about our vaunted 24-hour toll-free technical support.

We'll also tell you that Suitcase is backed by a one-year money-back guarantee.

So you can be sure this baggage will live up to its claims.
Masters of Macintosh

Be honest. Are you a Macintosh master? Here's how to find out if you are and how to make the grade if you aren't.

I don't believe in the tooth fairy. I don't believe that the check is in the mail, and I don't believe in the Apple/IBM alliance. Still, even if this alliance never yields a product, it will have one immediate, powerful effect: It will legitimize Macintosh.

Now when Apple employees, dealer salespeople, and Macintosh evangelists face the objection that Macintosh is just a "cute, graphics toy computer," they can retort, "If it's GUI enough for IBM, it's GUI enough for you." This is worth a lot.

Let's face it — this means that a lot of novices, beginners, and Great Un-Macintoshed Masses are going to be using Macintoshes very soon. This column is for them: It explains how to master a Macintosh. I don't expect you to need it — simply pass it along to your friends.

Definitions
Macintosh users come in three varieties: hackers, obsessives, and masters.
Hackers buy or pirate every product, install every utility, download every shareware product, and reformat their hard disks once a day. They go to product demonstrations and try to stump the speaker with insane questions such as "How many rules of Codd and Date's Relational Model does your database adhere to?" Hackers describe System 7 this way: "It's terrific. I only crash twice a day." Hackers don't achieve mastery, because using a Macintosh becomes an end rather than a means.

Obsessives are hackers with less brains. If they were athletes, they would buy $300 designer workout suits but never sweat. They read every book, they listen to all the audio training tapes, and they read the Read Me First! documents. Initially, their Macintosh experience is so wonderful that they think that they've mastered Macintosh in the first week. Then they hit a wall, get frustrated, and give up — blaming Macintosh, not themselves.

Masters understand that using a Macintosh is a means to an end. They understand that mastering a Macintosh is like climbing a series of hills and that each one gets you a little further up the power curve. Their path is analogous to that of martial-arts experts who don't "arrive" but constantly improve and raise themselves to a higher state.

Diagnosis
Before we get started, let's determine which kind of Macintosh user — hacker, obsessive, or master — you are. Sharpen your pen-based input device, and take this short quiz:

1. Which statement best describes you?
   a. I can't get any work done. I'm still looking for the perfect application or perfect next version so I can finally get started. When it arrives, I'll start.
   b. Even though I've spent more than $5,000 on books, training, and tapes, I still can't use a Macintosh very well. It's a stupid computer after all.
   c. I like my Macintosh OK. It's not perfect, but it helps me get the job done. I have to go right now to make some bank deposits.

2. When a software developer announces a new version of an existing product, what is your reaction?
   a. Call the developer and demand that you become a beta site or you'll switch to a competitor's product.
   b. Call Personal Training Systems and Mac-Academy to find out if there are tapes or classes for it.
   c. Smile to yourself for a second before going to the bank to make a deposit.

3. When you heard about the Apple/IBM alliance, what was your reaction?
   a. Called John Sculley to offer your services as a consultant to help design the next computer architecture, because you have ten years of C-programming experience.
   b. Went to Nordstrom to buy a new three-piece suit and a yellow tie so you can be properly dressed to use this new computer.
   c. Laughed uncontrollably before going to the bank to make a deposit.

If the first choice for each question describes you, you are a hacker. If the second choice describes you, you are an obsessive. If the third choice describes you, you're either a master or a liar.

The Road Less Traveled
Here is how to travel along the road to Macintosh mastery:

1. Set your expectations correctly. It takes about 15 minutes to set up a Macintosh, but it takes about two years to master it. When you first start using a Macintosh, you swallow huge gobs of gains in productivity, creativity, and enjoyment. The size of the gains, however, gets smaller and smaller as you achieve mastery. Using a Macintosh is a lot like skiing: It takes only about a day to get started but years to get good.

2. Go with the flow. The process of mastery is not only long but it is also cyclic. There are
A PERMANENT FILE & DISK ERASURE UTILITY FOR THE MACINTOSH™

SHREDDER™ is designed to keep your confidential files safe from recovery. Permanently and irrevocably deletes files from your disks. Shreds files immediately or automatically at any time you choose, without interrupting your work. When sensitive information truly needs to be erased from your hard disks, floppy disks, and networked disks, the trash can’t enough...you need SHREDDER!

COMPLIES WITH U.S. GOVERNMENT STANDARDS

TOLL FREE 1-800-554-2973
Bernoulli® and SyQuest . . . each is trying to take over the corporate world with their special technology for removable media. Who will be the winner? You will, if you choose the ETC DataPort™.

Start with the DataPort cartridge. It's a 3 ½" Winchester drive in a removable cartridge. Just like removable disks, the DataPort cartridge can be removed for storage, or carry it to another location. Better than a removable disk, our cartridges can access your data faster, and it's available in greater capacities ranging from 105 Mb to 1.0Gb. And, with our exclusive ETC Tools, you can even combine several smaller drives into a single, super volume—up to 2.1 Gb!

Next pick your system . . . the DataPort Twin with 2 drives or the Tower with 4. Fill the slots with DataPort cartridges and either a Bernoulli or SyQuest drive. Need something special? We can configure any combination you need. Don't get caught on the wrong side of a power struggle. Play both sides. Call 800-882-2863.

ETC Peripherals, 5426 Beaumont Center Boulevard, Suite 300, Tampa, FL 33634, (800) 882-2863, (813) 884-2863, Fax: (813) 888-9535

The DataPort is protected by patents 4,941,841 and 308,841. All brands and product names are trademarks or registered trademarks of their respective holders.

© 1992 Exportech Trading Corporation, d.b.a., ETC Peripherals

CIRCLE 63 ON READER SERVICE CARD.
Used Regularly, Prevents Unwanted Conflict Build-up.

Why wait for your Mac to bomb when you can keep it running smoothly with a little bit of Help!™

Help! pinpoints configuration conflicts, incompatibilities, and other problems and shows you how to fix them right at your desktop. You'll eliminate system errors, lock-ups, and system bombs.

Help! is the first intelligent application with a built-in knowledge-base of problem information covering over 2,000 software programs, INITs, cdevs and hardware products. It's the only Mac product that lets you solve these problems at your desktop: Startup document conflicts • Incompatibilities between hardware, system software and applications • Memory problems • Improperly installed files • Duplicate or damaged files • Operating system problems up to and including System 7.0.

The sooner you get Help! the sooner your Mac will run at peak performance. Single user version just $149. To order call:

1-800-873-3494

Outside the U.S.A. Call: 1-813-620-3494
Visa/MC/Amex

Every Mac User Needs It.

Help!™

3923 Coconut Palm Drive, Suite 111, Tampa, Fl. 33619

*Help! utilizes SMART Teknology™ from Teknosys.
Newton's Virtual Apple

Could Newton's apple be replaced by Apple's? There's a scientific revolution in the works, and it's going to start on a desktop, not in a laboratory.

In my column last October, I described Wolfram Research's Mathematica in these terms: "Mathematica is ... math. That is, it's a simulation of some of math ... ." It may have read as though I were saying that a computer simulation is the thing being simulated. I was, almost, and it is, almost. Simulation is a very important direction in computer software, and there are some good examples of simulation on the Mac.

I ended that October column by saying, "Now all we need is Physics, Biologica, Chemica, Philosophica ... ." The folks at Knowledge Revolution in San Francisco met the challenge, sending me a copy of Interactive Physics. This program, which earned a 1989 MacUser Eddy award for best education/exploration program, was reviewed in MacUser in April 1990 (page 65), and has a new version out now, "is" two-dimensional Newtonian physics. Its world contains user-specifiable gravity and air resistance; objects with user-specifiable elasticity, position, size, shape, density, and velocity; and ropes, springs, dampers, and constant forces to hook up to the objects.

When you set up an experiment by dragging objects and filling in parameters in dialog boxes, objects collide and fall and bounce in accord with the specified parameters. If you choose the right parameters, your simulated experiment will normally work just like the corresponding real-world experiment. There are some edges to this simulated world, and if you step over, the simulation breaks down badly — solid objects pass through one another, that sort of thing. But it's not too hard to skirt the edges.

You can watch the simulation run; you can record and play back a "tape" of the run, you can measure effects with various meters, and you can export the results of experiments to other applications. Prentice-Hall liked Interactive Physics enough to agree to bundle a modified version with all of its college-level physics textbooks.

Mathematica, Interactive Physics, and other programs that realistically simulate parts of the universe are worth a look not only for what they do but also for how they do it. There is a fundamental difference between a program that simulates a part of physics and one that demonstrates a part of physics. It's a question of trust. A simulation implements the fundamental principles of a domain and uses them to derive the appropriate behaviors, rather than just programming in the behaviors. If the principles are well chosen, the simulation acts exactly like the real thing. As a result, you can go ahead and try things that the designers of the program never thought of and you can believe the results you get.

And you do believe them. After a few checks against reality, you quickly learn to trust programs such as Mathematica and Interactive Physics. In fact, if your simulated falling apple doesn't act just like your real falling apple, you tend to question your real-world experimental procedure before you question the program.

And rightly so.

Two-Bit Expertise

But is this good? Shouldn't students be playing with real pendulums? Setting aside the pedagogical issue, should scientists be relying on simulations? Because working scientists are, more and more often, using computer simulations in their work, doesn't this breed an unhealthy distancing from the data, a suspect reliance on the computer?

In the words of one observer of science, "This new breed ... runs off to a mainframe whenever the going gets tough and lets a few million microchips get them out of hot water." At the risk of sounding like Dr. Science, I think a one-quarter course on the history and philosophy of science back in grad school, so I figure I also qualify as a two-bit expert on the goals and methods of science. Here's some two-bit expertise.

All instruments distance the observer from the subject matter, and scientists always use instruments. Think of the microscope, a couple of pieces of glass that distort vision and that a Dutch naturalist named Antonie van Leeuwenhoek claimed would enable you to see little animals swimming around in your drinking water. It took a while to sell that one. Or the electron microscope, or the radio telescope, or the kinds of "observations" one gets out of a particle accelerator. Science gets farther and farther from just looking in the horse's mouth as it employs increasingly subtle instruments. Each such instrument embodies a theory that justifies its use. It may be an uncontentious theory of visual perception, or of optics, or of red shift, or of quantum mechanics—but there's a theory.

Simulations at least have the courtesy to be explicit about their theories. In fact, a simulation is a theory. In the spring of 1987, when Allen Newell delivered the prestigious William James
Power Up with Newer...the Innovators in Power & Performance for Macintosh computers.

Macintosh Powerbook™
Memory Modules
Add 2MB, 4MB or 6MB to get a full 8MB of total RAM in all Powerbook models 100, 140 or 170.

NEW Macintosh Classic™ II
FPU-882 Card
FPU-882 Math coprocessor card handles most applications from 2 to 5 times faster.

NEW Low-Profile 16MB SIMMs for the
Macintosh Quadra™ 700 & 900
Newer’s specially designed low-profile 16MB SIMMs offer up to 68MB in the Quadra 700 and up to 256MB in the Quadra 900.

Use up to 1024MB of application
memory with MacSWELL™ INIT
Only Newer Technology offers this System 7 application memory solution. MacSWELL modifies the standard GET INFO box. Bundled exclusively with all of our 16MB SIMMs.

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

MACWORLD EXPOSITION
BOOTH #210
1-800-679-3726
For 310-665-0036

MACWORLD TECHNOLOGY
7603 E. Osce, Suite 105
Wichita, KS 67207

MICHAEL SWAINE

Lecture Series at Harvard, he claimed that psychology, after a century of muddling about in broad philosophizing and narrow theorizing, was finally ready for unified broad theories of cognition — that is, of all aspects and levels of mental activity. And he presented the first candidate for such a unified theory, a simulation called Soar. Doesn’t run on a Mac. Yet.

Simulation can be as important to science in the near future as observational methodologies and theory construction are today. That’s a radical statement, because science today is nothing but observational methodologies and theory construction and grant proposals, but I think the assertion is justified. A simulation embodies a theory and provides the means to generate the concrete predictions needed to test it. Modern science is, after all, young as human artifacts go, arguably having gotten its start by obtaining the seal of approval from Francis Bacon in the 17th century. Physics is so new that when Richard Feynman was looking for work as a physicist just before World War II, he was considered a novelty.

Simulations aren’t going to go away. Increasingly, they are where science is heading. Among the advantages of simulations are the ability to go where no scientist can go physically; the ability to check things faster; and the ability to visualize concepts more immediately, which is very important for learning. Also, simulations save money on equipment, experimental subjects, and insurance — not a trivial issue these days.

Cheaper Educational Software

So simulations can save some money. But software itself is costly, and scientific software will always have a limited market. Commercial software written for that market will therefore always be more expensive than comparable products for broader markets.

The problem will be solved in a way that is already obvious: Scientists will write their own software. They’re already doing it, but Mac software is notoriously hard to write. What is needed are programming environments for people who are not professional programmers, and to make these work, software must become more modular. There are several ways to do this, of which the object-oriented approach is the one currently getting the most attention.

Apple events, the set of protocols for System 7 interapplication communication, is an object-oriented approach. Apple events should be very useful for developing scientific software, according to William Rabinovich, who discussed the matter in the third-quarter-1991 issue of SciTech Quarterly, the journal of the Macintosh Scientific and Technical Users Society. Apple events can be thought of as consisting of objects, or generalized data structures, and verbs, which are messages sent from one application to another (from a client application to a server application), requesting that the server application perform some action it knows how to perform.

The key to making Apple events useful is to define suites of objects and verbs that serve a variety of purposes. For example, a suite of scientific Apple events needs to be developed, and work is underway to do this. Rabinovich gives high marks to Apple’s efforts to develop a generalized table format that will allow tabular data to be moved easily among applications, something that would be very useful in science.

Apple events also support distributed processing, which could let, say, a molecular-modeling package run on a IIx, which can do fast numeric calculations, while a molecular-display package runs on a IIcx with a graphics accelerator. The two could shuttle data and messages back and forth when needed, and both machines could run at full speed. Each program could be written to do its single task well, which ought to mean more reliable and cheaper applications.

 someday, an object-oriented environment such as Pink may let scientists exchange, across machines and laboratories and national boundaries, objects that encapsulate features and behavior of real-world objects in a realistic way: virtual atoms, molecules, genes. The question arises, Will these objects then constitute a simulation, and if so, what exactly will that simulation be?
"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 MacInTax™ for tax preparation
- Portfolio management
- Net worth calculator
- Insurance
- 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 1-800-288-MECA.*
You won't be disappointed.

CIRCLE 161 ON READER SERVICE CARD.

* Offer good while supplies last.
Now there are two ways to make sense of it.

The new LZR 1560 from Dataproducts is a complete departure from ordinary laser printers. At 15 ppm, it's not only faster than most office laser printers, it can also deliver output up to 11" x 17". Which means it can print spreadsheets, illustrations—any two-page layout—in the time it normally takes to process a letter-size page.

This kind of performance is the result of combining two powerful innovations. Namely, a RISC-based controller, for quicker rendering of fonts and graphics, and PostScript® Level 2, an advanced printing language that delivers PostScript's vast graphic capabilities faster than ever before.

But in addition to doing its job faster, we've designed the LZR 1560 to do a number of things better.

Take print quality, for instance. When you want greater resolution, other laser printers give you "enhanced" 300 dpi. Ours, on the other hand, gives you true 400 dpi. So you get outrageously crisp and clean text and graphics. And because it's software selectable, you can easily switch back to 300 dpi with just a click of the mouse.

Now that we've got you thinking fast and sharp, start thinking big. Because the LZR 1560 can let you take full advantage of the larger format with no sacrifice in productivity. Imagine creating two-page desktop publishing layouts without cutting and pasting.
The Next Generation of Business Aircraft

Highly loaded forward wing supplies about 40 percent of total lift and provides primary pitch control.

Curved windshield and side windows provide excellent visibility.

Ventral fin protects against blade strikes.

Elevators provide two-thirds of the pitching moment; the remaining third coming from the mechanically interconnected wing streamers.

Yaw damping, originally using the ventral fin, operates on two 2.4 m high wing tip sails which are the primary directional control surfaces.

Or finally getting your full production timeline on a single page that has legible 6-point type. Even your spreadsheets can be better presented in ledger size.

On top of that, the LZR 1560 gives you more workspace with the smallest footprint of any 11" x 17" laser printer.

If a printer that can do all this sounds like a good idea to you, contact 1-800-334-3174 for the name of your near-
est Dataproducts dealer. And discover why the LZR 1560 is the only way to fly.

POSTSCRIPT
Software From Adobe

Using PostScript Level 2 provides more power and design elements in your documents.

11" x 17" Laser Printer Market Snapshot

<table>
<thead>
<tr>
<th>Manufacturer/Model</th>
<th>Resolution (DPI)</th>
<th>Speed (PPM)</th>
<th>Processor</th>
<th>Page Description Language</th>
<th>List Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dataproducts LZR 1560</td>
<td>300x300 OR 400x400</td>
<td>15</td>
<td>None</td>
<td>Adobe PostScript Level 2 &amp; PCL4</td>
<td>$85.695</td>
</tr>
<tr>
<td>LaserMaster 400X1</td>
<td>400x400</td>
<td>20</td>
<td>Motorola 68020</td>
<td>Microsoft TrueType</td>
<td>$9.995</td>
</tr>
<tr>
<td>QMS PS210</td>
<td>200x200</td>
<td>20</td>
<td>Motorola 68020</td>
<td>Adobe PostScript</td>
<td>$81.995</td>
</tr>
<tr>
<td>Vistatype V7600W</td>
<td>200x200</td>
<td>7</td>
<td>Motorola 68020</td>
<td>Adobe PostScript</td>
<td>$82.247</td>
</tr>
<tr>
<td>DEC PrintServer 20</td>
<td>200x200</td>
<td>20</td>
<td>XGA</td>
<td>ATI LaserDrive &amp; PostScript</td>
<td>$15.995</td>
</tr>
<tr>
<td>ATI LC6020</td>
<td>300x300</td>
<td>20</td>
<td>Motorola 68020</td>
<td>Adobe PostScript</td>
<td>$82.247</td>
</tr>
<tr>
<td>DEC PrintServer 20</td>
<td>200x200</td>
<td>20</td>
<td>XGA</td>
<td>Adobe PostScript</td>
<td>$15.995</td>
</tr>
</tbody>
</table>

Sources: Datquest and Dataproducts Corporation, 1991

or registered trademarks of their respective holders.

CIRCLE 75 ON READER SERVICE CARD.
VideoSpigot

Now, pour video directly into your Macintosh for less than $500.

For the first time, getting digital video into your Macintosh® has become a reality. VideoSpigot® from SuperMac® makes it easy, practical, and, most important, affordable.

VideoSpigot is today's starting point for QuickTime® moviemaking on any Macintosh—from the LC to the Quadra® 900. It lets you pour footage from a TV, camcorder, laserdisc, or VCR, right into your hard disk or optical cartridge, instantly turning each frame into digital data. Because VideoSpigot offers the industry's best QuickTime-compatible software video compression, it puts more video—with much higher image quality—on disk than any other product.

You can actually put as much as 30 seconds of video onto a 1.4 MB floppy disk—or an hour or more of footage on an optical disk or CD-ROM!

It's another industry breakthrough from SuperMac—"spigoted" video in QuickTime's file format. Video you can treat just like text and graphics. Video you can import into QuickTime-aware applications. Video capable of transforming presentations, storyboards, newsletters, and training materials into compelling, dynamic documents.

Starting at under $500, VideoSpigot is the super-affordable way to get into QuickTime moviemaking. For true color and large-screen support, consider SuperMac's VideoSpigot Pro. See your Authorized SuperMac Reseller today, or call 1 (800) 334-3005 for the dealer nearest you.

See us at
MacWorld
San Francisco
Booth #1017
Moscone Center

FREE
ADOBE PREMIERE
DIGITAL MOVIE-MAKING TOOL
$495 VALUE
LIMITED TIME OFFER
SEE YOUR RESSELLER FOR DETAILS.
More CD-ROM: Wading through a CD-ROM can be like searching through the Library of Congress — one book at a time. But Peter Winer, of MORE-outliner fame, has created a CD-ROM interface that looks and acts like an outliner, making navigating through reams of data easy. So far, Winer’s work is available only as the front end to the Stat-Ref CD-ROM Medical Reference Library ([800] 755-7828 or [307] 733-5494), but there may be more to come.

By Russell Ito

How Green was my valley: It’s a New Age in Silicon Valley. IBM has discovered the value of a graphical interface, Apple is talking about price/performance, and several companies have decided that EC (environmental correctness) is definitely part of the New World Order. Apple has decided that boxes of color are EC, so the company has abandoned its familiar white packaging in favor of brown kraft boxes that can contain more recycled fiber. Apple is also reducing the amount of foam used inside the boxes. For example, the foam box that used to enclose the manuals and disks will be eliminated in favor of a cardboard box. Foam will still be used to cushion Apple’s CPUs, however. Apple has also announced a battery-recycling-and-disposal program for Portable and PowerBook batteries. These batteries die in about two years, but unfortunately, they can’t be buried, because they contain heavy metals such as lead and cadmium. Under the new program, users can take their dead batteries to an Apple service center, which ensures that the batteries are properly recycled or disposed of — all at Apple’s expense. Hewlett-Packard (Cupertino, California; [800] 752-0900, ext. 1872) has also gone green. The company now has an aggressive recycling program for its laser-printer cartridges. HP is including a prepaid UPS return slip with its replacement cartridges. Simply put your used cartridge into the box, seal it up, and affix the label, and HP does the rest. The returned cartridges are completely disassembled, and the parts are either reused or melted down to become raw materials. As a further inducement, HP’s cartridge vendor, Canon, has committed to donating 50 cents to the National Wildlife Federation and the same amount to Nature Conservancy for every cartridge recycled.

Up to Date...

Intouch, Advanced Software’s PIM, has been upgraded to version 1.1 and now includes one-step envelope printing. Intouch Network uses a client/server architecture for shared data files with minimal network traffic. (800) 346-5392 or (408) 733-0745. Intouch, $69.95; Intouch Network, $199.95. GeoQuery, GeoQuery Corp.’s demographic-analysis package, is now in version 3.0. New features include U.S. interstate highways plus full System 7 support, including two-way IAC links with 4th Dimension. (708) 357-0535. $395. GCC Technologies has upgraded its BLP printer line with the introduction of an 8-ppm version of the BLP Elite, complete with AppleTalk and Adobe’s PostScript. (800) 422-7777 or (617) 890-0880. $2,099.
Projected Presentations

LCD projection panels are great for making presentations. They're compact, light, and without an overhead projector, absolutely useless. Realizing this, In Focus Systems has paired some light sources and LCD panels in the same enclosure to produce three LCD projectors.

The LitePro series, consisting of the LitePro and the LitePro LS, pack 400-watt light source and a color LCD panel into a single 19-pound enclosure that's capable of projecting a 640-x-480-pixel image with as many as 4,913 colors. The LitePro takes its video signal from any standard 640-x-480-pixel Mac video source — either a card or internal video. The LitePro LS can even eliminate the need for a computer. With In Focus' LiteShow presentation-management system, which is built in to the LitePro LS, you can capture your presentation's slides; put them on a disk; insert the disk into the LitePro LS; and then arrange the slides, add transitions, and play the whole presentation back directly from the LitePro LS — without an attached computer.

And for even-more-sophisticated presentations, In Focus has created the TVT 6000, an active-matrix color-LCD projection system that can accept video input from either composite-video sources (such as a VCR or a videodisc player) or from a computer equipped with a scan converter that can output NTSC video. Weighing in at 24 pounds, the TVT 6000 can project an image measuring up to nine feet in diagonal length. It was expected to be available in January.

In Focus Systems, 7770 S.W. Mohawk Street, Tualatin, OR 97062; (800) 327-7231 or (503) 692-4968. LitePro, $6,995; LitePro LS, $8,495; TVT 6000, $7,995.

NEC's Familiar Video Card

In our December New on the Menu, we mentioned that NEC had plans for a video card that would drive its impressive FG line of digitally controlled multisync monitors. True to its word, NEC has announced its MacFG Color Display Interface card, an accelerated, upgradeable NuBus video card.

The MacFG comes in two configurations: the 8X, for 256 color (8-bit), and the 24X, for 16.7 million colors (24-bit). You can upgrade the 8X to the 24X simply by adding VRAM, and you can even stop at 16 bits (65,500 colors). The MacFG can display resolutions from 640 x 480 to 1,152 x 870 pixels.

If all this sounds vaguely familiar, it should. The MacFG is NEC's adaptation of Radius' previously released Precision-Color cards.

NEC Technologies, Inc., 1255 Michael Drive, Wood Dale, IL 60191; (708) 860-9500. 8X, $899; 24X, $1,899.

Swinging Data

Using spreadsheets is fine for analyzing most data, but only up to a point. Say, for example, that you want to study some sales figures for a group of territories. A spreadsheet's row-and-column structure is ideal. But now, imagine that you decide to look at each region by month, cross-tabbed by client — that's a problem a spreadsheet program would be hard-pressed to solve. Enter Data Pivot, an analysis tool from Brio Technology that makes performing crosstabs as easy as clicking and dragging.

Data Pivot accepts data in tab-delimited or spreadsheet format, so once you have raw data, you're ready for your analysis. Data Pivot reads the data set's row and column headers (or the "table" if your data is coming from an SQL database) and presents them in a scrolling list. To start your analysis, all you have to do is select each header and tell Data Pivot whether you want it to be for a row or a column. Once the headers are established, you can flow the data into the new grid. Adding more headers for further analysis is just a matter of dragging the additional ones from the list into the report grid. Similarly, transposing rows and columns is a simple matter of dragging (or pivoting, to be more precise) them. By keeping everything graphical, Data Pivot makes performing complex analyses a breeze, and you can save your reports as reusable templates. Data Pivot can also save a report in a variety of spreadsheet formats, including Excel and 1-2-3 for the Mac.

Brio Technology, 444 Castro Street, Suite 810, Mountain View, CA 94041; (800) 486-2746 or (415) 961-4110. S249.

Data Pivot makes performing complex data analysis such as creating cross-tabs and hierarchical groups. It's a simple click-and-drag operation.
Quantum’s new Passport XL series brings the capacity and performance of Quantums to a sealed, removable drive that blazes past SyQuest’s drives.

Quantum Goes Removable

Quantum has long been known for its fast, reliable fixed hard drives, and now it’s about to enter the removable-drive market. The new Passport XL line of removable hard drives boasts performance specs that match or better those of the fastest fixed-media drives and leaves standard removable-cartridge drives in the dust.

Unlike cartridge drives such as the SyQuest, the Passport uses a completely sealed drive system, with the head and the media enclosed in an air-tight housing. To use a Passport drive, you insert the drive into a housing unit that automatically loads the drive — it’s much like inserting a videocassette into a VCR. Because of the Passport’s sealed design, Quantum lists its MTBF (mean time between failures) rating at 250,000 hours and 20,000 insertion/removal cycles.

The Passport XL drives will be available in four capacities: 52, 105, 120, and 240 megabytes. The 52- and 105-megabyte models are available in January, and the others are expected in March.

Quantum Corp., 500 McCarthy Blvd., Milpitas CA 95035; (800) 624-5545 or (408) 894-4000. External chassis, $469; 50-megabyte model, $449; 105-megabyte model, $629; 120-megabyte model, $899; 240-megabyte model, $1,099.

Intelligent 3-D

When Ashlar introduced Vellum two years ago, it started a trend that practically every Mac-CAD vendor has since followed, the inclusion of an “intelligent” cursor to guide users through the drawing process. But even at Vellum’s introduction, users asked for a 3-D version, and Ashlar has finally obliged, with the release of Ashlar Vellum 3D.

Like its predecessor, Vellum 3D is primarily a drawing tool, so its 3-D capabilities don’t extend to doing rendering or solid modeling. Instead, Vellum 3D concentrates on precision wire frames. And to make the process of working in 3-D easier, Ashlar extended its Drafting Assistant feature from the original Vellum into the Z-Drafting Assistant, an intelligent cursor that functions in 3-D.

With the Z-Drafting Assistant, users can quickly create 3-D geometry without the complication of initially establishing working planes. In fact, working with Vellum 3D is much like working with the earlier Vellum, because the Z-Drafting Assistant performs the same intelligent cursor functions in 3-D space as its predecessor does in 2-D space.

Ashlar has also made viewing a 3-D drawing easier. Vellum 3D includes an on-screen trackball that lets users change the viewing angle simply by clicking and dragging the trackball around.

For output, Vellum 3D can automate the process with templates that include standard elements such as a company or artist’s name and that automatically prepare and size drawings properly. For example, a drawing can be prepared to print in an isometric view on C-sized paper with just a single command. Plus, the views in the print preview remain fully editable.

Vellum 3D also includes an animation function that can produce PICS files. Although the first version will not include the ability to write QuickTime Movie format files, Ashlar has confirmed that it will release a version with that function once QuickTime becomes available.

Ashlar, Inc., 1290 Oakmead Parkway, Suite 218, Sunnyvale, CA 94086; (408) 746-1800. $2,495.

With Ashlar’s Z-Drafting Assistant, you can draw in 3-D space as easily as if you were working in 2-D. The Z-Drafting Assistant gives you on-screen guides that help you through your drawing.

NewsLine
Reports and Analysis

Claris Buys Hollywood

SANTA CLARA, CA — With the Apple/IBM deal pointing the way, Claris, Apple’s software division, has followed suit by entering the Windows market. Claris has purchased a Windows presentation package called Hollywood, which IBM formerly distributed. IBM recently withdrew from the desktop-software market, leaving many products seeking new publishers. Claris will distribute and support Hollywood, but the package’s developer, Publishing Solutions, will continue all development work. Under Claris, Publishing Solutions will develop an OS/2 version of Hollywood. As the product evolves, it will get a Claris interface and Claris’ XTND file-translation architecture.

Borland Lays Off Ashton-Tate

SCOTTS VALLEY, CA — As expected, the merger of Ashton-Tate and Borland International has resulted in the virtual elimination of AT’s workforce. From a work force of more than 1,000, between 600 and 850 employees have been laid off. Although Borland has yet to make an official statement about the future of Ashton-Tate’s Mac programs — FullWrite Professional, Full Impact, and FullPaint — Borland CEO Philippe Kahn has made it clear that Borland has no interest in the packages and will try to sell them if it can find a buyer.

Farallon Sells Multimedia

EMERYVILLE, CA — Although its MacRecorder sound digitizer was the very first Mac multimedia package, Farallon Computing has decided to get out of the multimedia market and has sold MacRecorder and its software, SoundEdit, to MacroMind/Paracomputer. Farallon retained the right to use the sound technology it developed in its MediaTracks program. Prior to the sale, Farallon laid off 27 people associated with its multimedia projects. Farallon has recently focused its energies on its networking products, including its successful PhoneNET line.

Apple Settles Beatles Suit

LONDON, ENGLAND — The Beatles may have sung, “All you need is love,” but apparently singer Randy Newman was closer to the truth: “It’s money that matters.” Apple Computer has settled the lawsuit against Apple Corp., the Beatles’ holding company, after reporting $29 million. No settlement terms were disclosed.

MacUser February 1992 45
Outbound Notebook 2030

Fast, light, and upgradeable, the Notebook 2030 gives the PowerBook 140 a serious run for its money.

From the sound of the New Age startup chord to the feel of the ergonomic trackball, Apple's new PowerBooks are three sexy Macs. But before you put your money down, you'll do well to consider the Outbound Notebook System Series 2000. Although not as elegantly designed as the state-of-the-art PowerBooks, Outbound's four units are smaller and lighter and have bigger displays. The model we tested, the 2030, is faster than its comparably priced rival, the PowerBook 140.

Even better is that unlike the PowerBooks, the entire Outbound line of CPUs, coprocessors, and hard drives is upgradable. RAM is also easy to upgrade, so your Outbound notebook can grow with your needs. By comparison, Apple currently offers no upgrade path for its line of notebooks—buy one now, and forever hold your peace.

Lightweight Heavyweights

The Outbound notebooks are not Macintosh clones. They run on Mac Plus and SE ROMs. Unlike those of Outbound's first portable Mac (see "Have Mac, Will Travel," September '90, page 192), the new notebooks' ROMs come preinstalled, so you don't have to cannibalize your Mac's ROMs to make your Outbound run, as you did with the original portable. In addition, because the ROMs in the current batch of Outbound units are newer, the machines' features can compete with those of the PowerBooks.

Roughly matching Apple's PowerBook line in price and features, the Outbound Notebook System Series 2000 comprises the low-end 2000 (which is powered by a 20-megahertz 68000), the midline 2030 (20-megahertz 68EC030), the 2030E (25-megahertz 68EC030), and the 2030S (33-megahertz 68030). The 2030S hadn't been released at press time, but it should be available in the first quarter of 1992.

Outwardly, the most notable feature of the Outbound notebooks is their size. At 6.25 pounds, Outbound machines are half a pound lighter and an inch smaller than the PowerBook 140 and 170. The low-end PowerBook 100 is smaller than the Outbound notebooks, but it doesn't include a floppy drive. All Outbound notebooks are equipped with a floppy drive that's compatible with Apple's standard I.44-megabyte SuperDrive.

For cursor control, Outbound uses a much improved version of its IsoPoint pointing device. Called the TrackBar, it comprises two mouse buttons and a rolling bar that also moves sideways. The TrackBar takes up little space and is superior to many of the clip-on trackballs of DOS notebooks. We got used to the TrackBar after only a few hours, but it's not as natural to operate as the PowerBooks' built-in trackball. As with the PowerBooks, die-hard mouse fans can plug a standard mouse in to the Outbound models' ADB port.

The Outbound notebooks use the conventional forward placement for their keyboard, in contrast to the location of the PowerBook keyboard at the rear of the unit, a design that makes for comfortable typing because of the wrist support. Strangely, the location of the individual keys on the Outbound machines is more like that of a standard Mac keyboard than that of the PowerBooks, which reverse the position of the Enter and backslash as well as the Escape and tab keys. The Outbound keyboard is firmer than standard Mac keyboards, whereas the PowerBook keyboard is "mushier" than the desktop-Mac versions.

The PowerBooks offer excellent screen quality, and here the Outbound units have a harder time competing. All four Outbound Series 2000 models use a supertwist LCD display with screen quality and redraw speed that, although much improved over the old Outbound portable's, can't match the superior quality of the PowerBook displays. Moreover, none of the Outbound notebooks support color video.

But with a resolution of 640 x 480 pixels (the same resolution as an Apple 13-inch monitor), the Outbound notebooks can display more information on-screen than the 640-x-400-pixel PowerBook screens can. This is a nice feature to have if you work on spreadsheets or long word-processing documents.

Under the Hood

Hard-disk drives for the Outbound notebooks range in size from 40 to 120 megabytes. For $500 to $800, you can trade your hard drive in for a bigger one simply by sliding it out the left side of the notebook and sending it to Outbound. This design makes it easy for many users, each with a hard drive, to share a single notebook.

For fast access to data, you can buy internal RAM disks with capacities as large as 60 megabytes for the Outbound machines. External SCSI devices connect to the notebooks via a standard 25-pin SCSI port. The PowerBooks, on the other hand, use new, nonstandard 29-pin connectors. The Outbound notebooks are equipped with all the standard Mac ports as well as a built-in microphone.
Our tests showed the Outbound Notebook 2030 to be 25 percent faster overall than the comparably priced Apple PowerBook 140. The Outbound machine also nipped close at the heels of Apple’s top-of-the-line PowerBook 170. All the units tested were equipped with 4 megabytes of RAM and 40-megabyte hard drives.

Performance is another area in which the Outbound units excel. Our tests showed the midline 2030 to be 25 percent faster overall than the PowerBook 140, which has a 16-megahertz 68030. Even more impressive, the 2030 proved to be faster than even the high-end PowerBook 170 in some tests. The 2030 was aided by a 6/8881 floating-point coprocessor, a $1.49 option for all Outbound notebooks except the 2000. A floating-point coprocessor is not an option for the PowerBook 140.

The 2030’s 20-megahertz 68EC030 chip is a version of Motorola’s 68030 that doesn’t include a PMMU (Paged Memory Management Unit), so you can’t use virtual memory with the 2030 whereas you can with the PowerBook 140. But given the choice between virtual memory and a floating-point coprocessor, the latter makes sense for notebook users who don’t have ready access to a power source, because it doesn’t affect drive and power resources. The higher-end 2030S model does support virtual memory. And unlike the PowerBooks, an Outbound notebook can be upgraded to a beefier model if you decide you’ve outgrown its processing power. The entire logic board slides out the back of the unit. A 2000-to-2030 upgrade costs $599.

The removable logic board also enables easy RAM upgrades, and the upgrades are significantly less expensive than PowerBook RAM upgrades. That’s because the Outbound notebooks use the same standard 1-megabyte SIMMs as desktop Macs do. They can be had for as little as $30 per megabyte, compared with $200 per megabyte for the PowerBook’s special RAM. Like the PowerBook 100, the Notebook 2000, 2030, and 2030S are limited to a maximum of 4 megabytes of RAM (not including a RAM disk). You can outfit the 2030E model with up to 14 megabytes of RAM, however.

Although it uses Mac Plus ROMs, the Outbound 2030 overcomes many of the old ROM limitations with an EEPROM (electrically erasable programmable read-only memory) chip, which can be updated with software. Any incompatibilities resulting from changes in system software can be fixed with a software patch from Outbound. For instance, the Outbound notebooks were not compatible with System 7.0.1 for several weeks, but a simple patch fixed the problem. We encountered no incompatibility problems with applications in testing the 2030, and both System 7 and AppleTalk Remote Access ran without a hitch. Keep in mind that, unlike the Outbound units, the PowerBooks require System 7.0.1, something to consider if you absolutely must run System 6.

Like all the other Outbound notebooks, the 2030 is powered by a standard Panasonic camcorder battery ($99 apiece for extras). Because of their similar power-management techniques, including sleep mode, hard-disk spin-down, CPU standby, and backlighting off, the Outbound notebooks and Apple PowerBooks have a battery life of about three hours. The Outbound notebooks have an indicator light for battery charging, whereas the PowerBooks require you to open a DA to verify charging.

When it comes to telecommunications, the PowerBooks have the edge, with their built-in, 2,400-bps fax modem and elegant software (free with the 170 and optional with the 140). The Outbound machines don’t allow use of an internal modem, but Outbound offers the 2.4-ounce, 2,400-bps external PocketPort modem ($279) for data only.

The Outbound notebooks come with a nylon slipcase; a heavier carrying case is available for $89. Apple doesn’t offer a case. Neither company provides a built-in handle, but Outbound supplies an attachable strap.

The Bottom Line

Outbound has delivered a line of well-designed, well-built notebook Macs. Rather than duplicating Apple’s efforts, Outbound provides an alternative to the PowerBooks. The PowerBooks are decidedly sexier, with their excellent displays, ability to output video to color monitors, and built-in trackballs, but the Outbound notebooks are more practical, offering faster performance, cheap and easy RAM upgrades, and the ability to display more information. We wish more Outbound models were equipped to handle more than 4 megabytes of RAM, but you can always upgrade to the model 2030E. In fact, the Outbound notebooks’ ability to grow with your needs is probably their most attractive feature, given the potential they have to take advantage of future innovations.

— John Rizzo
GreatWorks is the first of several packages to breathe new life into the integrated-software arena. An amalgam of eight applications, GreatWorks succeeds in delivering impressive value, but the level of integration among the program’s modules is almost nonexistent and is clearly no match for the integration of another newcomer, ClarisWorks, which features a high degree of functionality among modules as well as within them.

How Great Is GreatWorks?
At a price of $299, GreatWorks combines a word processor, an outliner, two graphics applications, telecommunications software, a database program, and a spreadsheet program with charting. No set of comparable stand-alone applications gives you so much functionality for so little money. Despite the sturdy tools GreatWorks offers, it isn’t designed to compete with powerful stand-alone products such as Microsoft Word and FileMaker Pro.

GreatWorks also saves money because of its relatively minimal hardware demands. It requires less than 600K of disk space and runs in just 1 megabyte of RAM. Within that megabyte, we could open six documents simultaneously, each from a different module, which is great news for owners of Classics and LCs equipped with minimal RAM and small-capacity hard drives. Integrated software should also be easy to use, and GreatWorks meets this need with well-designed commands and dialog boxes that don’t overwhelm users with a wide variety of options.

But the capabilities of modules are only part of the integrated-software story. Integrated packages should offer more than the sum of their parts. Ideally, separate modules should work together in a way that separate applications can’t. In this regard, GreatWorks fails. True, all the modules are contained within a single application and you open them from a single dialog box. This is an advantage for users who aren’t using MultiFinder or System 7. Also, all the modules share GreatWorks’ Core technologies of search-and-replace, spell checking, thesaurus, and all font and style options. Similarly, the Paint, Draw, Chart, and Database modules all use a similar graphic Tool palette.

What’s missing from GreatWorks, however, is the ability to share data seamlessly between modules, to automatically update shared data, and to work effectively with more than one module at a time. GreatWorks’ charts, for example, aren’t updated when you change the linked data in the spreadsheet program. To do so, you must manually select an Update Chart command every time the data in your spreadsheet changes. But at least the Update Chart command is there. In most other respects, GreatWorks provides no way to link modules. If you change the data for a chart that has been pasted into a word-processing document, for example, you must repaste the chart after you’ve updated it. This would also be true if you pasted the chart into a stand-alone word processor, but that’s the point: GreatWorks fails to exploit its inherent advantage over stand-alone applications.

Similarly, GreatWorks’ Paint and Draw modules don’t interact with each other or any other modules. You can’t get a combined view of the two graphic layers, GreatWorks’ word-processing, spreadsheet, and database modules are, in themselves, quite serviceable, making the package an attractive value at $299. But compared with those of other integrated programs, GreatWorks’ modules do a poor job of sharing data and working smoothly with one another.
This packing slip has more than your name on it.

Lotus 1-2-3 for only $325
The power of Lotus 1-2-3 designed exclusively for the Macintosh. Innovative spreadsheet capabilities. You customize the desktop, manipulate data, text and graphics. And, it's System 7 compatible.

FREE DEMOS
Call for a free "auto demo" or "introductory video" of Lotus 1-2-3 for Macintosh. There's no obligation and you can enter the Mountain Bike giveaway when you call. While supplies last.

FREE GROUND SHIPPING
Call Toll Free from anywhere in the United States
Monday thru Friday 6:00AM to 5:00PM PST
Or Fax It!
1-800-933-8784 1-818-884-5310
20969 Ventura Boulevard, #13, Woodland Hills, CA 91364 • 818-710-9174

Prices subject to change without notice.

CIRCLE 35 ON READER SERVICE CARD.
Overall, when it comes to integration, as you can with SuperPaint or UltraPaint, Clari s Works is far superior to GreatWorks, and the only way to transfer graphic objects is via the Clipboard. Even from one module even as you're working documents residing in other modules.

Clarin's Worksis merely a product of a good midrange word processor, outliner, and database and spreadsheet programs are good enough to make it a better choice than midrange stand-alone packages for less demanding users.

The Bottom Line
Based on a module-by-module feature count, GreatWorks consistently outperforms veteran Microsoft Works, sometimes by a wide margin. Moreover, budget-conscious users will be attracted by GreatWorks’ solid value: Its word processor, outliner, and database and spreadsheet programs are good enough to make it a better choice than midrange stand-alone packages for less demanding users.

GreatWorks misses the mark when it comes to integration among its modules, however, leaving little to recommend it over ClarisWorks (look for a ClarisWorks review in an upcoming issue of MacUser). ClarisWorks is clearly the best choice among the three packages if you’re looking for integrated software that optimizes its modular design.

— Ted Landau

Get Info

GreatWorks

Published by: Symantec Corp.,
10201 Torre Avenue, Cupertino,
CA 95014; (408) 253-9600.
Version: 1.0.1.
List Price: $299.
Why Your Next IBM Computer Should Be A Macintosh.

SoftPC makes your Mac an IBM compatible. With SoftPC, the new Macintosh computers are more than just powerful and portable. They are also the most compatible computers available. Now they can run a whole world of MS-DOS software. Because SoftPC™ from Insignia Solutions lets you run any MS-DOS program on a Macintosh. Even over a Novell PC network.

And SoftPC works on any Mac, from the Plus to the new Powerbooks and Quadras.

It's simple. Just load SoftPC and an IBM window appears on the screen. There's no hardware installation required. It's like having two computers in one.

If you don't believe it can be that simple, call us at (800) 848-7677. We'll answer all of your questions, and show you how your next IBM computer could be Macintosh.

Insignia Solutions
Bridging Worlds Of Software™

INSIGNIA SOLUTIONS INC., 526 CLYDE AVENUE, MOUNTAIN VIEW, CA 94043 FAX: (415) 964-8433 CALL: (415) 894-7600
SoftPC is completely compatible with Apple's System 7 software. SoftPC is a registered trademark of Insignia Solutions Inc. All other product names are trademarks or registered trademarks of their respective holders.

CIRCLE 152 ON READER SERVICE CARD.
The first monitor for people who know which red is the right red.

You can match the red on your letterhead, the red on a slide, even the red on your favorite tie. And you can do it easily.

With NEC's new MultiSync® FG™ series monitors.* Our revolutionary AccuColor™ Control System allows you to adjust image colors to your exact needs.

This new color calibration system lets you match colors on your screen to Pantone® or any other color reference system. You can also match on-screen colors to those delivered by your color printer, another monitor, or a service bureau output.

Whether your monitor needs are for general business use, multi-media applications, or color prepress, you're probably relying on color more than ever. And we’ve made it easier than ever to match the color you need. You can actually set the red, green, and blue color guns in precise digital steps to adjust the colors on the display.

The FG series also gives you sharper graphics and text. So even if you're not one of those people who knows which red is the right red (top row, fourth column), the answer to your monitor needs couldn’t be clearer.

Call 1-800-NEC-INFO. (In Canada: 1-800-343-4418.) For immediate info via fax, call NEC FAST FACTS, 1-800-366-0476. Request #1521.
Because † is the way you want to go. NEC

Circle 142 on reader service card.
PageBrush Professional

You need a lot of time but not a steady hand to use the PageBrush Professional hand scanner.

The PageBrush Professional, from Mouse Systems, is a hand-held scanner that departs significantly from the way all hand-held scanners have always worked. This gray-scale scanner takes a free-form rather than a linear approach to scanning. You can move the PageBrush Professional in every direction over an image, and the scanner stitches the results together on the fly.

Unfortunately, Mouse Systems' innovative idea turns a bit sour, because of the abominably slow performance of the PageBrush Professional software.

Mouse on Steroids

The $899.95 PageBrush Professional is a 6-bit gray-scale scanner that reads 64 shades of gray at resolutions as high as 300 dpi. It saves images in 8-bit format. The scanner, which measures 4.5 x 3 x 2 inches, can double as an overgrown mouse, because the scanner case houses a sensitive two-button optical mouse as well as a petite scanner head.

The minimality of the PageBrush Professional hardware is due to its use of a Mac II NuBus card. Unlike most other hand scanners, this unit connects to the card rather than to a SCSI port. This arrangement moves most of the electronics from the scanner housing to the computer.

Like an optical mouse, the PageBrush Professional uses an acetate pad to track mouse movements, measuring its movement by reading a hairline grid printed in the acetate. You place the acetate over images you want to scan, and the grid also serves to track the PageBrush Professional's impressive free-form hand scanning.

The grid helps the scanner keep track of its location and what part of the underlying image it's already scanned. The PageBrush Professional's stitch-as-you-go approach also lets you adjust brightness on the fly by moving a wheel on the side of the scanner.

The scanning software of the PageBrush Professional sports several basic image filters and editing tools that soften, blur, despeckle, and rotate images. You can export images in TIFF, PICT, EPS, and MacPaint formats.

Setup is straightforward, and the card, scanner, and mouse worked the first time we used them. Scanned images were easy to create and had good quality, once we got used to the unit's unique technique.

Despite Mouse Systems' achievements with this innovative device, however, we were sorely disappointed, because of some of its drawbacks. The most significant problem is PageBrush Professional's performance: Its software is incredibly slow at saving and opening images. The image we scanned at 64 shades of gray with a resolution of 175 dpi took nearly 4 minutes to save as an uncompressed TIFF file. In comparison, the same image scanned and saved by a flatbed scanner at 256 shades of gray with a resolution of 144 dpi took only 10 seconds, and Photoshop resaved the image in about 30 seconds.

Mouse Systems' technical support had little explanation for this disparity, suggesting (wrongly) that saving the file in a compressed format might save some time.

We encountered another problem when the scanner strayed a bit from the acetate-grid boundaries. The image's stitching faltered, and we had to start over. Another irritating hardware-design flaw is the position of the scanner light, which is recessed from the sides of the scanner, making it hard to tell precisely where scanning will begin. This wouldn't be
QMS introduces a PostScript printer of extremely strong character.

The new QMS-PS® 815 MR™ print system gives you 300 x 300 dpi and true 600 x 600 dpi Adobe® PostScript® printing at your fingertips. Extremely sharp, crisp characters, fine line detail and clear halftones make this the reliable, affordable eight-page-per-minute printer you're after. See how the following features plus QMS National Service and free technical support will keep your 815 MR (and you) looking sharp.

- True 600 x 600 dpi delivers four times the gray levels as 300 x 300 dpi for clear halftones
- Connects to IBM® or compatible computers, Apple® Macintosh® computers & most mini computers & mainframes simultaneously
- Automatically switches to 300 x 300 dpi mode when needed for HP® applications
- Interprets incoming printer language (HP or PostScript) and switches automatically

For more information on the QMS-PS 815 MR, or on any other QMS® PostScript printer, call today. Or Fax QMS Product Information at 205-633-4866.
such a problem if the software didn’t require that you position the unit at the top left corner of each image prior to scanning. As a result, we had to restart the scanning process several times before we managed to click on the right spot.

In addition, scanned images must fit into RAM. The software doesn’t take advantage of System 7’s virtual-memory capability, which means that you must adjust an image’s size and resolution to shoehorn the image into your computer’s memory configuration before you can start scanning. The program requires 2 megabytes to run, but you need much more than that for scanning large and/or high-quality images.

If this isn’t enough to dampen your spirits, the PageBrush Professional is a miniature marvel as a scanner but it’s too big to use as a mouse. The manual says that you can use it for any kind of mousing, but unless you have Paul Bunyan hands, be prepared to experience a real cramp, literally, in your style.

One last complaint involves the manual, which has inconsistencies. In many cases, the manual disagrees with the software, and the terminology it uses is often non-standard for scanning software (there’s no mention of lines per inch, for example).

The Bottom Line
It’s definitely fun to scan with the PageBrush Professional. It shows a spark of innovation with its free-form approach to hand scanning. But with the PageBrush Professional’s price of almost $900, you don’t save enough compared with the price of a flatbed scanner to warrant the exorcising amount of time you’ll waste saving and opening scanned images. Mouse Systems promises to correct the performance problem in a future version of the software, scheduled for release in February 1992.
— Dave Valititis

Get Info
PageBrush Professional

Manufactured by: Mouse Systems, 47505 Seabridge Drive, Fremont, CA 94538; (510) 656-1117.
Version: 1.0.
List Price: $899.95.

Personal Label Printer, LabelWriter II, and Smart Label Printer Plus

Speed and well-engineered software give CoStar’s label printer the edge over competition from Seiko and Avery.

If you’re tired of manually feeding envelopes into laser printers, a good solution may be a personal label printer. Avery, CoStar, and Seiko offer inexpensive, easy-to-use, and compact devices that promise to end the frustration of printing on hand-addressing envelopes in small quantities.

Something in Common
Each of the three label-printer packages has a printing device and software, which contribute equally to the package’s value. The Avery Personal Label Printer and the CoStar LabelWriter II use identical hardware that has a stationary thermal head to produce a resolution of 138 dpi.

The Seiko Smart Label Printer Plus hardware uses a dynamic thermal head that’s capable of producing resolutions of 75 x 100 dpi or 150 x 200 dpi. But be forewarned: The higher resolution slows printing speed considerably. The Avery device is twice as fast as the Seiko printer running at its higher resolution, and the CoStar unit is three times as fast.

Although the performance of the three devices differs, the output quality is quite similar, resembling output from an ImageWriter II. All three printers print on 1½- by 3½-inch labels.

Setting up any of these devices is as easy as finding some space on your desk and a free serial port on your Mac. In case
The only thing missing from our new spreadsheet is the learning curve.

So, You Want It All Now.
Claris Resolve gives you the power of a billion cells and 149 advanced business functions. Yet it's readily accessible—for example, zooming, so you can see the forest or the trees.

Effortless Graphs.
Making your own charts and graphs with new Claris Resolve is unbelievably easy. Select one of 25 chart types.

Introducing Claris Resolve.
The new Claris® Resolve™ spreadsheet lets spreadsheet power flow to your fingertips freely and intuitively, for the first time. It utilizes interfaces, tools and commands familiar to anyone who's ever used a Macintosh.


But lurking just beneath the surface are enough tricks to inspire any power user. 149 built-in functions to help solve any business problem. 25 kinds of charts and graphs to excite the most jaded audience. Elegant, built-in database functions so you can swiftly access your data.

Yet, perhaps the most shining quality of Claris Resolve is how it exploits System 7's most powerful functionalities—Publish & Subscribe and InterApplication Communication. So you can effortlessly combine the power of Claris Resolve with other applications.

Claris Resolve is the latest addition to the Claris family of software for System 7—a new generation of applications that work together more simply, more powerfully, more gracefully than any software for the Macintosh ever has before.

Special offer for owners of other spreadsheets:* Get Resolve for only $99. Call 1-800-544-8554, ext. 97.

*Offer applies to owners of Microsoft Excel, Lotus 1-2-3, Informix Wingz, and Ashton-Tate Full Impact. Offer good in U.S.A. only. Expires June 30, 1992. ©1992 Claris Corporation. All rights reserved. For more information call 1-800-729-2292, ext. 20. In Canada, call 1-800-668-8948, ext. 48. Claris is a registered trademark of Claris Corporation. Resolve and Simply Powerful Software are trademarks of Claris Corporation. Apple logo and Macintosh are registered trademarks of Apple Computer, Inc.
your modem and printer ports are occupied. CoStar offers an A/B box ($49.95), which lets you connect two serial devices through a single port. CoStar also offers an AppleTalk Network Box ($199), so you can share your LabelWriter II on a network.

Each of these printers comes with DAs that are designed to make label printing a snap from within any word-processing program. You simply copy the name and address from a letter and open the label DA. With the CoStar and Seiko DAs, you don't even have to paste in the text — the software automatically places the text from the Clipboard in the label field.

Each printer comes with Chooser-level drivers, but you don't need to change the Chooser driver to print from the DAs. All three drivers run the label printers automatically, without interfering with LocalTalk printer connections.

**Avery Personal Label Printer**

The Avery DA, a component of Avery's MacLabelPro application, is downright cumbersome. It uses frames for text and graphics, which require you to paste names and addresses in a three-step process. After you've copied the text from a letter, you must select the text field for the label, select the contents, and then paste. The DA also lacks any sort of database capability for sorting or retrieving names and addresses.

The Personal Label Printer comes bundled with MacLabelPro, a full-featured label-printing program that lets almost any Mac printer print on a wide variety of labels. However, there was no template for the 4150 label — the one required for the Personal Label Printer. This omission might have been an oversight, but in retrospect, it's probably a good thing. Because of its complexity, MacLabelPro is not software you'd normally want to use with a simple label printer.

**CoStar LabelWriter II**

In the label-printing-software arena, CoStar is the hands-down winner. The LabelWriter II comes with an easy-to-use DA and a full-featured application. The DA supplies a powerful database engine for names and addresses. It lets you create multiple lists and access them readily through a pop-up menu. You can print graphics as well as text from the DA.

Another pop-up menu gives you access to templates that specify text formatting and the number of text lines. The templates can contain graphics and bar codes. You create templates with the LabelWriter II application. It has the same names-list feature as the DA does, so you can print directly from it. It's unlikely, however, that you'll use the application for everyday printing. It's geared toward users who require highly customized labels. It's also useful if you want to print pages of labels on a laser printer, because it supports other printers besides the LabelWriter II.

We encountered one problem with the DA when it came to switching type specifications. Instead of changing the specifications, the software changed the font.

**Seiko Smart Label Printer Plus**

If simplicity is your chief concern when it comes to label printing, then the Seiko package is the best buy. Its DA (no application is provided) is built around a no-frills database. The DA supports only text. You can't add graphics to your labels without using another application.

**The Bottom Line**

Of the three label printers reviewed here, only two are viable options. If you want the simplest approach and don't anticipate that your needs will grow, the Seiko Smart Label Printer Plus is probably your best buy. Compared with the CoStar printer, it's not smart, but its DA is easy to use and it gets the job done.

For those who are planning to use their label printer heavily, need to maintain a variety of mailing lists, and want to print graphics as well as text on their labels, the CoStar LabelWriter II is a solid investment. It's the fastest device, and its DA offers powerful features teamed with an excellent interface.

CoStar also plans an upgrade path to a new device that should be available by the time this review appears. It will feature a 2.5-inch print head instead of the 1-inch head used by each of these printers, so it will be able to print wider labels.

There's very little to recommend the Avery Personal Label Printer. The hassle involved in using its software may be enough to drive you back to hand-addressing your envelopes.

— Paul Yi
How to Master 20 Popular Macintosh Programs Without Ever Reading The Manuals

Macintosh Programs Can Be Learned in a Few Hours With the Right Training

Over the past four years I've been associated with over 50,000 people attempting to learn the Macintosh computer. I've watched each person wages their own personal, private battle to master the computer and the most popular Macintosh programs.

I've seen their frustration, have empathized with their confusion, and understood their computer fears. I've talked to workers who have had new computers and new programs simply dropped on their desk with the directive to, "learn this." I've listened to people who have struggled night after night trying to read and understand a computer manual.

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

Hard Earned Money Wasted

Can you imagine how much money has been wasted on programs and computers that are sitting abandoned? Right now think of the people working on Macs in your office. Do they really understand the computer? Do they know what to do when it goes down? How many programs are each of our people using? Have they really mastered the programs they're using? Do they know the short-cuts and valuable techniques that will save you money, time, and increase our professionalism?

The Video Answer

Two years ago we introduced the MacAcademy Video Training Library. This library now includes over 45 different titles. Each video is 2 hours long and offers clear, concise, effective training for the Macintosh and over 20 popular programs. In many cases you can purchase up to 6 hours of training for one program.

MacAcademy has resisted the temptation to follow competitive training programs who have recently implemented large price increases. Our videos started out at $49 each and are still only $49. The best training in the business for less than $50. This low cost training alternative has proven to be the Macintosh training choice of over 10,000 companies.

Guaranteed Results

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

To Order

Here is a current list of MacAcademy Video training tapes now available. To order, simply send check, credit card information, or purchase order to MacAcademy Video s Dept. MU 2/92 477 S. Nova Rd. Ormond Beach, FL 32174 or call the numbers listed below. Now is the time to start training. Thank you for allowing MacAcademy to help you in that effort.

To Order: Call Toll Free

1-800-527-1914

FAX Orders Call

1-904-677-6717

48 Hr. Delivery

Easy4D and 4thRight! Professional

Easy4D succeeds where 4thRight! Professional fails at simplifying the 4D-application development cycle.

Easy4D and 4thRight! Professional are shells for ACIUS’ 4th Dimension relational-database development environment. Although both were designed as fast routes for assembling custom applications that run in 4D’s Runtime Environment, the two programs achieve widely differing results. Easy4D forges a genuine shortcut, but 4thRight! Professional takes a long detour.

You don’t need to be a developer or programmer to use a 4D shell, but you should be comfortable working in 4D’s User and Design Environments and have familiarity with creating simple procedures and scripts. The more you know, the better you can exploit a shell.

Good shells can hide many of the nitty-gritty details involved in building an application from scratch. Once you’ve learned the basic steps of booking your database structure into the shell, you should be able to create basic multifile databases in a few hours.

As a result, a shell’s design philosophy should be evident in its documentation, which should be extensive. Moreover, sophisticated designers should be able to look to the shell’s layout and programming concepts for inspiration. In addition, as an extension of the 4D development environment, a shell’s approach should mimic 4D’s as much as possible.

Easy4D

Easy4D fulfills all these requirements. It emphasizes minimal coding and simplicity for the designer while also providing numerous features that can directly benefit users of completed applications. Easy4D is clean, consistent, and elegant throughout.

Easy4D’s metaphors are drawn from applications that users are probably familiar with, including 4D, the Finder, and HyperCard. In fact, the program’s documentation intentionally mirrors the structure of 4D’s documentation.

To set up input layouts for most files, you simply copy Easy4D templates and paste them into the files; layouts are smart enough to configure themselves. By contrast, most other 4D shells require you to set up an initialization script.

After you’ve created your file structure and layouts, you do most of the remaining design work in Easy4D’s database-administration area. This is where you connect layouts, reports, and procedures into the system. Easy4D’s routines can read layout and procedure names from the file structure, so you simply choose the names as needed from pop-up menus.

Easy4D’s Print Merge feature is also smart. It can detect whether the 4DWrite module is installed. If it is, it automatically provides a 4DWrite-based merge interface. Otherwise, it uses a layout-based interface that’s quite good in its own right.

The Print Merge Glossary function is well crafted and mimics the same feature in Microsoft Word. Special editors let you design the header and footer areas of your merge document separately.

Easy4D includes a clever interface tool called pseudo-folders. It displays 4D-style reports, labels, and procedures as if they were documents in folders that could be nested and associated with specific files in your database. A Get Info feature lets you provide users with descriptive text for each document. With this feature, you can present users with several customized features that have a consistent interface.

4thRight! Professional

4thRight! Professional demands much more from its users than does Easy4D but delivers far less functionality. Its structure file consumes a whopping 1.7 megabytes — nearly twice as much as the 1-megabyte Easy4D — before you add your own structures to it.

This shell has probably the largest collection of external procedures of any development package, and it includes Metropolis Software’s DB/Write. Unfortunately, the programming interface for DB/Write is not well documented.

4thRight! Pro’s tutorial claims that the 20 steps needed to set up a single file in 4thRight! Pro are significantly fewer than those necessary to do the same thing from scratch in 4D. Other shells, however, and most especially Easy4D, are far less tedious to set up.

But laborious setup is only the beginning of the program’s long list of shortcomings. Its documentation contains some notable inaccuracies, such as the claim that using a minus sign prevents 4D from drawing a double menu bar. Even more annoying is the performance of 4thRight! Pro’s interface, which is notably sluggish for uncompiled databases, even in its...
Being the best at CD-ROM takes a big commitment.

Not to mention a little one.

Whether we're coming up with big ideas, or small ones, NEC is always leading the way in CD-ROM. Take our readers. We have a complete line. With everything from high performance desktop models to the first truly portable* CD-ROM reader. The Intersect™ CDR-35. A product PC Magazine called one of the best of 1990. And winner of Systems Integration product of the year. A piece of CD-ROM technology topped only by our portable CDR-36M. What's more, our Intersect CDR-73M and CDR-83M drives have the fastest** data access rates in the business. In fact, with speeds of 280 milliseconds you might even be inclined to call them speed readers. All this from NEC. Whose CD-ROM products are known for their high quality and reliability. So high that we're offering a two-year limited warranty on every new reader. For product literature, or the nearest dealer location, call 1-800-NEC-INFO. CD-ROM from NEC. Our commitment to excellence is big. No matter what size the product.

*Based on published specifications of available drives from major manufacturers, June 30, 1990. NEC Technologies, Inc. reserves all rights to NEC Technologies, PC Magazine is a registered trademark of Ziff Communications Co. PC Magazine, 1990 issue, page 200, reprinted with permission.

CIRCLE 143 on reader service card.
“optimized” mode, which requires extra setup. We used the 4D debugger to confirm that a tremendous amount of code runs whenever operations such as opening a record are performed.

While reviewing the code, we found more dismaying features. A routine that’s intended to halt operations until a record is unlocked, for example, can leave users stuck with no way to abort and no indication of what’s happening. This procedure can also result in more network traffic than necessary. In addition, 4thRight! Pro’s register system locks all counters when it needs to increment only a single counter.

Digital Concepts touts the quantity of 4thRight! Pro’s procedures, but it provides quantity at the expense of quality. For example, the only difference among several alert procedures is two lines of code: a single procedure with the addition of one parameter would be more elegant. In fact, a plethora of window-drawing and alert procedures could be reduced to one or two by the judicious addition of a few parameters. The result of 4thRight! Pro’s overzealous approach to procedures is a shell that has more commands than 4D itself!

Stylistically, 4thRight! Pro’s layouts are often busy and cluttered. It also has a quirky trait of dimming radio buttons when they’re selected, an approach that contradicts conventional interface guidelines and adds unnecessary procedural overhead (several dialog boxes are also guilty of using radio buttons when standard buttons would be more appropriate).

The Bottom Line
A good development shell provides the basic elements of a good database program while adding specialty features that set it apart from its rivals. If you’re looking for a shell that teams outstanding features with a well-designed interface, choose Easy4D. It takes you over the hurdles of developing custom-4D applications quickly and efficiently. 4thRight! Professional, in contrast, can make the development process as cumbersome as using 4D.

— Louis E. Benjamin, Jr.

### Painter

Fractal Design’s software masterpiece makes you feel as if you’re painting with natural media.

Painter is an artist’s dream of a painting program that transcends the special effects of Oasis and PixelPaint Professional. Unlike those programs, Painter is designed specifically for replicating natural drawing and painting media, a difficult task at which it excels. Its unique effects make it the ultimate companion product for such programs as Photoshop or ColorStudio.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

Painter’s revolutionary brush tools are divided into several categories. Airbrushes, crayons, felt pens, chalk, charcoal, and pencils are all on the scrolling Brush palette. You can also find special-effects brushes, which include a water-drop tool (for softening edges and smearing paint), cloning brushes, two standard painter effects (based on the styles of Seurat and Van Gogh), and an eraser.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.

Users with Wacom graphics tablets will find that among Mac graphics programs, Painter uses a pressure-sensitive stylus to the best advantage. But even a lowly mouse can be used to control most aspects of Painter’s brush dynamics. Simulating natural media is one of the hardest challenges for graphics software. Until Painter, no other Mac program has been able to accurately reproduce natural brush dynamics and expression.

The modular design of the Tool palette lends itself to the addition of more brush types and effects. Each tool category has several variations. For example, multiple chalk settings include enlarged or sharpened tips as well as a softer pastel-like option. Custom brushes include an accurate calligraphy pen and a thick, rough-edged Japanese brush.
If You Can't See The Difference, Why Pay The Difference?

The Popular $30,000 Printer. The $10,999* RasterOps CorrectPrint 300.

Introducing The RasterOps CorrectPrint 300.
The only truly affordable photorealistic printer.

Until now, only high priced printers gave you high quality color output. But here's the new RasterOps CorrectPrint 300. An incredibly inexpensive printer that uses dye sublimation technology at 300 dpi to give you dramatic, continuous tone color at every pixel, without dithering.

A printer that turns out low cost, professional-looking comps and proofs.

A printer that uses a 33-MHz RISC processor to get the job done fast.

The new CorrectPrint 300 even includes PostScript®. And it has four networking ports for shared environments. Wouldn't a printer like this, at a price like this, make a tremendous difference in your company? Find out today. See your dealer or call 1.800.SAY.COLOR.

* Suggested retail price. Money expansion fee required.
NOW! Our Canadian customers can place orders, in most cases, delivered within 24 hours. By special arrangement with Canadian Customs all applicable duties and GST taxes will be charged when placing your order with CompuServe: Just Type: Go MZ

Microsoft Corporation
Microsoft Word 5.0
$299
Microsoft Word makes every day easy. The Ribbon lets you perform common tasks with a single mouse click. And a wealth of other helpful tools make it easier than ever to create everything from simple memos to newsletters and manuscripts.

• Intuitive Visual Interface: Makes it easy for beginners to quickly find their way around and for experts to do even complex tasks fast.
• Ribbon: Change fonts, format text, create multiple columns, use the drawing tools and more—all with one click of the mouse.
• Print Merge Helper: Click your way through simple or complex mail merges with ease; includes an automatic error checker.
• Balloon Help: Make full use of the System 7.0 pop-up Help features.

Microsoft Corporation
Microsoft Office V1.5 $519
Four essential business-productivity applications in one: word processing, spreadsheet, desktop presentations, and electronic mail. Use MS Word to write memos and reports; MS Excel to crunch numbers and create quality graphics; MS Power Point to create presentations; MS Mail to instantly share information.

Microsoft Corporation
Microsoft Excel 3.0 $299
The most advanced spreadsheet for the Mac! Microsoft Excel combines spreadsheet with business graphics and a database. Presentation tools like multiple fonts, variable row heights, shading, custom number formats, 68 built-in chart types and more, make Microsoft Excel the ultimate business tool. Transfer Excel charts and worksheets into Word.
The Word’s Gone Out!
Mac Zone has the Most for the Least

Adobe Photoshop
V.2.0

$548

Adobe Photoshop is the affordable image-processing program with enough power and versatility to be used as a paint, prepress, color correction and darkroom system—and it does it all in living 24-bit color! Whether you start with scanned photographs, slides or electronic artwork from scratch, Photoshop’s full range of filters, painting, drawing and selection tools gives you the artistic control and precision you’ve been missing. #04042

Adobe Photoshop
V.2.0

$548

Adobe Photoshop

XPress 3.1 boasts a more intuitive user interface, many new features, plus redesigned and reorganized documentation. New measurement and page palettes provide the user with interactive on-screen access. A library stores frequently-used items and a pasteboard provides work area next to each page. You can group text and graphics as single elements and rotate them a full 360° in 0.001 degree increments. Color trapping ensures precise color printing. #04736

Quark XPress

XPress 3.1

$579

Quark XPress

Pastel Development

DayMaker

$59

DayMaker is the first Macintosh product to combine scheduling, to-do lists, calendars, alarms, Gantt charts, addresses/phone numbers, categorization and personal organizer format printing—all in one integrated package. It does it all, fast and easy! #4752

Abracadata

Design Your Own Home

Architecture #3698
Interiors #3611
Landscape #3610

$64 each

Design Your Own Home

Abracadata

Architectural Design

Design Your Own Home

Architectural Design

WordPerfect V.2.0

$278

WordPerfect

Brand new interface with an eye toward simplicity! Compact, easy-to-understand menus and streamlined dialog boxes give you access to all the regular WordPerfect features and many exciting new additions. #3972

WordPerfect

V.2.0

$278

WordPerfect

Correct Grammar 2.0

$49

Correct Grammar 2.0

Avoid embarrassing mistakes in letters, reports or proposals. Correct Grammar makes your writing clear and precise. It identifies inconsistencies in grammar, style, punctuation, usage and spelling, then suggests how to correct any errors. #3813

Articulate Systems, Inc.

Voice Navigator II

$570

Articulate Systems, Inc.

Voice Navigator II

Control your Mac applications by voice! Voice Navigator II lets you format documents, control multimedia presentations, select tools and much more without ever hitting a key! Works with your particular voice, accent, language and Mac application. #3932

Writing Tools Group, Inc.

Correct Grammar 2.0

$49

Writing Tools Group, Inc.

Correct Grammar 2.0

$49

Correct Grammar 2.0

Correct Grammar for the Macintosh

$49

Correct Grammar for the Macintosh

$49

Voice Navigator II

$570

Voice Navigator II

$570

Voice Navigator II
Mac Zone Has it All-New 
Upgrade your Mac with these

$42
per Mb
1x8x80ns #4737

SIMMs LC (two 4mb SIMMs)
#3976 ...........................................$317
SIMMs 4x4 Mb for fx
#3985 ...........................................$759
LC SIMMs (two 2 Mb)
#0014 ...........................................$194
SIMMs 4x4 Mb '830
#3583 ...........................................$639

Mac Tech distributors

Lexus 2400 Bps Mini Modem
$89
Compact 2400 baud modem, fully compatible with Hayes AT command set. Easy to install and ready to use. All cables included. Includes auto answer, auto dial and advanced diagnostics for error checking. Macknowledge 1.02 MZ communications software and introductory membership to CompuServe and Genie. #0028

Customer Service call 1-800-248-9948. Please call weekdays from 6am to 8pm PT, 9am to 11pm ET.

Applied Engineering

3.5" HD Disk Drive
Add a second 1.44 Mb drive to any SuperDrive-equipped Mac and make backups and disk copying easy. This 3.5" external high-density drive looks and performs like Apple's but costs much less. Features auto-eject, MS-DOS compatibility and AE's exclusive two-color read/write indicator light. #3672

DiskFit Pro 1.0 $69
DiskFit Pro is fast, easy, efficient backup for your Mac. A few simple steps secure data against file corruption and hard disk failure. 'SmartSets' of floppy store files in Finder readable format, allowing retrieval directly from the backup. #4722

DayStar Digital

FastCache IIse $309
Increase your software's speed up to 45%... perfect for spreadsheets, graphics and databases. Shipped with DayStar's DualPort adapter providing a full-functional PDS slot and IIse cache slot. Optional math chip available. Guaranteed 100% capability. #4181

Raster Ops

Rasterops 24 Stv 2536 $1299
New generation 24-bit true color display board with real-time video in a window. MediaGrabber program included to provide control over the display and capture of a single video frame or sequence of frames for use as an animation file. #0005

Raster Silver gives your IIse a slot extender, cache card and math coprocessor (optional). The extender enables cards created for the SE/30 to fit neatly inside the IIse case. 25ns static RAM cache provides quicker screen refresh, faster scrolling and rapid image manipulation. The 68882-20Mhz FPU option greatly increases speed of math-intensive applications. Five-year manufacturer's warranty. #04154

Dantz

DiskFit Pro is fast, easy, efficient backup for your Mac. A few simple steps secure data against file corruption and hard disk failure. 'SmartSets' of floppy store files in Finder readable format, allowing retrieval directly from the backup. #4722
Products Added Every Day
Hardware and Connectivity Solutions

Shiva Netmodem V.32 9600
This 9600 bps modem was designed to be shared over AppleTalk. NetModem also includes Dial-In Network access software which allows a remote Mac or PC to dial into the network and use electronic mail, printers and other network resources. #3251

Farallon Star Controller En Pn 357
Manage and expand your network easier than ever. Star Controller hub’s patented circuitry amplifies LocalTalk signals up to 1M bps. With StarCommand V3.0 software manage your StarController hubs from any Mac computer on their network. #4736

Net=dem s1149
V.32 9600
This 9600 bps modem was designed to be shared over AppleTalk. NetModem also includes Dial-In Network access software which allows a remote Mac or PC to dial into the network and use electronic mail, printers and other network resources. #3251

#4128 Shiva Netmodem/E 10 Base T ........ $1748

Golden Triangle Twin-It
$189
Other backup systems make periodic backups of your disk to a tape or floppy. For the price of twin-It and a second disk, you can maintain a continuous backup created automatically as you work. Continuous, automatic, inexpensive, it works with all Macs.

Disk Twin
$699
Make an up-to-the-instant copy of one hard disk to another automatically. DiskTwin is ideal for file or mail servers because it doesn’t affect server performance. It also provides advanced features such as automatic cutover to keep your Mac on line even through a disk crash. #4724

Insigna Solutions Soft PC Entry Level 2.5
$125
SoftPC brings the vast world of PC software to your Mac. Entry Level emulates an IBM PC/AT and is ideal for text-based applications and limited graphics programs. #4540

#4541 Soft PC Universal 2.5 ........... $194

Shiva Shiva Fast Path V
$1899
FastPath V gateway allows Macintoshes on a LocalTalk network to access Ethernet network systems and services AND Ethernet-based machines to access AppleTalk on a LocalTalk network. Everyone has company-wide access to printing, electronic mail and file servers wherever they’re located. #4038

Shiva Shiva Fast Path V
$1899
FastPath V gateway allows Macintoshes on a LocalTalk network to access Ethernet network systems and services AND Ethernet-based machines to access AppleTalk on a LocalTalk network. Everyone has company-wide access to printing, electronic mail and file servers wherever they’re located. #4038

Cayman Systems Gator Box CS
$1955
Connects an entire Macintosh network on LocalTalk to high speed Ethernet! Now Mac users on LocalTalk can communicate with most minicomputer, workstation and PC users on Ethernet. Features 2 Mb of RAM, hardware and software diagnostic capabilities and a universal power supply. #0181

Microtek TrueLaser Printer
$1399
Tomorrow’s printer-today, TrueLaser is the first laser printer that’s fully PostScript, TrueImage, and PCL compatible. It’s also the first to come bundled with 35 resident TrueType fonts. You get faster printing and even auto-switching between interfaces. #04047
## Product Listings

### Printers

<table>
<thead>
<tr>
<th>Printer</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100</td>
<td>$1949</td>
</tr>
<tr>
<td>Apple LaserJet 4200</td>
<td>$2149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit</td>
<td>$2499</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual</td>
<td>$2699</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable</td>
<td>$2849</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab</td>
<td>$2999</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
</tbody>
</table>

### Scanners

<table>
<thead>
<tr>
<th>Scanner</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100 + PCL Kit</td>
<td>$1949</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual</td>
<td>$2499</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable</td>
<td>$2699</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab</td>
<td>$2849</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$2999</td>
</tr>
</tbody>
</table>

### Other Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### OPTICAL DRIVES

<table>
<thead>
<tr>
<th>Optical Drive</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### PROGRAMMING

<table>
<thead>
<tr>
<th>Programming System</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### Storage and Memory

<table>
<thead>
<tr>
<th>Storage and Memory</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### NETWORKING

<table>
<thead>
<tr>
<th>Networking</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### Printers

<table>
<thead>
<tr>
<th>Printer</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100</td>
<td>$1949</td>
</tr>
<tr>
<td>Apple LaserJet 4200</td>
<td>$2149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit</td>
<td>$2499</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual</td>
<td>$2699</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable</td>
<td>$2849</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab</td>
<td>$2999</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
</tbody>
</table>

---

### Scanners

<table>
<thead>
<tr>
<th>Scanner</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100 + PCL Kit</td>
<td>$1949</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual</td>
<td>$2499</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable</td>
<td>$2699</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab</td>
<td>$2849</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$2999</td>
</tr>
</tbody>
</table>

---

### Other Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### SOFTWARE

<table>
<thead>
<tr>
<th>Software</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---

### Other Products

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserJet 100 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3149</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3299</td>
</tr>
<tr>
<td>Apple LaserJet 4200 + PCL Kit + Manual + USB Cable + Cab +</td>
<td>$3349</td>
</tr>
</tbody>
</table>

---
a dark paint stroke ends up with a tainted tip, which you can remedy by dabbing the pen on a clean white area of the canvas.

For many artists, Painter’s built-in brush choices will probably offer everything they need for everyday work. Technically inclined users can dive in and experiment with the program’s advanced brush behavior controls. You can, for example, create chalk that smears underlying colors as a watercolor brush does.

Brushes can be manipulated to change their overall dynamics characteristics (opacity, color, size, or roughness), depending on stylus- or mouse-input variables that include speed, pressure, and direction. A unique feature for owners of a Wacom graphics tablet allows Painter to be fine-tuned to the velocity and pressure with which each user handles the stylus, a feature that’s sorely lacking in other painting programs that otherwise support the Wacom hardware.

Painter offers several paper textures that work like PixelPaint Professional’s PixelPaper. The paper breaks up the brush stroke to simulate a textured surface. Paper textures can also be applied to existing images as filter effects. Paper libraries appear as swatches in a scrolling window. Two libraries come with the program, and we expect to see others appear on the market.

Painter is not only a tool for creating artwork from scratch; it can also use existing pictures (including scanned images) as a starting point. By cloning a document and using the program’s clone brushes, you can manually convert a scanned image into a digital masterpiece. By applying short jabs of the Van Gogh cloner brush to a cloned image, for example, you can gradually approximate (and even mutate) the look of the master.

The driving-rain and felt-pen cloners are great fun, and there are also oil-pencil- and chalk-cloning brushes. The Autocloning command lets you apply a brush style to an entire selection or a document as a filtered effect. You can use Painter’s Tracing Paper option to view a background image as a template while you paint on a separate document in the foreground (this ability emulates Oasis’ most distinctive feature, the Lightbox). Painter can open and save files in TIFF, PICT, RIFF, or Photoshop format, in user-definable sizes and resolutions. Masks saved with ColorStudio documents are imported when you open a RIFF document.

Masks, or fitstrokes, are used to selectively paint on isolated portions of an image. You create masks by using Painter’s freehand drawing tool. You can rotate masks and move them into position, modify how they’re displayed, and specify whether tools paint inside or outside them. Painter comes with a library of predefined masks, and you can save custom ones.

**The Bottom Line**

For the absolute best in digital paint-brushes, crayons, charcoal, and markers, look no further than Painter. Shipped in a novel metal paint can, the program includes a clearly written manual with ample color samples and illustrations. Without question, at $299, Painter is a best buy in the crowded Mac graphics-software arena.

— David Biedny

**Get Info**

**Painter**

Published by: Fractal Design Corp., 101 Madeline Drive, Suite 204, Aptos, CA 95003; (408) 688-6800.

Version: 1.0.

List Price: $299.
In Macintosh-to-IBM mainframe connectivity, there’s only one company that leads the field. Avatar. Following our recent merger with Tri-Data Systems, we now offer the broadest range of Mac-to-mainframe connectivity solutions in the industry.

From our cost effective MacMainFrame board-level workstation and gateway solutions, to RISC-based Netway gateway products, we have an answer for every price and performance configuration. All made to the most exacting standards—easy to install and easy to use. Just as important, Avatar provides the responsive service and support you’d expect from a leader. To find out how to get your Macs talking with your mainframe, or to get our comprehensive “Macintosh-to-IBM Mainframe Connectivity Guide” call us now toll-free at 1-800-AVA-3270. Avatar. We’re the Mac-to-mainframe leader with all the right connections.

FREE MACINTOSH-TO-IBM MAINFRAME CONNECTIVITY GUIDE

I’d like to know more about connecting Macintosh computers to my IBM mainframe. Please send me your free “Macintosh-to-IBM Mainframe Connectivity Guide.”

NAME

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

TELEPHONE

Call 1-800-AVA-3270

send to: Connectivity Guide, Avatar Corporation, 65 South Street, Hopkinton, MA 01748-2212
World’s Smallest Portable Mass Storage
NEW! Battery Powered!

Liberty Systems is the first to offer Battery Powered Hard Drives! Charger, batteries, power supply and 120MB drive all fit into our 50 Series. Now, That's Pack-in it! Mac or IBM 50 cu.in.

Series 20Mb Per Cartridge

70 cu.in. Series 90Mb Per Cartridge

115 cu.in. Series 190Mb Per Cartridge

225 cu.in. Series 90Mb Per Cartridge

Bernoulli®

Sony Erasable Optical 5.25" 120Mb Per Cartridge

Dual Bernoulli®

Sony Erasable Optical 5.25" 120Mb Per Cartridge

Mac or IBM 50 cu.in.

50 cu.in. Series 20Mb Per Cartridge

115 cu.in. Series 90Mb Per Cartridge

1000MB Quantum Drives®

Floptical®

Hard Drives in
52, 105, 120Mb
Floptical/20Mb
Internal Battery includes:
Int. Battery Pak
Int. Power supply
Int. Charger

983-1127

CIRCLE 176 ON READER SERVICE CARD.

REVIEWS

PROGRAMMING

Compilelt! 2.0

Heizer Software's upgraded compiler offers enhanced speed for creating XCMDs and XFCNs from within HyperCard.

Compilelt! 2.0 is a significant upgrade to Heizer Software's HyperTalk compiler. This version supports HyperCard 2.0's new XCMD interface and is significantly faster than the previous version. Compilelt! allows anyone familiar with HyperCard's scripting language to write external commands and functions that extend HyperCard's capabilities.

A Stack-Based Compiler

Since HyperCard was introduced in 1987, its XCMD interface has been its most powerful feature. By writing code that conforms to the XCMD-interface format and installing it in a stack's resource fork, programmers can add commands and functions that customize HyperCard's scripting language. Compilelt!'s mandate is to give the power of customization to those unfamiliar with conventional programming languages such as Pascal or C.

Compilelt! is unique in that it is implemented as a HyperCard stack and its programming language is HyperTalk. External commands and functions were given those monikers because Apple programmers expected them to be developed outside of HyperCard, in another programming language. Compilelt!, however, makes developing externals possible within HyperCard.

Although it's implemented as a HyperCard stack, Compilelt! isn't limited to HyperCard. XCMDs developed with Compilelt! can be installed and used in SuperCard projects, for example, or with other products, such as Authorware and MacroMind Director, that support XCMDs.

To create XCMDs with Compilelt!, you type or paste HyperTalk scripts into fields in the Compilelt! stack and click on a button. Compilelt! subsequently compiles the code, installs it in the resource fork of the target stack, and sends you the stack so that you can test the XCMD.
After 20 Million Pages Of PostScript Color Output, The Last Print Looks As Great As The First.

The QMS ColorScript 100 Model 30i Printer, Strictly For The Image Conscious

If you’re a graphic designer, commercial artist or publisher, it’s easy to see how the Model 30i is revolutionizing your business. The Model 30i is changing the relationship between speed, quality and cost by allowing you to do your job faster, cheaper and better!

The Model 30i is the first true “what-you-see-is-what-you-get” color printer. The colors you see on a Pantone-approved monitor are the same colors you’ll see on a Model 30i proof and the same colors you’ll see on the finished, printed piece.

Calibrated Color From Kodak and QMS

Kodak Precision Color Printer Calibration Software for QMS printers is now available. This optional software is fully compatible with all major desktop publishing and graphics programs.

All QMS ColorScript 100 printers ship with AppleTalk, parallel and serial interfaces to accommodate quick, easy setup in the most popular host environments.

Top Performers Right Out Of The Box

Call us today and we’ll help you decide which QMS printer best fits your needs. Or FAX QMS Product Information at (205) 639-4866.

1-800-523-2696 EXT. 213

Where Imagination Leads

© 1991 QMS, Inc.

QMS ColorScript Models 10 and 30i shown.

To order, call 1-800-258-2227

CIRCLE 54 ON READER SERVICE CARD.
NEW ON THE MENU

REVIEWS

INSPIRATION is a brilliant brainstorming, outlining, and writing tool!

Get the free demo.
(800) 877-4292

Ceres Software, Inc.
2820 S.W. Dolph Ct. Suite 3, Portland, Oregon 97219
Voice (503) 246-9011; FAX (503) 246-4292

Compiler! provides various indications of its progress during compilation, which can run in the background under MultiFinder. Here’s an indication of its compilation speed: A 40-line test script took only about three minutes to compile into a 2,400-byte XFCN when running in the background on an 8-megabyte Macintosh II.

You’ll probably need to revisit the HyperTalk code to debug or improve it. Compiler!, which has all the basic components of a programming environment, can assist you with all the tools you need to edit and debug code as well as analyze code performance.

Getting the Bugs Out

One of these tools, Debuglt!, is new in version 2.0. Debuglt! is a source-level debugger you can install in the external (adding 40K to the external’s size). With Debuglt! installed, you can see (but not modify) the source code, set break points, single-step through the code, and examine and edit the values of variables. You can also halt execution, send HyperCard an arbitrary HyperTalk message, and resume execution.

According to Heizer, Debuglt! is not dependent on any HyperCard-specific features beyond those in HyperCard 1.0, so it should work with any application that supports externals (Heizer has tested it with all the versions of HyperCard and SuperCard).

Compiler! partially executes its translation by looking up symbols in a symbol table. The symbol table contains not only the names of HyperTalk functions but also the names of those unique to SuperTalk and the names of more than 500 Mac ROM Toolbox routines. The latter are gateways to real Mac programming. Compiler!‘s manual gives a good but brief introduction to ROM calls, which are covered in more depth in Inside Macintosh.

Some programming experience is required to use ROM calls. Not only do they speed up code but the roughly 100 Color QuickDraw routines are also useful for SuperCard developers or for anyone developing external windows.

Beginners may stumble when it comes to using numerics and string variables from within Compiler!, which isn’t as forgiving as HyperTalk in the use of these data types. Novices also need to be aware that even if a HyperTalk script compiles perfectly in Compiler!, it may tend to behave in subtly different ways. This happens because the external cannot occupy exactly the same place in the HyperCard message hierarchy as a HyperTalk script does. Also, because an external, unlike a script, is not associated with an object, the HyperTalk term me, which refers to the script’s object, doesn’t make sense in an external and is not supported.

Although Compiler!‘s manual represents a solid effort (users with some HyperTalk experience will be able to grasp the fundamentals), only programmers with broader experience will be able to make complete sense of it. Even though it acknowledges that it’s possible to use Compiler! to develop other kinds of software, such as Fkeys, the manual doesn’t cover such advanced use. The on-line documentation covers most of the manual topics in less depth, and there’s balloon Help for System 7 users.

In addition to the compiler and the 200-page manual, the Compiler! package contains a demo stack, a batch-compiling stack, Steve Maller’s ResCopy, a folder of alternative symbol tables, and HyperCard. The program requires 750K of memory, but Heizer recommends 2 megabytes. To its credit, Compiler! is clever with memory. As far back as 1975, when 4K was a lot of memory, Tom Pittman, Compiler!’s creator, wrote a complete BASIC interpreter and sold it for $5 per copy. He understands how to write memory-efficient code.

The Bottom Line

Although the original version of Compiler! was so slow that it wasn’t practical for serious development work, version 2.0 features much-improved compilation speed and supports the latest version of HyperCard. With its unique implementation as a HyperCard stack, Compiler! makes the process of creating XCMS and XFCNs accessible to anyone who’s familiar with HyperTalk.

— Michael Swaine

Get Info

Compiler!

Published by: Heizer Software, P.O. Box 232019, Pleasant Hill, CA 94523; (415) 943-7667.
Version: 2.0.
List Price: $99.
The latest twist on fonts is the AgfaType™ CD-ROM v3.0. It's what type on CD should be—the widest selection of fonts and typographic software plus a powerful set of free features.

Agfa made the new CD with the type-savvy user in mind. You can choose fonts in the format you want—PostScript from Adobe® or TrueType from Apple®.

And, we've added the features that you've asked for—features found only on the AgfaType CD-ROM. Your fonts come packed with an on-line electronic catalogue, a new multimedia typography tutorial, the complete collection of screen fonts, the latest shareware, and future upgrades—free.

The new interface lets you browse, learn about, select, and then quickly install additional fonts. Choose individual typefaces. There's no waiting for a shipment to arrive—your fonts can be added in minutes with a simple phone call.

Agfa believes that type on CD should give you more choices, more features, and more value. To help convince you, we've included Garth Graphic® a classic typeface, absolutely free.

Nothing in the industry can compare with the AgfaType™ CD-ROM v3.0. To take it for a spin, call us today at 1-800-424-TYPE.

### HOW DOES THE AGFA TYPE CD-ROM V3.0 STACK UP?

<table>
<thead>
<tr>
<th>Feature</th>
<th>AGFA</th>
<th>ADOBE</th>
<th>NEC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PostScript Fonts</td>
<td>1,900+</td>
<td>1,000+</td>
<td>1,000+</td>
</tr>
<tr>
<td>Pi and Symbol Fonts</td>
<td>145</td>
<td>19</td>
<td>19</td>
</tr>
<tr>
<td>TrueType Fonts</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Multimedia Type Tutorial</td>
<td>Free</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Electronic Catalog</td>
<td>Free</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Type Applications</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Shareware</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Upgrades</td>
<td>Free</td>
<td>?</td>
<td>?</td>
</tr>
</tbody>
</table>
Dynodex 2.0, Address Book Plus 2.0, and QuickDEX II

For those looking for a speedy way to access addresses and phone numbers, these three programs offer stellar performance.

If you use an electronic address book, your paper-based Rolodex was probably relegated to the landfill long ago. Address-book software offers major advantages over paper-based filing methods. In general, access to data is virtually instantaneous, updating is smudge-free, and information is selective and available for printing to special address-book stock.

Three-second-generation personal-address-book programs — Dynodex 2.0, Address Book Plus 2.0, and QuickDEX II — are faster and offer more features than previous versions did. Whether you’re a veteran user of address-book software or just beginning to contemplate conversion from paper, these three newly revamped programs rate serious consideration if you’re looking for a package to suit your own personal needs. If, on the other hand, your chief criterion for address-book software is to get a package that lets your workgroup share a database of names and addresses over a network, you’ll have to look elsewhere. None of the three packages reviewed here is designed for network use.

Dynodex 2.0

Dynodex looks strikingly similar to its chief rival, Address Book Plus, although Dynodex’s speed and better-designed data-entry screen give it the edge. Dynodex sorts, rearranges, finds, and displays names and personal data quickly. Although searching the program’s database is a bit slower than searching with the fully RAM-based QuickDEX II, our tests with a 2,300-item database showed Dynodex’s overall performance to be excellent and an improvement over that of its previous version.

Although the program’s complex, multifield data-entry screen isn’t exactly...
Introducing a new generation of safe-deposit boxes.

Data cannot be valued; it is, in fact, priceless. So never settle for anything less than the peace of mind that comes from saving your data on the best. The very best. Gold Standard Technology. Which you'll find only in the new Maxell Advanced Series 1/4-inch Data Cartridges, Streamer Cassettes, and 4 & 8 mm Data Cartridges.

Since data cartridges are only as good as the tape they house, Maxell researched and developed the most reliable tapes ever — resulting in Maxell's own Epitaxial Magnetic Oxide in the 1/4-inch cartridges, and Ceramic Coated Magnetic tape in the 4 & 8 mm cartridges. Both formats provide the ultimate in high amplitude, stability, and long-term error-free performance. Both are thoroughly tested. And Maxell 1/4-inch cartridges are QIC compatible and meet or exceed all ANSI standards.

Maxell Streamer Cassettes offer a data storage system of unparalleled cost performance and running stability. A system of high technology and simplicity that's as advanced as it is reassuring.

Simply stated, there is no safer place to store your data than on Maxell. Because for your information, you can't beat the Gold Standard.

maxell
THE GOLD STANDARD
The Largest Selection of Macintosh Products
In The World...For Very Little.

Selection.
At ComputerWare, we stock over 1800 different Macintosh products and we can special order any product you can name.

Low pricing. Payment options.
We offer special volume pricing and flexible terms for qualified corporate and international customers. Various payment options are available including check, COD, credit card and wire transfer.

Experience.
We ship our products directly from the heart of the Silicon Valley to everywhere in the world. You can reach us from 7:00 a.m. to 9:00 p.m. PST, 7 days a week.

Established in 1985, our business includes a chain of retail stores in Northern California, as well as a large number of mail order and corporate customers across the United States. We ship over 100,000 units annually.

Multilingual sales representatives.
We speak many languages including:
- French
- Italian
- Japanese
- Spanish
- German

INTERNATIONAL CUSTOMERS:
- U.S. Customers: Call 1-800-522-3052
- Outside the U.S.:
  - In Canada: 1-800-663-7735
  - In Europe:
    - France: 01-44-87-17-17
    - Germany: 01-44-87-17-17
    - Italy: 01-44-87-17-17
    - Japan: 01-44-87-17-17
    - Spain: 01-44-87-17-17

Although Address Book Plus can't compete with the speed of Dynodex or QuickDEX II, it offers more phone-dialing options than those two programs do.

Address Book Plus 2.0
The new version of Address Book Plus is a worthy competitor to Dynodex. The new version of Address Book Plus has more phone-dialing and printing options than Dynodex does.

With Dynodex, data entry in Address Book Plus involves a somewhat complex, multifaceted format that can be customized. From Address Book Plus' data-entry screen, you can move to a Browse screen, where you see your data. Selecting a particular record is as easy as typing the first few letters in a key field. To see an entire record, you can either leave Browse mode to return to the data-entry screen or choose to scroll horizontally, which can be a tedious process. You choose data-selection criteria in Browse mode.

Address Book Plus can operate as an application and as a DA. Most screen and dialing functions work equally well in either implementation.

Address Book Plus' import and export capabilities are more versatile than Dynodex's. You can merge multiple databases, although the program's poor implementation of this feature makes it faster and easier to maintain different databases separately and keep more than one open at a time. You can sort databases, employing up to four fields, and save as many as ten different sorts for instant recall with menu selections or keyboard command equivalents.
Six common mistakes can cause you big headaches on your taxes. An oversight here, an omission there. From unnecessary tax payments to full blown IRS audits -- you can end up paying too much ... or worse.

But now, using MaclnTax® and your personal computer, you can avoid these simple but costly mistakes:

1. **The Arithmetic Error**
   Today, even the simplest forms contain complex calculations. And with all the late-night scrambling, an innocent mistake could cost you plenty.

2. **The Transcription Error**
   With all those numbers being juggled from schedule to schedule, it's no wonder the figures are so often transcribed incorrectly or entered on the wrong line.

3. **The Omitted Form**
   Even "ordinary" returns require anywhere from six to a dozen forms to complete. It's easy to miss one ... or end up rushing all over town to find the one you need.

4. **The Misinterpreted Instruction**
   At best, IRS instructions can be tough to understand. At worst they can be mind-boggling. What you need are clear directions in plain English.

5. **The Overlooked Deduction**
   You'd have to be a professional tax preparer to know all the deductions you're entitled to. If you miss just one, it could cost you hundreds of dollars.

6. **The Exceeded Guideline**
   The fastest way to trigger an IRS audit is to exceed the "normal" range on one of your deductions. You need to know what the IRS looks for on a line-by-line basis.

When you do your taxes with MaclnTax, mistakes like these are virtually impossible. And filing your taxes couldn't be easier.

---

**America's #1 Tax Software**

MaclnTax is America's #1 best-selling Macintosh tax preparation software -- no others come close! With MaclnTax on your Macintosh, you can completely and accurately prepare your income taxes in just a few hours.

Here's how easy it is!

A. Gather your records and receipts.
B. Enter your data into MaclnTax just once.
C. Print out, sign and drop in the mail.

MaclnTax does the rest. MaclnTax asks you step-by-step questions and shows you how to enter every item. And like a good tax advisor, MaclnTax helps you identify every deduction you can claim.

Then MaclnTax makes all the calculations, checks for accuracy and consistency, and transfers every number to the proper lines on the proper forms. And, MaclnTax prints every form you need in IRS-approved format right on your own printer -- ready to sign and mail (or file electronically, if you prefer, for a faster refund).

Macworld Magazine says "... the most successful special-purpose program yet for the Macintosh ..." Try it for yourself. Free. We know that if you try it, you'll never go back to doing your taxes the old-fashioned way again. So we'll send you MaclnTax on an unconditional free trial basis: if you don't like it, you don't pay for it!

---

**Free Bonus!**

Plus, when you buy MaclnTax, we'll send you a FREE copy of Norton Utilities as a special bonus gift. Norton Utilities (regular $179) is America's best-selling disk repair and data recovery program. With over 40 different types of error checking, it performs the most extensive diagnosis and repair of any utility program for the Macintosh. And it's yours free when you buy MaclnTax.

---

**Yes, I'll try MaclnTax FREE!**

Rush me a FREE trial copy of MaclnTax ASAP (I pay just $8.50 shipping now). I'll try it free for 30 days, and if I don't like it for any reason, I'll just send it back and owe nothing (shipping fee is non-refundable) If I do keep it, I'll be charged $79.00 ($20.00 off the regular price) after my 30-day free trial.

**FREE BONUS:** Your free copy of Norton Utilities (reg $179) will be sent upon full payment.

---

**SPECIAL OFFER**

Pay now in full and we'll send both Norton and MaclnTax right away -- and we'll pay the shipping! Yes, charge my credit card in full now ($79.00)
Yes, check enclosed (payable to “ChipSoft”)

Mail your order to: ChipSoft, Box 85709
Or Call NOW: San Diego, CA 92186-5709

800-487-8297 Ext. 750

---

MaclnTax requires Macintosh Plus, System 4.2 or higher and hard drive. California residents please add 7.25% sales tax. Offer expires 4/15/92 -- void with any other offer. Offer includes free HeadStart Edition for orders received through 1/31/91. MaclnTax” is a registered trademark of ChipSoft CA Corp.
For a limited time, users of Adobe's Software, Inc.'s MenuFonts™ can type a new font in their font menu by conveniently grouping font families together on submenus.

MenuFonts™, designed with you in mind, is an easy-to-use desk accessory. It's set up like cards in decks. The cards can contain text in any order, and data entry is completely free-form. A single card is able to hold any quantity of data, limited only by the amount of available RAM. The text area is scrollable but not resizable.

Because all QuickDEX data is kept in RAM, the program's performance is outstanding. It's the absolute speed champ among these address-book managers when it comes to searches. You can keep as many as eight decks open simultaneously, and the program's phone-dialing function is similar to the ones in Dynodex and Address Book Plus.

Although you can enter data haphazardly, QuickDEX II functions better if you use a consistent structure. If you don't, phone dialing gets complex, because you have to select numbers manually, and exporting data quickly becomes impossible. QuickDEX II provides no sorting or multiple-criteria-selection capabilities.

Printing address books is not an option with the QuickDEX II package, although the publisher is currently working on two print utilities to remedy that situation. Overall, the program is intuitive and easy to use.

Address Book Plus is noticeably slower at most operations than Dynodex is. On the plus side, its printing options and control are the best available. Two-sided printing is a breeze, and printing selections from an entire database is faster and easier than with Dynodex. Address Book Plus has no special networking features. Special binder paper can be purchased from the publisher.

QuickDEX II is a DA that offers unbeatable search speed, but it lacks many of the features found in Dynodex and Address Book Plus.

The Bottom Line
Although each of these address-book managers has its strengths, we give Dynodex the highest score. Its data-entry screen is less daunting than Address Book Plus', and it offers excellent search capabilities. However, speed is also an important criterion for products in this category and, on the basis of performance alone, QuickDEX II wins hands down for on-screen search speed. It lags behind the other two programs in features and functionality.

—Steven Bobker

Get Info

Address Book Plus 2.0

Published by: Power Up Software, 2929 Campus Drive, San Mateo, CA 94403; (415) 345-5900.
Version: 2.0.
List Price: $99.95.

Dynodex 2.0

Published by: Portfolio Systems, 20370 Town Center Lane, Suite 135, Cupertino, CA 95014; (408) 252-0420.
Version: 2.0.
List Price: $125.

QuickDEX II

Published by: Casady & Greene, 22734 Portola Drive, Salinas, CA 93908; (408) 484-9228.
Version: 2.3.
List Price: $60.
Myth: You Have to Spend a Lot to get a Lot in a Desktop Publisher.

Reality: Publish-It™ Easy has All the Power at One-Third the Price!

Whoever said you get what you pay for never used Publish-It! Easy. Because with Easy you get a lot more.

Publish-It! Easy—Version 2.1
The Affordable All-In-One Desktop Publisher for the Rest of Us!

With Easy everything is included:

- Easy Page Layout
- A Complete Word Processor
- A 112,000-Word Spell Checker
- A 240,000-Word Thesaurus
- Our Slide-Show Feature
- Create slides, handouts & on-screen presentations
- 72 Sample Page Layouts
- Built-in Drawing and Painting Tools
- A Quick-Start Mini-Manual

PLUS NEW File-It! — An advanced Built-In Database and Mail Merge Program. Create a database; customize a form letter; select, sort, or edit the information in your database—all without leaving Easy.

NETWORK VERSION ALSO AVAILABLE!

Suggested Retail Price $249.95

For those of you without an art degree, you need an affordable desktop publisher that's easy to use, a snap to learn and combines all the tools needed to create dynamic documents. In other words, you need Publish-It! Easy.

Visit your favorite Dealer and find out why more people are making the Easy switch.

Please see us at MacWorld, Booth #2529, Moscone Center.

COMPETITIVE UPGRADE
Own Publish-It! Easy for $99 and Save Over $150

We want you to try Easy for only $99. With our 60 day money back guarantee, you have nothing to lose. Just bring this ad with a copy of the title page from the DTP manual you own to your favorite dealer. If the $99 offer is not available at your dealer, send it to us with a check for $99 plus $5.70 postage & handling to: Timeworks, 625 Academy Drive, Northbrook, IL 60062

Or call: 1 (800) 323-7744
(Ask for Operator 85)
Fax: 1 (708) 559-1360

[Payment Options]

Offer expires 12/30/92

Please print:

Name
Address
City State Zip

Acct# Exp. Date

Signature

1990 WINNER

COMPETITIVE UPGRADE
Own Publish-It! Easy for $99 and Save Over $150

We want you to try Easy for only $99. With our 60 day money back guarantee, you have nothing to lose. Just bring this ad with a copy of the title page from the DTP manual you own to your favorite dealer. If the $99 offer is not available at your dealer, send it to us with a check for $99 plus $5.70 postage & handling to: Timeworks, 625 Academy Drive, Northbrook, IL 60062

Or call: 1 (800) 323-7744
(Ask for Operator 85)
Fax: 1 (708) 559-1360

[Payment Options]

Offer expires 12/30/92

Please print:

Name
Address
City State Zip

Acct# Exp. Date

Signature

Competitive Upgrade
Own Publish-It! Easy for $99 and Save Over $150

We want you to try Easy for only $99. With our 60 day money back guarantee, you have nothing to lose. Just bring this ad with a copy of the title page from the DTP manual you own to your favorite dealer. If the $99 offer is not available at your dealer, send it to us with a check for $99 plus $5.70 postage & handling to: Timeworks, 625 Academy Drive, Northbrook, IL 60062

Or call: 1 (800) 323-7744
(Ask for Operator 85)
Fax: 1 (708) 559-1360

[Payment Options]

Offer expires 12/30/92

Please print:

Name
Address
City State Zip

Acct# Exp. Date

Signature

Competitive Upgrade
Own Publish-It! Easy for $99 and Save Over $150

We want you to try Easy for only $99. With our 60 day money back guarantee, you have nothing to lose. Just bring this ad with a copy of the title page from the DTP manual you own to your favorite dealer. If the $99 offer is not available at your dealer, send it to us with a check for $99 plus $5.70 postage & handling to: Timeworks, 625 Academy Drive, Northbrook, IL 60062

Or call: 1 (800) 323-7744
(Ask for Operator 85)
Fax: 1 (708) 559-1360

[Payment Options]

Offer expires 12/30/92

Please print:

Name
Address
City State Zip

Acct# Exp. Date

Signature
WordScan Plus

WordScan Plus brings powerful OCR features from Windows to the Macintosh.

WordScan Plus is an impressive optical-character-recognition package that, despite its Windows heritage, adheres to Mac-software standards. With its powerful text-and-graphics-selection tools and high accuracy rate, the easy-to-use WordScan Plus is a heavyweight that's sure to give market leader OmniPage a serious run for its money.

Setup's a Snap
WordScan Plus' attractive Setup window is icon-based and easy to use. It lets you set the program to scan pages for text or graphics only or a combination of the two. You can also select page orientation, predefined templates, type quality (dot matrix or normal), and image source (scanner; disk files in TIFF, EPS, or PICT format; or image files received via a fax modem). You can also control brightness.

In Automatic mode, WordScan Plus scans an entire page. You can select Preview mode to designate specific zones on a page for scanning. Once scanning is complete, the program prompts you for another page.

A unique and valuable feature of WordScan Plus lets you control whether text-zone selections for the first page are carried over to every other processed page. OmniPage does this automatically and doesn't offer an alternative. WordScan Plus gives users the freedom to define different text zones on every page of a job, a flexibility that service bureaus and those responsible for transferring hard-copy submissions to data files will come to rely on. This feature permits quick on-the-fly editing and can reduce processing time drastically, because WordScan Plus doesn't read unwanted text such as letterheads or signatures.

When the program has finished scanning and recognizing a page, it prompts you for another one. At this point, you can click on Done and look at what WordScan thinks it has read on a page. Its reading accuracy is nearly 20/20. We found that even in the case of dot-matrix material, particularly on poor-quality pages, it did a better job than did OmniPage outfitted with OmniDraft, which is specifically designed to read dot-matrix characters. WordScan Plus also provides a magnified view of any words it's unsure of.

The program features an adequate main dictionary of 75,000 words, which aids the recognition process. User dictionaries suffer from an anemic 1,000-word limit,

HIGH RESOLUTION IS JUST

1200 and 1000 dpi plain-paper output
Letter, legal, A3, A4, and 11" x 17" at up to 20 ppm
135 premium Type 1 fonts
RISC-based processor provides unmatched speed
Complete PostScript® language compatibility

LaserMaster's 1200 and 1000
Personal Typesetters offer Macintosh® freedom at an affordable price. Freedom from the expense and hassle of service bureaus. Freedom from paper size limitations and limited typeface choices. Freedom from unproductive down-time while you wait for your printer to print. And with camera-ready copy at just pennies a page, you'll see savings just as quickly as your printed page.

Powerful 400 dpi printing for your entire office
High duty cycle, 20 ppm work horse
Letter, legal, A3, A4, and 11" x 17"
135 premium Type 1 fonts
Complete PostScript® language compatibility

Increase resolution, decrease delays, and add flexibility to your company's Macintosh network with a LaserMaster 400XL printer. The 400XL's RISC-based processor dramatically increases print speed, while its powerful engine handles the heavy printing demands of your entire networked work group. And its paper flexibility is great for newsletters, posters, spreadsheets, CAD drawings, and bleeds.

800 dpi high resolution at an affordable price
Legal, letter, and A4 paper capabilities
135 premium Type 1 fonts
Unsurpassed speed from a business printer
Complete PostScript® language compatibility

With the LaserMaster 800 and 800/4, LaserMaster has harnessed its patented TurboRes technology to create powerful high-resolution business printers that will make your reports dazzle, your presentations sparkle, and even your most basic correspondence easier to read. Best of all, you can get high-performance 800-dpi Macintosh printing for the same price as a regular 300 or 600-dpi laser printer—or less.
and you can have only one dictionary open at a time.

When scanning is complete, you can save files to disk as unconverted images for deferred processing. You can save files in a variety of text and graphic formats, including WordPerfect, MacWrite, Microsoft RTF, FullWrite Professional, ASCII (with or without carriage returns), tab-delimited text, Excel, WingZ, and FrameMaker.

Once zones are graphic, you can save it as a PICT file or in a variety of TIFF formats. The Send Mail option lets those on a network send processed documents to Microsoft Mail users as the documents are saved.

WordScan Plus has several high-end bells and whistles. It lets you select as many as 100 zones on a single page, and you can rearrange them so they're recognized in a specific sequence. You can also designate zones to be read as numbers only, so the number 1 isn't read as the letter l, for example.

WordScan Plus is also able to autoclip graphics from the page and process them as image files at the same time as it processes the text zones. If you are scanning multiple documents in the same session, you can insert a blank page between documents to make the program...
How FileMaker Pro makes one man seem like a cast of thousands.

Jay Nathanson wears a lot of hats. His company—Target Marketing of Richmond, Virginia—is one of the fastest growing small businesses on the East Coast. Ask Jay to explain his success and he'll give you an uncharacteristically succinct response: FileMaker® Pro.

FileMaker Pro wears a lot of hats too. Jay literally built his business with it. He and his lean, mean staff use it to quickly research, quote, present, schedule, ship, label, invoice and generate checks and correspondence for every job. The entire staff can access that data simultaneously—and effortlessly. So almost any question a customer can think of can be answered while they're on the phone.

FileMaker Pro even closes Jay's books every month, in 45 minutes. As you might expect, those books look pretty good.

Jay Nathanson is just one of over a quarter-million people who benefit from FileMaker Pro. You can too. To see how call 1-800-729-2292, ext. 20.
save each document as a separate file. This trick is useful if you’re working with automatic document feeders.

Scanning with Style
WordScan Plus supplies style sheets that let you reformat documents as they’re scanned. You can specify margins, fonts, first-line indents, justification, and line spacing, and the number can even be aligned on decimal tabs.

WordScan Plus requires at least 4 megabytes of RAM, but we found that 5 megabytes or more was needed for processing multipage documents or for using the program under MultiFinder. You need a hard-disk drive with at least 6 megabytes of available space and System 6.05 or later. The software is System 7-compatible but not System 7-savvy.

Calera offers support for a variety of scanners, including the Abaton, Complete PC Page Scanner, Epson ES-300C, Hewlett-Packard ScanJet and ScanJet Plus, Howtek Personal Color Scanner, La Cie Silverscanner, various Microtek models, and any Apple-compatible scanners.

At $895, WordScan Plus costs $100 more than OmniPage 3.0. If $895 is more than you can spend, consider WordScan, a basic, less expensive alternative to WordScan Plus and OmniPage. Priced at $595, WordScan lacks WordScan Plus’ high-end features, such as style sheets and multijob processing as well as the ability to select more than one zone on a page at a time.

The Bottom Line
We found WordScan Plus’ performance and feature set superior in many ways to that of its main competition, OmniPage. Calera’s OCR package is full of features that let users control the recognition process to a fine degree. Its zone-selection capabilities are unsurpassed among Macintosh OCR software, and style sheets let you reformat documents as they’re scanned. WordScan Plus sports a hefty $895 price tag, but for cost-conscious buyers, the basic WordScan package is worth serious consideration. An upgrade path is available in case your needs outgrow this no-frills alternative.

The race is far from over in the Mac OCR arena. By the time you read this, a new version of Caere’s package—OmniPage Professional—may be available. It’s expected to be priced competitively with WordScan Plus and will offer a feature set that parallels many of the capabilities of Calera’s package. But currently, WordScan Plus reigns supreme.

—Gregory Wasson

Get Info

WordScan Plus

Published by: Calera Recognition Systems, 475 Potrero Avenue, Santa Clara, CA 94086; (408) 720-8300.
Version: 1.0.
List Price: $895.

WE’VE GOT IT ALL...

Leather Mousglove for computer mouse
Call for more information...

...mouspads, machine pads, wrist pads, anti-static pads and now our new graphic pads.
Why support foreign imitations, Moustrak’s promo mouspads start at $1.99 in volume, up to $9.99.
Many varieties of custom imprinting available -50pc. minimums. Fax or call for a free sample today.

MOUSTRAK

CIRCLE 73 ON READER SERVICE CARD.
To experience a whole new comfort level in document publishing, have a seat in front of a Macintosh running FrameMaker.

FrameMaker integrates the entire publishing process into one easy-to-use application: Authoring, editing, graphics, page layout, production, even hypertext. Whether you create short, simple documents or long, structured documentation, you'll feel right at home with FrameMaker.

You'll find our new version, FrameMaker 3.0, even more inviting. You can create your own intricate, multipage tables with its sophisticated table editor. And generate and maintain multiple versions of a single document with its conditional text capabilities. You can even import full-color images and produce four-color output of DCS images.

That's the kind of innovation that earned FrameMaker an Editor's Choice award from MacWEEK and accolades from MacUser.

And of course, it's compatible with System 7.0.

So call 1-800-U4-FRAME ext. 965 for more information on FrameMaker 3.0 and the name of your nearest reseller. And feel how comfortable a position in publishing can be.
Managing personal finances has never been easier than with the latest version of Quicken. Version 3.0 delivers a slew of valuable new features, including the ability to handle more than 200 separate account types in one file, unlimited transaction splits among categories, the ability to edit transactions directly in the Register window, varied budgets from month to month, and many new customizable reports.

**Held Accountable**

Quicken accounts use the familiar look and feel of standard checkbook registers, so it's easy to use the program. You enter payee, date, number, and amount of each check as well as ATM and other transaction information.

Quicken supports five basic account types: bank, cash, credit card, asset, and liability. The bank account is normally the primary account for transferring funds to and from other accounts. Bank and credit card accounts operate much as expected: You enter transactions such as deposits, checks, charges, and payments, and then you reconcile the accounts with your monthly statements.

The advantages to automating these basic procedures go far beyond helping you avoid arithmetic errors. By assigning categories and classes to transactions in Quicken, you can track tax information, compare actual income and expenditures to a budget, manage rental properties, maintain a payroll, and print detailed reports (such as Net Worth, Income Statement, and Balance Sheet). Version 3.0's ability to split transactions in an unlimited fashion among categories and subcategories makes for powerful analysis and reporting capabilities.

The asset and liability account types are also new features. They let you track mortgages, stocks, IRAs, depreciable office equipment, and the like. They can also be used to set up accounts receivable and accounts payable.

Quicken's BillMinder feature lets you schedule bill payments. Quicken can remind you to pay due bills either when you start up your machine or when you open the program, which is especially useful for recurring transactions. The program can print checks on almost any printer, and its extensive alignment options and...
Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.

Quicken 3.0 is a versatile tool for managing personal finances. The program supports more than 200 account types, including credit-card accounts, in a single file. You can also fill out checks on-screen and then print them on a wide variety of printers.
CheckFree

CheckFree is an electronic-payment option that uses modem transfer to send transaction instructions to central clearinghouses. CheckFree Corp. either sends a check for you on a requested date or performs an electronic funds transfer if the payee is set up to receive it. The service costs $9.95 a month for up to 20 transactions, and additional items are priced at $3.50 for 10.

But despite the money you can save in postage and checks (Quicken checks start at about 11 cents each, for a total of 40 cents per first-class-mail payment), we found using CheckFree to be somewhat cumbersome. For one thing, you must be sure to modem your transactions about two weeks before their due date. Another inconvenience is the difficulty of stopping a payment. All in all, this service makes sense only for users who handle many recurring payments.

Quicken’s superlative documentation, on-line help system, and user interface all contribute mightily to its usefulness and value. You can enter nearly anything from the keyboard, and you can even customize the keyboard command equivalents for menu items. As you move the scroll-bar box up and down, it shows the transaction date, making it easy to find items. Customized reports can be saved, and you can edit and rearrange category and class lists as well as automate the entry of category names so all you have to do is type the first few characters. The program saves transactions automatically as you work.

Quicken’s list of achievements as a personal-financial package is impressive. Be aware, however, that the program is missing the accounting safeguards and advanced features required for serious business use (beyond the needs of a very small company).

The Bottom Line

Quicken 3.0 is a worthy successor to Intuit’s original version of the program. The personal-finance package allows you to split transactions among a variety of categories, making it an excellent tool for analyzing the way you spend your money. Although Meca Software’s Managing Your Money (see “Your Money and Your Mac,” September ’91, page 96) supplies more extensive financial-analysis features, such as retirement planning, tax estimation, investment tracking, and loan analysis, it does so at three times the price of Quicken. We recommend use of Quicken as a simple and inexpensive way for users to control and track their personal finances.

— Becky Waring

Prices, SupraFAXModems

Introducing the SupraFAXModem™ family — three exciting new fax modems for the Mac™! All three modems feature Class 1 & 2 fax commands & compatibility with Group 3 fax machines, plus V.42bis & MNP (2–5, 10) data compression & error correction. And each SupraFAXModem is System 7 compatible & comes with everything needed to use it right away.

Now you can send & receive quality faxes in the background and enjoy transmission scheduling, fax broadcasting to multiple destinations, & an activity log. And for telecom, you’ll have a sophisticated scripting language & support for CRC, MacBinary XModem, & YModem protocols.

SupraFAXModem Plus, $249.95
9600 S/R FAX • 2400 DATA

SupraFAXModem V.32, $379.95
9600 S/R FAX • 9600 DATA

Supra Corporation

Orders: 1-800-944-8772
Distributed by Mereis/maCamerica
701 S. 26th St., Redmond, WA 98052 USA • 1-503-967-2401 Fax • 1-503-967-2410

Get Info

Quicken 3.0

Published by: Intuit, P.O. Box 3014, Menlo Park, CA 94026; (415) 322-0573.
Version: 3.0.
List Price: $69.95.
Like to shop at the

The original mail-order source for Macintosh products. Since 1984.
1991 Macworld World Class Award Nominee for Best Customer Support-Software.

System 7 Video: Featuring Macworld Contributing Editor Lon Poole. Free when you order Apple's System 7 for $99 (1074). Or buy one for just $9 (2244). We also have Lon's book Macworld Guide to System 7 for $19 (2239).

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

Companies participating in the 30 or 60 day Money Back Guarantee program are highlighted with The original mail-order source for System 7 Video: [2238].

We carry only the very latest versions of products. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. Also, all software is not copy-protected, unless indicated otherwise by (CP).

Corporate Accounts welcome. Bids and PO's accepted. Please call 800/860-4444 for information.

We reserve the right to limit quantities on returns.

MacConnection is the exclusive mail-order reseller for Outbound Notebook Systems.

Outbound Systems, Inc.
Full line and accessories available. All units listed below include a 1.4 Floppy Drive, an 80 MB hard drive, and a 2 MB RAM.

3119 @BeagleWorks-Integrated word processor, spreadsheet, database, paint, communications & draw modules all in one package. Lets you combine data from other modules & make changes without leaving that document. $185.

DAILY BUSINESS
ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

A Lasting Impression
ResumExpert or Cover Letters ... ea. 48.
ResumExpert Software Series ... ea. 48.
Abacus Concepts
Lexis (28 day MBG)
4233 @Lexis 3.0 MBG
4345 @Lexis 4.0 MBG
4318 @Lexis 6.0 MBG
4451 @Lexis 9.0 MBG

Advanced Software ... 30 day MBG
5008 @DocuComp 1.5
5106 @DocuComp 2.5
5177 @Amaze, Inc.
5382 @The Fast Side Computer Calendar ... 4.5.
5418 @Avery ... 60 day MBG
7446 @MacLabel Pro 1.5
7680 @MacLabel Pro 2.5
8367 @MacLabel Pro 3.0

Banner Blue ... 30 day MBG
3548 @Org Plus Advanced 1.0

MACINTAX

Like to shop at the

The original mail-order source for Macintosh products. Since 1984.
1991 Macworld World Class Award Nominee for Best Customer Support-Software.

System 7 Video: Featuring Macworld Contributing Editor Lon Poole. Free when you order Apple's System 7 for $99 (1074). Or buy one for just $9 (2244). We also have Lon's book Macworld Guide to System 7 for $19 (2239).

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

Companies participating in the 30 or 60 day Money Back Guarantee program are highlighted with The original mail-order source for System 7 Video: [2238].

We carry only the very latest versions of products. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. Also, all software is not copy-protected, unless indicated otherwise by (CP).

Corporate Accounts welcome. Bids and PO's accepted. Please call 800/860-4444 for information.

We reserve the right to limit quantities on returns.

MacConnection is the exclusive mail-order reseller for Outbound Notebook Systems.

Outbound Systems, Inc.
Full line and accessories available. All units listed below include a 1.4 Floppy Drive, an 80 MB hard drive, and a 2 MB RAM.

3119 @BeagleWorks-Integrated word processor, spreadsheet, database, paint, communications & draw modules all in one package. Lets you combine data from other modules & make changes without leaving that document. $185.

DAILY BUSINESS
ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

A Lasting Impression
ResumExpert or Cover Letters ... ea. 48.
ResumExpert Software Series ... ea. 48.
Abacus Concepts
Lexis (28 day MBG)
4233 @Lexis 3.0 MBG
4345 @Lexis 4.0 MBG
4318 @Lexis 6.0 MBG
4451 @Lexis 9.0 MBG

Advanced Software ... 30 day MBG
5008 @DocuComp 1.5
5106 @DocuComp 2.5
5177 @Amaze, Inc.
5382 @The Fast Side Computer Calendar ... 4.5.
5418 @Avery ... 60 day MBG
7446 @MacLabel Pro 1.5
7680 @MacLabel Pro 2.5
8367 @MacLabel Pro 3.0

Banner Blue ... 30 day MBG
3548 @Org Plus Advanced 1.0

MACINTAX

Like to shop at the

The original mail-order source for Macintosh products. Since 1984.
1991 Macworld World Class Award Nominee for Best Customer Support-Software.

System 7 Video: Featuring Macworld Contributing Editor Lon Poole. Free when you order Apple's System 7 for $99 (1074). Or buy one for just $9 (2244). We also have Lon's book Macworld Guide to System 7 for $19 (2239).

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

Companies participating in the 30 or 60 day Money Back Guarantee program are highlighted with The original mail-order source for System 7 Video: [2238].

We carry only the very latest versions of products. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. Also, all software is not copy-protected, unless indicated otherwise by (CP).

Corporate Accounts welcome. Bids and PO's accepted. Please call 800/860-4444 for information.

We reserve the right to limit quantities on returns.

MacConnection is the exclusive mail-order reseller for Outbound Notebook Systems.

Outbound Systems, Inc.
Full line and accessories available. All units listed below include a 1.4 Floppy Drive, a 80 MB hard drive, and a 2 MB RAM.

4165 @Outbound Notebook 2000/240 (68000, 2 MB, 40 MB Hard Drive) ... 2599.
4167 @Outbound Notebook 2000/440 (68000, 4 MB, 40 MB Hard Drive) ... 2899.
4169 @Outbound Notebook 2000/440 (68000, 8 MB, 40 MB Hard Drive) ... 2999.
4170 @Outbound Notebook 2030/441 (same as 2000/440, incl. math copro) ... 3149.
4172 @Outbound Notebook 2030/460 (68000, 8 MB, 60 MB Hard Drive) ... 3399.

4174 @Outbound Notebook 2030/461 (same as 2030/460, incl. math copro) ... 3549.
4175 Extra 12V Battery ... 59.
4177 Notebook Carrying Case ... 79.

DAILY BUSINESS
ACCOUNTING, DATABASES, SPREADSHEETS, WORD PROCESSING

A Lasting Impression
ResumExpert or Cover Letters ... ea. 48.
ResumExpert Software Series ... ea. 48.
Abacus Concepts
Lexis (30 day MBG)
4234 @Lexis 2.0 MBG
4346 @Lexis 3.0 MBG
4319 @Lexis 4.0 MBG
4452 @Lexis 5.0 MBG

Advanced Software ... 30 day MBG
5009 @DocuComp 1.5
5106 @DocuComp 2.5
5177 @Amaze, Inc.
5383 @The Fast Side Computer Calendar ... 4.5.
5419 @Avery ... 60 day MBG
7447 @MacLabel Pro 1.5
7681 @MacLabel Pro 2.5
8368 @MacLabel Pro 3.0

Banner Blue ... 30 day MBG
3549 @Org Plus Advanced 1.0

MACINTAX

Like to shop at the

The original mail-order source for Macintosh products. Since 1984.
1991 Macworld World Class Award Nominee for Best Customer Support-Software.

System 7 Video: Featuring Macworld Contributing Editor Lon Poole. Free when you order Apple's System 7 for $99 (1074). Or buy one for just $9 (2244). We also have Lon's book Macworld Guide to System 7 for $19 (2239).

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

Companies participating in the 30 or 60 day Money Back Guarantee program are highlighted with The original mail-order source for System 7 Video: [2238].

We carry only the very latest versions of products. For products or versions not yet released at press time we've indicated the expected availability dates as supplied to us by the manufacturers. Also, all software is not copy-protected, unless indicated otherwise by (CP).

Corporate Accounts welcome. Bids and PO's accepted. Please call 800/860-4444 for information.

We reserve the right to limit quantities on returns.

MacConnection is the exclusive mail-order reseller for Outbound Notebook Systems.

Outbound Systems, Inc.
Full line and accessories available. All units listed below include a 1.4 Floppy Drive, a 80 MB hard drive, and a 2 MB RAM.

4165 @Outbound Notebook 2000/240 (68000, 2 MB, 40 MB Hard Drive) ... 2599.
4167 @Outbound Notebook 2000/440 (68000, 4 MB, 40 MB Hard Drive) ... 2899.
4169 @Outbound Notebook 2000/440 (68000, 8 MB, 40 MB Hard Drive) ... 2999.
4170 @Outbound Notebook 2030/441 (same as 2000/440, incl. math copro) ... 3149.
4172 @Outbound Notebook 2030/460 (68000, 8 MB, 60 MB Hard Drive) ... 3399.
end of the week?

★ Provue ... 60 day MBG
4582 ★ Panorama II 2.0.3—Designed with enough power for small businesses & enough convenience for novice users. Includes Clairvoyance & command key equivalents to the Find/Select dialog. Now faster than ever. ......... $245.

★ Microsoft ... 30 day MBG
2572 ★ Schedule Plus 1.0 ... 129.
2884 ★ Works 2.0.0E ... 159.
4902 ★ Word 5.0 (Dec. '91) ... 299.
9803 ★ Excel 3.0 ... 309.
1420 ★ Excel 3.0 Companion Book ... 20.
2565 ★ Project 1.1 ... 449.
5454 ★ The Microsoft Office 1.5 ... 479.
★ New Era .... 30 day MBG
3130 ★ Quibase 1.3 ... 179.
★ Niles & Associates .... 30 day MBG
5048 ★ EndLink 1.13 ... 58.
4602 ★ EndNote 1.4 ... 85.
8010 ★ EndNote Plus 1.1 ... 145.
★ Nolo Press .... 30 day MBG
4228 ★ For the Record 2.0 ... 30.
2981 ★ WillMaker 4.0 (not valid in LA). ... 35.
★ Odesta ... 30 day MBG
5621 ★ Double Helix 3.5 ... 429.
5663 ★ Nitus 3.06 ... 245.

★ Teleware ... 30 day MBG
7616 ★ M.Y.O.B. 2.1—Incredible, easy-to-use, accounting software for small- to medium-sized businesses. Features include fully integrated AP/AR, General Ledger, Inventory, Checkbook, and Card File. System 7-savvy ....... $139.

★ Adobe Systems
4145 ★ Adobe Premiere 1.0—Easily combines video footage, audio recordings, animation, still images and graphics to create high-quality digital movies. Takes advantage of Apple's QuickTime media-integration technology ......... $309.

8794 ★ Adobe Type On Call .... 47.
6957 ★ Adobe Type Reunion 1.02 .... 41.
5750 ★ Adobe Type Manager 2.0 .... 59.
6053 ★ Adobe Plus Pack 2.0 .... 118.
6156 ★ Adobe Plus Pack/ATM .... 174.
6098 ★ TypeAlign for ATM 1.0.4 .... 62.
6671 ★ Adobe Type Set 1 or 6877 ★ Set 2 .... 62.
7587 ★ Adobe Type Set 3 .... 125.
★ Adobe Type Sets for Business:
2221 ★ Letters, Memos & Faxes .... 95.
2223 ★ Invitations & Awards .... 95.
2219 ★ Spreadsheets & Graphs .... 95.
2222 ★ Overheads & Slides .... 95.
6171 ★ Adobe Illustrator 3.2 (with ATM) .... 369.
6644 ★ Adobe Photoshop 2.0 .... 549.
5001 ★ Streamline 2.0. .... 122.
4145 ★ Adobe Premiere 1.0 .... 309.
★ Aldus .... 30 day MBG
2461 ★ Aldus Gallery Effects 1.0 .... 129.
3506 ★ Aldus SuperPaint 3.0 .... 133.
6674 ★ Aldus Personal Press 1.01 .... 195.

★ Abracadata, Ltd. .... 30 day MBG
9990 ★ Design Your Own Home-Architecture—Modify or design the home of your dreams! Includes a library of architectural objects and sample floor plans. Everything you need to create professional drawings or a simple sketch .... $63.
We have just the...

**Expert Software ... 30 day MBG**

4870 [Expert Color Flat 1.0-New! The latest in painting tools at an incredible price. You get hot 32-bit color, image editing, and tools that may be customized, anti-aliasing, virtual memory and System 7 support] $29.

9988 [FontMonger 1.05] 62.

9438 [Fluent Font Library 4.05] 99.

3507 [True Type Fonts 1 or 94] Fonts 2 ea. 59.

2875 [Aldus Super 3D 2.5] ......... . . 325.

7784 [TypeStyler 2.0] 77.

7828 [Color MacCheese 2.0.8] 56.


1427 [The Print Shop 1.3.2] 35.

1195 [Fontographer 3.3] 265.


1945 [True Type Starter Set] . 57.


4707 [Aldus Persuasion 2.0] 325.


1591 [True Type Fonts 3 or 1595 Fonts 4] ea. 98.


1945 [True Type Starter Set] . 57.


* Expert Software ... 30 day MBG

3988 [Aldus Digital Darkroom 2.0] 259.

3557 [Aldus Super 3D 2.5] 325.

7467 [Aldus PrePrint 1.5] 325.

4751 [Aldus Persuasion 2.0] 325.

1330 [Aldus FreeHand 3.1] (Dec. '91) 395.

7088 [Aldus PageMaker 4.2] (Dec. '91) 495.

8564 [Aldus Design Team (best buy includes PageMaker, FreeHand & PrePrint)] 859.

Altsy

9806 [Metamorphoses Pro 2.01] 89.

1993 [EPS Exchange 1.0] 89.

1195 [Fontographer 3.3] 265.

* Ares Software ... 30 day MBG

8876 [FontMononger 1.05] 62.

* Baseline Publishing ... 30 day MBG

8055 [Screen Shot 1.2] 34.

7784 [Color MacCheese 2.0.8] 56.

7828 [Exposure Pro 1.0] 78.

* Bitstream

9428 [True Type Fonts 1 or 9429 Fonts 2 ea. 59.]

1591 [True Type Fonts 3 or 1595 Fonts 4 ea. 68.]

Broderbund Software

3572 [Kid Pix 1.2] 34.

1427 [The Print Shop 1.3.2] 35.

6281 [TypeStudio 2.0] (with ATM, Dec. '91) 127.

* Casady & Greene ... 30 day MBG

8879 [Fluent Font Library 4.05] 99.

1945 [True Type Starter Set] 57.

**SoftSync, Inc. ... 30 day MBG**

7129 [Accountant, Inc. 2.1—Comprehensive, fully-integrated accounting software that includes General Ledger, Receivables, Payables, Inventory, Invoicing, Payroll, Check Writing & more] $359.

3828 [Accountant, Inc./MultiUser 1.0] 739.

**Claris ... 30 day MBG**

1123 [MacPaint II 2.0] $88.

2518 [MacDraw Pro 1.0] 279.

5807 [Claris CAD 2.0] 629.

* Custom Applications

8037 [Freedom of Press Light 3.0] (17 fonts) . 55.

3558 [DeltaPoint ... 60 day MBG] 209.

3277 [Canvas 3.0] 249.

* Denba Software ... 30 day MBG

4870 [Expert Software ... 30 day MBG] 29.

6728 [Comic Strip Factory 1.6] 36.

2417 [MacDraft 2.1] 279.

4707 [Dreams 1.10] 349.

* Letraset ... 30 day MBG

2619 [ImageStudio 1.5] 139.

4709 [LetraStudio 2.0] (Dec. '91) 165.

6300 [FontStudio 2.0] 359.

6302 [DesignStudio 2.0] 469.

6301 [ColorStudio 1.5] 599.

* Linguist's Software ... 60 day MBG

2636 [MacKanji 6.0] . 79.


**Deneba Software ... 30 day MBG**

3227 [Canvas 3.0—Award-winning precision drawing program featuring Bezier font outlines, professional word-processor-like text capabilities, object blending, a freehand Bezier curve tool, Smart Mouse drawing aid, and more ... $249.

3148 [MacDraft 2.1] 279.

5028 [ModelShop 2.0] 599.

7441 [Swivel 3D Professional 2.0] ea. 89.

3450 [SwivelMan 1.0] 599.

3440 [QuickPICS 1.0] 99.

9798 [Cacture 4.0] 82.

3013 [Color Ill. 1.0] 75.

7866 [Enhance 2.0] 235.

* MicroFrontier ... 30 day MBG

7558 [MapArt (PICT) of 7555 (EPS)] ea. 89.

* Microsoft ... 30 day MBG

2878 [PowerPoint 2.0] 245.

* Monotype Typography ... 30 day MBG

22 [Monotype Imprieto TrueType] ea. 22.

3292 [Classic Fonts (full line available)] 49.

* Postcraft International

2210 [Effects Specialist 1.04] 95.


2210 [Layouts: Stationery or Flyers] ea. 45.

2210 [QuarkXPress 3.1] (Dec. '91) 99.

2210 [QuarkXPress 3.1] (Dec. '91) 99.

**Specular International ... 30 day MBG**

4962 [Before-D 1.1—An integrated 3D modeling, 32-bit rendering, & 3D animation package. A powerful 3D environment to create images and present ideas. Features: anti-aliasing, shadowing, 3D texture mapping, noise, & shading ... $649.


3530 [Certificate Maker 2.02] 22.

7773 [Stratavision 3D 2.0] 629.

* SuperMacTech ... 60 day MBG


3942 [Images with Impact: Graphics 1] 49.


* Timeworks ... 30 day MBG

7115 [Publish It Easy 2.12 with File-It! ... 154.

* T/Maker ... 30 day MBG

1352 [Touch Base 2.0] 89.

1352 [Visual Business Sys. ... 30 day MBG]

8967 [GraphMaster 1.1] 189.


**PROGRAMMING**

UTILITIES, HYPERCARD, SECURITY

* Abbott Systems ... 30 day MBG

2515 [Calc 1.0] 39.

5236 [Calc 2.0] 62.

* Advanced Software ... 30 day MBG

8051 [Intouch 1.1 39. 9986 Network (3-Pak)] 112.

2808 [QuickTools 1.0] 45.

* After Hours Software

1352 [Touch Base 2.0] 79.

* Aladin Systems ... 30 day MBG

6169 [Shortcut 1.5] 45.

6740 [StuffIt Deluxe 3.0] (Jan. '92) 62.

* Aldus ... 30 day MBG


* ALSoft ... 30 day MBG


9807 [DeskExpress II 2.07] 49.

9886 [MultiDisk 1.27] 49.

* Alysia Software ... 30 day MBG

2637 [SuperDisk 2.0] 49.

* Apple Computer

5291 [System 7] (with free PCTV video) 99.

* ASD Software ... 30 day MBG

9440 [MacScriptCard Reactor (req. FileGuard)] 299.

9439 [MacScriptCard/FeiGuard (1 bundle)] 399.
<table>
<thead>
<tr>
<th>Software</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FileGuard</strong></td>
<td>Complete disk and file recovery and protection.</td>
<td>$89</td>
</tr>
<tr>
<td><strong>SmartCard Reader</strong></td>
<td>Professional replacement for Apple's calculator. Large display, paper tape printout, 96 key, DTP calculations.</td>
<td>$49</td>
</tr>
<tr>
<td><strong>Disk Doubler</strong></td>
<td>Double the space on any Mac by shrinking any Mac disk or folder by an average of 50%.</td>
<td>$49</td>
</tr>
<tr>
<td><strong>Salient Software</strong></td>
<td>Complete disk and file recovery and protection.</td>
<td>$89</td>
</tr>
<tr>
<td><strong>SmartCard Reader</strong></td>
<td>Professional replacement for Apple's calculator. Large display, paper tape printout, 96 key, DTP calculations.</td>
<td>$49</td>
</tr>
<tr>
<td><strong>Disk Doubler</strong></td>
<td>Double the space on any Mac by shrinking any Mac disk or folder by an average of 50%.</td>
<td>$49</td>
</tr>
<tr>
<td><strong>Salient Software</strong></td>
<td>Complete disk and file recovery and protection.</td>
<td>$89</td>
</tr>
<tr>
<td><strong>SmartCard Reader</strong></td>
<td>Professional replacement for Apple's calculator. Large display, paper tape printout, 96 key, DTP calculations.</td>
<td>$49</td>
</tr>
<tr>
<td><strong>Disk Doubler</strong></td>
<td>Double the space on any Mac by shrinking any Mac disk or folder by an average of 50%.</td>
<td>$49</td>
</tr>
</tbody>
</table>

**Service you seek.**

![Image of 1-800/800-4444 MacConnection](image)
## CD-ROM

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe Systems</td>
<td>Adobe Type On Call CD/ATM</td>
<td>$47.95</td>
</tr>
<tr>
<td>CD Technology</td>
<td>CD-ROM Cardy 11. 2533 (5)</td>
<td>$49.95</td>
</tr>
<tr>
<td>8037</td>
<td>Porta Drive CD-ROM</td>
<td>$99.95</td>
</tr>
<tr>
<td>4149</td>
<td>Multimem HANDisc (Dec. '91)</td>
<td>$71.25</td>
</tr>
<tr>
<td>9967</td>
<td>Nautilus</td>
<td>$99.94</td>
</tr>
<tr>
<td>9944</td>
<td>The WetSet CD</td>
<td>$99.94</td>
</tr>
<tr>
<td>9966</td>
<td>Shakespeare on Disc</td>
<td>$99.94</td>
</tr>
<tr>
<td>2717</td>
<td>Cosmic Osmo 1.1</td>
<td>$11.25</td>
</tr>
<tr>
<td>2321</td>
<td>CD-ROM Caddy 1.1</td>
<td>$25.33</td>
</tr>
<tr>
<td>4140</td>
<td>Multimedia HAN Disc</td>
<td>$41.40</td>
</tr>
<tr>
<td>777.2</td>
<td>Webster's Dictionary</td>
<td>$37.50</td>
</tr>
<tr>
<td>3717</td>
<td>Sherlock Holmes</td>
<td>$37.50</td>
</tr>
<tr>
<td>1874</td>
<td>Mammals N. America</td>
<td>$37.50</td>
</tr>
<tr>
<td>2615</td>
<td>Cosmic Osmo 1.1</td>
<td>$26.15</td>
</tr>
<tr>
<td>3915</td>
<td>Grolier Encyclopedia</td>
<td>$39.15</td>
</tr>
<tr>
<td>6625</td>
<td>Clip-Art 3D</td>
<td>$66.25</td>
</tr>
<tr>
<td>9441</td>
<td>CDR36 CD-ROM Portable Drive</td>
<td>$69.99</td>
</tr>
<tr>
<td>6636</td>
<td>Image Gallery</td>
<td>$66.36</td>
</tr>
<tr>
<td>2610</td>
<td>Vocabulearn/ce 2.0 Spanish 1 CD</td>
<td>$69.99</td>
</tr>
<tr>
<td>8607</td>
<td>Music Production Kit CD</td>
<td>$119.99</td>
</tr>
<tr>
<td>6641</td>
<td>Vocabulearn/ce 2.0 French 1 CD</td>
<td>$69.99</td>
</tr>
<tr>
<td>8220</td>
<td>Jack Nicklaus Golf</td>
<td>$34.99</td>
</tr>
<tr>
<td>3502</td>
<td>Beyond Dark Castle</td>
<td>$34.99</td>
</tr>
<tr>
<td>3559</td>
<td>SimAnt</td>
<td>$35.59</td>
</tr>
<tr>
<td>8266</td>
<td>SimEarth 1.0</td>
<td>$40.00</td>
</tr>
<tr>
<td>6490</td>
<td>Vivaldi: The Four Seasons</td>
<td>$49.99</td>
</tr>
</tbody>
</table>

### VIDEO & SOUND

#### MUSIC, MIDI, ANIMATION

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1215</td>
<td>Pracmusicas 2.2</td>
<td>$66.15</td>
</tr>
<tr>
<td>6135</td>
<td>Super Studio Session with Music Library</td>
<td>$99.00</td>
</tr>
<tr>
<td>5604</td>
<td>MusicPro 2.1</td>
<td>$56.04</td>
</tr>
<tr>
<td>8188</td>
<td>MusicPro 2.1</td>
<td>$81.88</td>
</tr>
<tr>
<td>1163</td>
<td>MusicPro 2.1</td>
<td>$116.30</td>
</tr>
<tr>
<td>9353</td>
<td>MacroMind MediaMaker 1.2</td>
<td>$479.93</td>
</tr>
<tr>
<td>6159</td>
<td>MacroMind Accelerator 3.0</td>
<td>$135.61</td>
</tr>
<tr>
<td>5087</td>
<td>MacroMind Director 3.0</td>
<td>$88.57</td>
</tr>
<tr>
<td>2246</td>
<td>MacroMind Thrice-D 1.0</td>
<td>$224.60</td>
</tr>
<tr>
<td>7839</td>
<td>FinderMaker 2.0</td>
<td>$435.80</td>
</tr>
<tr>
<td>2199</td>
<td>MacRecorder Sound System 2.0</td>
<td>$174.20</td>
</tr>
<tr>
<td>2592</td>
<td>QuickImage 24</td>
<td>$289.25</td>
</tr>
<tr>
<td>8253</td>
<td>TRAX 2.2</td>
<td>$57.62</td>
</tr>
<tr>
<td>9442</td>
<td>Audio TRAX 1.0</td>
<td>$209.44</td>
</tr>
<tr>
<td>3117</td>
<td>Master Tracks PRO 4 4.5</td>
<td>$317.17</td>
</tr>
<tr>
<td>8250</td>
<td>Encore 2.07</td>
<td>$379.50</td>
</tr>
<tr>
<td>3115</td>
<td>MIDI Interface</td>
<td>$311.50</td>
</tr>
</tbody>
</table>

#### Timeworks...30 day MBG

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>7115</td>
<td>Publish It Easy 2.12 with File-It!-This all-in-one desktop publisher combines ease of use with advanced features that make page layout a breeze. Now includes the new File-It!, a built-in database and mail-merge program!</td>
<td>$154.00</td>
</tr>
</tbody>
</table>

#### MicroSoft...30 day MBG

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>6392</td>
<td>The Microsoft Office (CD-ROM)</td>
<td>$479.63</td>
</tr>
<tr>
<td>6625</td>
<td>Clip-Art 3D (2500 full-color images)</td>
<td>$246.00</td>
</tr>
<tr>
<td>6636</td>
<td>Image Gallery (2000 line art)</td>
<td>$246.00</td>
</tr>
<tr>
<td>3422</td>
<td>DTRSS CD-ROM Portable Drive</td>
<td>$259.22</td>
</tr>
<tr>
<td>2592</td>
<td>Quicklmage 24</td>
<td>$289.62</td>
</tr>
</tbody>
</table>

### FOREIGN LANGUAGES, TRAINING, GAMES

#### Learn & Play

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accolade</td>
<td>Hard Ball II or 8217 Beicho</td>
<td>$31.00</td>
</tr>
<tr>
<td>8220</td>
<td>Jack Nicklaus Golf</td>
<td>$34.99</td>
</tr>
<tr>
<td>3502</td>
<td>Beyond Dark Castle</td>
<td>$34.99</td>
</tr>
<tr>
<td>8255</td>
<td>Vivaldi: The Four Seasons</td>
<td>$49.99</td>
</tr>
<tr>
<td>6619</td>
<td>Showplace &amp; MacRenderMan CD-ROM</td>
<td>$66.19</td>
</tr>
</tbody>
</table>

#### Pixar

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>5541</td>
<td>Showplace &amp; MacRenderMan CD-ROM</td>
<td>$554.11</td>
</tr>
<tr>
<td>1143</td>
<td>Showplace &amp; MacRenderMan CD-ROM</td>
<td>$114.30</td>
</tr>
<tr>
<td>1596</td>
<td>Showplace &amp; MacRenderMan CD-ROM</td>
<td>$159.60</td>
</tr>
<tr>
<td>2244</td>
<td>System 7 Video with Lon Poole (VHS)</td>
<td>$9.00</td>
</tr>
<tr>
<td>2245</td>
<td>System 7 Video with Lon's Book</td>
<td>$25.95</td>
</tr>
<tr>
<td>9967</td>
<td>RasterOps</td>
<td>$649.00</td>
</tr>
<tr>
<td>8952</td>
<td>Video Explorer</td>
<td>$499.00</td>
</tr>
<tr>
<td>7457</td>
<td>Video Color Board 364</td>
<td>$699.00</td>
</tr>
<tr>
<td>3224</td>
<td>Expresso Slide Scanner</td>
<td>$699.00</td>
</tr>
<tr>
<td>9977</td>
<td>RasterOps 245LI, 649, 8944 24STV</td>
<td>$1249.00</td>
</tr>
<tr>
<td>3547</td>
<td>Star Trek: The Logical Collection</td>
<td>$29.00</td>
</tr>
<tr>
<td>8236</td>
<td>Star Trek: The Final Frontier</td>
<td>$29.00</td>
</tr>
<tr>
<td>4920</td>
<td>Star Trek: The Bundle (I gotta have both!)</td>
<td>$49.00</td>
</tr>
</tbody>
</table>

#### SuperMacTech...60 day MBG

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1813</td>
<td>Spectrum/lSeries III</td>
<td>$599.00</td>
</tr>
<tr>
<td>1851</td>
<td>Spectrum/lSeries III</td>
<td>$599.00</td>
</tr>
<tr>
<td>1877</td>
<td>Spectrum/lSeries III</td>
<td>$599.00</td>
</tr>
<tr>
<td>2330</td>
<td>Spectrum/lSeries III</td>
<td>$599.00</td>
</tr>
<tr>
<td>4122</td>
<td>VideoPost/LC or 4114 V5 ISA</td>
<td>$419.00</td>
</tr>
<tr>
<td>4164</td>
<td>VideoPost/LC (for NuBus)</td>
<td>$419.00</td>
</tr>
<tr>
<td>6172</td>
<td>Mariah 1.0</td>
<td>$93.00</td>
</tr>
<tr>
<td>9322</td>
<td>Voyager VideoCast 2.2</td>
<td>$65.00</td>
</tr>
<tr>
<td>9328</td>
<td>Voyager AudioCast 2.2</td>
<td>$65.00</td>
</tr>
<tr>
<td>9326</td>
<td>Everest of 4037</td>
<td>$65.00</td>
</tr>
<tr>
<td>3116</td>
<td>Adobe Premiere thru 1131/92</td>
<td>$349.00</td>
</tr>
<tr>
<td>4164</td>
<td>VideoPost/LC (for NuBus)</td>
<td>$419.00</td>
</tr>
</tbody>
</table>

#### PCTV

<table>
<thead>
<tr>
<th>Product</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2619</td>
<td>PCTV System 7 Video with Lon Poole (VHS)</td>
<td>$9.00</td>
</tr>
<tr>
<td>2625</td>
<td>PCTV System 7 Video with Lon's Book</td>
<td>$25.95</td>
</tr>
<tr>
<td>5546</td>
<td>Showplace &amp; MacRenderMan CD-ROM</td>
<td>$554.60</td>
</tr>
</tbody>
</table>

**Call by noon Sunday.**
<table>
<thead>
<tr>
<th>Product Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MicroPro II</td>
<td>$29</td>
</tr>
<tr>
<td>MacWrite II</td>
<td>$35</td>
</tr>
<tr>
<td>EarthQuest</td>
<td>$29</td>
</tr>
<tr>
<td>Electronic Arts</td>
<td>$39</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (CP)</td>
<td>$44</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (GP)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (PCP)</td>
<td>$31</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (SP)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (module 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-4)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (modules 1-5)</td>
<td>$43</td>
</tr>
<tr>
<td>Flight Simulator 4.0 (new users)</td>
<td>$43</td>
</tr>
</tbody>
</table>
It's our latest Mac

Sir-Tech Software

8228 Wizardry II: Knight of Diamonds .................................. $28.
8229 Bane of Cosmic Forge .............................................. $35.
4073 Colour Billiards .................................................. $38.
3501 Classic Tricyc (Chirogog, Whist, Hearts) ........................... $50.
3472 Family Cards (Solitaire, Runaway, War) ............................... $50.
Software Toolsworks

4619 Mavis Beacon Typing 1.3 (CP) .................................. $32.
1908 World Affairs 1.0 .................................................. $52.
3472 Family Cards ...................................................... $50.
3017 Wordcirs 1.0 (Jan. '92) .......................................... $25.
3459 Falcon 2.2.1 or 8161 Vetle 1.0 ................................... $33.
4264 Classic Trilogy ................................................... $6112.
3464 Tetris 1.3 or 6112 Welltris ....................................... $6112.
8180 Faces 1.0 .......................................................... $14.
8228 Wizardry II: Knight of Diamonds .................................. $28.
3501 Classic Tricyc (Chirogog, Whist, Hearts) ........................... $50.
3472 Family Cards (Solitaire, Runaway, War) ............................... $50.
Software Toolsworks

4619 Mavis Beacon Typing 1.3 (CP) .................................. $32.
1908 World Affairs 1.0 .................................................. $52.
3472 Family Cards ...................................................... $50.
3017 Wordcirs 1.0 (Jan. '92) .......................................... $25.
3459 Falcon 2.2.1 or 8161 Vetle 1.0 ................................... $33.
4264 Classic Trilogy ................................................... $6112.
3464 Tetris 1.3 or 6112 Welltris ....................................... $6112.
8180 Faces 1.0 .......................................................... $14.
8228 Wizardry II: Knight of Diamonds .................................. $28.
3501 Classic Tricyc (Chirogog, Whist, Hearts) ........................... $50.
3472 Family Cards (Solitaire, Runaway, War) ............................... $50.
Software Toolsworks

4619 Mavis Beacon Typing 1.3 (CP) .................................. $32.
1908 World Affairs 1.0 .................................................. $52.
3472 Family Cards ...................................................... $50.
3017 Wordcirs 1.0 (Jan. '92) .......................................... $25.
3459 Falcon 2.2.1 or 8161 Vetle 1.0 ................................... $33.
4264 Classic Trilogy ................................................... $6112.
3464 Tetris 1.3 or 6112 Welltris ....................................... $6112.
8180 Faces 1.0 .......................................................... $14.
8228 Wizardry II: Knight of Diamonds .................................. $28.
3501 Classic Tricyc (Chirogog, Whist, Hearts) ........................... $50.
3472 Family Cards (Solitaire, Runaway, War) ............................... $50.
Software Toolsworks

4619 Mavis Beacon Typing 1.3 (CP) .................................. $32.
1908 World Affairs 1.0 .................................................. $52.
3472 Family Cards ...................................................... $50.
3017 Wordcirs 1.0 (Jan. '92) .......................................... $25.
3459 Falcon 2.2.1 or 8161 Vetle 1.0 ................................... $33.
4264 Classic Trilogy ................................................... $6112.
3464 Tetris 1.3 or 6112 Welltris ....................................... $6112.
8180 Faces 1.0 .......................................................... $14.
8228 Wizardry II: Knight of Diamonds .................................. $28.
3501 Classic Tricyc (Chirogog, Whist, Hearts) ........................... $50.
3472 Family Cards (Solitaire, Runaway, War) ............................... $50.
Software Toolsworks

4619 Mavis Beacon Typing 1.3 (CP) .................................. $32.
1908 World Affairs 1.0 .................................................. $52.
3472 Family Cards ...................................................... $50.
3017 Wordcirs 1.0 (Jan. '92) .......................................... $25.
3459 Falcon 2.2.1 or 8161 Vetle 1.0 ................................... $33.
4264 Classic Trilogy ................................................... $6112.
3464 Tetris 1.3 or 6112 Welltris ....................................... $6112.
8180 Faces 1.0 .......................................................... $14.
8228 Wizardry II: Knight of Diamonds .................................. $28.
3501 Classic Tricyc (Chirogog, Whist, Hearts) ........................... $50.
3472 Family Cards (Solitaire, Runaway, War) ............................... $50.
Software Toolsworks

4619 Mavis Beacon Typing 1.3 (CP) .................................. $32.
1908 World Affairs 1.0 .................................................. $52.
3472 Family Cards ...................................................... $50.
3017 Wordcirs 1.0 (Jan. '92) .......................................... $25.
3459 Falcon 2.2.1 or 8161 Vetle 1.0 ................................... $33.
ANOTHER INSPIRING BREAKTHROUGH FOR WEEKEND WARRIORS EVERYWHERE.

ORDER THIS WEEKEND

AND GET IT MONDAY, $3

OR ORDER FRIDAY, GET IT SATURDAY. (AVAILABLE IN MOST AREAS.)

1-800/800-4444
**ACCESSORIES**

**TONERS, Cases, Dust Covers**

**Apple Computer**
- Applewriter Ink Cartridge: $29
- Laserwriter II Toner Cartridge: $95

**Avery**
- Avery 5196: $2.99
- Avery 51B2: $8.99
- Avery 5196: $29.99

**Disks**
- 3112" HD Disks: $9.99
- 3112" DS Disks: $10.99
- 3112" DS Disks: $29.99

**FUJI**
- Fuji 35mb msdos disk: $9.99

**Symantric**
- Symantric Norton AntiVirus: $95
- Symantric Norton Utilities: $15

**Storage Media**

**3M 60 day MBG**
- 32MB Disk Storage Case: $95

**3M**
- 60 day MBG: $79

**Multifinder**
- Multifinder Programmable Buttons: $29

**Hayes**
- Autopilots: $29
- Smartcom II: $195

**Apple**
- Macintosh Bible: $35

**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, except 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. $250 minimum. Manufacturer support and upgrade eligibility may be limited outside the U.S.A.
- Upon receipt and approval, personal and company checks clear the same day for immediate shipment of your order.
- Corporate P.O.s accepted subject to credit approval.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices and promotions subject to change without notice.
- Our order lines are open continuously from 8:00 a.m. Monday until noon Sunday Eastern Time. You can call our business offices at 603/446-7771 Monday through Friday 9:00 a.m. to 5:30 p.m. Eastern Time.

**SHIPPING**
- Continental U.S.: Barring events beyond our control, all credit card orders shipped in weekdays by 3:15 a.m. Eastern Time will ship Airborne Express for delivery the next business day. Whose means same day delivery for orders placed between midnight and 3:15 a.m. Eastern Time. (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 total freight charge on any order placed with MacConnection is only $3.
- Hawaii, Alaska, Canada, Puerto Rico and U.S. Virgin Islands: Call 603/446-4444 for information on shipping and handling.
- All other areas: Call 603/446-7771 or FAX 603/446-7791 for information.
**INPUT/OUTPUT**

**MONITORS, KEYBOARDS, MICE, PRINTERS & SCANNERS**

**Abaton ... 30 day MBG**
- Good Monitor 300/350 (requires Scan Kit) ... 829.
- Scan 300/GS (requires Scan Kit) ... 998.
- Int. Kit for 300/GS with Photoshop ... 789.
- LaserScrib LTX ... 1729.

**Advanced Gravis ... 30 day MBG**
- Gravis Mouse Stick ... 59.
- Gravis Super Mouse ... 79.
- UPS 110SE 200 6666 UPS 370c ... 339.
- SurgeArrest Plus ... 39.

**Bravo Communications**
- 2 Position Switch Box (for laser printers) ... 95.

**Ceare**
- TopTrac Plus Graphics ... 479.
- OmniPage 3.0 ... 479.

**CoStar**
- LabelWriter II ... 139.
- ActifileWriter (Jan. '92) ... 499.

**Curtis Manufacturing ... 30 day MBG**
- Scan 300/GS (removable) ... 829.

**DataDesk ... 30 day MBG**
- MAC101E 129 2364 with QuickKeys ... 149.
- Switchboard (modular keyboard) ... 159.

**Everex ... 30 day MBG**
- Silhouette Trackball 1.0 (ADB Macs) ... 78.

**GDT Software**
- BattleWriters 1.0 (for software drivers) ... 39.
- PrintLink Collection/Serial 4.0.1 ... 59.
- PrintLink Collection/Parallel 4.0.1 ... 959.
- JetLink Express/Serial 2.1 ... 89.

**Heiwitt-Pickard**
- HP B/W DeskWriter (w/children) ... 479.
- HP Color DeskWriter C (w/color cart.) ... 849.

**Kensington ... 30 day MBG**
- Turbo Mouse 3.0 (Plus or ADB) ... 107.
- V.32 Turbo Modem (with MacPack) ... 419.

**INNOVATION**

**Freesoft ... 60 day MBG**
- 6115 @White* FreeSoft 1.0 ... 30 day MBG
- 6115 @White* Kensington 30 day MBG
- 6115 @White* Datadesk 30 day MBG

**Supertech ... 30 day MBG**
- Monochrome Card (NuBus only) ... 349.
- 19" Gray-SCALE/Color Display ... 999.
- 19" SuperMatch Color Display ... 1999.

**Thunderware**
- LightningScan 400 ... 385.
- LightningScan Pro 256 ... 519.

**UPGRADES & DRIVES**

**MEMORY, ACCELERATORS**

**SIMMs ... with free video & manual**
- 1 MB SIMMs (80ns, set of 2) ... 85.
- 2 MB SIMMs for llsi or II LC ... 89.

**Applied Engineering ... 30 day MBG**
- FastMath LC ... 139.
- 1.44 MB High Density Drive ... 229.
- QuickSilver Accelerator for the llsi ... 303.
- TransWarp SE with FPU (25 MHz) ... 829.
- TransWarp SE with FPU (40 MHz) ... 1499.
- TransWarp LC ... 1417 with FPU ... 999.

**Computer Care**
- BookView Imperial (memory and video card for Apple's PowerBooks) ... call
- BookRAM 25, 45, 85, DRAM 4 ... call

**Dayna ... 60 day MBG**
- DaynaFile II 1 2/3" Drive ... 429.

**DayStar Digital ... 30 day MBG**
- Does not include optional math chip.
- 3584 DualPort llls with 20 MHz 66882 ... 165.
- 8556 FastCache for Mac llli ... 265.
- 3401 FastCache llli ... 269.
- 369 PowerCache for SE/30, II, IIx, IIx, IIc, LC ... 1999.
- 3584 DualPort llls with 20 MHz 66882 ... 165.
- 8556 FastCache for Mac llli ... 265.
- 3401 FastCache llli ... 269.
- 369 PowerCache for SE/30, II, IIx, IIx, IIc, LC ... 1999.
- 3584 DualPort llls with 20 MHz 66882 ... 165.
- 8556 FastCache for Mac llli ... 265.
- 3401 FastCache llli ... 269.
- 369 PowerCache for SE/30, II, IIx, IIx, IIc, LC ... 1999.

**Dayna ... 60 day MBG**
- DaynaFile II 1 2/3" Drive ... 429.

**Diamond 120-510 MB Hard Drives**
- 1399.
- Mac 1B Interface ... call
- Mac 2B Interface ... call

**Ensignia Solutions**
- 3441 @SoftNode 1.0 ... 30 day MBG
- Your Mac can not run MS-DOS applications, it can also share programs over a Novell PC Network. Your next PC could be a Macintosh ... $105.

**Insignia Solutions**
- 3441 @SoftNode 1.0 ... 30 day MBG
- Your Mac can not run MS-DOS applications, it can also share programs over a Novell PC Network. Your next PC could be a Macintosh ... $105.

**Keyboard Solutions**
- 3441 @SoftNode 1.0 ... 30 day MBG
- Your Mac can not run MS-DOS applications, it can also share programs over a Novell PC Network. Your next PC could be a Macintosh ... $105.

**KOALA**
- 2593 @MacVision Gray-Scale Digitizer 3.5 ... 259.
- 2879 @MacVision Color Digitizer 1.1 ... 499.

**Logitech ... 30 day MBG**
- 1671 @ScanMan Model 32 G-Scale Scan ... 299.

**Mass Microsystems**
- 19" SuperMatch Color Display ... 1999.
- 19" Monochrome Display ... 999.

**Microwave ... 30 day MBG**
- 199 MicroSpeed ... 30 day MBG
- 3555 @Silhouette Mouse (w/colored ball) ... 599.

**Microwaves ... 30 day MBG**
- 199 MicroSpeed ... 30 day MBG
- 3555 @Silhouette Mouse (w/colored ball) ... 599.

**MicroTech ... 30 day MBG**
- 1981 @MS-E OCR Scanner ... 449.
- 1987 @ScanMan 600GS ... 1199.
- 1985 @ScanMan 600ZS ... 1599.
- 1982 @ScanMan 1600S ... 2299.

**Monster Design Group**
- 1486 @Turbo Mouse 3.0 (w/colored ball) ... 169.
- Mouse Systems ... 30 day MBG
- 3005 @A"Trackball (ADB) ... 79.

**Moxa**
- 2514 @MoxaScan Color PC-1000 ... 89.

**Nutmeg Systems ... 30 day MBG**
- 199 MicroMouse ... 30 day MBG
- 3554 @Silhouette Mouse (w/colored ball) ... 599.

**Orange Micro ... 30 day MBG**
- 3036 @Grappler 2.0 ... 92.

**OmnPage 3.0**
- 8229 @LX ... 111.

**PageBrush/Color**
- 3355 @PageBrush/Color ... 599.

**Rapid Digital**
- 3584 DualPort llls with 20 MHz 66882 ... 165.
- 8556 FastCache for Mac llli ... 265.
- 3401 FastCache llli ... 269.
- 369 PowerCache for SE/30, II, IIx, IIx, IIc, LC ... 1999.
- 3584 DualPort llls with 20 MHz 66882 ... 165.
- 8556 FastCache for Mac llli ... 265.
- 3401 FastCache llli ... 269.
- 369 PowerCache for SE/30, II, IIx, IIx, IIc, LC ... 1999.
- 3584 DualPort llls with 20 MHz 66882 ... 165.
- 8556 FastCache for Mac llli ... 265.
- 3401 FastCache llli ... 269.
- 369 PowerCache for SE/30, II, IIx, IIx, IIc, LC ... 1999.

**Roland**
- 19" Monochrome Card (NuBus only) ... 349.
- 19" Gray-SCALE/Color Display ... 999.
- 19" SuperMatch Color Display ... 1999.

**Silhouette**
- 3554 @Silhouette Mouse (w/colored ball) ... 599.

**Turbo Micro**
- 5993 @Silhouette Mouse (w/colored ball) ... 1149.
- 6754 @Silhouette Mouse (w/colored ball) ... 1679.
- 3596 ScanJet IIC (color) ... 1599.

**V42bis modem**
- 199 @V.42bis modem (with MacPack) ... 139.
- 2311 @V.32 Turbo Modem (with MacPack) ... 419.

**Zoom Telephonics ... 30 day MBG**
- MX2400R Modem (w/QuickLink II) ... 669.
- MX2400S Modem (with Send/Fax 9600) ... 79.
- FX9624 Send/Receive Fax/Modem ... 119.
- FX9624V Send/Receive Fax/Modem ... 169.
- V.42bis modem (with MacPack) ... 139.

** service unique!**
The new Outbound™ Notebook System offers true notebook size and portability, plus the Macintosh® environment you know and love. Small enough to fit in most briefcases, all models measure 8.5 x 11 x 2.1 inches and weigh only 6.25 pounds.

Mac-Compatible. The Outbound Notebook you choose is ready for action immediately because the Macintosh ROM is already installed. This means the thousands of Macintosh software applications available are completely compatible.

Upgradeable. You’ll appreciate the benefits of the easily upgradeable microprocessor boards, hard disk drives and system memory. This value-added bonus lets you expand the Outbound’s capabilities as your computing needs grow. There’s no need to worry about early obsolescence.

Power and Performance. If speed is important, look no further. Running at up to 33 MHz, the Outbounds are the fastest Mac®-compatible portables around. And now Outbound offers up to 14 MB of RAM. Designed for your comfort, each Outbound Notebook boasts a full-size, silent keyboard. In tight quarters, use the keyboard mounted TrackBar™ to point and click. Or, add a mouse or other ADB pointing device. The backlit, LCD screen is large and easy to read, and provides 17% more displayable area than the Apple® PowerBook screens. Plus, all Outbound Notebooks have a versatile, built-in floppy disk drive so you can work with high and low density Macintosh and MS-DOS® diskettes.

Service and Support. Your Outbound Notebook is backed by a one-year warranty. Should you need technical assistance, simply dial our Customer Service line — it’s just toll-free call away.

Easy Decision. Want a smaller, lighter, faster, Mac-compatible portable computer? One that’s so upgradeable it will last many years? The Outbound Notebooks give you all this and more. Just check the comparison chart below and see for yourself who offers more features and flexibility, then call us today.

1.800.444.4607
CIRCLE 79 ON READER SERVICE CARD.

Outbound Systems, Inc., 4840 Pearl East Ct., Boulder, Colorado
Phone: 303.786.9200 fax: 303.786.8611
See us at Macworld booth 51.
FrameMaker 3.0

FrameMaker, the workhorse among Mac page-layout programs, just got more muscle with the release of version 3.0. The changes and additions to the new version enhance FrameMaker's already enviable position as the hands-down favorite for laying out lengthy technical documents with the Mac.

FrameMaker 2.1 was reviewed in November '90 (page 54). This multitalented publishing program combines word processing, page layout, graphics, and equation editing.

New to version 3.0 is an elegantly designed, integrated set of table-creation tools that's similar in operation to Microsoft Word's. You simply choose the Insert Table command and specify rows, columns, and any table format you have defined and saved to disk (including custom rules, cell margins, and shading). You then begin entering data or text into the resulting table. The program lets you define table titles, headers, and footers.

FrameMaker tables can include text and graphics rotated at 90-degree increments. One slightly irritating convention is that you must unrotate the cells in order to edit the text. You can also rotate the entire table. All of FrameMaker's other powerful features, such as variables, auto-numbering flows, and footnotes, are available for use in tables.

FrameMaker's flexible table editor lets you merge columns, scale them to fit specific widths, and even copy and paste column widths. In addition, you have full control over page breaks in multipage tables.

Tables also give you a workaround for one of FrameMaker's failings — namely, the program's inability to specify the distance before or after graphics-anchored frames. Without this feature, you couldn't position the frames consistently (always 12 points after a paragraph, for example). However, because you can position tables this way, you can simply add a graphics-anchored frame to a one-cell table and then specify the desired offset. You can even use the table title as a caption for the graphic by moving the title to a position under the table. This nonobtrusive use of tables is discussed, albeit inadequately, in FrameMaker's New Features manual.

One disappointment is the lack of an easy way to sort rows in FrameMaker tables. You must either convert a table into text, generate an alphabetical list, and then convert the list back into a table or enter your table data first as tabbed text, use the Generate command to sort it, and then convert it into a table.

FrameMaker 3.0's other major enhancement is conditional text, a feature that lets you create multiple variations of documents, such as advertisements and product descriptions, using one base document file. Material that every variation has in common appears normally, whereas text or paragraphs unique to variations appear with special user-defined formatting tags, such as strike-throughs. In order to view or print out a particular version of the file, you can specify which tags are to be visible or hidden.

The new version, which is System 7-compatible, also includes some minor interface tweaks, faster text display, and support for DCS (Desktop Color Separation) graphics. Outputting color separations, however, remains a rather clumsy process.

Although the manuals have been streamlined, discussion of the new features in version 3.0 is not integrated into the main documentation but appears in a separate New Features manual.

The additions to FrameMaker make it an even more powerful publishing package. Overall, for long-document processing and page layout, FrameMaker has no peer in the Macintosh world.


— Gregory Wasson

Spaceship Warlock

Unlike most adventure games, Spaceship Warlock is not about solving puzzles or perfecting hand/eye coordination. Warlock is pure exploration that rewards players for using good old common sense. And Warlock offers plenty to explore. The game's artwork weighs in at 128 megabytes' worth of data that spans a CD-ROM. The result is entertainment that's guaranteed to keep even the most fanatical gamers intrigued for hours at a stretch.

Spaceship Warlock is a joint creation of Mike Saenz and Joe Sparks. Saenz is well known for his work on Shatter and Iron-Mind, two comic books created entirely on the Macintosh. If you're familiar with Saenz's comic books, then you already have a feel for Warlock's futuristic graphics. The artwork, which incorporates 2-D and 3-D images plus animation, is truly phenomenal.

Players begin their space adventure in the unlikely of places: getting mugged by a pop-eyed green alien in the back alley of a city on the dreary planet of Stanbul. Next, after you've successfully KO'ed the slippery mugger, you collect a reward from the police for capturing your assailant, a wanted criminal. The reward money is your ticket to escape off-world, far from grimy, dab Stanbul. From there, you're off, traveling through space on a luxury cruiser, getting hijacked by space pirates, and battling to liberate mankind from the evil Kroll.

Despite its brawls and battles, Warlock is no shoot-'em-up game. It's an animated space-age world that makes you an inhabitant. What's more, Warlock offers fast action that doesn't bog you down with heavy text-input requirements. Point-and-click is all there is to navigating. To move forward, you simply click in the middle of the screen; to move right or left, click on the corresponding sides.

In addition to its outstanding graphics, another of Warlock's strengths is good use of sound. Characters actually speak to you, and the background noises and music set definite moods, from the sinister to the suspenseful. It's readily apparent that a great deal of work and care went into this game.

Spaceship Warlock is suitable for all ages. Although Reactor's uncharted world may not be quite as thrilling as the one in the movie BladeRunner, the game draws you in and makes you part of the action, an experience no movie can match.

Reactor, Inc., 3110 N. Sheffield Avenue, Chicago, IL 60657; (312) 528-1600. Version 1.0. $95.

— Stephan Somogy

Cubase

Cubase is a double import, from Germany and from the Atari ST, that can hold its own among such established Macintosh sequencers as Opcode's Vision and Passport's Master Tracks Pro. Cubase is designed to let you edit while
Infinity 88 Turbo Removable Cartridge Drive

For years now, 45MB cartridge drives have been the de-facto standard removable media drive. Many hundreds of thousands of these drives are in use throughout the world. And PLI has shipped more of these drives than any other integrator.

But today, a 45MB cartridge just isn’t big enough. For that reason, among others, a new standard is being established — 88MB cartridges. And once again, PLI is setting the standard. That standard is the Infinity 88 Turbo.

More Capacity
The demands for high-capacity data storage have increased steadily. Power users need it for virtual memory. Artists and publishers need it for graphics and typefaces. Everybody needs it for System 7. Today, nearly every Macintosh user needs 80MB or more.

Higher Reliability
Over the years, drive technology has improved. Reliability is much better. The Infinity 88 Turbo offers a 60,000 hour MTBF rating, twice that of the smaller drives. To emphasize that increased reliability, the drives come with a two-year warranty.

Faster Performance
The new 88MB drives are faster than the 45’s. They support both synchronous and asynchronous data transfer and do so at higher rates of speed. A look-ahead cache has been added to improve access times as well.

Save Money
And there’s more good news. The Infinity 88 Turbo drives are faster, bigger and more reliable than earlier drives, but cost only a few dollars more. In fact, the cost-per-megabyte is less for the 88MB drives!

Buy from the World Leader
PLI has been at the forefront of removable media technology for five years and is well known for the high quality of its products. Our software is known for its speed and reliability. PLI’s award-winning drive subsystems are built from the best components available, tested thoroughly (including a burn-in period of at least 24 hours) and certified by UL and FCC.

Standardize
Personal computer users all over the world are moving up to the 88MB cartridges. They are the new standard in removable media. And in order to use the 88MB cartridges, you need an 88MB drive like the Infinity 88 Turbo. Don’t get left behind. Call PLI today.

Peripheral Land Incorporated
47421 Bayside Parkway • Fremont, California 94538
510-657-2211 or 800-288-8754 CIRCLE 180 ON READER SERVICE CARD.
a sequence is playing, without compromising the playback tempo. You set up tracks in Cubase's Arrange window, where you enter track information on the left and get a graphic overview of the song on the right. Each time you record, you lay down parts that appear as horizontal bars. To arrange and edit your piece, you can move, copy, stack, and otherwise manipulate the parts in any way. You can even make ghost copies of parts that you can move to other tracks and play as other instruments. Changes you make to the originals automatically appear in the ghost copies.

Cubase supplies four windows for editing at the MIDI-event level. Each presents a view of your data that's maximized for particular kinds of performances and editing. For example, the Key window displays a piano-roll grid above a controller pane and the Drum window uses diamond-shaped notes that make it easy to create and edit drum tracks.

A tear-off Tool palette lets you draw notes or controller curves as well as click and drag events to change pitch, attack time, duration, and curve parameters. You can also "kick" an existing event earlier or later and add a string of notes with one click and drag of the mouse.

In addition to letting you select any number of adjoining or discontiguous tracks, parts, notes, or other MIDI events, Cubase provides a Logical Editor with a powerful set of Boolean selection and editing criteria, so you can fine-tune your compositions in a variety of ways.

Cubase comes with several standard quantizing schemes, but it also offers excellent and unique Match and Groove quantizing tools, which are real time-savers. The Match tool lets you quantize any selection according to the rhythmic character of another selection, and the Groove tool lets you create a rhythmic template in a specialized dialog box and then quantize to it. Both provide terrific ways to incorporate the "feel" you want into a piece or to tighten up performances without making them stiff.

Not only is Cubase compatible with MIDI Manager but it now also comes with a driver for the SampleCell, Digidesign's sampler-on-a-NuBus-card. With the driver, Cubase can address SampleCell cards on 32 MIDI channels and still see 16 channels each on the modem and printer ports. The Cubase/SampleCell combination goes a long way toward turning your Mac into a small stand-alone production studio.

Unfortunately, Cubase is copy-protected. Even more unfortunate is its timing resolution of only 192 ticks per quarter note. Although this is poorer resolution than that offered by some other sequencers, Cubase's other features make it a worthy competitor.

Steinberg/Jones, 17700 Raymer Street #1001, Northridge, CA 91325; (818) 993-4091. Version 1.8, $495.
—Tim Tully

QuickTools is a well-programmed collection of eight utilities that's a testament to design simplicity. Although none of the devices is on a par with the superlative functionality of Now Utilities' Super Boomerang or NowMenus, as a whole, the package provides an easy way to beef up your productivity on the Mac.

QuickTools overlaps many popular commercial and shareware products. However, because its eight utilities were developed by the same person (Andrew Welch, author of many popular shareware and commercial programs), they share a consistent look-and-feel — once you've learned one, you've learned them all. Each operates as a System 7-compatible control-panel.

PowerStrip is a utility that provides a NeXT-like file-launching palette to which you can assign any application or Apple-menu item, thereby eliminating the hassle of navigating through layers of folders. Assignment of programs to the palette tiles is simple and direct, and each tile shows the icon of a selected application. Apple-menu items are depicted with a System 6-style DA suitcase. You can assign documents to each application (as you can with On Cue and DiskTop's DT Launch), so you can open them from PowerStrip as well as designate files that are to be opened automatically when you launch an application.

Of all the QuickTools utilities, Dialog Power! comes the closest to being a must-have. It lets you activate any dialog-box option from your keyboard. Required keys are clearly indicated by an underlined letter within each button (for example, the S in the Save button).

Sunset is a modular screen saver like Pyro! and After Dark, albeit without as much graphics pizzazz. QuickTools supplies 32 modules that contain various

NightWatch II. NightWatch II covers you with a new blanket of protection. Yes, the industry's most effective hard disk security has gotten even better. With three state-of-the-art protection options and master key capability, we've really caught the competition sucking their thumbs.

With ironclad hard disk protection while you're away, and hot spot screen security while you work, you'll feel safe again.

NightWatch II is easy to use and won't harm your data ... yet it's ruthless against snoops and intruders. So, whether you need absolute security, write-protection, or a myriad of automatic timed-lock options, rely on NightWatch II. It's System 7.0-compatible, great for site licenses, and soft on your budget. Nothing else can match it. With protection like this, you'll sleep like a baby.

Kent Marsh Building, 3260 Sul Ross, Houston, TX 77098
Sales: (800) 325-2537 Fax (713) 529-8965
Main: (713) 529-LOCK

ON READER SERVICE CARD.
BACKUP DESIGNED WITH RAMONA IN MIND.

Ramona's mother. But even she won't use our software unless it's fast and simple. So we designed DiskFit Pro to back up a Macintosh hard disk with just a few mouse clicks.

The first time you use it, DiskFit Pro creates a SmartSet™ — an exact copy of your hard disk. The next time you use it, DiskFit Pro copies and updates only the latest files, keeping your SmartSet clean and tidy. DiskFit Pro even prompts you to back up — just like a mom.

If you're too busy to spend hours learning a backup program, we think you'll like DiskFit Pro as much as Ramona does.

DiskFit Pro
To Go Forward, You Must Backup
AVAILAUBLE AT RETAILERS AND MAIL ORDER OUTLETS WORLDWIDE

1400 Shattuck Avenue, Suite 1, Berkeley, CA 94709 · 510/849-0295 · 510/849-1708 FAX

Circle 27 on reader service card.
Disk Array • 040!

High Performance Storage For The Macintosh Quadra 900
MicroNet's Raven • 040 Internal Disk Arrays

MicroNet's RAVEN brought unbeatable disk array performance to the Macintosh II. Now there's a more powerful Macintosh. The Quadra 900! It's based on 68040 technology and it's fast. The performance of the Quadra can be greatly increased by use of a MicroNet RAVEN-040 disk array.

The RAVEN-040 is a two-drive array that employs FAST-SCSI-2 technology. With data bursts as fast as 10 MBytes/sec, and average access times as low as 7 ms, these new systems are four times faster than the standard 160 MByte drive. They install internally and range in capacity from 624 to 2,020 MBytes.

The RAVEN-040 is expressly designed to use the built-in SCSI-2 ports of the Quadra 900. The PDS and all five NuBus slots remain open for other use.

The RAVEN-040's built-in performance makes it ideal for graphics, animation, pre-press, digital sound, multimedia, CAD/CAM, and file-servers, where speed and capacity are paramount.

The RAVEN-040 is the ultimate data storage system for Quadra 900.

No one can match the power of our RAVEN-040 storage solutions. Call our sales department today. We're ready to talk. 1-714-837-6033.

MicroNet Technology, Inc.

20 MASON • IRVINE, CA 92718 • TEL: (714) 837-6033 • FAX: (714) 837-1164
AppleLink: MICRONET.SLS • CompuServe: 76004.1611

RAVEN-040 is a trademark of MicroNet Technology, Inc. All other trademarks are the property of their respective owners.

CIRCLE 139 ON READER SERVICE CARD.
OCEANOGRAPHER HANS JANNASCH, LIKE 9 OUT OF 10 MAC® SPREADSHEET USERS, CHOSE MICROSOFT EXCEL.
Dr. Jannasch says, "Plankton's connected to the little fish. Little fish are connected to the big fish. And everything's connected by Microsoft Excel."

He's simplifying, of course.

But that comes naturally to Microsoft® Excel users. Because whether you're working on chemical analysis or cost analysis, Microsoft Excel can simplify just about anything.

As proof we offer the Toolbar. It turns multi-step jobs into one-button solutions, making everyday tasks that much easier. For example, to add a range of numbers just hit Autosum. And it's done.

If you're in the middle of a jumbo spreadsheet, you can use outlining to collapse your worksheet so you can view or print only what you need. Nothing more. Nothing less.

If you're working on two worksheets, or 22, or even 222, don't worry. You can easily consolidate them all into one.

And after you've found The Answer, you can communicate it beautifully. For instance, you can use any of Microsoft Excel's 68 charts. To add depth, choose from the 28 3-D versions—any of which will make you look 2X as good.

Now you're thinking, "How slick. How smart. How did they ever come up with all that?" Well, we had help. From users like Hans Jannasch of the Monterey Bay Aquarium Research Institute. And users like you. People whose input has helped make Microsoft Excel the spreadsheet standard since 1985.

For more information, just give us a call at (800) 541-1261. Ask for Department X37. And connect yourself with Microsoft Excel.
A flat-file database program is more than enough for most users, but buying a bargain isn’t a good idea.

BY SHARON ZARDETTO AKER

Flat-file database programs are a lot like alligators—they’ve survived through the years because they fit their niche perfectly. Flat-file database programs have been around almost from the beginning of Mac history, and even today, eight years later, a basic flat-file database program can satisfy many Mac users’ database needs. Unlike relational databases, flat-file databases deal with only one collection of information at a time, so related files, such as a database of company names and addresses and another of product names, can’t share information dynamically, although there are workarounds.

We looked at four flat-file database managers: RecordHolder Plus, Database, Panorama II, and FileMaker Pro. Two cost less than $150, and two are in the $300-to-$400 range. A fifth program, Filevision IV, takes such a different approach to data storage and retrieval that we’ve treated it separately (see the “Filevision IV: A Visual Database Program” sidebar). We expected that the low-end products would meet low-end needs, offering good but limited speed and functionality. We found that with the high-end products, you get what you pay for but that with the low-end ones, you don’t.
Flat-File-Database Programs

The Evaluation

Each of the four programs was evaluated for power, flexibility, and ease of use in four general areas: setting up the database and entering, manipulating, and retrieving information. We also noted any special features (or lack thereof) that make the programs unique (see Table 2).

For setup, we looked at the way programs let you (or make you) define fields, assign formatting, and create forms for on-screen data entry and for printouts. Are there special fields for specific data types, such as dates, times, and graphics? Can you make a repeating field — one that holds multiple data items in a single field? Can you incorporate background graphics in a form layout? Are there drawing tools? Can you create more than a single layout? (An alternative list view doesn’t count.)

The next thing we considered was data entry. We looked for automatic entry of repetitive data: buttons and pop-up menus, date and/or time stamping, and copying field contents from a previous record. Does the program check the validity of data, making sure that the contents of certain fields are numbers or dates or that they are within a certain range of allowable values? Is there any input formatting — can you type 123456789 and have it appear as #123-45-6789?

Data manipulation and retrieval are the crux of database management. To how many levels can you sort records? Can you work with a subgroup of existing records? What kind of criteria can you use for a search or select operation? Is there a wide range of functions for computed fields for doing calculations within a record? Is there a reporting function for calculations across records?

We used a 2,000-record file to compare the performance of the programs. We ran a series of benchmark tests, including a find and a variety of searches and sorts, under System 7 on a Mac Iici (see Figure 1).

RecordHolder Plus

Reviewers, like other users, tend to jump into a new Mac program without reading the documentation first. After playing with one of RecordHolder Plus’ sample files for a while (see Figure 2), we spent 15 minutes trying to figure out how to add a new record. After 10 minutes with the on-line help, we admitted defeat and turned to the manual.

Here’s what we found: Use the Clear command to erase the displayed record, type in the new information, and click on the Add button to add the data to the file. You can also type over existing data in a record and then click on the Add button. The whole procedure is based on RecordHolder Plus’ outdated approach: You use an Add command for each new record and a Replace command each time you edit a record. Luckily, you won’t find this approach in any other Macintosh database application: It’s clunky,

Figure 1: A flat-file-database program is sufficient for most database uses, but our tests showed that looking for a bargain isn’t a good idea. The two bargain-priced packages, Database and RecordHolder Plus, couldn’t perform many of the basic manipulation and retrieval operations we tested, and they were both too slow to be competitive. Even though the same 2,000-record file was used for these tests, the file size varied wildly among the programs. Being RAM-based, Panorama II streaked past the other packages, but FileMaker Pro’s capabilities made it the overall winner.

Figure 2: This unattractive window from one of RecordHolder Plus’ sample files is indicative of the program’s design. The reversed-out text at the top of the screen appears instead of a dialog box.
time-consuming, and totally counterintuitive.

Some of RecordHolder Plus' other interface flaws include a poor substitute for a dialog box — a few reversed-out words appear at the top of the screen. Pressing Return to acknowledge the message (a Mac user's instinctive response) moves you to the next field, because there's no interaction with these "dialogs." The program is also plagued by a variety of minor interface transgressions such as buttons that remain active even though their operations are not available. Basically the program's interface is ugly — buttons overlap each other and the edges of windows, for instance.

We might be able to overlook certain aesthetic and interface transgressions if the program had significant or special abilities. Although RecordHolder Plus provides a reasonable range of field types, a good selection of functions, and even input-formatting capabilities, everything is hidden someplace inconvenient. You can't even sort records into a specified order — you have to create a report form that has a specific order built in to it, and you can't see the report on-screen, except for two sample pages.

RecordHolder Plus wasn't able to perform most of our benchmark tests. Although it can do AND and OR searches, it can't do a group select — it looks for only the first record that matches the criteria. To see a sorted order on-screen, you have to save a report to disk and then open it, which accounts for the miserable performance results in the sorting tests (we timed only the processing time and not the time taken to set up the reports).

We could go on with the complaints or try to find a few compliments (the file size is compact). But whatever RecordHolder Plus' pluses are, its flaws are significant enough that we advocate avoiding it. The program is available not only as a separate product but also bundled in T/Maker's SmartBundle. We wonder if anyone at T/Maker has ever actually used it.
Flat-File-Database Programs

Database

If you read the review of Database in November ‘89 (“In Single File,” page 114), go back and reread it — Database hasn’t changed. But the program that looked promising two years ago doesn’t make the grade now.

You create a database with the Database Builder utility (see Figure 3). (The trade-off for having a compact database-management DA is that you need a separate utility to create and edit your databases.) Right away, you run into severe limitations in interface as well as functionality. Database is the only database program that makes you create a field and its label in separate operations. The process involves a confusing panel of icons, and it’s difficult to distinguish among the tools for text labels, text fields, and text formatting. Database Builder has no database capabilities, so you can’t test your form by inputting sample data.

Database has several limitations: It offers only one view for a file, although it does provide an alternative list view; it has no number or date fields (everything goes into text fields); and its calculated field has only the basic mathematical operators. There’s a border command for fields and labels and you can import graphics, but no drawing tools are available. Finally, the program has a 50-item limit for a database, which you can reach quickly, because it includes every element — fields, labels, and even background pictures.

Database Builder provides some special functions — its Xtras feature lets you incorporate things such as sound, phone dialing, and graphics grabbing. Its good points don’t balance out the bad ones, however.

And the Database DA’s good points don’t cancel out the problems involved in creating a database. Database’s general limitations hamper you in the number and types of fields you can create, and you also have to deal with minor but annoying “features” such as Command-K for Save and

Table 1: Deciding On a Database Program

<table>
<thead>
<tr>
<th>Pros</th>
<th>Database</th>
<th>FileMaker Pro</th>
<th>Panorama II</th>
<th>RecordHolder Plus</th>
</tr>
</thead>
<tbody>
<tr>
<td>DA convenience</td>
<td></td>
<td></td>
<td>RAM-based speed in</td>
<td>Small file size.</td>
</tr>
<tr>
<td>Xtras feature.</td>
<td></td>
<td></td>
<td>sorts and searches.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wide range of input</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>formatting.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Claimvoyance option.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lookup function.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Charting function.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 3: Database Builder lets you design a Database file, but it has a confusing set of icons in its Tool palette. There are two separate tools for text labels and text fields and a third for text formatting. The delete tool has no confirmation dialog box, and you can’t undo the action.

Figure 4: The Database DA window shows the form you designed in Database Builder and includes a set of control icons in the palette on the left. One glitch is in the dialog box that appears when you close the window: The Cancel button is always dimmed.
Cons

• Single view only.
• 50-field limit, including budget with equally limited memory and needs.
• Limited calculation options.
• No report.
• Large file size.
• Lacks input formatting.
• No exact match in database searches.
• Summary report fields don’t show on-screen.
• Slow in some operations.
• File size limited by memory-partition size.
• Confusing calculation needs setup.
• Clumsy, counterintuitive interface.
• Single view only.
• Slow.
• No group record selection.

Ideal Users

• Users on a limited budget with equally limited memory and needs.
• Medium-to-heavy-duty database users who need ease of use rather than speed.
• Medium-to-heavy-duty database users who need speed and are willing to surmount a learning curve.
• None.

---

The program did reasonably well in the benchmark tests it was able to perform, but it can’t do multiple-criteria selections. The test-file size was a whopping 1.020K.

DAtabase still shows promise, but there’s no indication that it will ever be fulfilled. With its design flaws and limited capabilities, it’s certainly not appropriate for heavy-duty use. It works best as a quickie database program when you need information at your fingertips. But if that information is phone numbers or other contact data, there are DAs that can handle those jobs more elegantly and more powerfully than DAtabase can.

**Panorama II**

Panorama’s approach to file handling is its greatest strength as well as one of its main weaknesses. The program keeps open database files entirely in RAM, so operations such as sorting and selecting are extremely fast but the overall size of any file is limited by the memory partition you’re willing to assign to the program. (The latest version has an auto-save feature, so the other problem of RAM-based information — data loss because of an unexpected power failure or a foolish move — is no more likely than in any other program where you may forget to save your work except at long intervals.)

Creating a simple database is easy, especially when you use Panorama’s default spreadsheet-like grid (see Figure 5). As soon as you go beyond the basics, however, you find some quirky features. Setting up a calculated field, for instance, requires writing an equation that’s linked to a field where the input is part of the equation — not to the field where the result appears. With this system, total=cost*tax is attached not to the total field but to the cost field. In addition, simple calculations are difficult to set up, because it’s not clear when to use the Formula Fill command, a macro, an equation in the design sheet, or a formula merge in an auto-wrap text object.

Panorama has more positive aspects than negative ones, however. Interestingly, many of its really nifty features are designed to conserve memory. The Flash Art feature, for example, is a way to retrieve graphics you want to use in picture fields in more than one record. The graphic is stored only once, but it can appear in any number of records. Panorama’s wealth of input-formatting options also helps save memory. If you’re storing 1,000 phone numbers for which you’ve typed a string of 10 digits with a defined format of (###) ###-####, for example, you’ll save 4,000 characters by not having to type the parentheses, space, and hyphen in each field.

In addition to practically endless input-formatting abilities, Panorama features Clairvoyance, an option that can be turned on for any field. When you enter data in a field, Clairvoyance suggests what you want after a few
Flat-File-Database Programs

keystrokes, based on the contents of that field in any other record. You can also ask to see that field's entries in other records and pick from a list.

The program provides a spreadsheetlike view of the database, but this version doesn't let you type a cell entry at the top of the screen and then enter in the cell as if you were using a spreadsheet program. Instead, a cell acquires a drop-shadow border when it's activated. Activating cells requires an extra keystroke or a double-click, and the window is limited to the column's width — you can't get at text beyond the cell's frame without scrolling or holding down an arrow key.

Panorama has a macro-recording feature — macros are listed on a menu for easy playback and are also available through user-definable buttons. It also has a lookup-table function that lets you access information in other files, the same semirelational capability FileMaker introduced.

Although Panorama does offer some multiuser support, it's a multiuser database program more in name than in deed. If you use Panorama in multiuser mode on a network — it requires network software, because it doesn't have any network capabilities built in — you can perform only three operations on a file. You can add a record, delete a record, or edit a record — you can't sort or otherwise manipulate the data. If more than one person edits a record, the last one to save the file "wins," which can be dangerous if your data is critical. If you want to do any data analysis on a shared file, you have to use the Snapshot mode, in which you can do anything you want to the data — except save it.

Because it's RAM-based, Panorama wins all the speed tests hands down. But speed is relative, and it isn't everything. Setting up your file and changing it takes a lot of time.

FileMaker Pro

FileMaker Pro is the champion Mac flat-file database manager, and deservedly so. This well-designed program has features like user definable buttons. It's worth putting up with a few minor glitches — or forgoing a few wished-for functions — in order to benefit from its overall functionality and ease of use.

FileMaker Pro gets high marks in the design category (see Figure 6). You can define almost any kind of field: text, number, date, time, picture, and calculated. Creating and formatting fields is a breeze, and wading through a long list of fields in the Create dialog box is much easier in this version than in previous ones. Repeating fields are available, but they can be frustrating to manipulate. Although you can perform overall operations (SUM, for instance) on the contents of repeating fields, you can't access an individual line of data.

You design forms for a database in the Layout mode, which includes a grid, a T square, and MacDraw-like drawing tools; you can also paste in graphics. Some things should be streamlined, though. Making a single-item check box, for instance, should be a matter of creating a field and defining it as a check box. The program makes you create the field and define a value list for it (two dialog boxes away), where you "list" the name of the field so it's assigned to the check box. Then you wend your way out of the dialog boxes, select the field, and use the Field Format command to make it a check box.

FileMaker Pro lets you create scripts that you can invoke
through buttons, which you create by using a menu command, or simply by moving into a specific view of the data. However, these are not true programming scripts like HyperCard scripts; instead, they’re single menu commands or options from a limited list of functions that are attached to a button. The scripting capability and especially the chance to attach a script to an on-screen button make FileMaker Pro very powerful and reasonably easy to use.

Data entry is easy in a well-designed FileMaker Pro file. With check boxes, radio buttons, and pop-up lists and menus, data entry can be quick. You can copy data for a specific field throughout a file, have data automatically entered when you create a new record, and use time and date stamps. Data entry would be even easier, however, if FileMaker let you define input formats for specific items such as phone numbers — as the program stands, if you want the area codes enclosed by parentheses, you have to do it manually.

FileMaker Pro has a powerful Lookup capability, which lets you retrieve related information from another file. This one-way information exchange falls short of true relational capability but provides an extra functionality that is often all most users need.

The Find function provides all the basic operators for retrieving data that matches specific criteria, but FileMaker Pro falls short in some of the basic search and select functions. You can’t make a specific match: Looking for Editor, for instance, also finds Managing Editor and Editorial. Even using the Exact Match option doesn’t do it, because in FileMaker Pro’s case, “exact” refers only to uppercase and lowercase letters; it doesn’t exclude extra characters on either side of the search string. Search, Select, and even the Lookup function ignore anything except alphanumeric characters, so FileMaker Pro doesn’t see the difference between A, A+, and A-.

As you can see in the benchmark-test results, FileMaker Pro doesn’t exactly scream through multilevel sorts, and it isn’t a speed demon for other basics such as importing data either — especially when compared with Panorama. (FileMaker Pro lacks a true NOT criterion for selections, but some simple processes can use the Omit function instead, which is what we used for the benchmark test.)

Even with these limitations, FileMaker Pro has some major advantages over the other database programs reviewed here. It’s easy to set up and use, and it’s the only true multiuser flat-file database manager available. In fact, because FileMaker Pro doesn’t require additional network software, it’s ideal for businesses or departments that need to share data but don’t want to go through the expense of maintaining a complex network.

Figure C: Déjà vu: The BeagleWorks database module is uncomfortably similar to the one in Works. Better formatting choices and background graphics make it look a little better, but you’re still stuck with field labels glued to field contents.

Figure D: Symantec’s GreatWorks offers a full range of layout capabilities. Its Tool palette proves that it’s not ClarisWorks or FileMaker Pro.

Figure E: Déjà vu all over again: ClarisWorks has most of the layout capabilities of FileMaker Pro.
Flat-File-Database Programs

Table 2: Features of Flat-File-Database Programs

<table>
<thead>
<tr>
<th></th>
<th>DAtabase 1.5.1</th>
<th>FileMaker Pro 1.0 v2</th>
<th>Panorama II 2.0.1</th>
<th>RecordHolder Plus 3.1 r6</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$129.95</td>
<td>$299</td>
<td>$395</td>
<td>$149.95</td>
</tr>
<tr>
<td>Data entry</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check boxes</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Copy field</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Date stamping</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Default field value</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Duplicate record</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Input formatting</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Lookup function</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Multiple open files</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Pop-up menus</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Radio buttons</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Unique fields</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Validity checking</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Field types</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Date fields</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Number fields</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Picture fields</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Repeating fields</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Time fields</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Forms design</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Background graphics</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Drawing tools</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Macros/scripts</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Multiple layouts</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Manipulation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AND/OR/NOT search</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Field functions</td>
<td>4</td>
<td>61</td>
<td>57</td>
<td>40</td>
</tr>
<tr>
<td>Report capabilities</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Group selection</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Sort levels</td>
<td>1</td>
<td>all fields</td>
<td>all fields</td>
<td>all fields</td>
</tr>
<tr>
<td>Company</td>
<td>Baseline Publishing 1770 Moriah Woods Blvd. Ste. 14 Memphis, TN 38117 (800) 926-9977 (901) 682-9976</td>
<td>Claris Corp. 5292 Patrick Henry Dr. P.O. Box 58168 Santa Clara, CA 95052 (408) 727-8227</td>
<td>ProVUE Development Corp. 15180 Transistor Ln. Huntington Beach, CA 92649 (714) 892-8199</td>
<td>Software Discoveries, Inc. 137 Krauser Dr. South Windsor, CT 06074 (203) 644-9225</td>
</tr>
</tbody>
</table>

The Fittest Flat-File

So what's the ideal flat-file-database program? It's simple: Combine FileMaker Pro with Panorama's Clairvoyance and input-formatting abilities, and mix in DAtabase's data retrieval.

More realistically, the recommendation for those who are considering buying a low-end database program is easy: Save your money until you can buy one of the high-end products. With DAtabase costing $130 and RecordHolder Plus priced at a sinful $150, spending twice as much money will get you 20 times the program.

As to deciding between FileMaker Pro and Panorama II: Unless speed is of the essence, FileMaker Pro provides at least as much as Panorama, in a more elegant environment, for a hundred dollars less. Sometimes the best bargains aren't the ones that cost the least.

Sharon Zardetto Aker is the primary author of the third edition of The Macintosh Bible (Goldstein & Blair) and is also author of The Macintosh Companion (Addison-Wesley).
How An Unlimited Imagination Thrives On A Limited Budget.

The world's most-persuasive graphics software is now the most-affordable. CA-Cricket Presents is now just $199, and CA-Cricket Graph is only $129.

It's fast, easy and fully integrated. It's CA-Cricket® Presents," and it has every feature you need to bring your ideas to life. A built-in outliner so you can organize your thoughts. Predesigned graphic templates. An electronic light table to edit and re-sequence your presentation. Plus speaker's notes and presentation-quality handouts and transparencies. And as you can see, you can even import graphics and scanned images from a wide variety of file formats including PICT, PICT2, EPSF and MacPaint files.

Need graphs for the slide show? Switch over to CA-Cricket® Graph." It comes with a selection of twelve graph types, plus all the color and fonts you need. With just a few clicks of the mouse, you'll have the charts and graphs that'll make your presentations shine.

So call 1-800-645-3003 for the location of your nearest dealer.

Now there are no limits to what the mind, or the wallet, can do.
Databases and
desktop publishing
are a match
made in heaven,
but getting them
to start talking
to each other
requires a little
help from the
right software.

Everybody loves a shortcut, especially one that saves money. If you need to publish a data-intensive docu-
ment such as a catalog or a schedule, database publishing is a shortcut you can’t afford to ignore. Instead of
outputting the information in your database; taking it to
a publisher; and having it reentered, formatted, and
typeset for publication, you can go (more or less)
directly from your database program to a finished
publication.

Database publishing has been around for several
years on the Mac, and a broad range of options is
available, from graphically sophisticated database
programs to database-savvy page-layout programs to
specialized software that bridges the gap between the
two camps. Let’s take a brief look at each approach.
Database Publishing

Solo Data

If your information is already in a database, the simplest solution is to leave the information where it is and use your database program to do your page layout for you. Many database programs, including ACIUS’ 4th Dimension, Odesta’s Double Helix, and Claris’ FileMaker Pro, have substantial layout features. (Another possibility is to use an integrated program such as ClarisWorks or RagTime, but they don’t offer very powerful database features.)

Unfortunately, no database program currently available for the Macintosh has the typographic sophistication of even the simplest page-layout program. For instance, not a single Mac database program can use the pair-kerning information that might be built in to a typeface. Most of these programs can specify leading (the space between lines of type) only in multiples of the type’s font size (such as single-spaced or double-spaced) rather than in absolute point values (such as 14 point). As for custom kerning, tracking, or hyphenation and justification, forget it.

Although many database programs let you specify colors, using the standard Mac pop-up 256-color palette, none allows for true spot- or process-color separations. Of course, if you’re brave, you can print your color database file to disk as a PostScript file (System 7 lets you do this by clicking on the PostScript File button from the Print dialog box) and run the file through a program that can separate it, such as Aldus PrePrint. This is a roundabout solution, however, compared with simply exporting the information to a program that can already handle color.

FileMaker Pro is one of the best database programs for creating pages. You can drag data fields from a pop-up list onto your layout, and you can apply rudimentary text sizing and styling to any field. You can draw rudimentary shapes and use FileMaker Pro’s rulers and T-squares to align objects. You can also lock the position of objects and even apply simple foreground and background colors and patterns when you’re using the FileMaker Layout view.

FileMaker’s Layout view can perform some simple mail-merge functions, such as compensating for blank fields in a record (see Figure 1). By designating a field as a “slider,” you can set up FileMaker Pro to move surrounding fields to compensate for a lack of data in that field. This lets you create a catalog of addresses, for example, in which even though some fields have one line and others have two or more, the output won’t be riddled with unsightly gaps. However, FileMaker Pro suffers from the same typographical naivété as other database programs do.

Solo DTP

Just as you can create layouts from within a database program, you can also manage a database from within a page-layout program. Publish It! Easy 2.1, from Timeworks, contains a built-in database program called File It! File It! is a simple flat-file-database program with few bells and whistles, but it’s more than adequate for maintaining simple lists of addresses or products. It also has many well-designed features for integrating data into Publish It! Easy documents.

File It! database files have only one layout, a simple row-and-column arrangement that looks like a spreadsheet. The plain look belies the data-management options that make

<table>
<thead>
<tr>
<th>Table 1: Five Ways to Do Database Publishing</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Method</th>
<th>Software</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use a database program only.</td>
<td>FileMaker Pro or any database program with advanced report-design features.</td>
</tr>
<tr>
<td>Use a page-layout program only.</td>
<td>Publish It! Easy! 2.1.</td>
</tr>
<tr>
<td>Combine a database and a page-layout program.</td>
<td>Any database program and any page-layout program.</td>
</tr>
<tr>
<td>Use typesetting tags.</td>
<td>Any programmable database program and any page-layout program that can read tags.</td>
</tr>
<tr>
<td>Use a database-publishing utility.</td>
<td>Xdata (for QuarkXPress) or DataShaper (for PageMaker).</td>
</tr>
</tbody>
</table>
File It! and Publish It! Easy a useful stand-alone database-publishing package. File It!‘s best feature is its ability to place the results of formulas in a field. By using a feature called Mr. Formula (don’t let the cute name fool you), you can access many relational, arithmetic, and conditional functions, including built-in smart text concatenation (see Figure 2). Mr. Formula can even check for syntax errors in your formulas.

You can set up Publish It! Easy so that documents containing data fields are treated as form letters (using one record per document and repeating the entire document for each new record) or as mailing labels (printing multiple records on each page). Calling this option Mailing Labels is a bit misleading, because it’s also how you print any other multirecord document, such as a catalog or a directory. Publish It! Easy and File It! are a convenient pairing, but they do have some drawbacks. Once you’ve created fields in a File It! data file, you can’t change their order. Although you can insert text as part of formulas, you can’t insert tabs or returns. So if your data file occasionally has empty fields (for instance, some entries have two or three fields of phone numbers and others have none), you can’t create a layout that avoids blank lines for these empty records. By using formulas and putting many elements on one line, you can reduce the number of blank lines, but you can’t eliminate them altogether.

Database and DTP Together

Suppose you have both a database program and a sophisticated page-layout program. Why not go directly from one to another? Well, you can, but it won’t necessarily be easy. The simplest method is to export your data from your database as a tab- or comma-delimited ASCII file. After you’ve exported the data, you can use your layout program’s text-importing command to position it in a document. Tab-delimited files usually require lots of work after you’ve imported them. Even if you use style sheets to quickly apply predefined paragraph formatting, you still need to do a lot of manual selecting and modifying, word by word and line by line.

What if you want to lay out your data in a format that’s more complicated than a columnar table? You might need to combine the information from several fields in a record into a single paragraph that contains some predetermined text such as a listing of sizes and prices for a single product, with tabs with leader dots between the entries. One problem with the ASCII approach is that it doesn’t address the problem of how to handle blank data fields. If you don’t want your document peppered with unnecessary blanks, you’ll need to proofread and edit it — a process that’s so labor-intensive that it negates the benefit of database publishing.

These problems can be solved in two ways. You can use your database program to massage raw information so that it contains the formatting instructions for your page-layout program, or you can configure your layout program to do the massaging.

Codes and Tags

Most high-end Mac database applications are programmable. If you take the time to learn their languages, it’s not difficult to create reports by using formulas that automatically compensate for blank fields or that concatenate the contents of several fields, along with text, to create new ways of arranging the database’s information.

You can tell a programmable database manager to add text-formatting information to exported files. To do this, you must know, in addition to the database’s programming language, the tagging system your layout program uses. Tagging is a method in which you include codes within a plain ASCII text file that instruct a layout program what formatting should be applied to the text.

Such a code can be a simple instruction for the layout program to apply a predefined style to a paragraph, or it can contain a specific formatting instruction for a single character or a range of text. When the layout program interprets the tags, it automatically applies the formatting and also removes the tags.

QuarkXPress supports two tagging formats: Style Tags and XPress Tags. You’ll probably want to stick with the newer XPress Tags, which lets you use tags to assign every one of QuarkXPress’ formatting commands as well as define styles through tags.

PageMaker 4.0’s more rudimentary tagging, available through its smart ASCII filter, is limited to assigning predefined styles to paragraphs. Version 4.2 of PageMaker supports far-more-powerful tagging capabilities, however. In fact, the new Aldus language sounds much like the DesignScript command language that is used by LetraSet’s
Database Publishing

DesignStudio. This powerful tagging language lets you not only specify text formatting but also create and position page elements, such as text and picture boxes, anywhere on a page.

Frame Technology's FrameMaker, a powerful long-document processor, also uses two tagging languages, MML and MIF. MML lets you create tags for most basic text and paragraph formatting, and MIF codifies virtually any object you can create in FrameMaker. And Xerox's Ventura Publisher, the pioneer of tagging, inserts formatting tags into any word-processing file it incorporates into a document.

If you're good at programming and are resourceful, you can write a program that has your database program add the appropriate tags to fields or groups of fields when you export data. Even simple FileMaker Pro, which isn't really programmable, can add tags to data in a report if you're clever with its arithmetic functions.

Tagging Tools

Writing your own database programs to produce tagged text gives you lot of flexibility, but it's not easy. What if you're not a genius programmer? There's still help for you.

CatBase 2.1, from BBF Publishing, is unique in the Mac database-publishing world. It's a stand-alone 4th Dimension database program (written in ACIUS' 4th Dimension but compiled so you don't need 4th Dimension to run it) custom-designed to export tagged data to QuarkXPress or PageMaker. As its name implies, CatBase is for keeping track of product information for catalogs. It consists of four linked relational-database files: Companies, Products, Company Contacts, and Product Details.

CatBase's facilities for entering and tracking data are powerful and varied, and BBF Publishing has designed enough flexibility into CatBase to accommodate maintaining a database of almost any information, not simply companies and products. In addition to all the data-entry fields you'd expect, the program has many user-definable fields. For those who find these inadequate, BBF can customize CatBase to fit more-specific needs.

As well organized as it is, CatBase would be just another database program if it weren't for its special exporting features, which let you apply the names of paragraph styles if you're sending data to PageMaker (you must define the actual styles in PageMaker) or define QuarkXPress paragraph styles from within CatBase. CatBase re-creates every dialog box that's in QuarkXPress for defining styles — down to the last radio button and check box. If QuarkXPress can do it, CatBase can specify it, from drop caps, leading, and tabs to custom colors, paragraph rules, and horizontal scaling.

Once you've defined paragraph styles, you must also have paragraphs to apply them to. CatBase also shines here, with a comprehensive set of dialog boxes for creating each paragraph as if you were assembling building blocks. You can combine data fields, text, formulas, punctuation, calculations (for summaries, subtotals, and the like), and subsidiary related elements in a single paragraph. Although it's complicated, CatBase gives you tremendous flexibility in exporting data. The formulas, in particular, let you have CatBase export different fields or specific text based on

Directory

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>Phone</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACIUS</td>
<td>10351 Bubb Road</td>
<td>(408) 252-4444</td>
<td></td>
</tr>
<tr>
<td>BBF Publishing</td>
<td>98 Wadsworth Blvd.</td>
<td>(303) 987-8577</td>
<td></td>
</tr>
<tr>
<td>CatBase</td>
<td>98 Wadsworth Blvd.</td>
<td>(303) 987-8577</td>
<td></td>
</tr>
<tr>
<td>Claris Corp.</td>
<td>5201 Patrick Henry Drive</td>
<td>(408) 722-9227</td>
<td></td>
</tr>
<tr>
<td>ElseWare Corp.</td>
<td>3201 Fremont Avenue N.</td>
<td>(206) 547-9623</td>
<td></td>
</tr>
<tr>
<td>Em Software</td>
<td>P.O. Box 402</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FileMaker Pro</td>
<td>$995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FileMaker Pro</td>
<td>$179.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FileMaker Pro</td>
<td>$995</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FileMaker Pro</td>
<td>$299</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PageMaker</td>
<td>$795</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PageMaker</td>
<td>$795</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DataShaper</td>
<td>$179.95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DataShaper</td>
<td>$179.95</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

February 1992 MacUser
conditional statements. If the price of an item is greater than a certain amount, for example, CatBase can automatically mention that that item's shipping is free. If a field is blank, a formula can tell CatBase not to bother exporting it.

Not only can you define paragraph styles in CatBase but you can also assign some character formatting, such as font, size, and color, to each paragraph element. As a final touch, wherever you enter text in CatBase, you can always include QuarkXPress formatting tags. Because CatBase produces a tagged ASCII file, these tags are seamlessly included in the final output.

Although CatBase frees you from having to write programs, you must still think like a programmer to get the most from the program, especially if you're working with large, complicated databases and report formats. Its other drawback is that CatBase handles only text, not graphics.

For those with simple database needs, BBF publishes CatBase Light, which is limited to 500 records but is only half the price of the unlimited single-user version. BBF also plans to publish a version of CatBase that will support FrameMaker's MML tagging format.

If your database program is 4th Dimension and your page-layout program is FrameMaker, you're in luck. ACIUS and Frame Technology are distributing 4D/Frame Connection. These tools can be pasted into any 4th Dimension database, adding buttons and dialog boxes designed for exporting data tagged with FrameMaker's MML format. The utilities won't let you actually define FrameMaker styles, as CatBase does for QuarkXPress, but if you create a FrameMaker document and define styles within it, any data that's imported with 4D/Frame Connection will have the proper styles applied. That's saying quite a bit, because Frame's character and paragraph styles are by far the most powerful of any in a Mac layout program.

4D/Frame Connection also lets you concatenate fields to build paragraphs, create anchored frames within FrameMaker, and import graphics. You can add indexing codes so your data will come into FrameMaker not only properly formatted but also ready to be automatically indexed. A few drawbacks: 4D/Frame Connection doesn't automatically compensate for fields that might be empty in some records, and you have to know enough 4th Dimension programming to properly incorporate these tools into your databases.

However, considering that Frame gives users 4D/Frame Connection without charge (simply mail the company a floppy disk), it's a must for anyone who uses 4D and FrameMaker. (ACIUS is mailing the utilities to its developers, who are free to modify and further distribute them.)

Although no Mac products are aimed at database publishing with Ventura Publisher, Ventura Software has introduced Ventura DataBase Publisher for PCs in GEM and Windows versions. This program exports information from PC database programs formatted with tags for the PC versions of Ventura Publisher, PageMaker, and InterLeaf Publisher. These three programs also have Mac versions that can import and format tagged files regardless of their origin. If you're adventurous enough to explore this avenue, don't forget to use a file-translation program that can properly convert DOS-style ASCII files to Mac-style by stripping out the line-feed character at the end of every line.

**Formattng Utilities**

Tweaking a database program to arrange and format your information can be quite a challenge, especially if you don't have programming experience. Suppose you use data from many different sources. It might be hard to ensure that all your information arrives at your page-layout program tagged and ready for use. In such cases, it's probably easier to work with plain delimited ASCII files and to do all the formatting in your layout program. It would be easier if you could set up your document once and have your layout program automatically apply the design and formatting you want to your data when you import it.

Fortunately, superb programs are available for the two most popular layout applications. PageMaker users can turn to ElseWare's DataShaper, and QuarkXPress users can get Em Software's Xdata. Both programs bring mail-merge functions to these layout programs.

DataShaper is a truly integrated add-on for PageMaker. To use DataShaper, you first write placeholder statements in PageMaker, using percent signs and somewhat cryptic codes that indicate where specific data fields go. You can then apply formatting to the code that represents each data field and export the text, using DataShaper's export filter. This creates a format file. When you use the Place command and select a format file, you get a DataShaper dialog box that lets you choose the actual data file. Then you can
Database Publishing

place the data as you can any other text, and it will appear preformatted, as specified by the placeholders.

Because you can have several formatted fields within a paragraph, using DataShaper is a useful, automated way to get around PageMaker's weak, paragraph-only tagging. DataShaper also lets you automatically import graphics files with your data and use PageMaker's indexing feature to index your data automatically. PageMaker supports links to text files, so anytime you need to update a document that uses DataShaper, you simply export the new information from your database to the same location and filename on your Mac and PageMaker automatically reimports and formats it with DataShaper.

DataShaper's single-character codes can be confusing at first, but the program comes with a full array of predefined templates for most uses such as creating catalogs, form letters, mailing lists, and name tags. For those who plan to use PageMaker for database publishing, DataShaper is probably the best product on the market.

Xdata works similarly to DataShaper, but instead of having to enter confusing one-character codes for most fields, you can enter the name of the field within brackets, along with other Xdata commands, to indicate where information should go (see Figure 3). Formatting works in much the same way that it does in DataShaper. You simply use QuarkXPress' character- and paragraph-formatting commands to give field names the formatting that you want to be applied to the text when you import it.

Instead of working with filters, Xdata uses prototype statements that you type directly into your QuarkXPress documents. If you position the insertion point anywhere in a prototype and use the Get Text command to import your delimited data, Xdata will replace the prototypes with your formatted information. Importing data wipes out the prototypes, so the manual recommends that you save prototype-containing documents you'd like to reuse as QuarkXPress templates.

Xdata 1.5, which should be available by the time you read this, lets you import picture files, although there are no PageMaker-like links to data files. You must manually reimport your data whenever you want to update documents.

Future Developments

One thing you won't see soon in the database-publishing field is much use of System 7's publish-and-subscribe. If you had a database containing 8,000 fields, you'd have to publish each one and then subscribe to each one in your page-layout program. Although an enterprising developer could surely automate this process, cluttering up your Mac with 8,000 edition files seems like a sure way to slow even the speediest machine to a crawl. This might not always be an insurmountable problem, however, because CatBase's distributor, BBF Publishing, is investigating using publish-and-subscribe to create two-way links between documents and databases. With this feature, if data changes in your layout program, the new information will be brought back into CatBase automatically.

In the future, expect to see more enhancements that reduce the number of steps needed to publish from a database. For example, upcoming versions of Xdata and DataShaper will work with Fairfield Software's ClearAccess and its ClearLinks external tools, which can use automated scripts to connect with remote Mac, PC, mini, and mainframe databases that support SQL (Structured Query Language). With the benefit of System 7's Apple events and future versions of these programs, you will be able to give a simple command from within your layout program and the combination of Xdata or DataShaper and ClearAccess will automatically find the source database; export the data fields you need; and bring the database into QuarkXPress or PageMaker, already formatted, positioned, and ready to be printed. You will even be able to create documents that periodically update themselves, untouched by human hands.

What to Choose?

It's convenient but limiting to create layouts directly in a database program. We also don't recommend working with plain delimited ASCII files unless you have a lot of time on your hands or you aren't fussy about the quality of your final output. Programming your database to add tags gives you flexibility that's limited only by your skill as a programmer but can be difficult and esoteric for neophytes. CatBase, 4D/Frame Connection, DataShaper, Xdata, and Publish It! are all excellent programs that offer powerful, flexible database-publishing possibilities, depending on your budget, current layout program, and database needs.

Eric Taub is a New York City freelance writer and Mac publishing consultant.
MicroNet’s 44 and 88 MB SyQuest Removable Cartridge Systems.

Now there’s more than one removable cartridge system to fit your on-line data storage needs. Our 44 or 88 MB drives provide infinite storage capacity and valuable data protection – simply lock away cartridges for total security.

MicroNet’s removable cartridge systems feature 20 ms access, embedded SGSI disk controllers to assure cartridge interchangeability, and proven Winchester technology with voice coil positioners. Our popular MR-45 offers assured compatibility with an installed base of 500,000 users. And the added capacity of our new MR-90 makes it great for backing up fixed hard disks and for transporting large graphic or CAD files.

Both the MR-45 and MR-90 are compatible with Macintosh, IBM PC/AT, and PS/2, and support Netware, UNIX, A/UX, and DOS. Internal PC systems are available with host adapter, cables, and device drivers for easy installation.

Choose a MicroNet 44 or 88 MB removable cartridge drive today. Either way you go, you’re sure to pick a reliable system with unlimited storage options. Give our sales department a call at 1-714-837-6033.

Quality You Can Count On.

MicroNet Technology, Inc.

20 MASON • IRVINE, CA 92718 • TEL: (714) 837-6033 • FAX: (714) 837-1164

AppleLink: D1666 • Compuserve: 76004,1611

MicroNet and MicroNet Technology are trademarks of MicroNet Technology, Inc. All other trademarks are the property of their respective owners.
Visibly faster. The RealTech laser printers' high performance Weitek RISC processor prints complex documents 4 to 5 times faster than other non-RISC laser writers in their price range. ATM font rendering technology builds raw type characters 4 to 5 times faster. The RealTech uses a new version of the Sharp printer engine that prints 9 pages per minute.

Based on Adobe PostScript® Level 2...
the next generation of Adobe’s page description language, which has become the industry standard for defining pages of integrated text and graphics. It contains a number of performance, function and print quality enhancements that save printing time and improve quality. PostScript® Level 2 is compatible with all current application software that supports the PostScript® language. In addition, PostScript® Level 2 offers new capabilities, including forms handling, graphic patterns support, and new half-tone algorithms.

500% FASTER than non-RISC printers
$1995

RealTech Laser

2 paper trays included.
An ideal choice for multi-user printing environments. Includes two 250-sheet cassette feeders as a standard feature. Optional envelope feeder available for RealTech only.

HOW REALTECH STACKS UP

PERSONAL LASER PRINTERS

<table>
<thead>
<tr>
<th>Price</th>
<th>Apple LaserWriter III</th>
<th>Quine CrystalPrint Publisher II</th>
<th>Texas Instru. PS35</th>
<th>GCC BLP1s</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1995</td>
<td>$3995</td>
<td>$2995</td>
<td>$1995</td>
<td>$2899</td>
</tr>
<tr>
<td>Pros</td>
<td>Weitek RISC processor</td>
<td>Weitek RISC processor</td>
<td>Motorola 68000</td>
<td>Motorola 68000</td>
</tr>
<tr>
<td></td>
<td>8 ppm 8.5x11</td>
<td>6 ppm 8.5x11</td>
<td>6 ppm 8.5x11</td>
<td>6 ppm 8.5x11</td>
</tr>
<tr>
<td></td>
<td>2nd paper tray</td>
<td>300 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td></td>
<td>SCSI port</td>
<td>SCSI port</td>
<td>SCSI port</td>
<td>SCSI port</td>
</tr>
<tr>
<td></td>
<td>2 mb RAM (+128x)</td>
<td>3 mb (+128x)</td>
<td>1.5 mb (+128x)</td>
<td>1 mb</td>
</tr>
<tr>
<td></td>
<td>PostScript Level 2</td>
<td>PS Level 2</td>
<td>PS Level 1</td>
<td>Quick Draw</td>
</tr>
<tr>
<td>Cons</td>
<td>Only available through</td>
<td>Very expensive</td>
<td>Expensive</td>
<td>Expensive</td>
</tr>
<tr>
<td></td>
<td>HARDWARE THAT FITS</td>
<td>No 2nd paper tray</td>
<td>No 2nd paper tray</td>
<td>No 2nd paper tray</td>
</tr>
<tr>
<td></td>
<td>1-800-972-3018</td>
<td>No SCSI port</td>
<td>Limited to 6 mb RAM</td>
<td>Limited to 6 mb RAM</td>
</tr>
<tr>
<td></td>
<td>Optional env. feeder $269</td>
<td>No SCSI port</td>
<td>Optional paper tray $199</td>
<td>Not PostScript compatible</td>
</tr>
</tbody>
</table>

Elimination of fragmentation = memory allocated dynamically and automatically reclaimed

Genius-level memory.
One pool of memory is available for all resource needs. Memory is dynamically allocated and automatically reclaimed; no arbitrary memory restrictions exist. Disk space management is improved to eliminate fragmentation and improve transfer of information from the hard disk to RAM.

HARDWARE THAT FITS
610 S. Frazier
Conroe, TX 77301
Rea/Tech laser printers come out on top in performance, features, AND price, every time.

TWICE THE PRINTER!

400 dpi/11x17 printer

- High-speed printing (16 ppm, letter size)
- 8 ppm (tabloid size)
- 2 paper trays included!
- SCSI port

See our ad on pages 150-155

$4495

RealTech Laser 400

AGAINST THE COMPETITION

11x17 PRINTERS/HIGH-SPEED PRINTERS

<table>
<thead>
<tr>
<th>RealTech Laser</th>
<th>QMS 2210</th>
<th>Hewlett-Packard U3i</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$4495</td>
<td>$9995</td>
</tr>
<tr>
<td>Pros</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weitek RISC processor</td>
<td>Motorola 68020</td>
<td>RISC-based formatter</td>
</tr>
<tr>
<td>8 ppm 11x17</td>
<td>11 ppm 11x17</td>
<td></td>
</tr>
<tr>
<td>16 ppm 8.5x11</td>
<td>22 ppm 8.5x11</td>
<td>17 ppm 8.5 x 11</td>
</tr>
<tr>
<td>2 paper trays</td>
<td>Optional 2nd paper tray*</td>
<td>2 paper trays</td>
</tr>
<tr>
<td>300 or 400 dpi</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td>SCSI port</td>
<td>SCSI port</td>
<td></td>
</tr>
<tr>
<td>4 mb RAM upgradable to 16</td>
<td>5 mb RAM upgradable to 17 mb</td>
<td>PS Level 1</td>
</tr>
<tr>
<td>PostScript Level 2</td>
<td>PS Level 1</td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Limited supply</td>
<td>Very expensive</td>
<td>Expensive</td>
</tr>
<tr>
<td>until 4/92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-800-972-3018</td>
<td>Limited to 300 dpi</td>
<td>Limited to 300 dpi</td>
</tr>
<tr>
<td>Poor paper handling</td>
<td>No 11x17 output; no SCSI port</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Our ads are created entirely on Macintosh systems, from concept to film.

The ideal networking printers.
The RealTech Laser's (and Laser 400's) three interface ports (Appletalk® RS-422, IBM PC parallel, and RS-232-C) can be used simultaneously. They can be assigned either PostScript® or LaserJet II emulation, making the RealTech an ideal network printer. It switches automatically between interfaces and emulations, and spools files on a real-time basis. A Hewlett Packard LaserJet Series II emulation allows use with non-PostScript applications software.

SCSI port. The standard configuration includes a SCSI port and 2 Mb of RAM upgradeable to 10 Mb (RealTech Laser) or 4 Mb of RAM upgradeable to 16 (RealTech Laser 400).

Money-back guarantee.
RealTech laser printers are backed by a one-year warranty. If you're not satisfied, we'll refund your purchase price, minus consumables.

Prices are subject to change without notice.
Before returning merchandise, we must ask that you call our Customer Service Dept. to receive a returned merchandise authorization number (RMA). This number must be included with any printer you return. No C.O.D. returns, please.

NOTE: Our ads are created entirely on Macintosh systems, from concept to film.
Staying in Contact

Contact managers give sales people the tools they need to close the deal.

BY TOM PETACCIA

Salespeople rarely use computers, because, until recently, no software was available that met their specific needs. Several database developers have successfully responded to this challenge by creating several very good sales-management tools based on the 4th Dimension, Double Helix, FoxBASE+/Mac, and Omnis 5 database managers and HyperCard. These sales, or contact, managers go far beyond being straight Rolodex-type lists of names and addresses. They can help users establish and track the development of new customers, from initial lead to final sale, as well as help maintain and retain existing customers.

We took a look at seven leading contact managers: Client 2.0, Colleague 2, Contact Ease, Control Classic, Market Master, QPID, and TeleMagic. (Chang Labs was invited to submit C•A•T III but declined to do so.) For the most part, we liked what we saw.
Contact Managers

Client 2.0

Trendware’s Client 2.0 is a HyperCard 2.0 stack. Although it’s not as feature-rich as the other products, it’s by far the least expensive and still provides a nice interface and a fair selection of features.

Each prospect/customer has one Main Client card (see Figure 1) plus an unlimited number of Interest, Financial (purchase history), and Contact cards. All are fully customizable. You can change any of the field labels and data types (text, number, or date) and decide whether the field is required — fields can’t be blank. For the Main Client, Interest, and Financial cards, you can also specify which fields can have lists of choices to streamline data entry.

For each new contact, you click on the Contact button on the Main Client card and then on the New Contact button on the Contact card. This automatically enters the client name and date you previously entered on the Main Client card on a new Contact card, and you simply enter a subject and comments in the fields provided. You can scroll through the various Contact cards, but you can’t get a list of contacts without creating a customized report. You can quickly remove old contacts by clicking on the Delete Contacts button, which gives you a Delete All Contacts Before dialog box.

Unlike the other programs, Client 2.0 doesn’t have an automatic in box in which the program automatically places a day’s scheduled activities. Instead, it has a Tickler card that lists follow-up date, company, division, phone number, and remarks. It doesn’t include the contact’s name, however. You add an item to the Tickler card by choosing Add Client to Tickler from the Client menu.

Importing files from another database isn’t as clean as it is in the other programs. The import file needs to have some formatting codes added for each record. A good word processor can handle these additions quite easily, but this is an extra step that’s unnecessary in the other programs.

There is no built-in mail-merge feature, but any search results can be exported to a text file. You’ll have to add formatting codes to this text file too before it can be used as a data file for creating form letters.

Trendware went to great lengths in working around HyperCard’s anemic report-generating capability to provide a small but functional set of preset reports and mailing labels that can print all records or a subset based on search criteria.

The 50-page manual is adequate but poorly organized. It assumes that users are familiar with HyperCard or at least have access to a HyperCard manual — for example, the section on reports refers users to the HyperCard manual for details on creating customized reports.

The skimpy manual and extra import and export steps might be enough to scare off some users, but for sales reps on a tight budget or wanting an extremely detailed personal address book, Client 2.0 may be worth considering.

Colleague 2

Colleague 2 is the slickest-looking package in the group. It sports a clean, attractive interface that makes using it a visual pleasure, so it’s perfectly suited for the graphic designers, photographers, and other creative-industry people for which it’s designed.

The program takes a comprehensive approach to prospecting and maintaining clients. It includes Calendar, Mail Merge, Bids, POs, Invoicing, Receivables, and Checking Account Management functions. Colleague 2 could even
The Client entry screen is composed of two pages. The first consists of standard business-card information plus special keyword and request lists and activity notes. All calendar events are posted to the activity notes automatically. Colleague 2 also allows multiple contacts ("associates") per client. Other packages do that too, but only Colleague 2 lets you tag more than one contact to be on a mailing list — quite a time and space saver. The second page contains any user-defined fields.

Job Tickets (see Figure 3) can be invoiced items, bids, or purchase orders. You can change a bid to an invoice without creating a new Job Ticket. In such a case, an invoice can mean a job in progress as well as a finished job. A job can be entered when it's first assigned, with charges added as they're incurred.

Product or service items, such as hourly rates or outsourced purchases, can be added to a products list, which contains Product Codes, Description, Vendor, Cost, Selling Price, Profit Margin, Commission Rate, Amount in Inventory, and Notes. Once entered, items can be quickly added to any job ticket by picking them from a products list.

The checking module, although it's not an accounting application, offers a nice selection of features. It handles multiple checking accounts, a Chart of Disbursement Accounts (expense categories), a Reconciliation Summary (which compares your account balance with your bank statement), and General Ledger and Cash Journal reports.

You enter information for deposits, checks, and cash withdrawals in the same window. Checks can be printed on laserprinters or on an ImageWriter with Deluxe check form style #091192. Even the most bookkeeping-phobic user will find Colleague 2 a painless way to keep track of cash flow.

Colleague 2 lacks the strategic-planning and automated-follow-up routines of its 4D sibling, Control Classic, but it does have the same formula, reporting, labeling, and charting features and implements them in virtually the same

Figure 2: Colleague 2 sports the slickest and most attractive interface of all the contact managers. Through its simple and elegant calendar, you access all the program's main functions, including the integrated checkbook.

Figure 3: Colleague 2's Job Tickets incorporate all charged items and reflect payments made on the invoice.
Contact Managers

Contact Ease's Activity card helps you record all your contact interactions. You can label an activity as Phone, Letter, Meeting, or Other through the Act. Type pop-up menu.

Figure 4: Contact Ease's Activity card helps you record all your contact interactions. You can label an activity as Phone, Letter, Meeting, or Other through the Act. Type pop-up menu.

Figure 5: Contact Ease's in box gives you an easy-to-read list of active items that shows you who and what needs attention.

Figure 6: Control Classic's big advantage over Contact Ease is its ability to display your clients in a list, as shown here.

Contact Ease

Developed by Westware and built on the Omnis 5 database program, Contact Ease is an extremely easy to use yet sophisticated contact manager.

Its unassuming design centers on four tab cards — Activity, Address, Custom, and Plan — for each contact. Address contains basic business-card information. Custom has user-defined fields that meet either an individual sales rep's or a company's needs.

After the initial input or importation of company data, most of the focus is on the Activity card (see Figure 4), where all interaction with the contact is entered. For each activity, you record the date, time, duration, status (active, on hold, completed), notes, follow-up action, and other information. All active items are automatically placed in your in box (see Figure 5). You can quickly see who needs attention by clicking on the In Box button.

The Activity, Address, and Custom cards alone would make Contact Ease a good product, but the advantage of this program is that it's designed so that users set the wheels in motion and then let Contact Ease do the rest.

Users can create Keep in Touch Plans, which are nothing more than outlines of the steps necessary to complete a sale. A Step usually consists of making a phone call or sending a form letter. Depending on the contact's response to this (which users enter on the Plan card), Contact Ease automatically moves to the next logical step. When you issue the Do Plans command, all applicable letters to be printed are sent to the out box and all phone calls to be made are sent to the in box. You can print all the day's sales and follow-up letters in one easy step, with a single mouse click on the Out Box button.

The built-in word processor incorporates a very easy mail-merge menu that makes creating personalized form letters a snap. These letters are maintained within the database and can be merged to an individual or group of contacts, whether or not they are part of a plan.

The Scripts feature lets you create a series of dialogues and questions to help with telemarketing sales efforts. Contact Ease also provides a nice selection of lists and reports, which can be customized via a dialog box.

The most frustrating thing about Contact Ease is that search results cannot be displayed as a list. When you conduct a search, you see only the first record that meets the criteria you've set. You must then issue Find Next commands to take you through the rest of the found items. Other minuses include the inability to change the addressee font (Courier) on an envelope or label and the lack of color and...
a shipping-label option. Also, some users may find the input screens a little cramped. However, these problems are relatively minor compared with the overall sleekness and simplicity of the program.

Documentation consists of a slim, clearly written 107-page manual. Beginners should have no trouble getting Contact Ease running quickly.

For sales professionals who want a program that concentrates on developing customers, Contact Ease is ideal.

Control Classic
Control Classic is a pure lead processor, a streamlined subset of Control II, Diamante Software's 4th Dimension-based lead-tracking, order-entry, and invoicing package.

Control Classic is just like Contact Ease — only different. It offers virtually the same feature set as Contact Ease does but with a slightly cleaner interface. Client information consists of four cards: General, Contacts, Activities, and Custom. Contact Ease dedicates a card to tracking Plan steps, whereas Control Classic incorporates the tracking function into its Activities card. Control Classic uses the Custom card to list multiple contacts (names) from a company — something Contact Ease doesn’t offer.

The big advantage Control Classic has over Contact Ease is the ability to show lists of contacts (see Figure 6). In fact, it’s the default view. Double-clicking on a line in a list brings up the corresponding client card. You can create sets that show a select list of clients, but the selection isn’t

---

**Table 1: Choosing a Contact Manager**

<table>
<thead>
<tr>
<th>Pros</th>
<th>Cons</th>
<th>Ideal Users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Client 2.0</strong></td>
<td>• Inexpensive. • Highly customizable.</td>
<td>• Minimal feature set. • No word processor. • Awkward import and export capabilities. • No color.</td>
</tr>
<tr>
<td><strong>Colleague 2</strong></td>
<td>• Clean interface. • Job Tickets. • Checking accounts. • Excellent mail-merge.</td>
<td>• No automated plans.</td>
</tr>
<tr>
<td><strong>Contact Ease</strong></td>
<td>• Simple interface. • Automated plans. • Mail-merge.</td>
<td>• No display lists. • Can't change envelope font. • No color.</td>
</tr>
<tr>
<td><strong>Control Classic</strong></td>
<td>• Automated plans. • List views. • Tracking of marketing efforts. • Excellent mail-merge. • Formulas.</td>
<td>• Multivolume, error-prone documentation. • Indirect way of accessing in/out boxes.</td>
</tr>
<tr>
<td><strong>Market Master</strong></td>
<td>• Totally automated customer development.</td>
<td>• Long setup time. •Weak mail-merge.</td>
</tr>
<tr>
<td><strong>OPID</strong></td>
<td>• Automatically presents daily scheduled events when launched. • Total job tracking. • Personnel files.</td>
<td>• No automated plans. • No word processor. • Confusing number of categories.</td>
</tr>
<tr>
<td><strong>TeleMagic</strong></td>
<td>• High speed. • Familiar notepad environment. • Selection filters. • Easy order entry.</td>
<td>• No formatting in word processor. • No automated plans. • No choice lists. • Large number of files needed.</td>
</tr>
</tbody>
</table>
Contact Managers

dynamic—if you create a set to show only clients and later add new clients, the set won’t include the new entries when you call it up. You have to reselect the list and create a new set.

Another way to manipulate groups of records is via Control Classic’s use of 4D’s Formulas feature, which lets you do everything from converting case to resetting follow-up dates and more.

As with Contact Ease, Control Classic’s strength is the ability to develop automated Processes for developing prospects into customers. Scheduled phone calls and form letters are automatically placed in your in box or out box (respectively) when you issue the Update Processes command. Control Classic also has another nice feature: Efforts. Efforts are marketing activities—such as direct mail, ads, and brochures—you use to attract prospects. With Efforts, you input the expenses associated with a promotion, for example, and then track the response. The result is a handy cost analysis on the effectiveness of the promotion in terms of response and sales.

For word processing/mail-merge, Control Classic incorporates DB/Write (see Figure 7), a full-featured writing tool for creating form letters and other correspondence (previous versions used ACIUS’ more sophisticated—and somewhat more cryptic—4D Write). Any Control Classic field can be merged anywhere within a Merge document.

Control Classic includes other standard 4D goodies such as a comprehensive reports generator, custom label maker, and graphing tools. All are outstanding and provide a wide range of flexibility.

Control Classic’s Achilles’ heel is its documentation, which is divided into three manuals: the main reference; the supplement, which incorporates new, updated, and corrected information since the 1.0 release; and the Diamante Language Reference, which covers creating formulas and custom scripts. Plus, some misplaced screen dumps depict screens from Control II instead of Control Classic. The result is a lot of switching back and forth that creates a little confusion and a good deal of frustration. Hopefully, the manuals will be consolidated in a future release.

There are also a few minor annoyances in using the package. Control Classic makes you go to the Splash screen (the opening screen) to check your in/out boxes as well as to perform an Update Processes procedure.

For salespeople who want the convenience of lists, multiple contacts per client, and the ability to track promotional activities and who can put up with wading through the manuals and a tiny bit of awkwardness, Control Classic is an excellent choice.

Market Master

Breakthrough Productions used Double Helix to create Market Master, which takes a highly automated approach to developing sales.

The prerequisite for using Market Master is to plan ahead. For this program to be truly effective, you need to plot out your sales strategy in advance.

As with Contact Ease and Control Classic, creating a strategy is very similar to writing a computer program based on IF/THEN/ELSE statements (see Figure 8). In the case of an unsolicited lead, the strategy might be as follows:

Step 10: Send introduction letter with brochure. If lead doesn’t respond in ten days, go to Step 20: Make phone call. If lead does respond and requests more information, go to Step 30: Send follow-up letter with information. If lead orders the product, go to Step 100: Take order info, and send thank-you letter.

Obviously, there can be numerous other steps in between—the more you anticipate, the better. However, you can add or subtract steps and form letters at any time. There are also two classes of Codes you can create to streamline the entering of various inquiry types and products requested. All this takes time up front, but it pays off in the long run. And that brings us to the beauty of Market Master.

Once it’s set up, all you have to do is enter (or import) new leads and take the initial step—Market Master takes over from there. Each time you log in, you can see how many letters and calls are scheduled for that day and the week ahead. All form letters (with envelopes or shipping labels) can be printed with a single command.

Market Master can also generate several preset data and summary reports. There is no custom-report generator, but Market Master’s preconfigured reports covered everything we could think of.

On the negative side, the setup and the menu structure are confusing, especially for novice users. Market Master has the weakest mail-merge function of the group—the only variable is the addressee. The body of the letter itself cannot incorporate any field data or tabs. Also, the Autodial feature
IF YOU DON'T HAVE THE PLP II, YOU'LL NEED SPECIAL EQUIPMENT TO GET EDGE-TO-EDGE PRINTING.

If you want a printer that's a cut above the competition, look no further than the $999 Personal Laser-Printer™ II (PLP™ II) from GCC Technologies®. GCC's exclusive edge-to-edge printing gives you the power to produce larger graphics, flow charts, and much more. With other printers, like the Apple® Personal LaserWriter® LS, you're forced to cope with margins that confine your graphics and narrow your options.

Edge-to-edge printing is just one of the features that set the PLP II apart from the pack. Other features include:

- **PostScript upgrade.** Provides an upgrade path to PostScript® and AppleTalk® networking.
- **Greater scaling capabilities.** Scales from 25% to 400% in 1% increments, compared with the Personal LaserWriter LS, which is limited to 50% and 75%.
- **Straight-through paper path.** Ensures wrinkle-free printing of heavy stocks, envelopes, labels, etc.
- **New! Background printing.** Lets you get back to work on your computer faster, and allows sharing using AppleShare® with System 7.0.
- **Faster print time.** Prints faster than the Personal LaserWriter LS. In fact, MacUser (May 1991) found the PLP II to be 20% faster than the Apple Personal LaserWriter LS on their Microsoft® Word test document, 40% faster on their MacDraw® II test, and twice as fast on their Excel test.
- **On-screen page preview.** Saves time, toner and paper.

Of course, the PLP II also features the unmatched reliability and innovation that go hand-in-hand with the GCC Technologies name. It's the name to count on when you're looking for a high-quality, affordable laser printer. And there's no margin for error.

**Easy Ordering. 800-422-7777, extension 285.**

To acquire your new PLP II, simply call us toll-free, and we'll give you the name of the GCC Technologies dealer nearest you. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery.
Contact Managers

doesn’t let you bypass the local area code or set outside-line access.
Breakthrough has broken Mac norms by colorizing the menu bars (gray) and menu text (red). The developer says that this is so users can tell if they’re in Market Master under MultiFinder or System 7, but it’s still a hair tacky.
Market Master Manager, which comes with all but the single-user version, lets sales supervisors reassign territory, check on who is and isn’t making follow-ups, get sales totals by sales rep, and perform other administrative functions.
The manual, like the program itself, is good but too methodical. If you like to proceed step by step by step,

**Figure 8:** Market Master takes a rigid stepwise approach to developing a sales plan. The required setup time is considerable, but once your plan is complete, keeping up with sales prospects is automatic.

you’ll appreciate Market Master’s structure, in both documentation and program.

**QPID**

Another 4D product, QPID, from GT Omnicom, wins the award for having the best manual. It’s clearly written and organized, so people who have never used a database program before will quickly learn database concepts and understand how QPID’s features relate to them.

Like Colleague 2, QPID takes an enterprise-wide approach to sales management and is more geared to service industries than to manufacturing (although both packages can easily be configured to handle nonservice businesses).

QPID doesn’t have Colleague 2’s checking features; instead, it has robust contact- and employee-management tools, including personnel files and time slips (see Figure 9).

The program is divided into the following 15 categories: Clients, Contacts, Incoming Messages, Quotes, POs, Invoices, Employees, Dockets, Items, Services, Suppliers, Time Slips, Tasks, Schedule, and Events.

When launched, QPID automatically presents a list of events scheduled for the day. The Schedule screen displays a calendar, where you can view your events or those of a coworker as well as events for a particular day, week, month, quarter, or year — or all the events. QPID color-codes events to indicate carried-over, present, and future items.

All the entry screens are clearly organized and incorporate standard information in their respective categories. A nice touch on all the list screens is a two-letter-keyed alphabetical index bar (A-B, C-D, and so on). Clicking on a two-letter index item immediately gives you a subset list of files beginning with either of the two letters.

What makes QPID stand out in the crowd is its ability to incorporate the elements of complete job or project tracking. Service items, tasks, suppliers, and employee-billing rates are all intertwined and can be assigned to a docket, or individual project ticket. Employees have weekly timeslips on which they enter the hours spent on various projects. At the end of the week, employees simply click on the Post to Docket button and charges for all applicable projects are updated. Outside purchases related to a project are assigned in the same way.

QPID offers the same formula, reporting, labeling, and charting features as the other 4D products do. Unlike the others, however, it does not include 4D Write or any other word-processing/mail-merge facility. Instead, GT Omnicom is committed to making its product System 7-friendly, so QPID’s next major upgrade will include publish-and-subscribe, which will dynamically link data to any System 7-savvy word processor. In the meantime, records can be exported to another program for mail-merge.

QPID is the only product that allows users to preview and change the import order of fields without starting from scratch — a great time saver.

If there’s a problem with QPID, it’s that it may be overcategorized. There were a few occasions when we weren’t quite sure where to go for what. New users may feel lost until they get accustomed to the program’s terminology and topography.

It’s not as polished as Colleague 2, but QPID offers a different and equally attractive feature set. For those looking for a way to automate projects and personnel records as well as prospect and client activities, QPID may be just the ticket.

**TeleMagic**

Imagine having a Rolodex-style file of very big cards on which you can write all you need to about each contact. Combine this feature with the powerful FoxBASE search-sort engine, and you have TeleMagic, a product tailored to the fast-paced, everything-doesn’t-always-fit-in-a-simple-category world of most sales professionals. The Mac version of the popular DOS product is lightning fast,
DOES IT SEEM LIKE INKJETS PRINT WITH SOMETHING OTHER THAN INK?

Waiting for an inkjet printer to print can be a pretty sticky situation. Fortunately there's a speedy alternative: the Personal Laser-Printer™ II (PLP™ II) from GCC Technologies. How fast is the PLP II? Try four to eight times faster than inkjet printers. And at just $999, it's also a very fast seller.

Speed is just one of the many features that help the PLP II pull away from the pack. Other features include:

- **Clean, dry output.** Unlike inkjet output, PLP II output never smears when wet.
- **High quality laser print.** Produces superior type clarity and sharper graphics.
- **Edge-to-edge printing.** Allows for larger graphics, flow charts, and more without the limitations of margins.
- **PostScript upgrade.** Provides an upgrade path to PostScript® and AppleTalk® networking.
- **Longer engine life.** Lasts at least three times longer than inkjet printers.
- **New! Background printing.** Gets you back to work on your computer faster, and allows sharing using AppleShare® with System 7.0.

Of course, the PLP II also features the unmatched reliability and innovation that go hand-in-hand with the GCC Technologies name. It's the name to count on when you need high-quality, affordable laser printing. And you need it fast.

**Easy Ordering. 800-422-7777, extension 247.**

To acquire your new PLP II, simply call us toll-free, and we'll give you the name of the GCC Technologies dealer nearest you. Or order direct from us, with a 30-day money-back guarantee and $9 overnight delivery.

© 1992 GCC Technologies, Inc. All listed trademarks are trademarks or registered trademarks of their respective manufacturers. GCC dealers are independent businesses and as such may offer different prices, policies, and service arrangements.

**CIRCLE 163 ON READER SERVICE CARD.**
Contact Managers

Figure 11: You can write up orders in a flash with TeleMagic by choosing predefined products and services from a handy list.

Figure 10: Because it's built on FoxBASE+/Mac, TeleMagic beats the other packages' speed. Its plain but comprehensive screen gives you a contact's complete history at a glance.

Figure 5: Unlike many of the other packages, QPID doesn't include a word processor; but it does include employee-management functions. QPID's Employees screen keeps records on all pertinent personnel data and includes employee pictures.

TeleMagic uses a notepad metaphor. Clicking on the notepad on the Main Contact screen (see Figure 10) automatically adds a new line that's date- and time-stamped, in which you enter any particulars for that contact. This note field is automatically generated when you finish a call initiated with the auto-dial feature. The auto-dial feature adds the option of letting you enter a user-defined response code (Busy, Sale, Awaiting Funding, and so on).

You then have the option of entering the follow-up, or Recall, date. A slight inconvenience is that you have to enter leading zeros — 07-08-91 instead of 7-8-91, for example. However, TeleMagic makes up for this with its own date shorthand. You enter 5D for five days from now, 1M for one month, and so on. TeleMagic calculates the proper date and enters it in the Recall field.

You can quickly access subsets of the data by creating filters to select groups of records such as prospects only or specific area codes. None of the other products have this useful feature. TeleMagic also lets you define as many as four custom indexes, which results in very fast search-and-sort patterns.

Once a sale has been made, you can use TeleMagic's Order Entry screen to write up an invoice (see Figure 11). Items (products, services, or comments) are stored in the Item List, which contains the item code, description, unit price, amount in inventory, and tax code. You can even have special codes for items such as individual client discounts. These are printed on one of two customizable invoice forms.

In addition to contact-specific screens, three nonspecific notepads — Goals, Appointments, and ToDo — let you enter free-form text without linking the text to a particular contact. A calendar is also available for entering appointments. Unfortunately, the Calendar and Appointment notepads are not linked. Scripts are also maintained in a notepad format and can be accessed from the Main Contact screen.

TeleMagic's Reports Generator includes a wide range of functions and formulas for producing analytical reports in addition to the standard directories, listings, and labels.

The manual, although a bit disjointed, does an excellent job of relating to sales professionals by providing everyday examples of how salespeople normally work and explaining how TeleMagic handles that type of situation.

Surprisingly, there is no way to automate plans or strategies in TeleMagic. It also doesn't have an in-box feature, but users can create a filter to select records that have the current day's Recall date.

It's easy to spot TeleMagic's DOS roots. No choice lists. No font formatting in the mail-merge word processor. The real giveaway is the 30-plus-file minimum actually needed for TeleMagic to run — and that doesn't even include any reports or form letters. But its performance flat-out blows away any database program in the group.

140 February 1992 MacUser
Finally, the first affordable PostScript® printer designed specifically for Macintosh® users. It's from GCC Technologies® and it's called the BLP Elite™. A printer so advanced that it offers exactly the features you're looking for, at a price you've never seen before. Just $1599.

That's a full $1000 less than Apple's Personal LaserWriter® NT. But that doesn't mean the BLP Elite has less to offer. In fact, the BLP Elite is packed with more features you want, like true Adobe® PostScript and built-in AppleTalk® for sharing over a network. There's also edge-to-edge printing for supersized spreadsheets and banners, and a straight-through paper path for printing wrinkle-free envelopes and labels.

The new BLP Elite is a faster printer, too. In fact, with its 16.67 MHz processor, it's one of the fastest PostScript printers in its class. About 40% faster than Apple's Personal LaserWriter NT.

But what makes the BLP Elite a more sophisticated, more affordable printing machine is its breakthrough technology, engineered at GCC. A compact controller board of the BLP Elite is the most compact, cost-effective PostScript controller board ever designed — half the size of the Apple® Personal NT's, with one-third the number of chips.

A compact controller means two things: fewer components and lower manufacturing costs, which translates to exceptional product reliability and a significant cost savings for you.

The New GCC “Frequent Buyer” Program.

And now, during our “Frequent Buyer” program (ends March 27, 1992), when you purchase a BLP Elite or any other GCC PostScript laser printer, you'll receive GCC “Bonus Dollars” worth up to $200! When you purchase a second GCC product of $500 or more, apply your GCC “Frequent Buyer Bonus Dollars” to your purchase, and experience savings like never before.

Easy Ordering. 800-422-7777, extension 357.

The $1599 BLP Elite PostScript printer is available from your Authorized GCC Dealer or directly from GCC. Call 800-422-7777, extension 357, for the name of the dealer nearest you or to place your order directly with us. Either way, you'll find it's painless to go lean and mean with the new BLP Elite.
Contact Managers

The Big Picture

Because all these packages are database products, they all have, at the very least, good file-searching tools. Only Client 2.0 and Contact Ease can't provide results in a list. With the exception of Client 2.0, all import and export files quite easily. All have an auto-dial feature, although Market Master doesn't support modem dialing. Only Client 2.0 and Contact Ease don't include color.

Except for Client 2.0, the programs are available in single- and multiuser packages. The multiuser option lets companies have a central database for optimum uniformity and consistency while letting individual reps maintain flexibility.

Contact managers are most productive when they're always accessible, so it's best if you have enough memory to run these database programs under MultiFinder or System 7. All are System 7-compatible.

Because the companies involved with these products are relatively small, they are extremely responsive to users, which means that they put out a lot of updates. This is great for users but hard on reviewers. All of these packages had at least one update during the review process, and some had two or three. Therefore, it's a good bet that by press time, just about all the products will have another version out—

with added capabilities and enhancements.

Everyone's a Winner

This is one of those rare win/win situations in software. There are no losers in this bunch. The differences are in the types of features offered and how they're implemented. Users have the luxury of choosing the interface most comfortable for them.

If we had to make a choice, we would give a very slight edge to Control Classic, based on its overall feature set and pricing, with Colleague 2, Contact Ease, and TeleMagic right on its heels. However, the shades of difference among most of these products are very slight.

Tom Petaccia runs Hired Gun, a Mac-consulting/development business in Charlotte, North Carolina.

Table 2: Contact Managers

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Client 2.0</td>
<td>Colleague 2 2.92</td>
<td>Contact Ease 1.2.2</td>
</tr>
<tr>
<td>List price</td>
<td>$195</td>
<td>$395; $175 per additional user</td>
<td>$395 (up to 5 users); $775 (20 users)</td>
</tr>
<tr>
<td>Company</td>
<td>Trendware Corp.</td>
<td>Colleague Business Software</td>
<td>Westware, Inc.</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 2285</td>
<td>10000 Research Blvd.</td>
<td>10148 Diamond Head Ct.</td>
</tr>
<tr>
<td></td>
<td>Huntington, CT 06843</td>
<td>Ste. 210</td>
<td>Spring Valley, CA 92077</td>
</tr>
<tr>
<td></td>
<td>(203) 926-1116</td>
<td>Austin, TX 78759</td>
<td>(800) 669-0671</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(800) 906-6965</td>
<td>(619) 660-0356</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(512) 345-6964</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Contact Managers, continued

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Market Master 3.0</td>
<td>QPID 1.4</td>
<td>TeleMagic 12</td>
</tr>
<tr>
<td>List price</td>
<td>$395; $595 (4 users); $495 (multiuser add-on)</td>
<td>$695 (single pack); $2,459 (5 pack)</td>
<td>$495; $995 to $9,995 (for network version)</td>
</tr>
<tr>
<td>Company</td>
<td>Breakthrough Productions</td>
<td>GT Omnicom, Inc.</td>
<td>Remote Control</td>
</tr>
<tr>
<td></td>
<td>210 Park Ave.</td>
<td>481 Queen St. E.</td>
<td>5928 Pascal Ct.</td>
</tr>
<tr>
<td></td>
<td>Nevada City, CA 95959</td>
<td>Toronto, Ontario M5A 1T9</td>
<td>Carlsbad, CA 92008</td>
</tr>
<tr>
<td></td>
<td>(916) 265-0911</td>
<td>Canada</td>
<td>(800) 992-9952</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(416) 368-1435</td>
<td>(619) 341-4000</td>
</tr>
</tbody>
</table>
If you're looking for unmatched reliability and convenience in a hard disk, then meet the new UltraDrive X series of high-capacity hard disks from GCC Technologies.

The new UltraDrive 1000X and UltraDrive 650X have a technologically advanced front control panel. With this panel, you'll have easy access to convenient features like a switch that lets you terminate your hard disk with the push of a button. You'll also have two LEDs that indicate your disk's power status and whether your drive is reading or writing. There's even an LCD that displays the SCSI ID number up front where it's easy to view.

The panel on the UltraDrive 1000X also offers the security of a push button write-protect switch. This protects your data from accidental loss, making the UltraDrive 1000X perfect as a file server.

Our UltraDrive X series utilizes Seagate's Winning mechanisms, the most trusted name for high-capacity disks. Each hard disk undergoes the tough temperature and shock tests that GCC is famous for. And every UltraDrive is backed by a full two-year warranty.

One-Key System Start.

We've also engineered the UltraDrive X series with a unique One-Key System Start™ feature. By simply pushing the power-key on your Macintosh® keyboard, One-Key System Start will automatically switch on your Macintosh computer, your UltraDrive X, and one auxiliary device. It even allows you to power down your entire system by selecting "Shut Down."

Valuable Extras.

Your UltraDrive wouldn't be complete with anything less than GCC's UltraWare™, a complete collection of value-added software the likes of which no one else offers. UltraWare includes GCC Partitions™ software that lets you partition information within your hard disk for better data organization. Included free with your UltraDrive is MacTools Deluxe™, a complete disk utilities package valued at $129.

For just $3,999 for the UltraDrive 1000X and $2,999 for the UltraDrive 650X, you can experience these disks for yourself. We offer internal as well as external versions of UltraDrives, in sizes ranging from 20 to 1000 megabytes. So there's sure to be an UltraDrive to suit your needs.

Easy Ordering. 800-422-7777, extension 489.

The UltraDrive X series and the complete family of UltraDrives are available from your Authorized GCC Dealer or directly from GCC. Call 1-800-422-7777, extension 489, for the name of the dealer nearest you or to place your order directly with us.
Is There a Pen in Your Future?

The pen-based-computing market is heating up, but Apple is keeping its plans under wraps.

BY HENRY BORTMAN

hat do you get when you cross a Mac with a pen? Not much. Not yet, anyway. Pen-based mobile computers are all the talk of the industry. They'll be light. They'll be cheap. They'll be pocket-sized. They'll be connected. They'll be easy to use: Millions of computerphobes will adopt them as indispensable. They'll breathe new life into the flagging computer market. They'll be so... '90s.

Nearly every major desktop-computer-hardware vendor has made announcements about its pen plans. Except Apple.

Apple CEO John Sculley has dropped hints that the company is hard at work on hand-held computers with built-in wireless-network connections and with cellular-fax and paging capabilities. Apple's application to the FCC to reserve portions of the radio spectrum for computer communications indicate that he's serious. Apple's licensing of handwriting- recognition routines and algorithms developed in the USSR by Moscow-based Paragraph JV has also raised a few eyebrows. And rumors abound that General Magic, the company headed by HyperCard wunderkind Bill Atkinson, is involved in similar efforts, developing products that will have multimedia capabilities and a pen-based HyperCard-like interface.

So it's clear that Apple is up to something. The question is, What? Will Apple develop a set of pen extensions to the Mac operating system, as Microsoft is doing with Windows for Pen Computing? Will it license portions of GO's PenPoint operating system for incorporation into the Mac OS? Or will it attempt to build a new alternative pen-based operating system not tied to the Macintosh? The definitive answers to these questions will simply have to wait.

Meanwhile, corporate giants such as DEC, Dell, HP, IBM, NCR, and Zenith as well as new companies such as Momenta and Pi Systems have announced pen-based hardware products or plans to develop them. Likewise, software companies ranging from Borland and
Clockwise from bottom left: NCR's System 3125, Samsung's PenMaster, and the Momenta computer.
WordPerfect to startups such as Ink Development and Slate have announced applications or demonstrated technologies that will run on this hardware.

But there is still a great deal of confusion, and most vendors are hedging their bets. One area in which this is most evident is in the choice of operating environments. The two leading contenders so far are Microsoft's Windows for Pen Computing (PenWindows for short) and GO's PenPoint. Many developers are excited about the object-oriented PenPoint environment, which was designed from the ground up specifically for pen-based applications for mobile workers. PenPoint is attracting the development efforts of creative startup companies, much as the Mac did in its early years. In fact, many Mac veterans are now working at GO or at companies that are committing major resources to PenPoint development.

But it is significant that, with one exception, every hardware vendor that has made a commitment to producing a pen-based computer — and more than 30 vendors have done so — has also made a commitment to supporting PenWindows. Many will support PenPoint as well. Some will support other, proprietary pen-based operating systems.

You can't really argue with their logic. It's a matter of simple economics. There are several million Windows users. For MIS managers already heavily invested in Windows, adopting and supporting Windows for Pen Computing will seem a much less risky prospect than switching to a completely new environment such as PenPoint. And for software developers, especially Windows developers, adding pen support to existing applications will require only an incremental effort, with the potential of high-volume sales in the short term.

Oh, you're wondering which the one holdout is? IBM. Its pen-based offerings will run only under PenPoint.

### Pointing the Way

Speaking of PenPoint, by the time you read this, the 1.0 release of this new operating system should be available. For more information on PenPoint, see "Computing on the GO," March '91, page 202.) NCR, Samsung, and GRiD have all announced computer models that will support both PenPoint and Windows for Pen Computing. NCR began shipping its System 3125 last November. Prices start at $4,765 for a system with 4 megabytes of RAM and no hard disk and at $4,795 for a system with 2 megabytes of RAM and a 20-megabyte hard disk. The Samsung PenMaster will ship with 4 megabytes of RAM and a 60-megabyte hard disk standard and will have a backlit VGA screen that can display 32 shades of gray. This configuration will list for less than $5,000. GRiD's standard-configuration GRIDPAD SL will have features similar to Samsung's PenMaster; pricing had not been set at press time. GRiD has been shipping pen computers that use its proprietary PenRight! operating environment for more than two years now. The SL is GRiD's first computer to support other operating environments. Neither Samsung nor GRiD has announced a specific shipping date for its pen units. Several other vendors, including DEC, Dell, HP, IBM, and Zenith have announced support for PenPoint, but none of these companies has yet announced a specific product.

On the software front, PenPoint developers have some new tricks up their sleeves. PenBook, from Slate, is one that should interest Mac users. Although we may have to wait a while to bolt pens onto our Macs, we will at least be able to share with PenBook customers the documents we generate on our Macs. PenBook will translate any document created on a Mac and saved as a PostScript file into an indexed document that can be read, navigated, and annotated on a PenPoint or PenWindows computer. Available in mid-1992, PenBook Author, required for the PostScript-to-Pen translation, will sell for $695; PenBook Reader, $99.

Then there are the true electronic-notepad applications that are ideally suited to pen-based computers. Remember Acta, the popular Mac outliner? Its author, David Dunham, is now working for a startup company called Pensée on a product called Penguin. Penguin is a sketch pad that gives users the freedom to place text-outline and free-form-artwork elements anywhere on an electronic page (see Figure 1). Ink Development is working on a suite of applications that will let users integrate handwritten notes and drawings with images captured by Logitech's FotoMan Digital Camera. And, yes, there will be a spreadsheet application: PenCalc, from Notable Technologies. Many of these products will run exclusively under PenPoint.

### Momenta's Decision

One of the more intriguing developments is the release of the Momenta computer, which its creators call a pentop device — a combination of pen and laptop computer. Realizing that pen-based computing is a technology in...
If you've ever wished you could afford to print in vivid color, the new Canon Color Bubble Jet™ printers are for you.

The first thing you'll notice is the brilliant, rich color. That's because both the BJC-800 and the BJC-820 print up to 360 dpi using four snap-in ink cartridges: black, cyan, magenta, and yellow. So you get true black and richer darker shades.

You'll also admire these printers' versatility. They print on virtually any size plain paper up to 11" by 17", on transparencies and envelopes.

Now you can be as creative as you want, preparing stunning presentations, graphics, even posters, right in your office. You'll be able to see results and make changes immediately, which saves time and gives you more control.

All these advantages are yours whether you use an IBM® PC or a Macintosh®, because the BJC-800 has a parallel interface and the BJC-820 has a SCSI interface.

You'll even be impressed with the cost. Both printers are a lot less than you'd expect, and the cost per page is remarkably low when compared with most other color printers.

Simply call 1 (800) 848-4123, and see how easily you can afford to improve your image.

Canon
COLOR BUBBLE JET PRINTERS
BJC-800/BJC-820

Canon® and BJL™ are registered trademarks and Bubble Jet is a trademark of Canon Inc. Macintosh® is a registered trademark of Apple Computer, Inc. IBM® is a registered trademark of International Business Machines Corp. The Color Bubble Jet printers will be available the first quarter of 1992. © 1991 Canon U.S.A., Inc.

CIRCLE 22 ON READER SERVICE CARD.
Pen-Based Computing

search of an installed base, Momenta has consciously hedged its bets and has produced a transitional hybrid machine. About the same size and weight as a laptop, the Momenta ($4,995) is a full-function DOS/Windows computer. Its screen tilts up for desktop use, and it has a detachable keyboard. Lower the screen so it’s flat and grab the tethered pen, and it can be used for pen-based computing, with Windows for Pen Computing or with applications developed in Momenta’s own Smalltalk-based environment.

Both environments can run simultaneously, and users can switch between them without rebooting, although no interaction, such as cut-and-paste, is possible between Windows and Momenta applications. The computer ships with basic pen-based word-processing, spreadsheet, addressbook, and calendar applications, all of which run in the Momenta environment. It will also have a built-in fax/data modem.

Momenta brings some innovative technologies to the pen-computing arena. The most intriguing is something called a command compass (see Figure 2). Momenta argues that pull-down menus and gestures — both PenPoint and Windows for Pen Computing use gestures for basic command input — require users to think too much. The command compass gives users an immediate visual indication of what actions can be performed on selected items on the screen.

Momenta also provides a unique approach to document retrieval. When users are in the DOS or Windows environment, the standard C> prompt is available. But in the Momenta environment, an alternative method is used. Users assign keywords to documents, which can then be retrieved by a keyword search.

And Then There’s Microsoft

Windows for Pen Computing may not have the bleeding-edge excitement of PenPoint, but one thing is certain: If the pen catches on, PenWindows applications will be pervasive. More than 100 software developers, including Aldus, Borland, Corel, Ventura, WordPerfect, and WordStar, have committed to supporting PenWindows. Don’t be surprised to see pen support in future releases of the Windows versions of Word and Excel either.

Pen capability is expected to make its first appearance with Windows 3.1 early in 1992. PenPoint’s object-oriented-programming model may make software development easy for those starting from scratch, and the time required to add pen support to existing Windows applications will be shorter still. Expect to see many developers shipping PenWindows applications before midyear. PenWindows users will also have a much larger selection of hardware platforms to choose from than will PenPoint users.

In fact, in its early years, the success of pen computing will be measured by the success of Windows for Pen Computing. It is here, with a familiar operating system from an established giant in the computer-software industry, that most users will get their start. With Apple out of the picture for the foreseeable future, and PenPoint — for all its elegance — an untested and therefore uncertain computing environment, many MIS managers will choose PenWindows as the way to experiment with introducing the electronic pen into their computing strategies.

Apple Revisited

That Apple is conspicuously absent from the hoopla over pen computing isn’t all that surprising. To a large extent, Apple has lost its innovative edge. When you think about it, the company hasn’t really done all that much that’s really new since it introduced the 128K Mac, the LaserWriter, and AppleTalk networking. Sure, it’s made faster Macs, color Macs, expandable Macs, and now even portable Macs that don’t require their owners to make weekly visits to the chiropractor.

All right, I take it back. QuickTime is pretty leading-edge stuff.

Still, for the most part, Apple’s product introductions, even its really cool stuff, have tailed the market, not led it. How long had color been around on the PC before the Mac II shipped? Sure, the PowerBooks are great Macs, but aside from being Macs, what do they offer that DOS laptops don’t? OK, System 7 introduced file sharing, but TOPS has offered peer-to-peer file sharing to Mac users for years.

But — and it’s a big but — when Apple does get around to doing things, even if they arrive a little late and cost a little too much, it usually does them well. When the Mac, or its successor, finally gets a pen, you can expect it to be as powerful and as easy to use as a pencil and eraser.

Henry Bartman, MacUser’s technical director, is spearheading a PenPoint development project for MacUser Labs.

148 February 1992 MacUser
Radius Redefines The Cost Of Color.

Introducing the latest in PrecisionColor technology from Radius. The most versatile and cost-effective 8 and 24-bit color video cards money can buy. Thanks to our own custom-designed ASIC chips, we can price these new PrecisionColor interfaces so low—our competition is turning green with envy. What’s more, these new interfaces work with virtually any color display ever made for the Macintosh. Which means true 24-bit color is now an affordable reality for everyone. PrecisionColor 8 ($599) gives you a full 256 colors. PrecisionColor 8x ($899) lets you upgrade to 16 or 24-bit color. Both PrecisionColor 8x and 24x ($1999) also give you the added benefits of on-board acceleration. Regardless of which one you choose, all our PrecisionColor cards allow you to view images in the resolution of your choice – 640 x 480, 1024 x 768, 1152 x 882 and 1152 x 870. And, if you’re connected to our new PrecisionColor Display 20, you can switch resolutions on the fly. Leaping from presentation to WYSIWYG to two-page mode without restarting your Macintosh. Our multi-frequency PrecisionColor Display 20 works with a variety of both Macintosh and PC video cards. Its built-in microprocessor synerizes with the video card to provide the best possible image for your selected resolution. And its extensive controls lets you fine tune the screen for a perfect image every time. Call 1-800-227-2795 for the name of the Radius Authorized Reseller who can show you our new PrecisionColor products. At these prices, you can’t afford to be without one.
INTRODUCING
the RealTech Trinitron

AT LAST...THE VALUE-PRICED ACCELERATED 24-BIT, 19" SOLUTION!

$2899

RealTech Trinitron System
The monitor solutions that break the price barrier for 19" Trinitrons!

Our 24-bit system includes the RealTech RT-24 video card with pan-zoom and extended desktop and G-world support. Socketed for up to 16 Mb of RAM! State-of-the-art engineering, On-board QuickDraw acceleration, 75 Hz vertical refresh rate. View 16.8 million colors at 72 dpi x 768 resolution. Our 8-bit system includes the RealTech RT-8 video card...a great starter system for 19" color!

CPU Monitor Price
--- --- ----
Mac II, IIX, IICx, Ilfx, IIci, Ilfx, SE/30, LC, Quadra 700 & Quadra 900 8-bit system $1899
Mac II, IIX, IICx, Ilfx, Quadra 700 & Quadra 900 24-bit system (accelerated) $2899

*Ilxi solution retains PDS slot for the RealTech cache card.

RasterOps 24XLTV 21" Color System
The latest in 24-bit technology. Live video and on-board acceleration, 16.8 million colors, 72 dpi, 75 Hz refresh rate. 1152 x 870 resolution. A full two pages of vibrant color!

$5819

We've been an authorized RasterOps dealer for 4 years; we support these excellent products with top-of-the-line service and warranties.

ColorBoard 24S ..............379 ImagePak Still Compression ....335
ColorBoard 245L .............669 TV Tuner .........................335
ColorBoard 24XLi ..........2349 14" Trinitron 24-bit ..........979
ColorBoard 24STV ..........1199 19" Trinitron 8XLI ..........2999
ColorBoard 24XLTV ..........2689 ClearView Classic 21" ..........1639
ColorBoard 264SE/30 ..........599 
ColorBoard 8LC .............599 Other monitors available. Please call for prices.
ColorBoard 8XL .............469
ColorBoard 364 .............679
CorrectColor Calibrator ....2019

Selko/RasterOps 24-Bit Bundle
$979

High-resolution Trinitron tube...view 16 million shades of color! 640 x 480 resolution, 72 dpi. 14" display has integrated tilt & swivel base. Includes RasterOps 24S video card. 43% brighter than the leading competitor!

ImagePak Still Compression ..335
TV Tuner .........................335
14" Trinitron 24-bit ..........979
19" Trinitron 8XLI ..........2999
ClearView Classic 21" ..........1639
Other monitors available. Please call for prices.

43% brighter than the leading competitor!
WE ONLY SELL NAMES YOU CAN TRUST.

RealTech Laser Printer

500% FASTER!

- RISC processor
- 2 paper trays
- 9 pages/minute
- SCSI port

$1995!

RealTech Laser 400

- RISC processor
- 16 ppm (letter size)
- 8 ppm (11x17)
- 300 or 400 dpi

$4495!

SEE OUR OTHER AD FOR COMPREHENSIVE INFORMATION AND PRICE COMPARISONS
GUARANTEE.

If you're not satisfied with what you buy from us, just call. We'll refund your purchase price (minus consumables, for printers).*

$1249

Ti MicroLaser* Plus.

300 dpi with HP LaserJet Series II emulation standard. 1.5 Mb RAM. Nine pages per minute; 17 resident fonts; 3,000 pages per month duty cycle. Optional accessories: 2nd paper tray, separate envelope tray.

ORANGE DEVICES

MacWorld have et “one of the rage devices...” authorized mail order ard-winning drives.

ly what size you should We'll be happy to help ght storage solution.
drives come with a one-year year is available. MicroNet in its most competitive market.

External Storage Devices

MB MB Per Sec. Price

<table>
<thead>
<tr>
<th>Model</th>
<th>MB</th>
<th>Per Sec.</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBT1288NP</td>
<td>3.1</td>
<td></td>
<td>$5769</td>
</tr>
<tr>
<td>SBT2022NP</td>
<td>2.6</td>
<td></td>
<td>$6849</td>
</tr>
<tr>
<td>SBT2600NP</td>
<td>3.8</td>
<td></td>
<td>$9879</td>
</tr>
<tr>
<td>SB606NPR</td>
<td>3.6</td>
<td></td>
<td>$4649</td>
</tr>
<tr>
<td>SB808NPR</td>
<td>3.6</td>
<td></td>
<td>$4879</td>
</tr>
<tr>
<td>SBT1288NPR</td>
<td>4.1</td>
<td></td>
<td>$5829</td>
</tr>
<tr>
<td>SBT2022NPR</td>
<td>3.8</td>
<td></td>
<td>$7499</td>
</tr>
<tr>
<td>SBT2600NPR</td>
<td>4.4</td>
<td></td>
<td>$10519</td>
</tr>
</tbody>
</table>

* Before returning merchandise, we must ask that you call our Customer Service Dept. at 1-800-972-3018 to receive a returned merchandise authorization number (RMA). This number must be included with any products you return. No C.O.D. returns, please. Thank you for your cooperation.

This ad was created entirely on Macintosh systems, from concept to film. Call us!
**Microtek Scanmak 600 DPI Scanner**

- **$1429**
- **Microtek 600ZS Color Scanner** includes Adobe Photoshop — full version, with 24-bit color editing and color separation capabilities.
  - 16.8 million colors
  - 3 scanning passes (red, green and blue filters)
  - 14 brightness settings for each color plane
  - Scanning speed 150 seconds
- **$2095**

**RealTech Dual-Page Displays**

- **$995!**
- 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, 74 dpi. Vertical refresh rate of 75 Hz, full gray-scale capability, and flat CRT (P4 phosphorus, polished screen). 1-year warranty.

**Microtek Scanmaker Slide Scanner.**

The affordable 35mm color slide scanner. Scans landscape or portrait slides at 1850 dpi. Captures 24-bit color and 8-bit grayscale. Bundled with PhotoShop, you’ll be able to produce 4-color separations from your color slides.

- **$1935**
- **Ti TurboLaser** - 300 dpi with Adobe PostScript Level and RISC-based processor. 2.5 Mb RAM. Nine pages per minute; 35 resident fonts. 15,000 pages per month duty cycle. Optional accessories: 2nd paper tray, SCSI interface.

**RealTech Full-Page Displays**

- **$579!**
- 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
  - Flat CRT, P4 phosphorus, polished screen
  - Full grayscale capability
  - One-year warranty

**CPU** | **Monitor** | **Price**
---|---|---
Mac SE, SE30 | Mono | $995
Mac II, IICx, IICI | Mono | $955
Mac IIx | GS 256 | $1435
Mac IIsi | Mono | $1059
Mac Portable | Mono | $1249

**CPU** | **Monitor** | **Price**
---|---|---
Mac II, IICx, IICI | Mono | $579
Mac IIx, IICx | GS 256 | $1079
Mac IIsi, IICI | GS 16 | $495
Mac Portable | Mono | $849

**MICRONET ST**

MacUser and Macworld rated MicroNet's best mass storage...and we're the ONLY dealer for these av...If you're not sure exact...buy, just give us a call...you determine the requ...All of MicroNet's h...quality...warranty; an optional second...continues to lead the industry.

**Internal Storage Devices**

<table>
<thead>
<tr>
<th>MB</th>
<th>MB Per Sec</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>III-303</td>
<td>1.4</td>
<td>$1465</td>
</tr>
<tr>
<td>III-404</td>
<td>1.4</td>
<td>1589</td>
</tr>
<tr>
<td>III-644</td>
<td>1.4</td>
<td>2259</td>
</tr>
<tr>
<td>III-1000</td>
<td>1.4</td>
<td>2929</td>
</tr>
<tr>
<td>III-1350</td>
<td>1.4</td>
<td>3519</td>
</tr>
<tr>
<td>III-644NP</td>
<td>3.0</td>
<td>2605</td>
</tr>
<tr>
<td>III-1000NP</td>
<td>2.5</td>
<td>3279</td>
</tr>
<tr>
<td>III-1350NP</td>
<td>3.2</td>
<td>3865</td>
</tr>
</tbody>
</table>

**Other SCSI Devices**

<table>
<thead>
<tr>
<th>De</th>
<th>MB</th>
<th>MB Per Sec</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD5000DAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44Mb Removable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>88Mb Removable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rewritable Optical</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
When you order from us, you order from computer experts, not order takers!

All of our salespeople have a minimum of 3 years of computer experience. They're trained in Apple's intensive program, as well as our own. We're proud of our team of sales and service experts. They're ready to help you (with a smile!) both before and after the sale.

**$8449** Mac IIfx 19" Ikegami System, 1 Floppy Drive, 8Mb RAM, 303 Mb MicroNet Drive, 8-bit 19" Color Monitor and Video Card, MacPro Plus Keyboard

**$2819** Mac IIsi B&W Full Page System, 3 Mb RAM, 40 Mb Hard Drive, MacPro Plus Keyboard

**$3845** Mac IIsi 14" Trinitron System, 5 Mb RAM, 105 Mb Quantum, MacPro Plus Keyboard, Cache Card

**$3629** Mac IIsi 14" Trinitron System, 5 Mb RAM, 105 Mb Quantum, MacPro Plus Keyboard

**$4595** Mac IIsi B&W 21" Dual Page System, 5 Mb RAM, 105 Mb Quantum, MacPro Plus Keyboard, Cache Card

**Introducing 4 new performance enhancements for Macintosh.**

RealTech IIsi Cache Card $159
- Full 64K of static RAM cache, and SANE control via the control panel.

RealTech IIsi Cache Card $169
- Can be connected directly to the internal slot in the Mac IIsi or to the RealTech Si adapter, which has a math coprocessor socket, a cache card slot and a processor direct slot. 64K of static RAM and SANE control via the control panel.

RealTech IIsi Adapter $59
- Has a math coprocessor socket, a cache card slot and a processor direct slot. Works with the RealTech IIsi Cache Card while retaining the processor direct slot.

RealTech Classic Upgrade $39
- Based on the latest SIMM technology, this card includes six SIMM slots and can be populated to 1 Mb, 1.5 Mb or 3 Mb. Add your own Mb, or buy it from us with 3 Mb.

**HARDWARE THAT FITS**

610 S. Frazier
Conroe, Texas 77301
Call: 1-409-760-2400
Prices are subject to change.
A NOTE FROM THE PRESIDENT:

"We demand that the products we sell are backed by absolute top quality, service and delivery. When our suppliers don't provide that, we search for sources that will meet your (and our) highest expectations. We've combined forces with Applied Engineering and Fusion Data Systems to offer the best products on the market."

Real Provencher

APPLIED ENGINEERING

Applied Engineering is Apple's oldest 3rd-party developer. For 12 years they've sold and installed more products for Apple computers than any other company except Apple. Their technical services department has over 70 years of combined experience working on Apple products.

After selling 1,000,000+ units...they're simply the best in the business!

FUSION DATA SYSTEMS

TokaMac 68040 Accelerator Boards
Highest performance upgrade available for the Iici, Iili, SE/30 or LC. TokaMac runs applications up to 300% faster than a lli!

Provides significant productivity improvement to users whose primary applications include CAD, graphics, multimedia, modeling, simulation and analysis, animations, spreadsheets, and heavy "number-crunching" routines. Processes at 20 MIPS and 3.5 MFLOPS. System 7.0 compatible; no re-booting required.

WACOM TABLETS

Standard 12 x 12.............779
Standard 12 x 18.............1169
Standard 18 x 23.............3119
Standard 6 x 9.............549
Choice of stylus or 4-button cursor. Please specify when ordering.

QUANTUM HARD DRIVES

Reliable drives backed by a two-year warranty.

Internal Hard Drives

Q 52L..........................249
Q 105L.........................369
Q 210S..........................709
Q 425S..........................1389

External Hard Drives

Q 52L..........................335
Q 105L.........................415
Q 210S..........................795
Q 425S..........................1475

PERIPHERAL LAND

Infinity Turbo 44.............629
Infinity Turbo 88.............829
Quick SCSI w/cable...........349

We've run our business on Macs from the very beginning.

We know networking...so if you have a question, try us!

We run our entire business on Macs; we've had to deal with networking issues for more than six years. We use Shiva, Farallon, Dayna, and Asante networking products in our day-to-day operations, and we know from experience how they work. We can tell you firsthand how a twisted pair Ethernet network is configured and interfaced with a LocalTalk network. If you already have a sticky network issue, our sales consultants will team up with one of our technical specialists to find a custom solution for you. Give us a call!

ASANTE

Asante continues to lead the pack with quality Ethernet products at affordable prices. If you don't know whether you need 16 or 64K call us; we’ll tell you! 16K Cards (all machines)...199 64K Cards (all machines)...255

DAYNA

Fastpath 4..........................2079
Netbridge..........................445
NetModem 9600 v.32.............1249
NetModem v.2400..............369
Netserver..........................295

FAURLON

Star Connector..................17
Star Connector EN...............131
Star Controller..................865
Star Controller EN.............1709

CABLING

Hypernet Din 8 Connectors...27
Hypernet DB-9 Connectors...27

SHIVA

Ethergate..........................1389
Fastpath 4..........................2079
Netbridge..........................445
NetModem 9600 v.32.............1249
NetModem v.2400..............369
Netserver..........................295

CAYMAN SYSTEMS

GatorBox..........................2015
GatorPrint..........................399

EVEREX

EMAC Silhouette Trackball......79
EMAC 150 Mb Tape Backup......665
EMAC Pocket Fax Modern.......309

ZOOM MODEMS

CABLING

Hypernet Din 8 Connectors...27
Hypernet DB-9 Connectors...27

1-800-972-3018

FAX: 1-409-539-4141

Circle 197 on reader service card.
BIG SCREENS FOR SMALL MACS:

Mac LC and IIsi

Color Display Systems

No more big-screen envy!
Now you can treat your LC or IIsi to a million color pixels for less than you might have thought possible.

Admit it: Once you’ve gazed into an enormous color monitor, it’s hard to settle for limited screen real estate. But then gaze at the price of a high-performance large-screen 24-bit-color system—as much as $10,000—and you’ll understand why only graphic artists and prepress professionals, whose work demands 16 million colors and 1 million pixels, can justify the cost of top-of-the-line color acreage.

But relief from big-screen envy is in sight. Thanks in part to deep-pocket desktop publishers, there are now big-screen solutions for those of us who can’t afford or simply don’t need the biggest, best, and brightest color displays money can buy. As competition at the color summit drives down the prices of professional 24-bit display systems, the entry fee for large-screen 8-bit systems is also shrinking.

BY MARK FROST
AND THE MACUSER LABS STAFF
Mac LC and Ilsi Color Display Systems

The rich photographic hues of a 24-bit-true-color display system may be necessary for image retouching, illustration, digital video, and the best-quality desktop publishing, but an 8-bit-color display — which provides 256 simultaneous colors out of a palette of more than 16 million — is more than enough for most users.

What’s more, a large 8-bit monitor is more than just a pleasure to behold — it’s also a great productivity booster. If you’ve ever been forced to scroll back and forth to perform simple spreadsheet operations or up and down to compare ideas in a word-processing document, you know the frustration a small screen can cause. And if you keep several applications open on your desktop simultaneously, the need for a larger screen becomes more acute. Luckily, Apple offers two Macs that make the transition to big-screen color affordable: the Mac LC — the lowest-priced color Mac — and the compact Mac Ilsi.

How It Works: 8-Bit-Color Video

Video Card

Color QuickDraw, part of the Mac’s system software, generates the image you see on your screen. Image data is sent to the video card via the PDS(processor-direct slot) connector 1.

"Glue" chips 2 and the firmware in ROM on the video card coordinate communication among the Mac and components on the video card.

The frame-buffer-controller chip 3 accepts image data and writes it to VRAM (video RAM) 4. Also, in conjunction with a timing crystal, it generates the sync timing, which controls the rate at which video data is sent to the monitor.

Image data is stored as a bit map of 8-bit index values in VRAM. A CLUT (color-lookup table) containing three 8-bit channels converts these index values into the proper amounts of red, green, and blue on your screen.

Because three 8-bit channels provide a total of 24 bits, an 8-bit video card can still produce the same 16.7 million colors a 24-bit card can produce, but it’s limited to a palette of 256 of any of these colors at a time.

The VRAM is dual-ported, so the Mac can be writing video data at the same time as it’s being read for display on the screen.

A custom-designed ASIC (application-specific integrated circuit) 5 reads image data and sends it to the RAMDAC (random-access-memory digital-to-analog converter) chip at frame rates determined by the frame-buffer controller and the timing crystal.

The RAMDAC chip 6 contains the color lookup table in its own RAM and also contains three digital-to-analog converters that convert video-index values to the proper red, green, and blue analog video signals.
(video random-access memory) is required. If you attach a larger monitor without increasing your Mac’s VRAM, the bit depth—the number of bits of information that determines the total possible number of colors or shades of gray—will fall quickly.

The LC’s motherboard contains a slot for VRAM SIMMs, and Apple ships the LC with either 256K or 512K VRAM SIMMs. With 256K VRAM SIMMs installed, the LC can support 8-bit color on the Apple 12-inch RGB Analog Color Monitors

Analog Color Monitors

In the monitor, video amplifiers boost the red, green, and blue signals to the levels necessary to drive the electron guns in the CRT (cathode-ray tube). The sync signal is decoded and amplified to drive the horizontal and vertical deflection coils, which deflect the electron beams in a raster, or repeating scan. On the Mac, a complete image is painted on-screen at a rate of 60 to 75 times a second. This rate is often called the vertical-sync rate. The horizontal-sync rate is the number of times the beam sweeps from left to right in painting each line of each video frame.

The electron beams pass through either an aperture grille (on Trinitron CRTs) or a shadow mask, which aligns the electron beams so that they strike the appropriate red, green, and blue phosphors, causing them to glow and produce an image.

— Jeff Pittelkau

monitor, at 512 x 384 pixels, or 4-bit color (16 total colors or shades of gray) on the 12-inch gray-scale monitor or 13-inch color monitor, at 640 x 480 pixels. With 512K VRAM SIMMs installed, the LC can support the Apple 12-inch gray-scale and 13-inch color monitors at 8 bits and the 12-inch RGB monitor at 16 bits (32,768 colors—more than enough for all but the most demanding work).

Also, because large-screen monitors have a greater number of pixels than smaller ones do, video data must be passed more quickly in order to refresh the screen in the same amount of time. Because the LC and Ilisi’s built-in video cannot write to the screen fast enough to support these higher-resolution displays, these computers need the help of video cards that contain not only a greater amount of VRAM but also components that can send data to the screen at a much faster rate.

To help you choose the best route...
into the wonderful world of big-screen color, MacUser Labs checked out eleven 8-bit-color systems — five for the LC and six for the Ilsi — that hook up to either computer’s PDS (processor-direct slot). Each system consisted of a video card, a cable, and a color monitor. We chose to examine PDS-based systems not only because the LC has no NuBus slots but also because PDS cards access the Mac’s processor directly and thus can theoretically transfer information more quickly than NuBus cards can for some high-end applications. Also, they’re better suited for the tight space and power constraints of the LC and the Ilsi. Some cards even contain a PDS on the video card, providing a place to put other cards, such as Ethernet cards.

After deciding to narrow our search for the ideal 8-bit-color display system for the LC and the Ilsi to PDS-card-based systems, we rounded up the usual suspects — and some newcomers as well. Last May when we looked at 24-bit-color systems (see “The Perfect Image: True-Color Displays,” May ’91, Buyer’s Guide page 4), we found that the E-Machines ColorPage T16 — which had also taken top honors the year before in a review of 8-bit-color systems (see “In Living Color,” May ’90, Buyer’s Guide page 32) — was again the best when coupled with E-Machines’ 24-bit-card. This year we tested the ColorPage T16 with E-Machines’ 8-bit PDS card for the LC. Could it “threepath?” Also for the LC, we looked at the E-Machines ColorPage E16; Radius Color Pivot LC, which can be rotated into either a portrait or a landscape orientation; RasterOps 19” 8LC; and SuperMac 19” SuperMatch Spectrum/8 LC.

For the Ilsi, we looked at the Mirror ProView 20”; Radius Color Pivot si; SuperMac 21” SuperMatch Spectrum/8 si; and SuperMac 19” Dual-Mode Spectrum/8/24 PDQ si, which also offers a 24-bit-mode. In addition, we tested the identical Ehman 20” Color Trinitron and Nutmeg N19Csi, which use not only the same display but also the same video card.

**Pixel Pointers**

The Mac’s display scheme — for both screen display and printing — is designed around the traditional printing measurement of 72 points per inch. Thus, monitors that pack 72 pixels (picture elements — the tiny dots that make up an image on-screen) per inch most accurately match objects on the screen with those on the printed page. A screen that has 72 dpi (dots, or pixels, per inch) is referred to as WYSIWYG — what you see is what you get.

Resolutions higher than 72 dpi make on-screen objects appear smaller than they are on the printed page. High-resolution monitors can fit more information into the same space than can WYSIWYG monitors, but they’re less useful for applications such as drafting or desktop publishing that require precise measurements. However, because many photo-retouching applications benefit from tightly packed pixels that reduce the visibility of the pixel grid — the spaces among the pixels — high-resolution monitors can make images appear smoother and more like photographs. Also, if you don’t mind squinting, a high-resolution monitor can display more spreadsheet cells and DTP-page territory.

**Gem Screens**

Most of the monitors we examined use the Trinitron technology, with tubes made by Sony. The Trinitron technology has gained a well-deserved reputation for sharpness and evenness of color and brightness, but the older technology — shadow mask — is gaining ground, thanks to new shadow-mask materials such as Invar that help produce brighter pictures, without distortion.

In both types of monitor tubes, three electron beams are focused on the inside of the front of the tube — what we see as the screen — which is covered with phosphors — chemicals that glow when hit by electrons. Three types of phosphors are used, one for each of a monitor’s primary colors: red, green, and blue.

In a Trinitron tube, the beams pass through an array of vertically aligned wires, called an aperture grille, which separates the three electron beams before they hit the red, green, and blue phosphors on the screen. The three guns, which fire the electron beams from the back of the tube, are mounted in one unit and are focused with a single lens, therefore reducing the possibility that any single beam will...
lose focus or become misaligned.

The time-tested shadow-mask tube uses a sheet of perforated metal instead of a wire array (see the “How It Works: 8-Bit-Color Video” sidebar). The three guns are not mounted together, and some designs also use separate lenses, thus increasing the possibility of misalignment and focusing problems. A shadow mask sometimes also suffers from doming, a heat-distortion phenomenon that results in discoloration and blotchiness on the screen — the Trinitron wire array is immune to this distortion. However, the new shadow-mask alloy Invar resists deformation and doming.

The E-Machines ColorPage E16 and the Radius Color Pivots are based on older-design Toshiba shadow-mask tubes; on the other hand, the RasterOps 19” 8LC and the two single-resolution SuperMac models use new Hitachi Invar alloys that offer a picture quality much improved over their predecessors'. These displays are very similar to, and in some cases better than, Trinitron displays.

**Installation: Be Careful**

Installing a PDS card is a fairly straightforward process, and most of the systems have ample documentation
covering both the card’s installation and the monitor’s cabling. However, the design of the LC is such that while the monitor cable is being plugged in to the PDS video card, the card is torqued at an angle to the PDS connector. This torquing can damage the connector; we recommend leaving the LC open when you connect the cable so that you can support the back of the card to reduce stress on the connector. None of the manuals provide this warning.

A warning should also accompany the Ilsi systems, because all of their PDS cards—with the exception of the Radius one, which is so compact that it fits vertically in the Ilsi—require an adapter that places the display card at a right angle to the adapter. Some cards get around the torquing problem by bolting directly to the Ilsi’s back panel. The SuperMac cards, for example, have metal supporting plates attached to the adapter cards to reduce any torque on either the display card or the PDS connector. They also have screws that attach the cable connector directly to the case, which reduces the threat of torquing. It should be noted, however, that when the Mirror system arrived, it came without an adapter (Mirror offers it as an extra for $50), even though it was shown in the installation manual as being required for proper installation of the display card.

Seeing Is Believing

Hundreds of display systems have passed through MacUser Labs’ doors, and a procedure for running them through their paces has long been established. Before we test a display, we degauss it—zap the screen with a uniform magnetic field to remove traces of latent magnetic fields that might otherwise distort images. We then orient each display along the earth’s east/west axis to protect against possible distortion caused by the earth’s magnetic field.

After each monitor has warmed up for at least an hour, we measure its active area, the portion of the screen that lights up. Some manufacturers claim that their screen dimensions include the entire diagonal distance across the screen from one corner of the bezel (the portion of the case that surrounds the screen) to the opposite corner. However, the actual image area is often considerably smaller, because manufacturers use only that part of the screen that performs best—the middle. Accurate focus and color at the corners are difficult to accomplish on big displays. The bigger the display, the more the electron beams sent to the corners must be bent and aimed by the electromagnets at the base of the tube. This not only slows the beams down but also reduces the accuracy of the beams’ aim, causing part of the beams to hit the wrong pixels. If the manufacturer reduces the image area or uses a smaller tube, the degree to which electron beams must be bent will be reduced and the image quality will be more uniform—but at the price of a smaller working area.

One obstacle to getting a sharp image is the conflict between brightness and focus: The greater the brightness, the less precise the focus. The search for a happy medium between brightness and focus causes monitor users to spend hours fiddling with tiny knobs and adds new levels of frustration to using a Mac.

We used a Minolta TV Analyzer to determine the maximum usable screen brightness in footlamberts, a measure of how bright a display can be before it starts to lose focus. The two E-Machines systems for the LC set the standard for brightness, with most others close behind: the Mirror ProView 20” for the Ilsi and the RasterOps 19” 8LC, however, were dim.
Some monitors let you increase the brightness beyond usable levels so that as the phosphors on the screen fade with age, you continue to get a bright image many years down the road. It’s important to note, however, that the higher the level at which you set brightness, the faster the phosphors deteriorate. A screen saver can lengthen phosphor life by turning down the brightness of the screen while the computer is idle or by playing moving images across the screen so that no one color or shade of the screen’s phosphors is depleted. If you really want to save your screen while your Mac runs all night, simply turn off the monitor.

Most monitors provide accessible controls for contrast, image position, degaussing, and *convergence* — the ability of the three electron beams to come together on the correct dots of phosphor. These controls not only allow different users to adjust a display to their own preferences but also let them maintain a crisp image over the long haul. There are also other fine-tuning controls, some of which may require you to use a screwdriver to operate them or to open a panel on the monitor’s case to access them. We strongly caution against attempting to open your display’s case — many of the internal components retain high-voltage electrical charges that can kill even after the display has been turned off. You paid good money for this display, and you’ve only one life to live — leave internal adjustments to the experts.

Another aspect of screen quality is sharpness. MacUser Labs uses a custom-built CCD (charge-coupled device) array to compare the brightness levels of a series of wide white lines separated by thin (one-pixel wide) black lines and thin white lines separated by wide black lines. Measuring a monitor’s ability to display this array crisply provides an objective measure of screen sharpness called *MTF*, or modulation-transfer function. A sharp monitor delivers the same brightness across the wide white lines as it does in the narrow white ones. In displays that aren’t as sharp, the areas where the white and black lines meet seem to bleed together, making the interface between the two soft and gray. The overall result is an image that appears dim and fuzzy. Monitors with fewer pixels per inch perform better in this test, because the pixels, which are farther apart, bleed less into each other.

The Apple Macintosh 21” Color Display (left) and the Radius PrecisionColor Display/20 are two new contenders in the 24-bit-color-monitor market.
monitor’s face to reduce glare generally results in lowered sharpness. Turning the brightness up to compensate causes you to lose some focus. The best antiglare treatment comes from OCLI (Optical Coating Laboratories, Inc.), but it isn’t cheap. Mirror uses this superior method, as does SuperMac on its 21” SuperMatch Spectrum/8 si and 19” Dual-Mode Spectrum/8×24 PDQ si. Asahi Glass’ antireflection treatment, used on the RasterOps 19” 8LC, is virtually the same. Both E-Machines displays use an inexpensive but effective silica coating to reduce glare. Like the others, this coating simply diffuses reflected light. No matter what type of coating is used, the best defense against glare is to make sure that lights are baffled so that direct light never strikes the screen.

If the three electron beams stay from each other, the result is misalignment — a rainbow outline around on-screen objects. If a monitor has external convergence controls or if you bought your system from a reputable dealer who knows how to adjust your display, convergence will not be much of a problem. On the E Machines ColorPage T16 and the SuperMac 21-inch Ilsi systems, the red, green, and blue beams converged to within 10 percent of the width of a pixel. The E-Machines ColorPage E16 had the worst convergence (70 percent), followed by the Ehman 20” Color Trinitron (50 percent) and the Radius Color Pivot si in portrait orientation (40 percent).

Color tracking is a measure of how well the three electron beams deliver exactly the same color intensity. Color tracking is described as a percentage, with 100 percent being perfectly matched intensity across all three beams. Results of our testing showed that all the displays averaged better than 90 percent, making color tracking a nonissue for choosing among these monitors.

But How Do They Look?
After we completed this exhaustive suite of objective tests, a jury of lab experts subjectively examined each

The Bottom Line

Spending the same amount of money for a color monitor as you did for your Mac LC or Ilsi might seem ridiculous, until you have the opportunity to spend time with one of these beauties. When you consider what 24-bit systems are going for today and what 8-bit systems cost a couple of years ago, you’ll agree that a big-screen high-resolution color system for less than $3,000 is a good deal.

Of the 11 LC and Ilsi systems we looked at, the majority were based on Trinitron tubes — historically the better-performing monitors. This time around, however, our tests proved that shadow-mask monitors are improving.

Among the LC systems, the E-Machines ColorPage T16 ($3,095 list, $1,940 street) had the finest picture of them all. However, with a screen size of 16 inches, this monitor might not offer you enough screen real estate. The Radius Color Pivot LC ($2,790 list, $1,947 street) was the jury’s favorite. Many users may see the pivot as a gimmick, but when you look at the price and realize that you get most of the benefits of a big screen at about half the cost, you’ll see why it’s so highly rated. The SuperMac 19” SuperMatch Spectrum/8 LC ($3,599 list, $2,408 street) performed well, coming closest to the ColorPage T16 in screen performance. This system uses perhaps the most efficiently designed display card, requiring no adapter. All the SuperMac systems come with well-built cables and even have the size of the monitor stamped onto the cables so you can tell which system they belong to. But the high cost of this SuperMac system made it less desirable compared with the other two systems. The E-Machines ColorPage E16 ($2,190 list, $1,095 street) came in last in our judging. Although attractively priced, it just didn’t meet the usually high E-Machines standards.

On the Ilsi side, the SuperMac 21” SuperMatch Spectrum/8 si ($5,199 list, $3,358 street) was the clear winner, with not only a fine picture but also a very low cost per pixel. If a big, big screen is what you want, this 21-incher is your best buy. The Ehman 20” Color Trinitron ($2,795 direct), although inexpensive, turned out to be a “you get what you pay for” runner-up.

The top-performing LC color systems are, from left to right, the E-Machines ColorPage T16, the Radius Color Pivot LC, and the SuperMac 19” SuperMatch Spectrum/8 LC. For the Ilsi, the SuperMac 21” SuperMatch Spectrum/8 si (far right) was head and shoulders above the rest.
display system for focus; geometry, or the monitor’s ability to accurately represent shapes; color; and nuisances, such as flicker, jitter, or any other annoying movement of the screen’s image. The jury awarded point values on a scale of 1 to 5 for each category, with 5 being the best. The displays’ identities were masked to remove any possible favoritism. The results surprised even the jury.

For focus, the E-Machines ColorPage T16 topped the jury’s list, at 4.5 points, with the SuperMac 19" SuperMatch Spectrum/8 LC a close second, at 4.1. Tied for the unenviable distinction of worst focus were the SuperMac 21" SuperMatch Spectrum/8 si and the ColorPage T16’s smaller sibling, the ColorPage E16, with 3.3 points. Our experts also gave the ColorPage E16 poor marks for geometry (3.3 points), an area in which all the other displays averaged better than 4.4 points.

The E-Machines ColorPage T16 system, which had been champion in previous evaluations of 8- and 24-bit color displays, received an impressive 4.8 points for color quality — but it was edged out by all three SuperMac systems, which received perfect 5s. Nuisance proved to be a nonissue, because all the systems scored better than 4.5 points in this category. After tabulating and averaging all scores, we found that the SuperMac 19-inch LC system scored highest in our subjective testing, with 4.6 points, followed closely by its Iisii siblings and the E-Machines ColorPage T16, which all averaged 4.5 points.

Some Handy Software

In addition to providing high-quality displays, some manufacturers add a premium: high-quality utility software. Radius — the first to bundle handy screen utilities with its display systems — provides SoftPivot software, which enables users to enlarge their menu font for easier readability and adds screen-capture and save utilities as well as the ability to pan across a large “virtual display.”

SuperMac’s SuperVideo software provides similar utilities as well as a zooming feature and a convergence test for keeping the display well tuned. SuperVideo also has a homing feature, which returns the cursor to a preset location if it becomes lost — a common occurrence on a big screen.

Ehman provides a soft-FPU utility that emulates a floating-point unit coprocessor, thus allowing the LC, which has no FPU, to run applications that require one. Mirror Technologies also has a fine bundle of utilities, which includes pop-up menus, an enlarged cursor and menu bar, and a screen copier. The E-Machines software offers brightness and contrast controls as well as a screen saver.

Big Screen, Big Decision

A large-screen color monitor can do wonders for your outlook on life, not to mention your view of a spreadsheet, a DTP layout, or an illustration. Top-of-the-line 24-bit true-color monitors can cost far more than the Macs to which they’re attached, and the vast majority of business applications do just fine on an 8-bit display.

When a wide-screen 8-bit display is coupled with a low-priced Mac LC or a powerful, compact Mac Iisii, color becomes an affordable option for average Mac users. And we’re happy to announce that most of the big-screen 8-bit display systems we looked at were more than adequate.

After tabulating our objective and subjective test results, our research staff sought out reasonable street prices for each product. On an overall price/performance basis, the systems based on shadow-mask technology fared much better than systems based on this technology had in past years, but Trinitron-based systems still make up the bulk of the middle-to-good range (see Figure 1). For a closer look at specific monitor systems and our recommendations, see the “Bottom Line” sidebar.

Mark Frost, a MacUser associate editor, is basking in the afterglow of LC and Iisii monitors.

<table>
<thead>
<tr>
<th>Table 1 Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong> — The vendor’s suggested prices for a complete system (monitor,</td>
</tr>
<tr>
<td>and cables, and software) for the monitor alone, and for the Mac display card</td>
</tr>
<tr>
<td>alone.</td>
</tr>
<tr>
<td><strong>Tube type</strong> — The monitor tube’s OEM and whether the tube uses a shadow</td>
</tr>
<tr>
<td>mask or Trinitron aperture grille.</td>
</tr>
<tr>
<td><strong>Screen size (diagonal)</strong> — The length, diagonally, of the portion of the screen</td>
</tr>
<tr>
<td>that lights up, in inches.</td>
</tr>
<tr>
<td><strong>Screen dimensions (W x H, pixels)</strong> — The number of dots (pixels) displayed on</td>
</tr>
<tr>
<td>the screen, counting horizontally (width) and vertically (height).</td>
</tr>
<tr>
<td><strong>Resolution</strong> — The number of dots (pixels) per inch, measured horizontally.</td>
</tr>
<tr>
<td><strong>Vertical-scan (refresh) rate</strong> — How quickly, in cycles per second (hertz), the</td>
</tr>
<tr>
<td>screen is redrawn from top to bottom; 65 hertz is considered sufficient to eliminate</td>
</tr>
<tr>
<td>flicker.</td>
</tr>
<tr>
<td><strong>Horizontal-scan rate</strong> — How many lines of pixels can be written on the screen per</td>
</tr>
<tr>
<td>second, in kilohertz.</td>
</tr>
<tr>
<td><strong>Power consumption (watts)</strong> — The electrical-power requirements of the monitor</td>
</tr>
<tr>
<td>as well as those of the display card, in watts.</td>
</tr>
<tr>
<td><strong>Antiglare treatment</strong> — The coating or transparent panel on the monitor screen,</td>
</tr>
<tr>
<td>designed to eliminate or diffuse reflected light.</td>
</tr>
<tr>
<td><strong>Controls</strong> — The location and/or type of any controls for adjusting power, screen</td>
</tr>
<tr>
<td>brightness and contrast, vertical and horizontal position and size of the image,</td>
</tr>
<tr>
<td>degaussing, and vertical and horizontal convergence.</td>
</tr>
<tr>
<td><strong>Case dimensions (L x W x H)</strong> — The outside length, width, and height of the</td>
</tr>
<tr>
<td>monitor’s plastic shell, in inches.</td>
</tr>
<tr>
<td><strong>Footprint</strong> — The area the monitor stand occupies on the top of your desk, in</td>
</tr>
<tr>
<td>square inches.</td>
</tr>
<tr>
<td><strong>Software features</strong> — Specific features of the software that’s bundled with the</td>
</tr>
<tr>
<td>display system.</td>
</tr>
</tbody>
</table>
### Table 1: Features of Color Display Systems for the Mac LC and Ilsi

<table>
<thead>
<tr>
<th></th>
<th>Mac LC</th>
<th>E-Machines</th>
<th>Radius</th>
<th>RasterOps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ColorPage E16</td>
<td>ColorPage T16</td>
<td>Color Pivot LC</td>
<td>19&quot; BLC</td>
</tr>
<tr>
<td><strong>List price</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pull system</td>
<td>$2,190</td>
<td>$3,095</td>
<td>$2,790</td>
<td>$3,698</td>
</tr>
<tr>
<td>Monitor only</td>
<td>$1,595</td>
<td>$2,500</td>
<td>$1,995</td>
<td>$2,799</td>
</tr>
<tr>
<td>Display card only</td>
<td>$595</td>
<td>$595</td>
<td>$795</td>
<td>$899</td>
</tr>
<tr>
<td>Street price (system tested)</td>
<td>$1,095</td>
<td>$1,940</td>
<td>$1,947</td>
<td>$2,309</td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Least expensive</td>
<td></td>
<td>Best picture.</td>
<td></td>
<td>Inexpensive.</td>
</tr>
<tr>
<td>Inexpensive software, and price.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor display</td>
<td></td>
<td>Smallest screen. Poorly shielded cable.</td>
<td></td>
<td>Dim screen. Large footprint.</td>
</tr>
<tr>
<td>characteristics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poorly shielded cable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Specifications

<table>
<thead>
<tr>
<th></th>
<th>Mac LC</th>
<th>E-Machines</th>
<th>Radius</th>
<th>RasterOps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube type</td>
<td>Toshiba shadow mask</td>
<td>Sony Trinitron</td>
<td>Toshiba shadow mask</td>
<td>Hitachi shadow mask</td>
</tr>
<tr>
<td>Screen size (diagonal)</td>
<td>16 in.</td>
<td>16 in.</td>
<td>15 in.</td>
<td>19 in.</td>
</tr>
<tr>
<td>Active screen size (diagonal)</td>
<td>14.5 in.</td>
<td>14.5 in.</td>
<td>13.22 in.</td>
<td>17.8 in.</td>
</tr>
<tr>
<td>Screen dimensions (W x H, pixels)</td>
<td>832 x 624</td>
<td>832 x 624</td>
<td>A: 640 x 870; B: 564 x 760*</td>
<td>1,024 x 768</td>
</tr>
<tr>
<td>Resolution</td>
<td>72 dpi</td>
<td>72 dpi</td>
<td>A: 82 dpi; B: 72 dpi</td>
<td>72 dpi</td>
</tr>
<tr>
<td>Vertical-scan (refresh) rate</td>
<td>75 Hz</td>
<td>75 Hz</td>
<td>A: 75 Hz; B: 85.2 Hz*</td>
<td>75 Hz</td>
</tr>
<tr>
<td>Horizontal-scan rate</td>
<td>50 kHz</td>
<td>50 kHz</td>
<td>68.85 kHz</td>
<td>60.24 kHz</td>
</tr>
<tr>
<td>Power consumption of monitor</td>
<td>130 watts</td>
<td>150 watts</td>
<td>100 watts</td>
<td>120 watts</td>
</tr>
<tr>
<td>Power consumption of display card</td>
<td>3.75 watts</td>
<td>3.75 watts</td>
<td>3 watts</td>
<td>4.5 watts</td>
</tr>
<tr>
<td>Artiglare treatment</td>
<td>silica oxide</td>
<td>silica oxide</td>
<td>OCLI</td>
<td>silica oxide</td>
</tr>
</tbody>
</table>

### Controls

<table>
<thead>
<tr>
<th></th>
<th>Mac LC</th>
<th>E-Machines</th>
<th>Radius</th>
<th>RasterOps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power switch</td>
<td>front</td>
<td>front</td>
<td>side</td>
<td>front</td>
</tr>
<tr>
<td>Brightness/contrast</td>
<td>front/front</td>
<td>software/software</td>
<td>side/side</td>
<td>front/front</td>
</tr>
<tr>
<td>Vertical position/size</td>
<td>front/front</td>
<td>NA/NA</td>
<td>internal/internal</td>
<td>NA/NA</td>
</tr>
<tr>
<td>Horizontal position/size</td>
<td>front/front</td>
<td>NA/NA</td>
<td>internal/internal</td>
<td>NA/NA</td>
</tr>
<tr>
<td>Deagussing</td>
<td>front</td>
<td>automatic</td>
<td>automatic</td>
<td>front</td>
</tr>
<tr>
<td>Vertical/horizontal convergence</td>
<td>NA/NA</td>
<td>NA/NA</td>
<td>NA/NA</td>
<td>NA/NA</td>
</tr>
</tbody>
</table>

### Other

<table>
<thead>
<tr>
<th></th>
<th>Mac LC</th>
<th>E-Machines</th>
<th>Radius</th>
<th>RasterOps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case dimensions (L x W x H)</td>
<td>16.5 x 16.5 x 16.5 in.</td>
<td>19 x 16 x 15 in.</td>
<td>17 x 12.5 x 18 in.</td>
<td>20 x 19 x 18 in.</td>
</tr>
<tr>
<td>Footprint</td>
<td>110 sq. in.</td>
<td>138 sq. in.</td>
<td>155 sq. in.</td>
<td>148.6 sq. in.</td>
</tr>
<tr>
<td>Weight</td>
<td>45 lb</td>
<td>60 lb</td>
<td>48 lb</td>
<td>62 lb</td>
</tr>
<tr>
<td>Software features</td>
<td>screen dimmer, contrast/ brightness control, enlarge menus, set virtual screens, keyboard options, on-screen help</td>
<td>screen dimmer, contrast/ brightness control, enlarge menus, set virtual screens, keyboard options, on-screen help</td>
<td>monitor rotation, dynamic desktop, enlarged menu, screen capture, screen saver</td>
<td>hardware pan and zoom, extended-desktop modes: 1.024 x 896; 2.048 x 896; 4.096 x 896; 8.192 x 896</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
<td>3 years</td>
</tr>
</tbody>
</table>

### Company

<table>
<thead>
<tr>
<th></th>
<th>Mac LC</th>
<th>E-Machines</th>
<th>Radius</th>
<th>RasterOps</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-Machines</td>
<td>9305 S.W. Gemini Dr.</td>
<td>9305 S.W. Gemini Dr.</td>
<td>1710 Fortune Dr.</td>
<td>2500 Watch Ave.</td>
</tr>
<tr>
<td>Beaverton, OR 97005</td>
<td>(800) 344-7274</td>
<td>(800) 344-7274</td>
<td>(800) 227-2795</td>
<td>(800) 729-2656</td>
</tr>
<tr>
<td>(503) 646-6699</td>
<td>(503) 646-6699</td>
<td>(400) 434-1010</td>
<td>(408) 562-4200</td>
<td></td>
</tr>
</tbody>
</table>

*The Radius Color Pivot software allows two modes of operation for the ColorPivot: Mode A sets the resolution to 62 dpi for applications that need high screen resolution, and mode B sets the resolution to 72 dpi for WYSIWYG applications.*
“The better the tools, the better the artist.”
That’s how a successful artist explained it when asked why he believes a famous illustrator from an earlier time would have been even more creative with the Wacom Tablet.

It’s certainly true for Mac artists today. For the Wacom Tablet brings the new dimension of creative pressure to computer graphics. With Wacom’s pressure-sensitive pens, the harder you press, the thicker a line becomes. Or you can control the color, density, or even “wetness” and dryout speed, depending on software.

Now you can use pressure with Adobe Photoshop, ColorStudio 1.1, Digital Darkroom 2.0, Easy Color Paint 2.0, Fractal Design Painter, Pixel Paint Professional 2.0, Studio/32, Time Arts Oasis and more.

A Wacom pen is a joy for artists. It is ultralight (just 1/3 ounce) as there are no batteries or magnets) and very natural and responsive since there’s no cord to hinder your freedom.

Vector Drawing. You don’t need pressure to benefit by using the Wacom Tablet. Many artists are discovering they can draw faster and more naturally with vector programs such as FreeHand and Illustrator as well as Fontographer.

New. Pressure-sensitive Vector Drawing. Now, with Aldus FreeHand 3.1 and the Wacom Tablet, graphic artists also can use hand pressure to vary the line widths of strokes drawn with the freehand tool.

Isn’t it time you, too, benefited from using the Wacom Tablet?

Wacom Technology Corporation
501 S.E. Columbia Shores Blvd.
Vancouver, WA 98661; Tel: (1) 800-922-6613

CIRCLE 149 ON READER SERVICE CARD.
### Table 1: Features of Color Display Systems for the Mac LC and Ilsi, continued

<table>
<thead>
<tr>
<th></th>
<th>Mac LC</th>
<th>Mac Ilsi</th>
<th>Mirror</th>
<th>Nutmeg</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SuperMac 19&quot; SuperMatch Spectrum/8 LC</td>
<td>Ehman 20&quot; Color Trinitron ProView 20&quot;</td>
<td>N19Csi</td>
<td></td>
</tr>
<tr>
<td>List price</td>
<td>$3,599</td>
<td>$2,795</td>
<td>$2,799</td>
<td>$4,599</td>
</tr>
<tr>
<td>Full system</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Monitor only</td>
<td>$2,800</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Display card only</td>
<td>$799</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>Street price (system tested)</td>
<td>$2,408</td>
<td>$2,795</td>
<td>$2,799</td>
<td>$2,595</td>
</tr>
<tr>
<td>Pros</td>
<td>Well-shielded cable.</td>
<td>Buyers cannot evaluate system before purchase, because it is sold only directly. No FPU slot on video card.</td>
<td>No FPU slot on video card.</td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td>Large footprint.</td>
<td>Buyers cannot evaluate system before purchase, because it is sold only directly. No FPU slot on video card.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tube type</td>
<td>Hitachi shadow mask</td>
<td>Sony Trinitron</td>
<td>Sony Trinitron</td>
<td>Sony Trinitron</td>
</tr>
<tr>
<td>Screen size (diagonal)</td>
<td>19 in.</td>
<td>20 in.</td>
<td>20 in.</td>
<td>20 in.</td>
</tr>
<tr>
<td>Active screen size (diagonal)</td>
<td>17.76 in.</td>
<td>17.61 in.</td>
<td>17.6 in.</td>
<td>17.6 in.</td>
</tr>
<tr>
<td>Screen dimensions (W x H, pixels)</td>
<td>1,024 x 768</td>
<td>1,024 x 768</td>
<td>1,024 x 768</td>
<td>1,024 x 768</td>
</tr>
<tr>
<td>Resolution</td>
<td>72 dpi</td>
<td>72 dpi</td>
<td>72 dpi</td>
<td>72 dpi</td>
</tr>
<tr>
<td>Vertical-scan (refresh) rate</td>
<td>75 Hz</td>
<td>78 Hz</td>
<td>78 Hz</td>
<td>78 Hz</td>
</tr>
<tr>
<td>Horizontal-scan rate</td>
<td>60.24 kHz</td>
<td>64 kHz</td>
<td>64 kHz</td>
<td>64 kHz</td>
</tr>
<tr>
<td>Power consumption of monitor</td>
<td>135 watts</td>
<td>150 watts</td>
<td>150 watts</td>
<td>150 watts</td>
</tr>
<tr>
<td>Power consumption of display card</td>
<td>4 watts</td>
<td>3.6 watts</td>
<td>3.6 watts</td>
<td>3.6 watts</td>
</tr>
<tr>
<td>Antiglare treatment</td>
<td>silica oxide</td>
<td>Asahi coating</td>
<td>Asahi coating</td>
<td>Asahi coating</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power switch</td>
<td>front</td>
<td>front</td>
<td>front</td>
<td>front</td>
</tr>
<tr>
<td>Brightness/contrast</td>
<td>none/none</td>
<td>front/front</td>
<td>front/front</td>
<td>front/front</td>
</tr>
<tr>
<td>Vertical position/size</td>
<td>front/front</td>
<td>side/side</td>
<td>side/side</td>
<td>side/side</td>
</tr>
<tr>
<td>Horizontal position/size</td>
<td>front/front</td>
<td>side/side</td>
<td>side/side</td>
<td>side/side</td>
</tr>
<tr>
<td>Degaussing</td>
<td>front</td>
<td>side</td>
<td>side</td>
<td>side</td>
</tr>
<tr>
<td>Vertical/horizontal convergence</td>
<td>NA/NA</td>
<td>side/side</td>
<td>side/side</td>
<td>side/side</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case dimensions (L x W x H)</td>
<td>19.5 x 19 x 18 in.</td>
<td>21 x 19 x 19 in.</td>
<td>21 x 19 x 19 in.</td>
<td>21 x 19 x 19 in.</td>
</tr>
<tr>
<td>Footprint</td>
<td>145 sq. in.</td>
<td>113 sq. in.</td>
<td>113 sq. in.</td>
<td>113 sq. in.</td>
</tr>
<tr>
<td>Weight</td>
<td>59.4 lb</td>
<td>85 lb</td>
<td>85 lb</td>
<td>85 lb</td>
</tr>
<tr>
<td>Software features</td>
<td>pan and zoom, switch menu bar, turn acceleration on/off</td>
<td>pseudo-FPU</td>
<td>pop-up menus, screen saver, large cursor, large menu bar, screen copy</td>
<td>Mac system-software features only</td>
</tr>
<tr>
<td>Warranty</td>
<td>display, 3 years; card, 5 years</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Company</td>
<td>SuperMac Technology 485 Potrero Ave. Sunnyvale, CA 94086 (800) 334-3005 (408) 245-2202</td>
<td>Ehman P.O. Box 2126 Evanston, WY 82930 (800) 257-1666 (307) 789-3830</td>
<td>Mirror Technologies 2644 Patton Rd. Roseville, MN 55113 (800) 654-5294 (612) 633-4450</td>
<td>Nutmeg Systems 25 South Ave. New Canaan, CT 06840 (800) 777-8439 (203) 996-3226</td>
</tr>
</tbody>
</table>
Introducing a few surprises you won't find in other $2,000 scanners.

There are certain things you'd expect from a 600 dpi color scanner. Rapid speed. A choice of 24-bit color or 256 shades of gray. Exceptional optical quality.

But nothing you've learned about other scanners will have prepared you for the new UC630, by UMAX.®

The items above are a good example.

The lamp: There's one inside the UC630. Only one. Most scanners have three. And because each of those three lamps wears out at different rates, next month's scans may be weaker in reds than today's. A couple months later, it might be the greens that suffer.

Eventually, our single lamp wears out too. That's unavoidable. But thanks to our auto-calibration, you'll never have to put up with off-color scans.

The dots: The UC630 outputs 600 of them to an inch. Other vendors choose to sell 300 dpi scanners that use software to bump the resolution up to 600 dpi. The software manipulation works, but the image quality is perceptibly less than from a 600 dpi machine. Like ours.

And finally, what about those feet? A reference to UMAX's brutal drop test: We pick up a UC630 (in its original box), and drop it. Three feet down. And what happens next? It works. The optical mirror even realigns itself automatically.

Look, we're already out of space and haven't even touched on the UC630's speed (up to 60% faster than others), optical precision (a system given top marks by MacUser and MacWorld), or dynamic range (accurate readings of 16.8 million colors, and all 256 shades of gray). Not to mention our 24-hour turnaround for repairs, and the free Adobe Photoshop® we include with every UC630.

So do us both a favor: Call 800-562-0311 for your nearby UMAX dealer, and come take a look.

You'll see we've kept a few other surprises for your visit.

UMAX®
Maximize your image.

2552 Walsh Avenue, Santa Clara, CA 95051
408-982-0771; 408-982-0776 (fax)

©1992 UMAX Technologies, Inc. UMAX is a registered trademark of UMAX Data Systems, Inc. "Maximize your image" is a trademark of UMAX Technologies, Inc. Other company names and product names are trademarks of their respective companies.

CIRCLE 193 on reader service card.
### Table 1: Features of Color Display Systems for the Mac LC and Ilsi, continued

<table>
<thead>
<tr>
<th></th>
<th>Mac Ilsi</th>
<th>SuperMac 19&quot; Dual-Mode Spectrum/8</th>
<th>SuperMac 21&quot; SuperMatch Spectrum/8</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Color Pivot si</td>
<td>PDQ si</td>
<td>PDQ si</td>
</tr>
<tr>
<td></td>
<td>Radius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>List price</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Full system</td>
<td>$2,790</td>
<td>$5,590</td>
<td>$5,199</td>
</tr>
<tr>
<td>Monitor only</td>
<td>$1,995</td>
<td>$4,200</td>
<td>$4,400</td>
</tr>
<tr>
<td>Display card only</td>
<td>$795</td>
<td>$1,399</td>
<td>$799</td>
</tr>
<tr>
<td>Street price (system tested)</td>
<td>$1,947</td>
<td>$3,548</td>
<td>$3,358</td>
</tr>
<tr>
<td>Pros</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Good image quality, software, and price.</td>
<td>24-bit capability built in.</td>
<td>No PDS adapter required.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cons</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Large footprint for size of screen.</td>
<td>Expensive.</td>
<td>Large footprint.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tube type</td>
<td>Toshiba shadow mask</td>
<td>Sony Trinitron</td>
<td>Hitachi shadow mask</td>
</tr>
<tr>
<td>Screen size (diagonal)</td>
<td>15 in.</td>
<td>19 in.</td>
<td>21 in.</td>
</tr>
<tr>
<td>Active screen size (diagonal)</td>
<td>13.22 in.</td>
<td>17.76 in.</td>
<td>18.72 in.</td>
</tr>
<tr>
<td>Screen dimensions (W x H, pixels)</td>
<td>A: 640 x 870; B: 564 x 750*</td>
<td>1,024 x 768; 1,152 x 870</td>
<td>1,152 x 870; 1,152 x 870</td>
</tr>
<tr>
<td>Resolution</td>
<td>A: 82 dpi; B: 72 dpi*</td>
<td>72 dpi; 82 dpi</td>
<td>77 dpi</td>
</tr>
<tr>
<td>Vertical-scan (refresh) rate</td>
<td>A: 75 Hz; B: 85.2 Hz*</td>
<td>75 Hz</td>
<td>75 Hz</td>
</tr>
<tr>
<td>Horizontal-scan rate</td>
<td>66.85 kHz</td>
<td>60.24 kHz; 66.8 kHz</td>
<td>56.69 kHz</td>
</tr>
<tr>
<td>Power consumption of monitor</td>
<td>100 watts</td>
<td>220 watts</td>
<td>145 watts</td>
</tr>
<tr>
<td>Power consumption of display card</td>
<td>3 watts</td>
<td>7.5 watts</td>
<td>7.5 watts</td>
</tr>
<tr>
<td>Antiglare treatment</td>
<td>OCLI</td>
<td>OCLI</td>
<td>OCLI</td>
</tr>
<tr>
<td>Controls</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power switch</td>
<td>side</td>
<td>front</td>
<td>front</td>
</tr>
<tr>
<td>Brightness/contrast</td>
<td>side/side</td>
<td>front/ front</td>
<td>front/ front</td>
</tr>
<tr>
<td>Vertical position/size</td>
<td>internal/internal</td>
<td>front/NA</td>
<td>NA/NA</td>
</tr>
<tr>
<td>Horizontal position/size</td>
<td>internal/internal</td>
<td>NA/NA</td>
<td>NA/NA</td>
</tr>
<tr>
<td>Degaussing</td>
<td>automatic</td>
<td>automatic</td>
<td>front -</td>
</tr>
<tr>
<td>Vertical/horizontal convergence</td>
<td>NA/NA</td>
<td>front/front</td>
<td>NA/NA</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Case dimensions (L x W x H)</td>
<td>17 x 12.5 x 18 in.</td>
<td>20 x 19 x 18.5 in.</td>
<td>20 x 19 x 18 in.</td>
</tr>
<tr>
<td>Footprint</td>
<td>155 sq. in.</td>
<td>135 sq. in.</td>
<td>145 sq. in.</td>
</tr>
<tr>
<td>Weight</td>
<td>48 lb</td>
<td>72.6 lb</td>
<td>59.41 lb</td>
</tr>
<tr>
<td>Software features</td>
<td>monitor rotation, dynamic desktop, enlarged menu font, screen capture, screen saver</td>
<td>pan and zoom, switch menu bar, turn acceleration on/off</td>
<td>pan and zoom, switch menu bar, turn acceleration on/off</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>display, 3 years; card, 5 years</td>
<td>display, 3 years; card, 5 years</td>
</tr>
<tr>
<td>Company</td>
<td>Radius</td>
<td>SuperMac Technology</td>
<td>SuperMac Technology</td>
</tr>
<tr>
<td></td>
<td>1710 Fortune Dr.</td>
<td>485 Potrero Ave.</td>
<td>485 Potrero Ave.</td>
</tr>
<tr>
<td></td>
<td>San Jose, CA 95131</td>
<td>Sunnyvale, CA 94086</td>
<td>Sunnyvale, CA 94086</td>
</tr>
<tr>
<td></td>
<td>(800) 227-2795</td>
<td>(800) 334-3005</td>
<td>(800) 334-3005</td>
</tr>
<tr>
<td></td>
<td>(408) 434-1010</td>
<td>(408) 245-2202</td>
<td>(408) 245-2202</td>
</tr>
</tbody>
</table>

*The Radius Color Pivot software allows two modes of operation for the ColorPivot: Mode A sets the resolution to 82 dpi for applications that need high screen resolution, and mode B sets the resolution to 72 dpi for WYSIWYG applications.*
October 22, 1991

Dearest Ellen:

If there is anything better than being loved by you... it is loving you.

And you are so easy to love. You've brought such wonder into my life and have touched my heart with your love.

I just want you to know, my darling, that it feels so good being in love with you and I want to love you for a very long time.

You are a wonderful woman and I love you dearly. If I'm dreaming, please don't wake me up - I don't want this to end.

Monogamously yours,

Your Mac can say a lot about you.

If somebody sat down at your Mac and started snooping around your disk, which would embarrass you more? The details of your love life? Your resume? Your adjusted gross income?

How about the Confidential Employee Evaluation you were working on when the Boss hauled you into his office for a chat?

What? You never thought about this before? Then read on and you'll never have to think about it again.

All you'll have to think about is your password.

That's the key to DiskLock, the painless, yet powerful, System 7 savvy way to keep other people's noses permanently out of both your personal and professional data.

You can password-protect selected files, folders or your entire hard disk. And encrypt everything to U.S. Government DES specs.

You don't even have to be there. DiskLock blanks your screen and secures your system for you – without interrupting your applications – whenever you wander off.

When you return, it asks for your password and lets you know if anyone got curious while you were away.

If you're curious about DiskLock, or about our one-year money-back guarantee, call 1-800-666-2904.

We'll give you all the juicy details.
Practically Perfect Printing:
High-Resolution PostScript Printers

You've grown accustomed to a 300-dpi typeface. But sometimes that's not good enough. MacUser Labs tests ten PostScript printers that set a high quality standard.

BY BRUCE FRASER, PAUL YI, AND THE MACUSER LABS STAFF

It's not easy to set yourself apart from the crowd these days. Thanks to the desktop-publishing boom started by Apple's original LaserWriter, everyone's turning out "near typeset quality" (300-dpi laser-printed) manifestos, memos, and newsletters by the truckload. But despite the polished look and apparent high quality of laser printing, a typeface at the 300 dpi resolution of most laser printers is still noticeably jagged. And high-contrast halftones (those with few grays) can also be unacceptably coarse.

Professional publishers know that using 300-dpi laser-printer output as a reproduction master often gives unsatisfactory results. Instead, they rely on the far-superior quality of an imagesetter's 2,540-dpi film — great for book, magazine, and other high-quality graphics printing — but film is expensive and inconvenient, putting you at the mercy of a service bureau. And bringing an imagesetter in-house — if you can afford the $30K+ capital investment — plunges you headlong into a world of darkroom chemistry, noxious fumes, and production hassles.
High-Resolution Postscript Printers

Figure 1: Laser-Printing Quality

But you don’t have to climb all the way up the quality scale. You can choose from several types of high-resolution printers. High-resolution printers create a bitmap for printing — rasterize — at more than 300 dpi; enhanced-resolution printers use algorithms to smooth jaggies and improve the perceived resolution of a 300-dpi raster image. Vendors boost resolution in a variety of ways, and each claims advantages for its method (see Figure 1).

Vendor claims are one thing; real-world performance is another. For this report, MacUser Labs put ten high-resolution printers through a battery of tests for speed, image quality, and compatibility with the Adobe PostScript page-description language. The Apple LaserWriter IIIf and IIG and the Hewlett-Packard LaserJet III and IIIIsi are four 300-dpi laser printers that use various enhancement techniques to boost output quality. The LaserMaster LaserMAX 800 and 1000, Printware 720 IQ Laser Imager, QMS-PS 815 sr, and Varityper VT600W are high-resolution printers, with resolutions ranging from 800 x 300 dpi to 1,200 x 600 dpi.

We also looked at the Xante AccelaWriter upgrade board for the Apple LaserWriter II printer, which increases the LaserWriter’s resolution to 600 dpi.

We discovered that claims of higher resolution don’t necessarily translate into improved image quality on the page. We also found that some PostScript clones are still bedeviled by compatibility problems and that improved image quality comes at the price of speed.

Performance Penalty

To put each printer through its paces, we timed the printing of a 30-page Microsoft Word document containing a few printer-resident fonts; a complex PostScript illustration created with Adobe Illustrator; a 4.5-megabyte 300-dpi gray-scale TIFF image; and a composite page containing line art, type, an EPS image, and a gray-scale TIFF image.

The runaway speed winner was the Hewlett-Packard LaserJet IIIIsi (see Figure 2). Its 17-page-per-minute powerhouse Canon NX engine, coupled with an Am29000 RISC processor, delivered speedy PostScript performance. Apple’s new printers were the next-fastest, but each was only slightly faster than the venerable LaserWriter IINTX, our test reference standard. As we expected, all the other printers were slower than the IINTX — higher resolution means that the printer has more information to process.

Two printers, however, were noticeably slower than the rest of the pack. The 16-megahertz 68000-based Hewlett-Packard LaserJet III simply doesn’t have the horsepower to compete with the new generation of PostScript printers. The Printware 720 IQ Laser Imager was also very slow, although improvements to its RIP (raster-image processor) have made it faster now than when we last tested it (see “The Letter-Perfect PostScript Printer,” October ’90, Buyer’s Guide page 4). Nonetheless, the Printware 720 IQ Laser Imager’s slow speed is forgivable: At 1,200 x 600 dpi, it processes eight times as much data per page as the 300-dpi LaserJet III does.
Quality Worth Waiting For

But unless you’re doing volume printing on demand — producing the number of copies you need directly from the laser printer (see the “Alternative Press” sidebar), quality is more of an issue than speed. We judged the composite page on the basis of line-art, type, and halftone-image quality. As a double-check for halftone quality, we also judged a full-page gray-scale image. To further check type quality, we printed font-sample sheets for Adobe Garamond Italic — a serif face — and Optima — a sans-serif face — at all sizes from 1 point to 36 points. Using downloadable fonts eliminated any differences that might have arisen from using different printer-resident fonts. We totaled the scores for each of these categories to obtain the final image-quality score for each printer.

The VariType VT600W, with its 600-dpi engine, scored the best for overall image quality (see Figure 3). The VariType printer, which has been on the market for several years, was a winner in our previous high-resolution-printer lab. We had expected that some of the new offerings would displace — or at least match — the venerable VariType, but it scored top marks in every category. Second and third places went to the QMS-PS 815 mr and the Hewlett-Packard LaserJet IIISi, respectively. But both of these fell short of the VT600W, particularly in the halftone test. Last place went to the LaserWriter III, the less expensive of the two new Apple offerings.

The results demonstrate the differences among alternative resolution-enhancement techniques. The LaserWriter III is a 300-dpi printer that uses Apple’s new FinePrint type-enhancement technology. Type produced by FinePrint was less readable, particularly at small sizes, than that produced

---

**FinePrint versus RET**

Unless you’re a hyperactive photo-scanning fiend, most of your laser-printed output is likely to be text and line art.

Apple’s FinePrint and Hewlett-Packard’s RET (Resolution Enhancement Technology) are two techniques for improving the look of text and line art without high resolution’s sacrifice in speed. FinePrint and RET are *postprocessors*: After PostScript has rendered a page into a bit map, both FinePrint and RET locate lines and text in the bit map. FinePrint employs a *pulsing* technique — the laser beam’s intensity and duration are modified — to extend or contract the size of the dots and smooth the jaggies. RET, on the other hand, fills in the jaggies by adding smaller dots to the bit map. Both techniques result in smoother curves and lines — and ultimately, more-legible text.

---

**Apple LaserWriter IIg**

100% 11 pt abcdefghijklmn
12 pt abcdefghijklm
13 pt abcdefghijkl
800% 100%
(FinePrint off)

---

**Hewlett-Packard LaserJet III**

100% 11 pt abcdefghijklmn
12 pt abcdefghijklm
13 pt abcdefghijkl
800% 100%
(RET off)

---

**Hewlett-Packard LaserJet IIISi**

100% 11 pt abcdefghijklmn
12 pt abcdefghijklm
13 pt abcdefghijkl
800% 100%
(RET off)

---

---

(FinePrint on)

---

(RET on)
High-Resolution PostScript Printers

Figure 2: Printing Times

<table>
<thead>
<tr>
<th>Overall Time</th>
<th>Better</th>
<th>Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hewlett-Packard LaserJet III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple LaserWriter II</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple LaserWriter Ilg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hewlett-Packard LaserJet III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Varityper VT600W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QMS QMS-PS 815 MR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xantec AccelaWriter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LaserMaster LaserMAX 800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LaserMaster LaserMAX 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printware 720 IQ Laser Imager</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Text Document</th>
<th>Better</th>
<th>Worse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple LaserWriter II NTX</td>
<td>Uses the fast 17-ppm Canon NX engine.</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2: Boosting resolution by means of an enhancement algorithm doesn't affect a printer's speed, but laying more dots per inch on the page—as with real high-resolution printers—does: A 600-dpi printer processes four times as much information as a 300-dpi printer does. And a 600-dpi printer must lay down four times as many dots on the page, which is why high-resolution printers are generally slower than enhanced-resolution printers.

Our speed benchmark tests consisted of printing a 30-page Word text document, a complex PostScript graphic, a 4.5-megabyte grayscale image, and a composite page. Both a printer's engine and its microprocessor affect performance.

The results also show that the print engine's quality is as important as the resolution-enhancement method: Note the Canon NX-based 300-dpi LaserJet III's strong showing compared with the relatively unspectacular performance of the Canon SX-based 1,000-x-400-dpi LaserMAX 1000.

Because the results vary widely among printers, it's important to clearly define the kind of output you need and set your expectations accordingly. All the printers we looked at provide acceptable quality for on-demand publishing. If you use the printer to generate camera-ready copy for reproduction on a printing press, however, the requirements are much more stringent, particularly for halftones. Although it's easy to divide the printers into three broad output-quality classes—best, medium, and worst—the printers within each class have different
Text Document:

Printing a simple 30-page Word text document tests a printer’s raw engine speed. This test highlighted the Hewlett-Packard LaserJet IIISi’s 17-ppm Canon NX engine — it really screamed. We were surprised by the last-place finish of the LaserMAX 800 and 1000, because both use an 8-ppm engine, as do most of the other printers.

Complex PostScript Graphic:

Our one-page Adobe Illustrator test document taxes a printer’s PostScript processor. The Hewlett-Packard LaserJet IIISi’s Am29000 RISC chip and the Apple LaserWriter IIIf and IIg’s 68030 processors proved to be the quickest. The Printware 720 IQ Laser Imager is hampered not by its 68020 processor but by the PostScript-clone interpreter it uses.

Gray-Scale Image:

The results for the LaserJet IIIf show that it’s time for Hewlett-Packard to upgrade this printer’s processor. The Printware 720 IQ Laser Imager couldn’t print this test, because of memory constraints.

Composite Page:

Our composite-page test combines text, graphics, and gray-scale elements to tax almost everything on the printer. The Hewlett-Packard LaserJet IIISi is again the fastest, but the most surprising showing is the speed of our reference model, the Apple LaserWriter IINTX.

Printer Performance

Apple’s new PostScript Level 2 printers, the LaserWriter IIIf and IIg, feature Apple’s FinePrint resolution-enhancement technology (see “Image Makers,” November ’91, page 98). Apple claims that FinePrint type quality approaches the look of 600-dpi laser printing. Although the type looks better than standard 300-dpi output, FinePrint type samples rated lower than all the others in our tests. Apple believes that FinePrint adheres more faithfully to the character outlines than does Hewlett-Packard’s proprietary RET. This may be true — we weren’t able to draw any conclusions from our test output — but apparently such claims don’t translate into more-readable type. Small features plugged up on the output from both Apple printers, especially at small sizes.
High-Resolution PostScript Printers

Alternative Press

Traditional desktop publishing
Macintosh
Enhanced-resolution or high-resolution laser printer
comp/proof prints

On-demand printing
Macintosh
Enhanced-resolution or high-resolution laser printer
finished publication

Copy machine printing
Macintosh
Enhanced-resolution or high-resolution laser printer
mechanicals

Direct-to-plate imaging
Macintosh
Enhanced-resolution or high-resolution laser printer
proof prints

Imagesetter
CMYK negatives

Enhanced-resolution and high-resolution laser printers enable you to meet more of your printing needs from the desktop. High-resolution output can be used for final high-quality volume printing or as originals for reproduction on a photocopier or a printing press.

Although high-resolution laser printers can't match the quality of 2,540-dpi imagesetters, plain-paper output does make suitable camera-ready copy for many print jobs. For example, because...
ink bleeds — spreads — when it hits newsprint, the differences in quality between plain-paper laser and imagesetter typographic output are masked. Decent plain-paper halftones take some work to produce, but plain-paper laser-printed halftones are good enough for most newspapers. DuPont has had some success in the newspaper market selling a 600-dpi laser printer made by Chelgraph UK that prints on tabloid-sized paper.

Laser-printed originals are also now of high enough quality for many business and office printing needs — employee directories, how-to manuals, memos, and the like. If you bring the entire printing process in-house, you can reap the benefits of increased control, catching and correcting problems at any stage of the process. You can also produce the number of copies you need on demand. On-demand printing has the advantage of economizing on paper. In traditional offset printing, setting up a printing press for a print job takes a significant amount of time and therefore money. Because setup charges comprise a relatively smaller percentage of the total cost of any job as the number of copies goes up, print buyers often order a larger print run than they actually need. When the document undergoes revision, the 2,500 extra copies in the warehouse get trashed.

If you'd rather not push your printer: Print a high-quality master copy on your enhanced-resolution or high-resolution laser printer, and then photocopy the master. In this case, the quality depends on the photocopier. The current crop of laser printers significantly raises the level of quality that can be achieved for the master copy, making the laser-printer-to-copier route viable for a wide range of documents.

There are times, however, when higher press quality is necessary. An emerging technology that makes shorter press runs economical is direct-to-plate imaging — each page is imaged directly onto a paper or a metal plate that goes directly on the press. Printware offers a plate-imaging system that uses the same controller as the Printware 720 IQ Laser Imager does. Direct-to-plate imaging offers large savings in setup charges, particularly for single-color print jobs — color registration isn't an issue. In this case, the laser printer plays a vital role as a proof generator: High-resolution laser printers offer a close approximation of the final page, enabling you to go to press with confidence that your print job will turn out to your satisfaction.

Although FinePrint proved somewhat lackluster, Apple's halftone-enhancing technology, PhotoGrade, exceeded our expectations. The LaserWriter Ilg's 85-lpi halftones were a pleasant surprise, but the default 106-lpi halftones were little short of astonishing: They looked as good as those printed by the Laser Imager and the VT600W. PhotoGrade is also available for the LaserWriter Ilf, if you upgrade to 5 megabytes of RAM, but we tested the LaserWriter Ilf in its standard 2-megabyte RAM configuration, so it scored much lower than did the LaserWriter Ilg. Without PhotoGrade, the LaserWriter Ilf can't compete when it comes to halftones.

We were disappointed by the speed of both Apple printers; they were only slightly faster than the LaserWriter IINTX. However, Apple hasn't yet shipped a PostScript Level 2 printer driver for either printer: The drivers should be available this year and should boost performance considerably.

Another performance booster — an EtherTalk port — is already on the LaserWriter Ilg. If you have Macs networked via high-speed EtherTalk, you can cable a LaserWriter Ilg directly into the network rather than queuing up print jobs at LocalTalk speeds.

If you're looking for speed, the Hewlett-Packard LaserJet IIIIsi is a strong contender for your printer dollar. By far the fastest of the printers we tested, the LaserJet IIIIsi also made an excellent showing in all the image-quality categories except for the halftone category (it does print halftones as well as does any other high-quality 300-dpi laser printer, though). Hewlett-Packard's RET is limited to improving the look of type and line art, not halftone screens.

But improve the look of type and line art it does. Output samples for the LaserJet IIIIsi show a clear distinction between .25-point lines and hairlines. Type is readable even at a minuscule 2.5-point size. One caveat: Other vendors have accused Hewlett-Packard's RET of distorting the shapes of characters and exaggerating and
High-Resolution PostScript Printers

Figure 3: Image Quality

<table>
<thead>
<tr>
<th>Printer</th>
<th>Text</th>
<th>Gray-scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>VariType VT600W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hewlett-Packard LaserJet III/Si</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QMS QMS-PS 815</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primeware 720 IQ Laser Imager</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LaserMaster LaserMAX 1000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple LaserWriter Ilg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LaserMaster LaserMAX 800</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xante AccelaWriter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hewlett-Packard LaserJet III</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apple LaserWriter IIg</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Jury rating

Figure 3: Our jury rated the output samples on a scale from 1 to 3. The image quality from all the printers proved superior to that of the LaserWriter IIINTX, a standard in 300-dpi output. In general, output from the high-resolution printers was superior to that from the resolution-enhanced 300-dpi printers, with two exceptions. The Hewlett-Packard LaserJet III/Si really showed how good its new Canon engine is when coupled with RET. The III/Si was on a par with the high-resolution printers in text quality, whereas the Apple LaserWriter Ilg with PhotoGrade matched the high-resolution printers in halftone quality.

Sometimes even adding serifs. We didn’t see these effects in our tests, but we printed a limited range of fonts. If you value font fidelity, make sure that the III/Si’s renditions of your selected fonts are satisfactory. If your primary consideration is type legibility, the III/Si will serve you well.

Hewlett-Packard’s RET can take only part of the credit for the LaserJet III/Si’s high marks, however. The Canon NX printer engine also plays a role, as evidenced by the fact that the Hewlett-Packard LaserJet III — which also uses RET but which is based on the older Canon SX engine — tied for second-to-last place for text quality. Although it produced better-looking type than did the LaserWriter III/G and Ill/G, the LaserJet III is very slow for a 300-dpi printer. Its $3,395 list price is aggressively discounted, but you’ll find better deals on other PostScript printers. All in all, the LaserJet III was a disappointment.

The most disappointing printers of the bunch, however, were the LaserMaster LaserMAX 800 and 1000. The LaserMAX PostScript-compatible interpreter — ETI (Enhanced True-Image) — is housed on a NuBus card you must install in a NuBus-equipped Mac. The host Mac then appears in the Chooser, just as the printer would. If you’re using a LaserMaster printer on a network, other Macs connect and print via the host Mac. LaserMaster claims that you can use the host Mac while printing is taking place in the background. Technically speaking, this is true, but background printing causes even the simplest task to slow the Mac to a crawl.

Both printers fell solidly in the middle of the pack on both the type and the halftone tests. The LaserMAX 1000 produced slightly better halftones than did the LaserMAX 800, but they did about equally well on the type test. Both printers did poorly on the line-art test, with jaggies on the hairlines and the .25-point lines. And both printers were slow, finishing ahead of only the slow Hewlett-Packard LaserJet III and the Printware 720 IQ Laser Imager.
At 1,200 x 600 dpi, the Printware 720 IQ Laser Imager was the highest-resolution printer we tested and so had good reason to be slow. Unfortunately, the Laser Imager's Printstyle 2.2 PostScript-clone interpreter is plagued by PostScript-compatibility problems: The Laser Imager printed the finest hairlines of all the printers, but it rendered the .25-point lines at the same width as the hairlines.

In general, the Laser Imager produced type that equaled or surpassed that produced by the VT600W. But at sizes smaller than 5 points, the type began to drop out — again alerting us to a PostScript problem. In this case, the interpreter apparently wasn't making correct use of Type 1-font hints, which help render clean typefaces at minute point sizes.

One other problem: The Laser Imager couldn't print the 300-dpi grayscale TIFF image at all. It did print a 200-dpi version of the image, however, which suggests that this printer needs more than the 8 megabytes of RAM it ships with. To the Laser Imager's credit, the output from the lower-resolution scan was rated on a par with the top-ranking images.

Of all the printers we tested, the QMS-PS 815 MR came closest to matching the Varityper VT600W. The VT600W had slightly superior type image quality, particularly at small point sizes, and its 10-ppm engine nudged it ahead of the QMS printer in overall speed. But thanks to the higher clock speed of its 68020 processor, the 815 MR was considerably faster at printing the complex PostScript page. The 815 MR is also just over a third as expensive as the VT600W and has a longer-rated engine life.

The 815 MR also features QMS' autoport-switching technology, first introduced on the QMS-PS 410. We were concerned by reports that the QMS-PS 410 "disappears" from AppleTalk networks, so we kept four Macs printing to an 815 MR on a busy Mac network. We experienced no problems; however, we didn't test it in a multiplatform environment.

The Varityper VT600W received the highest possible rating in each of our image-quality tests, a distinction shared by no other printer. With a 10-ppm engine and a 16-megahertz 68020 processor, it performed respectably in the time tests as well, finishing slightly ahead of the other 600-dpi printers.

Despite its outstanding ratings for image quality, the Varityper VT600W isn't flawless. It has an automatic toner-replenishment feature that recycles excess toner as well as any dust that might come off the paper. You'll want to choose your paper carefully for this one. And at $14,995, the VT600W is the most expensive printer we tested. However, it does support tabloid (11 x 17-inch) paper and the hefty price tag includes installation and setup by Varityper.

The Xante AccelaWriter is a $1,695 upgrade board for the Apple LaserWriter II series that boosts the printer's resolution to 600 dpi. The PhoenixPage PostScript-clone interpreter is one of the more reliable we've come across, and the resulting output is a definite improvement over unenhanced 300-dpi output. Apple is also offering upgrade boards for the LaserWriter II series. For $2,399 you can upgrade a LaserWriter II to a Ilg, or for about the same price as the Xante AccelaWriter, you can upgrade to a IIIf ($1,399). You get PostScript Level 2, PhotoGrade, FinePrint — and EtherTalk with the Ilg — as well as the security of owning a mainstream Apple product. We expect that choosing an upgrade board will be easy for most LaserWriter II owners.

**Fit to Print**

Memos printed on daisywheel and dot-matrix printers tend to look crude today, thanks to a printer called the

---

**On the Horizon**

Apple sets a new standard for laser printing with its LaserWriter IIIf and Ilg. Thanks to its proprietary resolution-enhancement techniques — FinePrint and PhotoGrade — these 300-dpi plain-paper laser printers produce pages that match the quality of much-higher-resolution laser printers. FinePrint and PhotoGrade will undoubtedly become a standard feature in future Apple printers. In the meantime, other vendors have quickly responded with their own better-than-300-dpi printers.

NewGen has introduced the TurboPS series, a new line of laser printers featuring the company's IET (Image Enhancement Technology). IET smooths jaggies and enhances grayscale-image printing in much the same fashion as FinePrint and PhotoGrade do. The TurboPS 840e ($5,495) prints at 800 x 400 dpi and includes IET as a standard feature. The TurboPS 846 ($4,765) and TurboPS 6030 ($3,495) print at 600 x 400 and 600 x 300 dpi, respectively, and offer IET as an option. The Weltke-RISC-chip-based printers in the TurboPS series use a PostScript-compatible interpreter. NewGen Systems, 17590 Newhope Street, Fountain Valley, CA 92708; (714) 841-8500.

LaserMaster has announced TurboGray, a PhotoGrade-type halftone-enhancement technology. TurboGray will be available as a software upgrade for the existing line of LaserMaster printers, including the LaserMAX 800 and 1000. At press time, information on pricing and availability was still pending. LaserMaster Corp., 7156 Shady Oak Road, Eden Prairie, MN 55344; (612) 944-9151.

Canon made news not with its own complete PostScript printer but when it announced the OEM availability of the Canon NX engine — the engine Hewlett-Packard uses in the LaserJet IIIH. A printer's engine is a key factor in image quality, and the 17-ppm Canon NX is by far the best of the 300-dpi engines. In our tests, the type quality produced by the printer with this engine rivaled that of the 1,200 x 600-dpi Printware 720 IQ Laser Imager, which our jury decided was the overall best. Canon NX printers can also have two 500-sheet paper cassettes, a duplex mode, and an offset-exit-tray mechanism for separating multiple jobs. One wonders how FinePrint and PhotoGrade would fare with such an engine. Canon, One Canon Plaza, Lake Success, NY 11042; (800) 323-0766 or (516) 485-5700.
LaserWriter, which Apple introduced in 1984. But when you compare a LaserWriter's 300-dpi plain-paper output to 2,540-dpi imagesetter output, you can see just how unpolished laser printing really is — it suffers from fuzzy rules and jagged type, for example. And using 300-dpi output as camera-ready copy for reproduction often produces disappointing results.

Fortunately, vendors are improving the output quality of plain-paper laser printers. High-resolution printers use a bit map that contains more dots per inch, and enhanced-resolution printers use intelligent algorithms to smooth curves and lines in a 300-dpi bit map. And Apple has set the standard for laser printing once again by building its proprietary enhancement technologies — PhotoGrade and FinePrint — in to its newest generation of laser printers. Although both these enhancement techniques fall short of the quality offered by true high-resolution printers, they are significant steps up from standard unenhanced 300-dpi output.

Bruce Fraser is the author of Adobe Illustrator 3.0 Complete and Using Freehand 3.0. Paul Yil is a former MacUser associate editor currently pursuing a career as a consultant and technical writer.

The 300-dpi Apple LaserWriter III ($3,999 list, $2,829 street) offers only slightly better-looking type than previous Apple printers do. But when you stack it against the IIfX, the III is faster and holds the promise of even better performance when PostScript Level 2-aware software and printer drivers become available — and it costs $2,000 less than the IIfX. With a 4-megabyte RAM upgrade, you get PhotoGrade resolution enhancement as well.

Apple's new flagship printer, the 300-dpi LaserWriter Ilg ($4,599 list, $3,599 street) is a little faster still, but its outstanding feature is PhotoGrade, which produces halftones that we would have sworn were impossible to get from a 300-dpi printer. The IIfg also has Ethernet built in.

If you're a LaserWriter II owner looking to upgrade, buy the IIf upgrade (the 5-megahertz difference in clock speed between the III and IIfg is barely significant) and then buy an extra 4 megabytes of third-party RAM to get the benefit of PhotoGrade.

If speed is more important to you than halftone quality, the 300-dpi Hewlett-Packard LaserJet III SI ($6,995 list, $4,077 street) is a natural choice. If you use your printer to generate camera-ready copy for printing on newsprint or for quick-print jobs, we suspect that you'd be hard-pressed to tell the difference between type and line art generated by a LaserJet III SI and that produced by a Varityper VT600W, once the pages come off the press — and you'll have a printer that runs 40 percent faster at slightly less than half the cost.

The 600-dpi QMS-PS 815 ($5,495 list, $3,895 street) comes close to the Varityper VT600W in both speed and overall image quality, again at a fraction of the cost. You can also switch the 815 MB's resolution from 600 dpi to 300 dpi for faster printing when you don't need the higher resolution. The QMS-PS 815 MR also offers automatic port switching, which is a boon in multiprocessor environments.

Any one of these five printers will do a great job of producing an image (left to right): the Varityper VT600W, Apple LaserWriter III, Apple LaserWriter Ilg, Hewlett-Packard LaserJet III SI, and QMS-PS 815 MR.
Now easy-to-install Accel-a-Writer™ controllers from Xante turn any Apple® LaserWriter® or HP® LaserJet® into a true 600 x 600 dpi PostScript® compatible SuperPrinter.

Affordably.

Whether you're the owner of a LaserWriter or Laserjet, the Accel-a-Writer delivers other important advantages, too. Like an advanced RISC processor that makes your printer assemble text and graphics 4 to 12 times faster. Expanded connectivity for simultaneous operation of Apple® Macintosh®, IBM®/compatibles and other popular workstations. A SCSI port to plug in external hard drives for permanent storage of downloadable fonts and programs. And dual page processing which gives your printer the ability to print a page while assembling another. If you want all the speed and connectivity but don't currently need 600 x 600 resolution, Xante even makes an Accel-a-Writer for you at just $1295!

Call Xante toll-free to order the Accel-a-Writer you need today. And get the professional advantages of increased resolution, speed and connectivity, affordably.


CIRCLE 108 ON READER SERVICE CARD.

© 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, 2559 Emogene St., Mobile, AL 36606, Post Office Box 16526, Mobile, AL 36616-0526 USA, TEL 205 476-8189

### Table 1: Features of High-Resolution PostScript Laser Printers

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>List price</td>
<td>$3,599</td>
<td>$4,599</td>
<td>$3,395</td>
<td>$6,995</td>
</tr>
<tr>
<td>Street price</td>
<td>$2,829</td>
<td>$3,599</td>
<td>$2,457</td>
<td>$4,077</td>
</tr>
<tr>
<td>Cons</td>
<td>Image quality inferior to that of other printers in review.</td>
<td>Slow.</td>
<td>Bulky.</td>
<td></td>
</tr>
</tbody>
</table>

#### Specifications

<table>
<thead>
<tr>
<th>Laser-engine model</th>
<th>Canon SX</th>
<th>Canon SX</th>
<th>Canon SX</th>
<th>Canon NX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine speed (Ppm)</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>17</td>
</tr>
<tr>
<td>Engine life (pages)</td>
<td>750,000</td>
<td>750,000</td>
<td>750,000</td>
<td>not specified</td>
</tr>
<tr>
<td>Monthly duty cycle (pages)</td>
<td>16,000</td>
<td>16,000</td>
<td>16,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Microprocessor, clock speed (MHz)</td>
<td>68030, 20 MHz</td>
<td>68030, 25 MHz</td>
<td>68000, 16 MHz</td>
<td>Am29000, 16 MHz</td>
</tr>
<tr>
<td>PostScript version or clone</td>
<td>Level 2</td>
<td>Level 2</td>
<td>Level 1, version 5.2.3</td>
<td>Level 1, version 5.2.3</td>
</tr>
<tr>
<td>Resolution (dpi)</td>
<td>300</td>
<td>300</td>
<td>300 dpi</td>
<td>300 dpi</td>
</tr>
<tr>
<td>Memory (standard, maximum)</td>
<td>2 MB, 32 MB</td>
<td>5 MB, 32 MB</td>
<td>2 MB, 5 MB</td>
<td>5 MB, 17 MB</td>
</tr>
<tr>
<td>No. of resident fonts</td>
<td>35</td>
<td>35</td>
<td>35</td>
<td>35</td>
</tr>
<tr>
<td>Interfaces</td>
<td>LocalTalk, serial, parallel</td>
<td>LocalTalk, serial, parallel</td>
<td>AppleTalk, serial, parallel</td>
<td>AppleTalk</td>
</tr>
<tr>
<td>Printer emulations</td>
<td>PCL4+</td>
<td>PCL4+</td>
<td>PCL5, ProPrinter, Epson</td>
<td>PCL5, ProPrinter, Epson</td>
</tr>
<tr>
<td>Paper handling</td>
<td>16 - 36 lb</td>
<td>16 - 36 lb</td>
<td>16 - 36 lb</td>
<td>16 - 36 lb</td>
</tr>
<tr>
<td>No. of trays, page capacity</td>
<td>1, 200</td>
<td>1, 200</td>
<td>1, 200</td>
<td>2, 500 each</td>
</tr>
<tr>
<td>Other options</td>
<td>NA</td>
<td>NA</td>
<td>duplex printing, $695</td>
<td>NA</td>
</tr>
</tbody>
</table>

#### Miscellaneous

| Toner (price, copies) | $119, 4,000 | $119, 4,000 | $125, 4,000 | $169, 8,000 |
| Dimensions (L x W x H, in.) | 19 x 20 x 9 | 19 x 20 x 9 | 19 x 18 x 6.5 | 21.6 x 23 x 16.5 |
| Weight | 45 lb | 45 lb | 50 lb | 106 lb |
| Warranty | 1 year | 1 year | 1 year | 1 year on-site |
| Service contract (on/off-site) | none | none | $264/$180 | $540/none |

**Company**

- **Apple Computer, Inc.**
  - 20525 Mariani Ave.
  - Cupertino, CA 95014
  - (408) 996-1010
- **Apple Computer, Inc.**
  - 20525 Mariani Ave.
  - Cupertino, CA 95014
  - (408) 996-1010
- **Hewlett-Packard Co.**
  - 19310 Pruneridge Ave.
  - Cupertino, CA 95014
  - (800) 752-0900
  - (408) 323-2551
- **Hewlett-Packard Co.**
  - 19310 Pruneridge Ave.
  - Cupertino, CA 95014
  - (800) 752-0900
  - (408) 323-2551

*Without paper tray.*
Get Quadra SCSI Performance and More...

**PLI QUICKSCSI BOARD**

**PERFORMANCE**

The PLI QuickSCSI board improves your Mac's SCSI performance by up to 300%.

- **UP TO 4.4MB/SEC SUSTAINED TRANSFER RATE**

Eliminate the Macintosh SCSI bottleneck. That's more than twice as fast as the Mac's built-in SCSI*, because QuickSCSI uses newer, faster SCSI technology, including SCSI-2! Get all the performance your fast drives can give - use QuickSCSI. See the chart below for QuickSCSI's real world performance with a PL 1.3GB using an Elite drive from Seagate.

**Set-up is easy, because QuickSCSI is compatible with most popular disk drives, including internals.**

- **UP TO 14 SCSI DEVICES**

You can install QuickSCSI in any NuBus Macintosh. And because QuickSCSI doesn't disable the built-in SCSI, you can have up to 14 SCSI devices online at a time. (If you need even more devices, just add more QuickSCSI cards to your computer.)

**PLI's MiniArray support**

The MiniArray uses parallel read/write transfers to multiple drives using a single SCSI ID number. The transfer rate is up to 6MB/sec.

**MIRRORING**

QuickSCSI provides Mirroring

- AUTOMATIC, CONTINUOUS BACKUPS
- SUPPORTS DISCONNECT / RECONNECT
- UP TO 3 SETS OF MIRRORED DRIVES
- IN CASE OF A DRIVE FAILURE QUICKSCSI SWITCHES AUTOMATICALLY TO THE OTHER DRIVE
- PARTITIONING

Everything you write to the main drive will be written to a second drive at the same time. And since QuickSCSI supports disconnect/reconnect with mirrored pairs, mirroring your drives improves their access time! Partitioning allows a smaller capacity drive to be mirrored into a partition of a larger capacity drive.

You never have to re-create data or waste time restoring.

Mirroring is by far the safest, most reliable way to maintain current backups of your important data. And QuickSCSI uses a fast-burst, disk mirroring technique which is so fast and easy, you may never do a traditional backup again. It's ideal for network administrators, desktop publishers, computer artists or anyone who hates to make backups.

**Powerful drives work well with QuickSCSI**

Three PLI drives which work particularly well with QuickSCSI are the Wren Runner II and Elite drives. These high-capacity, super-performance Seagate drives are ideal for your disk-intensive applications.

---

**Table from MacWEEK Test labs 10-29 issue**

<table>
<thead>
<tr>
<th>Drive Type</th>
<th>Sustained Reads</th>
<th>Sustained Writes</th>
<th>19.6MB File</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mac II</td>
<td>Mac II with QuickSCSI</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2GB</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>500</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2500</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2GB</td>
<td>500</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1500</td>
<td>2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2500</td>
<td>3000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19.6MB File</td>
<td>9</td>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Performance will vary depending on sustained transfer rate of the drive connected to QuickSCSI. *The Quadra 900 has faster SCSI performance than other Macs and similar performance to QuickSCSI but does not offer mirroring. All company names and product names are the property of their respective holders.

**Seagate**

Peripheral Land Incorporated
47421 Bayside Parkway • Fremont, California 94538
510-657-2211 or 800-288-8754

The Most Trusted Name in Storage Solutions.

**CIRCLE 181 ON READER SERVICE CARD.**
## Table 1: Features of High-Resolution PostScript Laser Printers, continued

<table>
<thead>
<tr>
<th>Model</th>
<th>LaserMaster LaserMAX 800</th>
<th>LaserMaster LaserMAX 1000</th>
<th>Printware 720 IQ Laser Imager</th>
<th>OMS-PS $150K</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>List price</strong></td>
<td>$4,995</td>
<td>$6,995</td>
<td>$13,990</td>
<td>$5,495</td>
</tr>
<tr>
<td><strong>Street price</strong></td>
<td>$4,995</td>
<td>$6,995</td>
<td>$13,990</td>
<td>$3,995</td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td>Decent image quality.</td>
<td>Good halftone quality.</td>
<td>Excellent image quality.</td>
<td>Good image quality.</td>
</tr>
<tr>
<td><strong>Specifications</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Laser-engine model</td>
<td>Canon SX</td>
<td>Canon SX</td>
<td>Printware 720 IQ</td>
<td>Canon SX</td>
</tr>
<tr>
<td>Engine speed</td>
<td>8 ppm</td>
<td>8 ppm</td>
<td>8 ppm</td>
<td>8 ppm</td>
</tr>
<tr>
<td>Engine life (pages)</td>
<td>750,000</td>
<td>750,000</td>
<td>2 million</td>
<td>750,000</td>
</tr>
<tr>
<td>Monthly duty cycle (pages)</td>
<td>12,500</td>
<td>12,500</td>
<td>20,000</td>
<td>none</td>
</tr>
<tr>
<td>Microprocessor, clock speed</td>
<td>proprietary RISC</td>
<td>proprietary RISC</td>
<td>LaserMaster ETI</td>
<td>LaserMaster ETI</td>
</tr>
<tr>
<td>PostScript version or clone</td>
<td>LaserMaster ETI</td>
<td>LaserMaster ETI</td>
<td>Printstyle 2.2</td>
<td>Level 1, version 5.2.4</td>
</tr>
<tr>
<td>Resolution</td>
<td>800 x 300 dpi</td>
<td>1,000 x 400 dpi</td>
<td>1,200 x 600 dpi</td>
<td>300 dpi, 600 dpi</td>
</tr>
<tr>
<td>Memory (standard, maximum)</td>
<td>6 MB, 9 MB</td>
<td>9 MB, 16 MB</td>
<td>8 MB, 16 MB</td>
<td>6 MB, 16 MB</td>
</tr>
<tr>
<td>No. of resident fonts</td>
<td>135</td>
<td>135</td>
<td>35</td>
<td>45</td>
</tr>
<tr>
<td>Interfaces</td>
<td>NuBus</td>
<td>NuBus</td>
<td>AppleTalk, serial, parallel</td>
<td>AppleTalk, serial, parallel</td>
</tr>
<tr>
<td>Printer emulations</td>
<td>none</td>
<td>none</td>
<td>ICL</td>
<td>PCL; HPGL, $295</td>
</tr>
<tr>
<td><strong>Paper handling</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paper weight</td>
<td>24 lb</td>
<td>24 lb</td>
<td>16 – 24 lb</td>
<td>16 – 21 lb</td>
</tr>
<tr>
<td>No. of trays, page capacity</td>
<td>1, 250</td>
<td>1, 250</td>
<td>1, 250</td>
<td>1, 200</td>
</tr>
<tr>
<td>Paper sizes</td>
<td>letter, legal</td>
<td>letter, legal</td>
<td>statement, letter, legal, A4</td>
<td>letter, legal, A4</td>
</tr>
<tr>
<td><strong>Other options</strong></td>
<td>NA</td>
<td>NA</td>
<td>spot-color printing</td>
<td>NA</td>
</tr>
<tr>
<td><strong>Miscellaneous</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toner (price, copies)</td>
<td>$195, 3,000</td>
<td>$195, 3,000</td>
<td>$56,25, 5,000</td>
<td>$130, 4,000</td>
</tr>
<tr>
<td>Dimensions (L x W x H, in.)*</td>
<td>19 x 18 x 8</td>
<td>19 x 18 x 8</td>
<td>19.5 x 18.5 x 12</td>
<td>19 x 16 x 9</td>
</tr>
<tr>
<td>Weight</td>
<td>38 lb</td>
<td>38 lb</td>
<td>65 lb</td>
<td>44 lb</td>
</tr>
<tr>
<td>Warranty</td>
<td>1 year</td>
<td>1 year</td>
<td>1 year parts, 1 year</td>
<td>1 year</td>
</tr>
<tr>
<td>Service contract (on/off-site)</td>
<td>through dealer</td>
<td>through dealer</td>
<td>through dealer</td>
<td>$649/$390</td>
</tr>
<tr>
<td>Company</td>
<td>LaserMaster Corp.</td>
<td>LaserMaster Corp.</td>
<td>Printware</td>
<td>OMS, Inc.</td>
</tr>
<tr>
<td></td>
<td>7156 Shady Oak Rd.</td>
<td>7158 Shady Oak Rd.</td>
<td>1385 Mendota Heights Rd.</td>
<td>One Magazine Pass</td>
</tr>
<tr>
<td></td>
<td>Eden Prairie, MN 55344</td>
<td>Eden Prairie, MN 55344</td>
<td>St. Paul, MN 55120</td>
<td>Mobile, AL 36618</td>
</tr>
<tr>
<td></td>
<td>(600) 950-0353</td>
<td>(600) 243-0110</td>
<td>(800) 456-1616</td>
<td>(800) 631-2692</td>
</tr>
<tr>
<td></td>
<td>(612) 944-9151</td>
<td>(612) 944-9151</td>
<td>(612) 456-1400</td>
<td>(205) 633-4300</td>
</tr>
</tbody>
</table>

*Without paper tray.
1Auto-select ports and emulations.
If there were a printer that could give you this kind of color, would you still make your presentations in black and white?

Do your presentations go in one eye and out the other? The Colormate PS 40 can easily and affordably give them the impact they deserve, enhancing your work with truly amazing color.

The Colormate PS 40 integrates readily with any network, PC or Mac. And it's compatible with most popular presentation software. Of course, Adobe PostScript is standard, so you can scale, rotate and shade the 17 resident fonts. 300 DPI graphics means that output is sharp and clear, whether paper or transparencies. And with its small footprint, the Colormate PS 40 won't fill up your desk.

After all, the world isn't black and white, why should your presentations be?

CIRCLE 141 ON READER SERVICE CARD.
### High-Resolution PostScript Printers

#### Table 1: Features, continued

<table>
<thead>
<tr>
<th>Model</th>
<th>List price</th>
<th>Street price</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varityper VT600W</td>
<td>$14,995</td>
<td>$14,995</td>
<td>Tops in image quality.</td>
<td>Big and bulky.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fast for 600-dpi printer.</td>
<td>Expensive. Need service</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>contract.</td>
</tr>
<tr>
<td>Xante AccelaWriter</td>
<td>$1,695</td>
<td>$1,695</td>
<td>2-year warranty. Fast</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>processor.</td>
<td></td>
</tr>
</tbody>
</table>

#### Specifications

<table>
<thead>
<tr>
<th>Laser-engine model</th>
<th>Panasonic LD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine speed</td>
<td>10 ppm</td>
</tr>
<tr>
<td>Engine life (pages)</td>
<td>600,000</td>
</tr>
<tr>
<td>Monthly duty cycle (pages)</td>
<td>12,000</td>
</tr>
<tr>
<td>Microprocessor, clock speed</td>
<td>68020, 16 MHz</td>
</tr>
<tr>
<td>PostScript version or clone</td>
<td>Level 1, version 48.10</td>
</tr>
<tr>
<td>Resolution</td>
<td>600 dpi</td>
</tr>
<tr>
<td>Memory (standard, maximum)</td>
<td>12 MB, 12 MB</td>
</tr>
<tr>
<td>No. of resident fonts</td>
<td>35</td>
</tr>
<tr>
<td>Interfaces</td>
<td>LocalTalk, RS-422, RS-232</td>
</tr>
<tr>
<td>Printer emulations</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>PCL4</td>
</tr>
</tbody>
</table>

#### Paper handling

<table>
<thead>
<tr>
<th>Paper weight</th>
<th>16 – 24 lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of trays, page capacity</td>
<td>1, 200</td>
</tr>
<tr>
<td>Paper sizes</td>
<td>letter, legal, ledger, A4, B4</td>
</tr>
</tbody>
</table>

#### Other options

<table>
<thead>
<tr>
<th>AutoToner Replenisher, $995/12,000</th>
</tr>
</thead>
</table>

#### Miscellaneous

<table>
<thead>
<tr>
<th>Toner (price, copies)</th>
<th>$18, 2,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions (L x W x H, in.)*</td>
<td>21 x 23 x 18.5</td>
</tr>
<tr>
<td>Weight</td>
<td>176 lb</td>
</tr>
<tr>
<td>Warranty</td>
<td>90 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service contract (on-/off-site)</th>
<th>$1,995/NA</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Company</th>
<th>Varityper</th>
<th>Xante Corp.</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Mt. Pleasant Ave.</td>
<td>2559 Erinogenic St.</td>
<td></td>
</tr>
<tr>
<td>East Hanover, NJ 07936</td>
<td>Mobile, AL 36686</td>
<td></td>
</tr>
<tr>
<td>(800) 631-8134</td>
<td>(800) 926-8839</td>
<td></td>
</tr>
<tr>
<td>(201) 887-8000</td>
<td>(205) 990-8199</td>
<td></td>
</tr>
</tbody>
</table>

* Without paper tray.

### Table 1 Criteria

| List price — The manufacturer's suggested retail price. |
| Street price — An average price charged by dealers in the United States in October 1991 or the price charged by the vendors that sell direct. |
| Laser-engine model — The make and name of the printer engine. |
| Engine speed — The rated speed of the engine, in ppm (pages per minute). |
| Engine life (pages) — The number of pages the printer's engine can print in its lifetime. |
| Monthly duty cycle (pages) — The manufacturer's recommended maximum number of pages per month. |
| Microprocessor, clock speed — The processor that powers the printer and the processor's clock speed, in megahertz. |
| PostScript version or clone — The version of Adobe's PostScript or the PostScript clone used in the printer's RIP (raster-image processor). |
| Resolution — The resolution of the printer engine, in dots per inch (dpi). |
| Memory (standard, maximum) — The amount of on-board memory that ships with the printer and the maximum amount of memory the printer can accommodate. |
| No. of resident fonts — The number of outline fonts in ROM that are shipped with the printer. |
| Interfaces — The types of connections that can be made between the printer and the CPU. |
| Printer emulations — Additional page-description languages that the printer supports. |
| Paper weight — The maximum stock weight the printer can handle. |
| No. of trays, page capacity — The number of paper trays and the number of sheets of paper each can hold. |
| Paper sizes — The paper sizes the printer can handle. |
| Other options — Any other feature or option and its price. |
| Toner (price, copies) — The cost and life of replacement toner cartridges. |
| Dimensions (L x W x H, in.) — The size of the printer without the paper tray installed. |
| Service contract (on-/off-site) — The price and type of service contract available with the printer. An on-site service contract is a must with the Varityper VT600W. |
It doesn’t take a rocket scientist to figure it out. But one did.

Quite a few scientific types focused on the heavens above have found that NewGen™ high-resolution, PostScript®-compatible printers offer advances found nowhere else on earth.

Like Image Enhancement Technology (IET)™, for character quality that’s out of this world. Plus Automatic Recognition Technology (ART)™, to select the right interfaces and emulations for you. And Program Updating with the latest in controller technology to make your NewGen printer virtually obsolescence-free.

Yet, for all their innovation, you’ll find they’re offered at very down-to-earth prices.

Take our TurboPS Pro Series, delivering incredibly crisp, professional documents and superb performance at up to 800x400 dpi for single and work group users alike.

We also offer the compact and very affordable TurboPS Personal Series, for 300 or 400 dpi resolution at 4 pages per minute.

Then there’s the new T Series, with exceptional 1200x600 dpi in 11”x17” format for truly outstanding graphics capability.

You can add a second paper tray, IC memory cards, SCSI interface and other options as you like.

And with NewGen, you can count on solid customer and technical support as well.

All of which makes NewGen a leader in the printer technology race.

To learn more, or for your local NewGen Dealer, call today. We’ll be happy to help you decide which of our machines is just right for your mission.
When Lightning Strikes: Power Protection

Fire, earthquake, flood, lightning — MacUser Labs looks at two technologies that protect your Mac from disaster.

BY ANDREW EISNER AND THE MACUSER LABS STAFF

ike most people, you’re probably not too thrilled when an insurance premium comes due. Sure, you know it’s smart to have a policy, but it’s hard to get excited about dishing out a pile of money for something you may never use. The same attitude often applies to uninterruptible power supplies and surge suppressors: You know you should protect yourself, but you put it off until it’s too late.

From single users to network administrators, we all have a considerable amount of time invested in our data and money invested in our hardware — investments worth protecting. This month MacUser Labs looks at two types of devices that are designed to protect your data and equipment from the ravages of errant electricity.
Surge Suppressors and UPSs

How Safe Are You?

Maybe you've heard horror stories of blackouts trashing hard drives and destroying data and high-voltage surges blowing up computers. If your response was to buy a power strip from the local hardware store, you might be protected — and you might not. If you can't even remember the last time you saw lightning, do you really need heavy-duty protection? Certainly your local climate plays a big part in the amount of power protection you need (see the “Regional Risks” sidebar). Once you've decided that your equipment and data need extra protection, the next step is to decide what type of device will work best in your situation.

There are two types of devices on the market that can help protect your computer and your data: A surge suppressor prevents high-voltage surges from destroying your hardware, and a UPS, or uninterruptible power supply, protects your data by providing your equipment with power long enough for you to shut it down properly. Some UPSs, with the help of special software such as PowerChute, can even shut down a Macintosh server automatically (see the “On the Horizon” sidebar).

Fear of Frying

A surge suppressor, the simpler of the two types of devices and often built in to a power strip, contains MOVs (metal-oxide varistors), which absorb high-voltage surges that might harm your hardware. Surge suppressors can cost anywhere from a few dollars to around $50. The cheaper ones act like fuses, blowing up to protect your equipment. The more expensive suppressors are designed to survive and to absorb huge surges while continuing to send safe power to your computer. A surge suppressor offers inexpensive and prudent insurance for your Mac and its peripherals. In fact, you already own several — your Mac and most of your peripherals already contain internal surge suppressors.

Does an external surge suppressor give added protection? Maybe. If a hard-to-reach internal surge suppressor inside your Mac or hard drive blows up when it's hit by a surge of

---

**Figure 1: The Mac's Power Supply**

This area represents the Apple specification for the Mac power supply.

This area represents our test results for the Mac power supply.

---

**Figure 1:** The Mac's power supply turned out to be far more forgiving than we expected it to be. Although Apple says that the Mac's power supply can maintain data integrity only for power interruptions that last no longer than 20 milliseconds, our tests showed that it can safeguard data for interruptions more than ten times as long. The standby-UPS units we tested were all able to switch over to battery power in less than 4 milliseconds, leaving a hefty safety margin. Apple also says that the Mac's power supply needs at least 85 volts to operate; our tests showed that it could operate on as little as 60 volts.
Whether you need a surge suppressor or a UPS is not just a question of what type of equipment and how much data you have to protect — where you live is also a big part of the equation.

The North American Electric Reliability Council (NAERC) points out that, in general, the farther you live from an urban center, the less reliable your power. Urban centers usually have backup systems for restoring lost power; rural areas seldom do. But it’s lightning that’s the real culprit in power outages. The National Weather Service (NWS) claims that lightning strikes and other violent weather conditions are the most common source of power failure in the U.S.

Florida’s west coast leads the way, with the nation’s highest average number of thunderstorm days per year — about 100. If you live on the Pacific coast, you can expect only about 5 per year. Everywhere else falls somewhere between 10 and 90. Preliminary data from a National Power Laboratory (NPL) study echoes the NWS study, showing that the Southeast suffers more than double the number of outages of the next-closest regions, the mid-Atlantic and Texas/Oklahoma. The NPL defines an outage as zero voltage for 4 milliseconds or more.

Brownouts — when power doesn’t completely cease but voltage drops below acceptable levels instead — are also a major concern, because they can force your equipment to shut down unexpectedly or require your UPS to use its battery too frequently. The NPL defines a brownout, or sag, as any fluctuation below 104 volts lasting from 2.1 milliseconds to 2.5 seconds.

Proximity to urban areas also plays an important part in the number of power fluctuations you may experience. Historically, the Northeast has suffered frequent brownouts as a result of heavy loads being placed on the power grid by appliances such as air conditioners and heaters during peak periods. A lack of suitable generating facilities has added to the problem. Word from the NAERC is that new generating facilities have reduced the hazard, although data from the NPL study still shows the region to be prone to brownouts. The Northeast leads the country, with an average of 19.5 brownouts per month, followed closely by the Midwest (13.1) and the Pennsylvania/Maryland region (11.0).
How It Works: Surge Suppressors and UPSs

**On-Line UPS**

An on-line UPS constantly routes power from a wall outlet through a DC power supply — which also functions as a battery charger — and an inverter before sending it to your Mac. When power from the wall outlet is interrupted, the power to the inverter is drawn from the battery instead of from the DC power supply, with no measurable switch-over time. The on-line UPS constantly monitors power for surges and sags, augmenting or reducing it as necessary.

**Standby UPS**

With a standby UPS, AC power from your wall outlet normally passes straight through without coming into contact with the battery or the inverter. When a power failure occurs, the UPS switches over to the battery, which feeds the inverter. The inverter changes the DC power from the battery into AC power for your Mac. This supply of AC power can last anywhere from minutes to days, depending on the size of
Surge Suppressor

The most common type of external surge suppressor plugs into a wall outlet and contains one or more AC outlets for your Macintosh and peripherals.

Disk-shaped MOVs (metal-oxide varistors) lower their resistance and absorb the power when the voltage increases to harmful levels. Dangerous surges are thereby isolated by the MOVs, which sometimes sacrifice themselves in the process.

the load (how much power your equipment draws from the UPS), the capacity of the battery, and the design of the UPS.

A regulating standby UPS also includes a step-up transformer, which enables the UPS to provide normal output voltage, given low input voltages. By doing so, it mimics an online unit in its ability to flatten out power fluctuations without resorting to battery power.

renegade voltage, you’ll wish that you had lost an inexpensive external suppressor instead. However, most surges that are either powerful or fast enough to destroy your external surge suppressor are severe enough to continue down the wire and destroy your Mac as well. Also, MOVs are designed to respond only to surges exceeding 400 volts, so they’re ineffective against less powerful overvoltages — sustained voltage increases greater than the normal 120 volts but less than the 400 volts required to trigger the MOVs. Fortunately, the Mac’s filtering circuitry can protect your machine from most overvoltages.

Many manufacturers also point to electronic-noise filtration as an important feature of surge suppressors. Electronic noise, caused by electrical equipment (especially motor-equipped devices such as drills and blenders) plugged in to the same circuit as your Mac, can cause annoying patterns on-screen and even data errors in extreme cases. Again, the Mac and most peripherals already contain filtration circuitry. But for those who live in an area that’s prone to lightning strikes, a surge suppressor with the ability to protect your equipment from surges passing through telephone or network cabling is very valuable. These lines can act like giant antennae, attracting and conducting lightning right to your machine. Good suppressors offer connections for telephone as well as network lines, so that your Mac can be completely isolated from potential hazards.

Keep the Power On

A UPS, a much more complex protection device than a surge suppressor, is designed not only to protect your equipment from surges but also, more importantly, to protect your data by keeping your Mac running when the power is interrupted. Accordingly, UPSs are much more expensive than surge suppressors are, typically costing between $500 and $800.

A UPS generally contains surge-suppression and filtration circuitry,
Surge Suppressors and UPSs

along with a battery and an inverter, which converts the battery’s power to 120 volts AC, like that of an outlet. The UPS does its job by swiftly shifting power to an internal battery when it detects a power outage. The battery power keeps your equipment running long enough for you to shut it down properly and thus save your data.

Two types of UPSs — standby and on-line — are available. A standby UPS has two separate circuits joined by a switch. An AC circuit passes electricity from a wall outlet to your machine until the UPS detects a power failure, at which time it switches over to battery power. The battery circuit — dormant until a power outage occurs — consists of a DC battery and an inverter.

An on-line UPS constantly routes AC power from the wall outlet through a DC power supply — which also acts as a battery charger — and the inverter before passing the power on to your Mac. When the UPS detects a power failure or a brownout (a temporary drop in voltage), the inverter draws from the battery whatever power it needs. This eliminates any switch-over time, a period when no power reaches your Mac while the UPS switches to battery power. An on-line UPS’ ability to flatten out shifting voltages makes it ideal for sites that suffer chronic power fluctuations.

Figure 2: Picking the Right UPS

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Amps</th>
<th>Volts</th>
<th>Volt-Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mac Classic with 2 MB of RAM, 40-MB hard drive</td>
<td>.49</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>Mac LC with 2 MB of RAM, 40-MB hard drive</td>
<td>.25</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Mac SE/30 with 4 MB of RAM, 40-MB hard drive</td>
<td>.66</td>
<td>79</td>
<td></td>
</tr>
<tr>
<td>Mac IIci with 5 MB of RAM, 80-MB hard drive</td>
<td>1.24</td>
<td>148</td>
<td></td>
</tr>
<tr>
<td>Mac IIci with 5 MB of RAM, 80-MB hard drive</td>
<td>.60</td>
<td>72</td>
<td></td>
</tr>
<tr>
<td>Mac IIx with 20 MB of RAM, no hard drive</td>
<td>1.39</td>
<td>167</td>
<td></td>
</tr>
<tr>
<td>Radius Pivot (monochrome)</td>
<td>1.00</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Apple 12” RGB display</td>
<td>.53</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Apple 13” RGB display</td>
<td>1.01</td>
<td>121</td>
<td></td>
</tr>
<tr>
<td>Rodine Cobra 100e hard drive</td>
<td>.32</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>FWB Hammer 300 hard drive</td>
<td>.35</td>
<td>42</td>
<td></td>
</tr>
<tr>
<td>MacTEL HD Index 1010 MB hard drive</td>
<td>.48</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>NECN9631 9,600-bps modem</td>
<td>.10</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Example

Apple 13” RGB display | 121 VA
Mac IIci with 5 MB of RAM, 80-MB hard drive | 148 VA
NECN9631 9,600-bps modem | 12 VA
Total required | 281 VA

Figure 2: It’s important to buy a UPS whose rating is appropriate for your needs. To match your Mac to a UPS, add up the power requirements, in VAs (volt-amps), of all the equipment that will be drawing power from the UPS. (Remember, some equipment, such as laser printers, uses a lot of power but doesn’t really need to be connected to your UPS.) To determine the VA requirements of your equipment, simply add up the amperes required for each piece of equipment (look on the back of your unit for this number) and multiply by 120 to calculate the VAs (see the example). If your equipment is rated in watts, add up the watts required and divide by .7 to get the VAs. This figure shows some typical VA requirements.
DataPak™ Removables
More Storage, More Choices

Macintosh storage solutions from MASS Microsystems™. That’s what MASS Media means. And our DataPak removables give you more storage and more choices than ever before.

**Selection** Choose a DataPak model to meet your individual needs. With footprints to match your Macintosh, DataPak 45 and 88 drives provide hard disk performance. Or choose our DataPak MO optical drive with 512 megabytes per cartridge. Whether you’re archiving large files or need network backup, DataPak MO gives you the most cost-effective optical storage available.

*Now available for Quadra 900: DataPak 45i and 88i Internal Drives*

**Infinite Storage** With DataPaks you never run out of storage. Each removable cartridge packs up to 45 or 88 megabytes of hard disk storage, or 512 megabytes of rewritable optical storage. Need more? Just buy another cartridge.

**Security & Backup** The compact removable cartridges are ideal for securing your data. Take them with you or lock them up. And DataPak doubles as the ideal backup system.

FREE DEMO

The MASS Microsystems Edge
With more industry awards for removable storage, and as the first Macintosh-only public corporation, MASS Microsystems is one company you can count on. With dealers and distributors worldwide, up to 2-year warranties, next-day repair, and toll-free technical support, we’re there when you need us. For a free demo disk, or the name of a dealer near you, call toll-free 800-522-7979.

810 W. Maude Avenue Sunnyvale, California, 94086
408-522-1200 Fax: 408-733-5499

Macintosh is a registered trademark of Apple Computer, Inc.
DataPak and MASS Microsystems are trademarks of Mass Microsystems, Inc.

See us at MacWorld, Booth # 1139, Moscone
Surge Suppressors and UPSs

Table 1 Criteria

| VA rating | The unit of output measurement is the volt-amp, a measurement similar to the watt that gauges the total load you can plug in to a UPS.
| Type of UPS | Is the UPS a standby or an on-line unit?
| Output wave | Does the unit provide power output in the form of a sine, step-approximation, or square wave?
| No. of outlets | The number of outlets.
| Transfer time | The amount of time it takes a standby UPS to switch to battery power when it detects an outage, in milliseconds.

Table 1: Directory of UPS Units

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>American Power Conversion</td>
<td>110SE UPS</td>
</tr>
<tr>
<td></td>
<td>370ci UPS</td>
</tr>
<tr>
<td></td>
<td>Smart-UPS 400</td>
</tr>
<tr>
<td></td>
<td>Smart-UPS 900</td>
</tr>
<tr>
<td></td>
<td>Smart-UPS 2000</td>
</tr>
<tr>
<td></td>
<td>Back-UPS 250B</td>
</tr>
<tr>
<td></td>
<td>Back-UPS 400B</td>
</tr>
<tr>
<td></td>
<td>Back-UPS 450B</td>
</tr>
<tr>
<td></td>
<td>Back-UPS 600</td>
</tr>
<tr>
<td>Best Power Technology</td>
<td>Fortress Model L1360</td>
</tr>
<tr>
<td></td>
<td>Fortress Model L1460</td>
</tr>
<tr>
<td></td>
<td>Fortress Model L1560</td>
</tr>
<tr>
<td></td>
<td>Fortress Model L1595</td>
</tr>
<tr>
<td></td>
<td>Fortress Model L13100</td>
</tr>
<tr>
<td></td>
<td>Fortress Model L12000</td>
</tr>
<tr>
<td></td>
<td>FERRUPS M1200VA</td>
</tr>
<tr>
<td>Deltec</td>
<td>Watchman II Model W525</td>
</tr>
<tr>
<td></td>
<td>PowerRite Plus PR 250</td>
</tr>
<tr>
<td></td>
<td>PowerRite Plus PR 400</td>
</tr>
<tr>
<td></td>
<td>PowerRite Pro PR 400</td>
</tr>
<tr>
<td></td>
<td>PowerRite Plus PR 600</td>
</tr>
<tr>
<td>Emerson Computer Power</td>
<td>AccuPower Model 10</td>
</tr>
<tr>
<td></td>
<td>AccuPower Model 20</td>
</tr>
<tr>
<td></td>
<td>AccuPower Model 30</td>
</tr>
<tr>
<td></td>
<td>UPS400</td>
</tr>
<tr>
<td>Exide Electronics</td>
<td>PowerWare Personal 350</td>
</tr>
<tr>
<td></td>
<td>PowerWare Personal 500</td>
</tr>
<tr>
<td>Insight</td>
<td>In-Line UPS</td>
</tr>
<tr>
<td>Kensington Microwave</td>
<td>Power Backer 360</td>
</tr>
<tr>
<td></td>
<td>Power Backer 450</td>
</tr>
<tr>
<td></td>
<td>Power Backer 520</td>
</tr>
<tr>
<td></td>
<td>Power Backer 600</td>
</tr>
<tr>
<td></td>
<td>Power Backer 1200</td>
</tr>
</tbody>
</table>

- "yes" | On-line UPS units have no measurable transfer time.
- "no" | This hybrid unit has traits of both standby- and on-line-UPS technology.
- "+" | The three additional outlets are not provided with power when the standby battery is being used.
- "*" | The two additional outlets are not provided with power when the standby battery is being used.

Coffee pot dimmers the lights. Because online UPSs operate at all times, the chance that they won’t kick in when needed (a possibility with standby units, if the battery has failed to charge) is negligible.

If you are the worrying type, an online UPS may be the right choice. But don’t expect that assurance to come chance that they won’t kick in when needed (a possibility with standby units, if the battery has failed to charge) is negligible.

As noise affects users, so too does the wave pattern of power affect electrical or electronic equipment. Wall outlets provide power in the form of a sinewave.

On the Horizon

If you operate a Mac network and want a UPS that can safely shut it down unattended, you may be in for a little shock. UPS units that have software for shutting down servers and issuing warnings to clients are still almost solely limited to the DOS world. Currently, only Deltec and American Power Conversion offer software, called PowerChute, for the Macintosh that’s capable of safely shutting down a server — and it can shut down only the server, not your client Macs.

However, other sophisticated features available for DOS computers are slowly beginning to appear in the Macintosh market. American Power Conversion, for example, has a program called PowerDoctor that accesses built-in diagnostics in its Smart-UPS line, letting you turn attached equipment on or off remotely. You can also run diagnostics to see if your standby UPS’ batteries need to be replaced, a feature that adds value to these inexpensive units. The diagnostics are also built into the American Power Conversion 370ci, but — as yet — there’s no way of accessing them from your Mac. American Power Conversion, 132 Fairgrounds Road, West Kingston, RI 02892; (800) 541-8996 or (401) 789-5735.

Emerson is currently working on a UPS for Macs that will notify a system extension developed by Intelligolf (of Novato, California) of a power failure. This extension, located on client Macs, will then save the entire contents of RAM onto the hard disk and shut the machine down. When power returns, the contents of RAM will be restored. This software has been available for some time under the name Bookmark. We tried Bookmark and found that although it took several seconds to save an image on a Mac with 8 megabytes of RAM, it seamlessly restored us to where we’d left off. Emerson Computer Power, 15041 Bake Parkway, Suite L, Irvine, CA 92718; (800) 222-5877 or (714) 380-1005.
curving sine wave, produced when power rises and lowers smoothly in alternating directions. Some UPS units, however, provide power in square waves or step-approximation waves, which are easier to produce but are not as smooth and curving as sine waves are. A square wave provides alternating current that's either fully on or fully off — no smooth transitions. A step-approximation wave takes the power up and down in discrete steps — again, no smooth transitions but also no abrupt shift between fully on and fully off.

Your Mac and most Mac peripherals contain switching power supplies that aren't too fussy about the shape of the power they receive and that may find square or step-approximation waves quite agreeable; in fact, some of these power supplies may actually run cooler and more efficiently with square- or step-approximation-wave power than with sine-wave power. However, equipment with transformers, fans, or motors isn't so happy with square and step-approximation waves and might overheat or even fail. If you have any doubts about the equipment you'll be powering, stick with a unit that can produce sine-wave output.

### The Muscular Mac

Some manufacturers of online UPSs claim that their units are superior to standby UPSs, because of the inevitable tiny delay as a standby unit switches over to battery power. To determine how critical this switch-over time really is, we examined a range of Mac power supplies to find out how temperamental they are when it comes to delays, surges, and sags.

We assembled several Mac configurations, from a sophisticated II×-based graphics system to an unabombed Mac Classic, and subjected them all to blackouts and brownouts to see what it takes to starve a Mac's power supply (see Figure 1). An auto-transformer allowed us to create brownout conditions by dialing any voltage from 0 to 132, and a line-voltage-variation simulator allowed us to precisely
A Mac can survive on as little as 60 volts and can operate through power outages lasting as long as 250 milliseconds.

control the duration of a power outage in milliseconds.

Apple’s technical specifications claim that its power supplies need at least 85 volts and can only operate through outages lasting no longer than 20 milliseconds. Our tests, however, showed that a Mac can survive on as little as 60 volts and can operate through power outages lasting as long as 250 milliseconds — an enormously long time in the microchip world. Even a IIIfx with all six NuBus slots filled (NuBus cards draw extra power from the Mac’s power supply) coasted through 150-millisecond interruptions. Most manufacturers of standby UPSs claim that their devices can switch from wall-socket electricity to battery power in 5 milliseconds or less, a claim our testing confirmed. This speed may be necessary to keep more-finicky computers running, but Macs can afford to wait around for even the most sluggish standby UPS to provide backup power.

How long that power lasts can vary greatly, however, depending both on the UPS and on the load plugged into it (see Figure 2). When we surveyed the UPS market, we discovered dozens of products with a broad range of capacities (see Table 1). We chose a dozen representative models for testing. First, we looked at two standby UPS units with sine-wave power output: the American Power Conversion 110SE UPS and 370ci UPS. We also examined two step-approximation-wave standby units that are targeted specifically at the Mac market: the Kensington MicroPower Backer 360 and 520. Finally, we looked at two muscular on-line units with sine-wave output: the Sola Sidekick Micro UPS 520 and the Network UPS.

All these units were able to keep our Macintosh IIIfx server powered for 20 to 30 minutes — more than enough time to shut it down properly and protect valuable data. And all were equipped with substantial suppression and filtration circuitry. But don’t let a UPS lull you into a false sense of security. It’s no substitute for a regular backup program (see “Overnight Success: Network Backup,” August ’91, page 112).

Strategies for Safety

Internal surge suppression in the Mac and most peripherals is excellent, making external suppressors almost unnecessary.

Table 1: Directory, continued

<table>
<thead>
<tr>
<th>Company</th>
<th>Product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panamax</td>
<td>Nonstop 450</td>
</tr>
<tr>
<td></td>
<td>Nonstop 520</td>
</tr>
<tr>
<td></td>
<td>Nonstop 900</td>
</tr>
<tr>
<td></td>
<td>Nonstop 1300</td>
</tr>
<tr>
<td>Para Systems</td>
<td>Minuteman AT300/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman AT500/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman AT650SL/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman AT800SL/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman AT1200SL/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman AT1600SL/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman AT2300SL/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman On-line 500/1</td>
</tr>
<tr>
<td></td>
<td>Minuteman On-line 1000/1</td>
</tr>
<tr>
<td>Sola Electronics</td>
<td>Network UPS</td>
</tr>
<tr>
<td></td>
<td>Sidekick Micro UPS 100</td>
</tr>
<tr>
<td></td>
<td>Sidekick Micro UPS 360</td>
</tr>
<tr>
<td></td>
<td>Sidekick Micro UPS 520</td>
</tr>
<tr>
<td></td>
<td>Sidekick Plus (SPS/R)</td>
</tr>
<tr>
<td>Square D/Power Protection Systems</td>
<td>Topaz CUB 250</td>
</tr>
<tr>
<td></td>
<td>Topaz CUB 350</td>
</tr>
<tr>
<td></td>
<td>Topaz CUB 550</td>
</tr>
<tr>
<td>Tripp Lite</td>
<td>Unison PS 4.5 UPS</td>
</tr>
<tr>
<td></td>
<td>BC 295 Standby UPS</td>
</tr>
<tr>
<td></td>
<td>BC 375 Standby UPS</td>
</tr>
<tr>
<td></td>
<td>BC 500LAN Standby UPS</td>
</tr>
<tr>
<td></td>
<td>BC 1000LAN Standby UPS</td>
</tr>
<tr>
<td></td>
<td>OMNI 450LAN</td>
</tr>
<tr>
<td></td>
<td>OMNI 750LAN</td>
</tr>
<tr>
<td>Viteq</td>
<td>VPS-1500</td>
</tr>
<tr>
<td></td>
<td>VPS-750</td>
</tr>
</tbody>
</table>

* On-line UPS units have no measurable transfer time.

*This hybrid unit has traits of both standby- and on-line-UPS technology.
Andrew Eimer, director of testing for ID Labs, had to suppress the urge to write this report until supplied with the power to be uninterrupted.
PacerTerm
- Combines today's standards—Communication Toolbox and HyperTalk scripting—into a comprehensive solution that provides the flexibility to call monitoring, modem manager, and connection protocols (TCP/IP, LAT, and others). Keyboard remapping, on-screen modems, and multiple VT220 terminal windows let PacerTerm meet your needs. Publisher: Pacer Software NETO

PacerForum
- Get your group working! An innovative conferencing and bulletin board application that provides easy and efficient distribution of information on any AppleTalk network. With PacerForum's icon-based user interface, you can share, organize, and archive text, files, pictures, and sounds. 7/10/91 MacWorld calls PacerForum "a very useful tool that will greatly facilitate office communications." Publisher: Pacer Software NET0167

Timeslips III.2.0
- Timeslips III.2.0 is a complete time keeping and billing package. You gather time data with TS Timer DA. When the time comes to send the bill, TS Report will extract the data and generate invoices and reports in a wide variety of formats. Timeslips can handle the big jobs—250 users, 250 different activities and over 6,000 clients up to 128 projects per client. Publisher: Timeslips Corporation B159043

WristSaver/MousePad
- WristSaver provides a comfortable wrist guard to help prevent the pain associated with Carpal Tunnel Syndrome. The WristSaver MousePad provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand. Manufacturer: LB Innovators WristSaver/MousePad ACC065 $18. WristSaver ACC050 $18. Bundle BD160851 (Available in Gray, Black, Red or Navy)

Meeting Maker
- Meeting Maker is a Macintosh network application that helps you plan, schedule, and confirm meetings. You can schedule a time and date, add required participants, and reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out personal activities. 5 User B109165 $599.

Instant Update
- Instant Update is a groundbreaking collaborative application for Macintosh users that helps you communicate through live documents. Two or more documents in a single window can be updated in real time, making it easy to view remote parts of a single document. Publisher: On Technology 2 User B109096

Hayes Personal Modem 2400 Plus with Smartcom
- The Hayes Personal Modem 2400 Plus provides you with everything you need to go on-line. This 2400 baud modem has a built-in call monitoring speaker and two LEDs, plus both phone and computer cables. Included in the package is the Smartcom terminal software. Keyboards and accessories provide a comprehensive solution that includes custom monitors and more. Publisher: Hayes M000060

ProModem 2400 Mini Plus
- Now you can get V.22bis/VPX-5 data compression and error correction in a mini-sized 2400 bps modem, for up to 3600 bps throughput. All the features of the full-size modem at half the price and size. Offered as a complete communications package with MNS KNOWLEDGE™ communications software and cable. Manufacturer: Prometheus M100065

FoxBASE+/Mac 2.0
- FoxBASE+/Mac 2.0 combines the flexibility of the database language, the speed of Foxbase+, and the user-friendly Mac interface. With all your Foxbase III plus programs on the Mac, without requiring you to change a single line of source code. In NBI benchmarks, it outperforms other relational database managers, some by as much as 200 times. Version 2.0 has an improved report writer that creates complex columnar and free-form reports without programming. FoxBASE+/Mac 2.0 provides access to up to 16 levels of functions and commands (FUNCTIONS and XCMDs). Publisher: Fox Software B109017

ClickArt Color Graphics for Presentations
- Contains more than 250 high-quality, full-color images created specifically for use in slide presentations. The images have been designed to deliver quick, clean, straightforward, and colorful impact against colored backgrounds typically used in presentations. The subjects, appropriate for any type of business presentation, include people in office-related situations, time, money, maps, business symbols, communications equipment, calendars, arrows, logos, and more. ClickArt Color Graphics for Presentations is available in PICTA format for the Macintosh and works with Aldus Persuasion®, MS PowerPoint®, CS Clicker® Presentation, or any other application that imports PICTA files. Publisher: T/Maker B102272

Macintosh Warehouse
- Many of our products come with a thirty day money back guarantee if you are not completely satisfied. Ask for details when you place your order.
White Knight V.11
- The perfect low-cost solution to almost any Mac telecommunicator's needs. Offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and more flexible. 270+ page user manual is geared to all levels of experience. Winner of 11 awards including MacWorld's World Class Software Award 1987-1991.
Publisher: Free Soft COM0060
$85

Blueprint 2.1
- Blueprint makes 2D drafting and design easy. It has a hierarchical symbol library, automatic alignment, associative dimensioning, and witness lines. It calculates with 9-decimal precision, so you can work at any convenient scale. Blueprint offers unlimited layers, color, hatching, mirroring, and a built-in DAZ translator. Blueprint also exports EPS files.
Publisher: Graphisoft CAD0024
$219

WordScan
- WordScan offers the same basic OCR capabilities as WordScan Plus but does not include the more advanced features. UT0215 S4n.
- WordScan Plus offers accurate OCR with a wealth of user-conveniences. Special dictionaries help WordScan read pages other software can't read. It even reads fixed document and draft-quality dot matrix output. Deferred Processing allows you to scan now and process later. Advanced features include, Pop-Up Image Editor, AutoClipping and Style Sheets.
Publisher: Calera Recognition Systems UT0216
$739

White Knight V.11
The perfect low-cost solution to almost any Mac telecommunicator's needs. Offers the kind of power associated with products costing hundreds of dollars more, but is easier to learn and more flexible. 270+ page user manual is geared to all levels of experience. Winner of 11 awards including MacWorld's World Class Software Award 1987-1991.
Publisher: Free Soft COM0060
$85

Blueprint 2.1
Blueprint makes 2D drafting and design easy. It has a hierarchical symbol library, automatic alignment, associative dimensioning, and witness lines. It calculates with 9-decimal precision, so you can work at any convenient scale. Blueprint offers unlimited layers, color, hatching, mirroring, and a built-in DAZ translator. Blueprint also exports EPS files.
Publisher: Graphisoft CAD0024
$219

WordScan
WordScan offers the same basic OCR capabilities as WordScan Plus but does not include the more advanced features. UT0215 S4n.
WordScan Plus offers accurate OCR with a wealth of user-conveniences. Special dictionaries help WordScan read pages other software can't read. It even reads fixed document and draft-quality dot matrix output. Deferred Processing allows you to scan now and process later. Advanced features include, Pop-Up Image Editor, AutoClipping and Style Sheets.
Publisher: Calera Recognition Systems UT0216
$739

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.

FREE CATALOG SUBSCRIPTION MUB2
Free MacWAREHOUSE Catalog Subscription 1660 Oak Street, P.O. Box 801, 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 6-8 weeks)
Symantec AntiVirus for the Mac (SAM) 3.0
- SAM detects viruses by monitoring the suspicious activities that characterize them. New version 3.0 has enhanced update and repair capabilities, faster scanning, and more. The IN T portion acts like a watchdog during startup to detect virus. The CD/ portion operates during normal Mac usage and offers a number of options for checking disks and folders as you work. Audit Trail keeps track of all activity and your responses. Includes Virus Clinic. Publisher: Symantec
- $65

Puzzle Master
- Solve crossword puzzles or create your own. Includes 250 of The New York Times classic puzzles, 20 daily puzzles and 50 Sunday puzzles. Built-in timer and scoring system allows you to test your skill against the experts. ENT00051 $29.

PowerCache
- 33, 40, 50 MHz PowerCache. Here's the affordable way to get the maximum from your software. DayStar's proprietary technology combines a blazing fast 68030 processor with a superfast RAM cache. Now you can get 100% performance with proven 330 compatibility including System 7.0 virtual memory. Accelerates virtually every function in all applications. An optional math chip is a real time saver for spreadsheet recalls beyond scientific tasks. The universal design makes it easily transportable to almost every Mac including the SE/30, IIcx, IIx, LC II, IIsi & IIci. Guaranteed 100% compatible. Publisher: DayStar
- $949

Accountant, Inc.
- "Accountant, Inc. is the most complete integrated accounting and financial management package for the Mac" says MacUser magazine. It's an easy to use program that gives you exceptional power to streamline your accounting. You only have to enter information once because every transaction is automatically posted to the general ledger. Accountant, Inc.'s revolutionary System 7 design means you can customize your forms, screens and reports to handle exactly the way you do business. The UnMousc also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (66 in advanced mode). With its one million touch points the UnMousc also performs as a small graphics tablet. Publisher: Microtouch
- $339

The UnMouse
- The UnMouse does everything a mouse can—only faster, easier, and in less space. To move the cursor, simply slide your finger over the glass surface. To make a selection merely press down. The UnMouse also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (66 in advanced mode). With its one million touch points the UnMouse also performs as a small graphics tablet.
- $159

Blackjack Strategy Tester
- Test Blackjack betting and playing strategies by playing up to 100,000 hands under a broad variety of settings. ENT00030 $65.

The New Sunday Crosswords
- Solve crossword puzzles or create your own. Includes 250 of The New York Times classic puzzles, 20 daily puzzles and 50 Sunday puzzles. Built-in timer and scoring system allows you to test your skill against the experts. ENT00051 $29.

Canis
- A new educational/reference program for current and prospective dog owners. Includes VAG pictures of most popular breeds, health care, and nutrition. ENT00051 $27.

Targus Universal Notebook Carrying Case for the Mac
- Designed especially for the new generation of Notebook Macs. The Targus Universal Notebook Carrying Case provides a convenient way to tote your computer and accessories (including a printer). Two padded compartments (11.5 x 8.5 inches each) keep your Notebook computer and accessories separated. Non-skid rubber feet, rigid Corian finish, velcro closures and self-healing nylon zippers top it off.
- $79

Hand-Off II ver. 2.2.1
- Get Hand-Off II for fast, easy file access. **SuperMenu** for System 7 makes the Apple menu multi-level. instantly open or browse in instant thumbnail view of files, folders, applications or aliases hierarchically. **Pop-up menuing** speeds opening files and applications with "Find". create custom groups of applications and folders. **On-the-fly** application substitution eliminates the mounting. **Application Not Found** error message. **Switches** application color depth and sound on automatically. **AutoHide** hides Dock during login automatically hiding background applications.
- $56

Rapport
- Use any combination of Rapport and Kernext's Drive 2.4 (3.5") or Drive 2.5 or Drive 500 (3.5") to read, write and format Mac and IBM formatted on your Macintosh. Or use Rapport alone on older Macintoshes to read IBM files from your internal drive.
- $195

Casino Master
- Offers all the fun of playing the odds in Las Vegas without the risks. Simulates the five most popular casino games: Blackjack, Craps, Roulette, Poker, and Backgammon.
- $40

Accountant, Inc.
- "Accountant, Inc. is the most complete integrated accounting and financial management package for the Mac" says MacUser magazine. It's an easy to use program that gives you exceptional power to streamline your accounting. You only have to enter information once because every transaction is automatically posted to the general ledger. Accountant, Inc.'s revolutionary System 7 design means you can customize your forms, screens and reports to handle exactly the way you do business. The UnMousc also serves as an extended keyboard. Tap the large red button and you have a Power Keypad with 16 keys instantly available to execute macros (66 in advanced mode). With its one million touch points the UnMousc also performs as a small graphics tablet. Publisher: Microtouch
- $339
MacPrint 1.2

Use a Macintosh with non-Apple printers. Print Mac applications on IP Laserjet, Desco, or compatible printers including all Series Hs, Is, and the Desco 950. Prints text and graphics at the printer's maximum resolution.

Does not require PostScript. Cable is included. Publisher: Insight Development

$95

DiskDoubler 3.7

D DiskDoubler 3.7, the system 7 savvy version, can double your hard disk and floppy disk storage capacity without the expense of an additional hard disk. The new version provides even more enhancements, including smaller compressed file sizes, increased compression speed, and self-expanding files, which can be expanded without needing the DiskDoubler application. DiskDoubler can also split large files into pieces for backup purposes and combine files together for telecommunications. Works transparently within any application, and operates in the background under MultiFinder. DiskDoubler works with documents, applications, plus sound graphics, and scanner files. Publisher: Salient Software UT0179

$49

Word Search Deluxe

Perfect for newsletters, classrooms, and puzzle enthusiasts everywhere. Fun to create. Fun to play. Improve your vocabulary in any subject. Use as stand alone application to create, play and print word search puzzles or use in combination with word processing, paint and page layout programs for more decorative results. Supports color and digitized sounds. Publisher: Nordic Software EDU0276

$35

MAXIMA 2.0

0 EMB SMM user! MAXIMA 2.0 extends your RAM access to as much as 125MB. Creates a powerful non-volatile RAM disk that survives system crashes, Resarts, and shutdowns. Use the RAM disk to boost boot time, accelerate many menu operations, and speed up memory intensive applications. Get MAXIMA 2.0 to maximize your RAM investment for System 7 or 8 1/2- or 32-bit mode. Publisher: Com camino UT0309

$45

Design Your Own Home:

Design Your Own Home: - Residential, Interior, or Landscape. Create floor plans and building plans with structural details. Do individual room plans and landscape design. Ease your dream house with graphic landscape plans. Interiors and Landscape programs generate 360-degree views from top-view perspective. Sample plans included. Publisher: Abrahamdula

$65 ea.

FileGuard 2.7

9 "Try, slick, fast, and easy. I highly recommend it."-MacUser 4/90. Protect your hard drives and partitions from unauthorized access (including security breaches with a password), copying and erasing applications and files (including system folders) from unauthorized access, deletion, and for backup copying. Designers include in system folders. From animations to animations. Recognized as an industry leader with the system uses log which continually tracks user group activity. System compatible. Publisher: AND Software Office Pack UT0139-$199. Office 10 Pack UT0131-$799. Single UT0135

$139

ResumExpert

Whether you're seeking an entry-level position or an executive corner office, ResumExpert Software Editions are the next best thing to knowing the boss. Each edition features 40+ professionally written and fully-formatted Microsoft Word templates that let you quickly and easily create eye-catching resumes. Just select a template, highlight the text and substitute your personal information. MacUser 10/89 awarded ResumExpert a "nice and racy" award that includes expert writing tips. MacUser 12/89 rated it as one of the Top 200 Software Programs of 1989. See listings for editions. Publisher: Asia Lasting Impressions RES0087

$49

DiskDoubler 3.7

D DiskDoubler 3.7, the system 7 savvy version, can double your hard disk and floppy disk storage capacity without the expense of an additional hard disk. The new version provides even more enhancements, including smaller compressed file sizes, increased compression speed, and self-expanding files, which can be expanded without needing the DiskDoubler application. DiskDoubler can also split large files into pieces for backup purposes and combine files together for telecommunications. Works transparently within any application, and operates in the background under MultiFinder. DiskDoubler works with documents, applications, plus sound graphics, and scanner files. Publisher: Salient Software UT0179

$49

The "ULTIMATE" Classic & Classic Extended Carrying Case

All ultimate style carrying cases are designed with the same high-quality standards as other MacLuggage products. The "ULTIMATE" Classic case (pictured closed) offers padded internal compartments for keyboard, external drive, mouse & cords. The Classic Extended case (open picture) offers these same features plus an internal 30mby disk pocket. Both models offer two external pockets for everything from disk to umbrella. Combine these features with sturdy Dupont Cordura Plus® nylon exterior, 1/2" high density foam padding, and a LIFETIME WARRANTY and you'll see why these are the "ULTIMATE" carrying cases for your Mac. Available in many blue and black. Manufacturer: LO Designs, Inc.

Ultimate Classic AC0129 $65.
Ultimate Classic Extended AC0140 $85.
## Technologies Works

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>$219</td>
</tr>
</tbody>
</table>

## DESKTOP PUBLISHING

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldus</td>
<td>$229</td>
</tr>
</tbody>
</table>

## DRIVE DISK & HARDWARE

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Care</td>
<td>$349</td>
</tr>
</tbody>
</table>

## EDUCATIONAL & ENTERTAINMENT

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>AppleWorks</td>
<td>$139</td>
</tr>
</tbody>
</table>

## GRAPHICS & MULTIMEDIA

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>$219</td>
</tr>
</tbody>
</table>

## UTILITIES & PROGRAMMING

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>$219</td>
</tr>
</tbody>
</table>

## MODEMS & FAX

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>$219</td>
</tr>
</tbody>
</table>

## INPUT & OUTPUT

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>$219</td>
</tr>
</tbody>
</table>

## WORD PROCESSING

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adobe</td>
<td>$219</td>
</tr>
</tbody>
</table>
The PowerUser Hard Drive from MacWarehouse

MACWAREHOUSE TAKES THE HARD WORK OUT OF BUYING A HARD DRIVE.
The PowerUser Hard Drive is packed with quality components. There's a rear panel SCSI address

drive includes the popular "Disk Manager" software by On Track and is pre-formatted - ready
to use right out of the box. Each unit goes through quality control and testing before it leaves the

factory. The comprehensive "User Manual" includes all the necessary step-by-step instructions.

STATE-OF-THE-ART COMPONENTS.
The PowerUser Drive is covered by a one year manufacturers warranty and, if you
do ever have a problem, the MacWAREHOUSE support desk program promises you'll never be
without a fix for more than a few hours.

Tomorrow's Upgrade For Your Mac Is Only $49*

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!

Ask for item # CHP8012 TSWNS

The Mac Classic comes with a standard 1MB of memory, which is surface mounted (soldered) to the
motherboard. Additional memory for your Mac Classic is provided by an Expansion Board which slides into a slot on the Classic's motherboard. The Expansion Board can be purchased with 1MB of memory for a total of 2MB, or two 1MB SIMMs can be added for a total of 4MB. Or, you can install a 4MB Expansion Board, which brings your Mac Classic up to

its full 4MB.

The Mac Plus and Mac SE have four available slots on the motherboard, which originally contain four 256K SIMMs modules - totaling 1 meageg (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do it in pairs. Replace two 256K modules and you will have a total of 2MB of memory. (That's the way one 1MB module fits the original 256K module.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for last use if you want to pass your Mac on to someone else.)

The Mac LC comes with four slots on the motherboard, which originally contain four 256K SIMMs modules - totaling 1 meg (1MB) of memory. To upgrade, you can replace each 256K module with a 1MB module, but you must do it in pairs. Replace two 256K modules and you will have a total of 2MB of memory. (That's the way one 1MB module fits the original 256K module.) Replace all four modules and you'll have 4MB. (You should save the 256K modules for last use if you want to pass your Mac on to someone else.)

The Mac SE/30, IIf, IIfx, and IIfci each come with a total of eight slots. The standard configuration has four 256K SIMMs modules, or a total of 1 MB. Here, memory must be upgraded in multiples of four. This allows for expansion from 1MB to 4, 5, or 8MB on the II and IIx, and up to 32MB on the SE/30, IIIf and IIfci, depending on whether you are using 1MB, 2MB or 4MB SIMMs. If you are upgrading a Mac SE, you must use SIMMs rated at 80ns or faster.

FREE STEP-BY-STEP VIDEO INSTRUCTIONS**

Ask for item #8AA1000 and receive our FREE* video when you purchase two or more SIMMs modules.

CIRCLE 156 ON READER SERVICE CARD
Introducing the TI microLaser™ Turbo printers: They race through sophisticated graphics software faster than other printers.  

How do they do it? A RISC-based 8220 board with PostScript software from Adobe® processes information from your computer quicker. So you spend less time waiting for graphic output.

Swift and still affordable, the personal 9ppm microLaser Turbo retails for $2,349* — a savings of more than $2,000 on the Apple LaserWriter® II NTX.

The 16ppm XL Turbo goes for $3,749* and is ideal for an AppleTalk® network. Both feature PostScript Level 2 with 35 scalable fonts. Two of the smallest footprints you'll find. And superior paper handling that includes a 250-sheet paper drawer that slides inside the printer.

Dial the number below for the name of your nearest TI dealer. And take a Turbo out for a spin.

1-800-527-3500.

*Suggested retail price — dealer prices may vary. microLaser is a trademark of Texas Instruments Incorporated. Adobe, PostScript and the PostScript logo are registered trademarks of Adobe Systems, Inc. Apple, LaserWriter and AppleTalk are registered trademarks of Apple Computer, Inc.

CIRCLE 71 ON READER SERVICE CARD.
If you don’t yet own ATM, then run, don’t walk, to the nearest phone; dial (800) 521-1976, ext. 4400; and ask for your free copy of ATM and Adobe Garamond. (International users, call [303] 799-4000, ext. 4600.) Yes, Adobe is now giving away ATM and four fonts as an interim way to provide Type 1 fonts to Mac owners until the technology is incorporated into System 7, per its agreement with Apple. (There is a $7.50 shipping fee.)

By Aileen Abernathy

Fonts on demand: CD-ROM discs are an increasingly popular way for companies such as Adobe, Agfa Compugraphic, Bitstream, The Font Company, Image Club, Monotype, and URW to distribute typeface libraries. For $50 to $99 per disc, you can indulge yourself and have the entire libraries of several vendors at your fingertips. The catch: Only a few fonts are unlocked at purchase time. The rest are hidden until you call a toll-free number and trade your credit-card info for the access codes. Monotype’s FoneFonts disc contains more than 1,450 Type 1 faces from Monotype, Adobe, and the Font Bureau. $50 gets you the disc and eight faces; additional faces are $45 each. (312) 855-1440. Type Treasury ($69) contains Bitstream’s library of more than 1,000 Type 1 and TrueType faces. Four faces are unlocked at purchase time; others cost $35 to $49 apiece. (617) 497-6222.

The German font giant URW recently opened a U.S. office ([603] 882-7445) and plans to release the TypeWorks CD-ROM disc in early 1992. The disc will contain 500 master designs from URW’s extensive library (including some typefaces previously unavailable in the States) along with five “variations” — such as drop shadow, outlining, and relief — on each face, for a total of 3,000 Type 1 faces. $50 with six unlocked fonts (one face plus five variations). Despite increased competition, Agfa Type remains the best deal, however. Version 3.0 has nearly 2,000 Adobe and Agfa Compugraphic Type 1 faces plus 20 TrueType fonts. The disc is loaded with extras, including 7 megabytes of shareware, several (locked) commercial programs, and a wonderful interactive tutorial on typography. For $99 you get 20 unlocked display fonts plus one Pi and Symbol font; $695 also nets you a Toshiba TXSM3301 CD-ROM drive. (508) 658-5600.

Color resources: Trapping remains one of the biggest stumbling blocks to getting high-quality color from the desktop. Now Pixel Ink ([415] 564-0962) is offering an interactive tutorial that teaches the basics of trapping: what, why, when, and how. The paltry $19 investment can save you thousands of dollars.

Agfa Compugraphic ([800] 395-7007 or [508] 658-5600) has released a sequel to Digital Color Prepress, its excellent booklet on desktop color. Volume Two ($10) focuses on color-halftone reproduction, copiously illustrating everything from scanning to screen angles to proofing. The newly formed National Desktop Color Alliance is dedicated to the exchange of reliable information about Mac-based color among vendors, designers, prepress houses, printers, and individuals. NDCA benefits include a monthly newsletter, a quarterly research journal, and regional meetings. Memberships are $295 for individuals and $995 for businesses. (202) 466-6322.
The Letraset Display Type Library Introduces FONTEK. Superior Quality Digital Display Type Fonts In TrueType™ and PostScript® Type 1 Formats For The Macintosh®.

• Unique fonts in classical and innovative styles from Letraset’s world renowned display type library—type-faces which are unavailable from any other type foundry!

• Superior typographic quality—faithful to the library’s original type designs in every detail—on screen and in print.

• Each FONTEK Digital Display disk features a complete character set, alternatives, accents and contains both TrueType and PostScript Type 1 formats.

For a free FONTEK Specification Brochure, or for more information on FONTEK just call 1-800-343-TYPE, or write Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653.

Ad design and digital illustration by Marcellina Design Inc., Philadelphia, PA

CIRCLE 190 ON READER SERVICE CARD.
Workgroup Publishing

Publishing on the Mac no longer has to be a solitary pursuit. Powerful new publication-management tools can turn electronic publishing into a collaborative effort.

By Michael Roney

Five years ago, publishing with a Macintosh meant one person squinting into the 9-inch display of a Mac Plus, armed with a copy of MacWrite (or PageMaker 1.0), a handful of fonts, and a LaserWriter. Today, computer publishing has expanded beyond single users into the workgroup world of commercial publications. Mac-based publishing networks have replaced the proprietary, multimillion-dollar composition and production systems at some of the country's largest magazines and newspapers.

Unlike proprietary systems such as ATeX, most Mac-based publishing tools have been designed for the individual. Because publishing is a collaborative effort, producing a complex publication on the Mac creates significant new challenges. A typical publishing scenario includes an editorial staff writing and editing copy to fit the available space, artists and photographers creating illustrations, an advertising department selling ad space for each issue, an art director designing layouts based on story assignments, and a managing editor planning and coordinating the assembly of the publication. Stories and pictures flow from one desk to another, are revised, and flow again (see Figure 1). Priorities shift, layouts are modified, stories are cut, ad sizes change.

How do you manage the tight communication and cooperation required to keep the process running smoothly? How do you monitor hundreds of publication elements, including editorial assignments, art, ads, and multiple story revisions? How do you track copy flow from one desk to another and manage constantly evolving layout requirements?

Until recently, Mac users did it the hard way, using schedule and assignment sheets, complex filing conventions, sneakernet copy routing, and endless photocopying. Necessity is the mother of invention, however, and a new generation of Mac-based workgroup publishing tools now offers powerful capabilities for tracking, assembling, and configuring all the elements of a publication.

We surveyed this rapidly evolving and diverse field, focusing on systems available from Managing Editor Software, North Atlantic Publishing Systems, Odesta, P.I.N.K America, Digital Technology International, and Quark. A few of these products are available off the shelf, but most are sold by VARs (value-added resellers) and system integrators. Some products cost a few hundred dollars, but most will set you back thousands, and prices are usually quoted per workstation, or seat. The right product for you depends on your budget and publication requirements (see Table 1).

Common Features

The main advantage of publication-management tools is their ability to manage dozens of documents and to organize and track work
flow. All the products we examined are network-based systems that turn single-user applications such as QuarkXPress into powerful workgroup publishing tools. Most rely on Mac- or UNIX-based database servers for overall management, members of the Mac II family for graphics and page layout, and more-humble Macs (SEs or Classics) for text entry and editing.

These systems include many of the publication-management features of older, proprietary products, such as copy routing, parallel pagination, and access control (see Table 2). To these, they add the Mac’s familiar benefits: a graphical user interface, modularity, and flexibility.

**Open Architecture.** Older Atex-style systems used only proprietary hardware and software. Some vendors of the new generation of publication-management tools also offer complete systems, but most take a more open, multivendor approach. Many products link to QuarkXPress for page layout; others let you use applications of your choice for both the front end (text composition and editing) and the back end (page design and output) of your production cycle.

**Database Links.** At the heart of many systems is a relational-database manager that ties the publication’s many elements into a cohesive whole. The database server is a dedicated computer, with links to files residing there or on workstations around the network. From this central location, the database application keeps track of each element’s status and location; controls who has access rights to specific files; and lets editors search for stories or graphics according to criteria such as creation date, issue, writer, or file type. Several of the database managers communicate with workstations by using SQL (Structured Query Language), the standard database query language. A key advantage of SQL is portability — a database manager that uses SQL can access information in any SQL database.

### Table 1: Choosing a Publication-Management System

<table>
<thead>
<tr>
<th><strong>Pros</strong></th>
<th><strong>Cons</strong></th>
<th><strong>Ideal Users</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>CopyFlow family</td>
<td>• Can mix and match modules for easy customization. • Accurate copy fitting and H&amp;J with QuarkXPress. • Links PCs running XyWrite with Macs running QuarkXPress.</td>
<td>• No tracking for text files. • No advertising features. • Works only with QuarkXPress.</td>
</tr>
<tr>
<td>ODMS</td>
<td>• Open architecture works with off-the-shelf software. • Powerful database manager with good file security. • Highly customizable.</td>
<td>• No built-in editorial, layout, or ad capabilities.</td>
</tr>
<tr>
<td>Page Director</td>
<td>• Fast dummying capability. • Off-the-shelf integrated package. • Suggests color configurations. • Creates signatures. • Good value.</td>
<td>• No built-in database manager (will use QuarkDispatch). • Lacks file locking, version control, scheduling, H&amp;J, and parallel pagination.</td>
</tr>
<tr>
<td>P.INK Press</td>
<td>• Fast H&amp;J handled at editorial workstations. • Powerful customizable database manager. • Optimized for large magazines. • Fast.</td>
<td>• Expensive. • Complex. • Works only with QuarkXPress. • Doesn’t use QuarkXPress’ H&amp;J algorithms.</td>
</tr>
<tr>
<td>QuarkCopyDesk, QuarkDispatch</td>
<td>• Powerful full-featured database manager. • Fully integrated with QuarkXPress (including H&amp;J) at editorial workstations. • Open and expandable with XTensions.</td>
<td>• Untested in the real world. • No parallel pagination. • Advertising, wire-service input, and signatures available only through third-party XTensions.</td>
</tr>
<tr>
<td>Speed family</td>
<td>• Fast, powerful, and comprehensive. • Heavy-duty database manager. • Open architecture. • Can be installed in stages. • Dummying capability.</td>
<td>• Expensive. • Complex installation.</td>
</tr>
</tbody>
</table>
**Text Editor.** Some systems include modules for writing and editing text. Many accept files from popular word-processing programs and traditional newspaper- and magazine-editing systems.

**Dummying.** The ability to create quick *dummies* (rough page layouts) without having to launch a page-layout program can save a lot of time at the outset of production and if you need to rearrange page geometry later.

**Page Layout.** Some publication-management products have their own layout modules, but most of them just supply links to QuarkXPress or other page-layout programs.

**Copy Routing.** All the publication management systems can automatically direct the flow of copy among writers and editors.

**Copy Fitting.** Professional publishing systems handle copy fitting through sophisticated H&J (hyphenation and justification) routines. H&J refers to the word-spacing and line-breaking rules used in typesetting and to the process of using those rules to format and fit copy into predefined text boxes. Publication-management tools offer varying levels of control over H&J.

**Parallel Pagination.** This feature lets two or more people work simultaneously on any given page or document, a real efficiency booster for most publications.

**Access Control.** When writers, editors, and designers work simultaneously on a publication, the control over story access and revision becomes very important. You don’t want different versions of the same story floating around without a way of managing who does what to them or of keeping track of which version is the final one. Systems have options that let an editor control access to selected files and system areas, maintain uniquely identified file revisions (*version control*), and prevent access to final approved stories (*file locking*).

**Scheduling.** All but one of the programs let you track the progress of publication elements. Typically, a spreadsheet-like list displays the status of all elements, providing detailed information about who has each story and where it is in the production cycle.

**Wire-Service Input.** Two of the products offer hooks for automatically downloading and formatting wire-service copy from AP, UPI, Reuters, and other news agencies.

**Signatures.** Large printing presses routinely print 8, 16, or 32 publication pages on a single sheet of paper, called a *signature*. The arrangement of individual pages in a signature — critical to the folding, cutting, and binding that follows — is called *imposition*. A few publication-management systems help automate the imposition process, taking into account such factors as process- and spot-color requirements.

**Advertising.** Many of the products offer modules for ad booking and accounting, and a couple of them provide ad-makeup capabilities.

**Archiving.** Some programs offer facilities for archiving stories and pictures in an electronic morgue.

**Page Director**

Page Director 1.5 ($1,495), from Managing Editor Software, is a feature-packed stand-alone application that lets you quickly create a publication dummy from files created in just about any word-processing or graphics program. You then port the layout, including all elements and styles, to QuarkXPress (via a QuarkXTension) for final adjustments and output. Page Director also contains an impressive set of publication-management tools, enabling you to keep track of story creators and sizes, file locations, ad/editorial breakdowns, impositions, color pages, and scores of other variables. For your advertising department, Managing Editor offers Ad Director ($3,995, or $4,995 with PageDirector), which supports ad dummying, discrete handling of coupons, reverses, zoning, advertiser conflicts, and page requests; issue templating; multiple advertising classes; and libraries.

Unlike most products in this survey, Page Director can be bought off the shelf and ready to use. However, the program
lacks a high-powered database manager for tracking and storing publication elements, so it doesn’t provide centralized automated features such as file locking, parallel pagination, and scheduling. (Managing Editor is currently developing an XTension to the QuarkDispatch database manager.) You can install Page Director in various configurations — on an isolated Mac, on one or two Macs linked to others on a network, or on several Mac workstations linked to a central file server — depending on your publication’s workflow needs.

Laying out a publication with Page Director is easy and quick. First, you specify the design parameters: trim size, gutters and columns, text and picture boxes, color pages, and so forth. Then you enter the names of the publication’s elements; classify them by category (copy, graphics, or advertising); and assign typography, styles, colors, and sizing restrictions. (You can further divide items into subclasses such as feature stories or sports stories, photos or infographics, car ads or electronics ads.) Once you’ve defined the elements, you enter a location for each or import a tab-delimited run sheet to tell Page Director where to find them. The Gatherer then retrieves the elements (from anywhere on the network) and creates an Items List, which shows all the elements and their characteristics. Drag a story or picture from the Items List onto a page grid, and the selected item automatically adjusts itself to fit the free space most efficiently.

Although Page Director doesn’t support parallel pagination, it can merge individual pages from several documents into one finished issue, enabling designers to work simultaneously on different pages of the same publication. You can change page positions within a signature simply by dragging, find married pages (those that need to be kept together), and have up to 2,048 color configurations (color-page groupings for press runs). Page Director can even suggest optimum color configurations based on the size of the issue and the number of spot- and process-color pages.

Those in an all-Mac shop should have no trouble using Page Director with the software they already own. For those who have PCs on their network, it accepts Mac-readable files (such as those in Microsoft Word or ASCII format). Managing Editor also sells a filter ($1,000 plus $300 per user) for XyWrite, the PC word processor used at many commercial publications. The company plans to extend Page Director’s usefulness with XTensions to QuarkDispatch (Quark’s new publications database manager) and QuarkCopyDesk (a workgroup editorial tool). These hooks will let Page Director users access such features as text composition, parallel pagination, automatic copy routing, version control, and file locking.

Page Director is impressive in its power, flexibility, and level of integration with QuarkXPress. Its fast dummying capabilities improve on QuarkXPress’ performance severalfold and are extremely valuable in tight-deadline situations. Once the links to QuarkDispatch are available, Page Director should come into its own as a full-featured publication-management system.


### XTensions and Other Goodies

Thanks to numerous specialized XTensions, QuarkXPress is the best-equipped of all Mac page-layout programs for publication management. In addition to the four products mentioned in the main article, several other XTensions, most of which will have links to QuarkDispatch, bear mentioning.

Atan EXPRESS links Atax-created stories to QuarkXPress layouts while preserving all formatting. Likewise, QuarkXPress stories can be sent back to Atax for re-editing, wire transmission, or archiving. TMS EXPRESS does the same for copy generated with TMS or EMS front-end systems. First license, $5,000 for each product; each additional user, $2,000. John Juliano Computer Services, 4 Executive Park East, Suite 100, Atlanta, GA 30329; (404) 321-3037.

BaseView Products offers an extensive collection of QuarkXPress-based publication-management tools. NewsEdit ($349) has a text editor and sophisticated copy-management features; it can also access wire-service input. WireManager ($1,895) feeds wire-service stories to a file server or local hard disk and will be able to link to QuarkDispatch and QuarkCopyDesk. ClassManager ($2,485) is a multilayer advertising database that has sophisticated entry, rating, and accounting functions. ClassManager/Plus ($2,995) adds WYSIWYG ad-text entry. TranTags ($395) and ConnLink/Plus ($695) work together to bring code-driven text from old front-end systems into QuarkXPress. Baseview Products, Box 368, Dexter, MI 48130; (313) 426-5751.

DK&A’s InPosition ($1,750) creates signatures and saves them in QuarkXPress format. Because the signatures are QuarkXPress documents, you can edit elements without having to reimport the pages. PALOS ($6,500, plus $4,500 for each additional user) automates the layout of display ads and catalogs. It has three modules: PhotoCuts, a video-capture and editing system; Adbase, a database that holds page geometry and parameters, text, and images; and AutoLayout, which automates the layout of display ads, ad copy, and photos and generates ad indexes. DK&A, 1010 Turquoise Street, Suite 310, San Diego, CA 92108; (619) 498-8118.

Mycro-Comp PAGE ($6,000), designed for use with Mycro-Tek’s proprietary front-end editorial system, produces ad pages for editorial as well as classified sections. Features include vertical justification of columns, text jumps, graphics fitting, and ad import to page dummies. Mycro-Tek, 9229 E. 37th Street N., Wichita, KS 67226; (316) 636-6000.

NewsLink ($750) flows editorial copy into QuarkXPress from SunType editorial systems. AdLink ($2,500, plus $250 per user) provides advertisement-tracking and scheduling capabilities. Mcro-Tek, 1075 S. Van Dyke Drive, Appleton, WI 54915; (414) 734-6635.

SCS/LinX ($2,750) is a set of XTensions for quickly creating entire newspaper pages in QuarkXPress by importing page geometry and elements from front-end editorial systems, scanners, PostScript graphics programs, and wire services. Software Consulting Services, 3182 Bath Pike, Bath, PA 18014; (215) 837-8484.

Some new non-Quark products are also worth consideration.

WriteOn is an open-architecture integrated system of planning, production, and administration modules being developed in the Netherlands by Van Gennep Media Automation. Van Gennep is reportedly negotiating with Linotype-Hell for U.S. distribution. Already used by three Dutch magazines, WriteOn is based on the Inside Out relational-database manager and works with off-the-shelf word-processing and layout software. WriteOn also has a PC module, and the company is currently developing XTensions for QuarkXPress.

Job Tracker ($695) is a customizable 4th-Dimension-based copy-routing and scheduling tool that can be used to track and report on story assignments, schedules, milestones, and histories. It’s available in book and periodical versions. InfoSolutions, 147A Silverdale Road, Julian, PA 18844; (614) 355-2953.
Why you should try our fonts.

Price!
Because with our "Buy one, get one free" special, you won't find a better font value anywhere.

Quality!
Because we design our fonts to meet the high standards our customers need & expect. And of course, our fonts are all Type 1 PostScript" format, completely compatible with Adobe Type Manager." Using system 7. For more fonts available in TrueType" format as well.

Selection!
Because as PC Magazine (10/91) said, "If there's a typeface you haven't been able to find, chances are you didn't look in the Image Club Typeface Library. We have over 600 typefaces, more with the way. Whether you need fonts for your Macintosh" or IBM PC System or even on CD-ROM, you're sure to find them at Image Club.

Service!
Because there's nothing we won't do to keep your important business.. And that means before, during & especially after you place your order.

Guarantee!
Because satisfaction is guaranteed, or your money back.

Order it today! Use it tomorrow!
1. Carefully select all the fonts you want.
2. Complete font families only. Minimum $80 order.
3. Select the value of "fonts for free." Again, complete font families only.
4. Call our order desk.

Call 1-800-661-9410

Guaranteed overnight Federal Express delivery.

Outside the USA, call (603) 362-8008. Or place your order by fax or mail. All major credit cards accepted. "The "Buy one, get one free" offer expires 6/30/93. For a free catalog featuring the entire Image Club product line, call (603) 362-8008.
CopyFlow Family

North Atlantic Publishing Systems (NAPS), founded by two former ATeX engineers, offers a variety of QuarkXTensions that let you merge off-the-shelf word processors and graphics programs with QuarkXPress. (NAPS is also developing Additions for PageMaker 4.2.) Using NAPS' highly modular approach, you can mix and match products according to your publication's needs, choosing relatively simple (and economical) assistance with copy routing and copy fitting or opting for a full-blow database manager that monitors and controls every aspect of the production process.

Most XTension modules can be purchased individually from NAPS, VARs, and system integrators. The database-management module, Publication Administrator, requires VAR installation and resides on a Mac file server.

NAPS' flagship product, CopyFlow ($395), provides powerful automatic links among QuarkXPress and external word-processing and graphics files. You set up the links by assigning names to text and picture boxes within QuarkXPress and identifying which file belongs in each box (or linked chain of boxes). With a single command, CopyFlow can then perform batch imports of individual items or of all text and graphics associated with the QuarkXPress document. Story revisions can thus be handled at editing or word-processing stations (including PCs running XyWrite) without the hassle of manually reflowing the revised text into the layout.

CopyBridge ($1,500) offers additional advantages for XyWrite users. It transmits QuarkXPress' H&J formatting to the linked text files, and it passes style-sheet data between XyWrite and QuarkXPress. NAPS is about to release CopyBridge/W ($1,995), which will provide the same level of integration between QuarkXPress and the Mac version of Microsoft Word.

Once you've named all the boxes in a publication, CopyFlow Reports ($225) can track the elements, providing status reports on each piece's page number, the QuarkXPress box name and its size, the amount of text currently in the box (or the amount of overset, or leftover, copy), the name of the editor working on the story, the last batch revision, and the file type and format.

It can also create thumbnail views of the pages with their assigned box names. For those who'd like to automate the creation of their publications, CopyFlow Geometry ($495) provides a scripting language for creating an ASCII text file with the necessary page-geometry descriptions. It subsequently reads the file and creates the QuarkXPress document to your specifications, including the import and placement of all elements.

NAPS' auxiliary products include Publication Locking ($250), which lets you lock the content and design of QuarkXPress pages (and their source files) in a box-by-box basis, preventing others from changing them. Relink ($149) automatically reflows text in the correct sequence if you change the order of linked text boxes, and Overset! ($69) creates a temporary text
box that displays the overset copy for any text box on a QuarkXPress page.

For those who require the tracking and sorting power of a database manager, Publication Administrator (base price, $4,500, plus $800 per seat) can help pull everything together. Using ACIUS’ 4th Dimension as the front-end database manager, Publication Administrator monitors the status of every element in QuarkXPress installations across the network, providing customized status reports on each element’s copy fitting, copy routing, publication locking, last import/export, and version number. Unfortunately, NAPS still has no facility for tracking files on the text-entry side, but this situation may be remedied with an XExtension for QuarkCopyDesk.

NAPS offers an impressive array of tools at a reasonable price. Its CopyFlow family offers you the flexibility of building an automated management system in stages, with the option of full database-management capability (either 4th Dimension or QuarkDispatch). It may be the system of choice if you produce a high-quality commercial publication, have a network that includes PCs running XyWrite, and use QuarkXPress for page layout.

Users: Allure, Business Week, BYTE, Cruising World, Family Circle, Food and Wine, PC Week, Reader’s Digest.

ODMS

Unlike the other systems we surveyed, ODMS (Odesta Document Management System) wasn’t designed specifically for magazines or newspapers. Instead, it has an open architecture that can be linked to nearly any page-layout software as well as to any word-processing or graphics program. This approach lets you use existing applications while gaining the power of a multiuser publication-management system. For example, ODMS can be integrated with FrameMaker across multiple platforms.

ODMS’ open architecture enables it to fit in as well in the corporate world of staff-generated reports and proposals as it does in commercial publishing. There’s even a bundled icon- and mouse-driven application generator that lets you create customized add-ons such as a graphics database, a cover index, or extra tracking and management routines.

ODMS was formerly sold only through VARs, system integrators, and third-parties such as DEC, but Odesta is now selling a do-it-yourself shrink-wrapped version at $500 for the base package and $1,500 per seat.

ODMS’ power comes from tight integration with Odesta’s Double Helix, a

New Aldus SuperPaint 3.0.

Let’s put this argument to rest. It’s both. SuperPaint® is the all-in-one program that makes it easy to do it all—combining paint, draw, and image enhancement—saving you time and money.

As you can see, its range of capabilities makes it perfect for either business users or graphic designers. And now with the added color capabilities, EPS import and export, textures, and gradients, it gives you even more creative options (by the way, it still works great in black and white).

Of course, the best way to settle any argument over SuperPaint is to try it.

See your Aldus dealer or call 206-628-2320 for more information.

CIRCLE 148 ON READER SERVICE CARD.
The first commercially available version in the U.S. (version 2.0) should appear in early 1992. (P.INK is based in Germany, and P.INK Press is already available commercially in Europe. The largest installation is at the Leipziger Volkszeitung, a German newspaper with 150 networked Macs.) P.INK offers a modular, tiered pricing structure that amounts to about $3,800 per seat for an installation of 50 workstations.

The heart of P.INK Press is its database manager, named P.INK SQL, which can run on a Mac or on UNIX platforms (under SyBase), including VAX machines, IBM’s RS/6000, and Sun servers. Database files can reside on the central server or on individual Macintosh workstations. P.INK Press’ reliance on a SQL database manager lets users and other vendors extend the system’s functionality with customized, fully integrated add-ons, using applications such as FoxBASE+/Mac, 4th Dimension, HyperCard, SuperCard, RagTime, WingZ, Excel, and other database managers.

As with other high-end packages, the layout, text-entry, and management modes work together closely. The process begins with the layout artist or art director designing pages in QuarkXPress. Writers and editors then create and modify text by using a powerful text editor, which can display copy in either “typewriter” or galley mode. Text flows over the network to the layout module (an enhanced version of QuarkXPress), where it’s placed on the page and copy-fitted through use of P.INK Press’ own dictionary and justification algorithms. (P.INK claims that its system matches QuarkXPress’ final H&J routines more than 95 percent of the time.)

Several users can work simultaneously on a single page, and further modifications to stories from the text-editor module are automatically reflected in the copy that appears on the layout.

P.INK Press’ speed is impressive; retrieving data from the P.INK SQL database is quite fast, even when you ask for thousands of records or build custom directories. The database is accessible from within any application via the List Box, a spreadsheet-like window that lets you customize the sorting and display of 35 story characteristics.

P.INK Press’ system-administration features let you set user access rights and copy-flow and story-update parameters.
Everyone who uses a Macintosh ought to back up regularly. But most people don’t back up at all.

In fact, if the people you work with are like those working in most places we know, about the only way their data is going to get backed up is if it happens without them.

Guess what?

Now it can.

Now you can set up fully automatic, unattended backups for every Mac in the house.

What’s more, you can easily customize the nature and timing of each one to suit your specifications.

And transform a simple, effective backup policy from fantasy into fact.

All you need is Fastback Plus.

The Macintosh version of the world’s most popular backup software is also the Mac world’s most flexible backup software.

Along with being System 7 savvy, Version 2.6 lets you back up to just about anything you can think of, from floppies and hard disks to tape drives and any HFS device.

It also lets you back up in the background while you’re using an application in the foreground.

Using Fastback Plus for Macs is very much like using Fastback Plus for PCs—same look, same functionality.

Same backups, even.

That’s right. You can actually restore a Mac file directly onto a PC, and vice versa.

Nobody else can do that.

But then, nobody else can back up more than 1MB per minute on a Mac.

And no other program is backed up by our vaunted 24-hour toll-free technical support.

There’s more. So pick up the phone. Dial 1-800-666-2904.

And tell everyone to stand back.
The wire-service module captures incoming stories and stores them in the database for customized keyword searches and retrieval directly into preformatted text boxes. The system's state-of-the-art advertising-management and accounting system is fully integrated into the overall publication database. Advertising managers have access to a full range of information on ad sizes and rates, run dates, ad makeup and status, and so forth.

If you have a complex publication produced by a large work group, need multiuser access to files, require powerful and flexible control over file tracking and version maintenance, and want to expand the system with your own SQL applications, you'll be hard-pressed to find a more complete and elegant solution than P.INK Press. P.INK Press' muscular capabilities are reflected in its complexity and relatively high price, however, making it most suitable for large commercial magazines.

Users: Leipziger Volkszeitung, Money, under consideration at Entertainment Weekly and Time.

**Speed Family**

Digital Technology's collection of Speed products, which includes PageSpeed, AdSpeed, and SpeedPlanner, represents a hybrid of conventional proprietary systems such as Atex and the modular-open-architecture products currently in vogue.

DT can sell you a complete Macintosh-based hardware/software system, including text-composition and -editing, page-layout, graphics, copy-management, wire-service-input, advertising, accounting, output, and SQL-database-management capabilities — which are all installed by its technicians.

If you want to upgrade gradually, you can install one or two of the Speed modules and they'll work with existing applications such as PageMaker and QuarkXPress. Software-only costs run $795 to $8,995 per workstation (the latter price includes the SyBase database manager).

As the names suggest, DT's products are predicated on speeding up the workgroup publishing process, especially the handling of large color-graphics files. DT's setup includes a SQL database manager running under SyBase on a UNIX-based Sun server and editorial, pagination, advertising, and business modules running on Macintoshes. The database application supports fast and efficient search-and-retrieve capabilities, and because it contains only page geometry and pointers, with the actual files residing on SCSI-linked storage devices (usually 1-gigabyte drives), text and image transfer is relatively fast.

The Speed products are the only system other than Page Director to offer quick dummying capability, a major benefit in deadline situations. You create dummies in SpeedPlanner, which can produce layout templates for export to DT's layout module, PageSpeed, or to the page-layout program of your choice.

DT offers several alternatives for creating and editing text. SpeedWriter handles basic text entry, including tags. NewsSpeed offers text entry plus basic layout capabilities, including the production of headlines.
rules, boxes, and tints. SpeedReader lets you import text generated on PCs and other platforms. DT’s advertising modules include AdDatabase, a SyBase system with a 4th Dimension interface that’s designed specifically to track display and classified ads.

The company also offers a complete graphics system that includes hardware and software for scanning, file transfer, graphics manipulation, and color separation. Although DT has standardized on Pre-Press Technologies’ SpectrePrint Pro for color separation (DT calls it SpeedSep), the company will give you Photoshop or any other software you request.

You should consider DT’s Speed system if you’re looking for power and speed, have a Macintosh-based network, want quick dummying capability with full SQL database-management power, like the idea of upgrading your publication-management system in stages, and have a bit of spare change to spend.


QuarkCopyDesk and QuarkDispatch

The plethora of publication-management Quark XTensions for QuarkXPress has not gone unnoticed at Quark. “When we see a lot of products extending QuarkXPress in a particular way, it’s clear there’s a significant user requirement that should be addressed,” said Quark founder, Tim Gill, at last October’s Seybold computer-publishing show.

Quark will enter the fray in the second quarter of 1992 with two fully integrated publication-management products for QuarkXPress. They are QuarkCopyDesk ($695 per seat), a text-entry and -editing module that can link editorial workstations with QuarkXPress, and QuarkDispatch ($2,995, plus $495 per seat), a non-SQL database manager that Quark claims is faster than SQL database managers. QuarkDispatch can link to QuarkXPress through an XTension that costs an additional $1,995 but can be freely copied. (Why is the QuarkDispatch XTension priced separately? Because Quark believes that QuarkDispatch can stand on its own as a product that can be used without QuarkXPress—for example, in networked word-processing or database-publishing systems.)

Unlike QuarkXPress, these products will not be sold in computer stores or by mail order but instead will be distributed through Quark’s direct-sales force as well as through systems integrators. Quark estimates that a typical system (minus the QuarkXPress program), including software for 10 users and 90 days of 24-hour toll-free technical support, will cost around $17,880.

QuarkDispatch can keep track of as many as 10,000 customizable file headers. (The files themselves reside on a server—preferably, but not necessarily, the same Macintosh that holds QuarkDispatch.)

QuarkDispatch offers a full set of routing, revision, and reporting features as well as a multilevel security system. With QuarkDispatch, an editor can organize users by publication (or publication subsection), each with its own style sheets, hyphenation

Made Objects And Functions, Applications To Suit Your Tastes.

programming tools includes high-level database, multimedia, communications, networking, and XCMD object libraries at a fraction of the cost of leading programs in those categories. And, they all work together...seamlessly. What’s more, with Serius Developer™, advanced users can create their own new objects.

For a free demo disk or more information, call 1-800-876-6847 and see for yourself how Serius can give you all the tools you need to build applications the way you want them.
Sell the Idea with Infini-D™

You have great ideas. You need a tool to put your ideas to work.

Introducing Infini-D, a breakthrough 3D visualization package from Specular International.

Create stunning images for your proposals, prints and slides. Produce dynamic animations that breathe life into your video and multimedia presentations. All at a cost that will keep you ahead of the competition.

Find out why MacUser calls Infini-D “a quantum leap for 3D design packages priced at less than $1,000.”

Call (415) 549-7600, and we’ll send you a free interactive tour showing how Infini-D can transform your ideas into reality.

You can’t afford to miss this powerful new tool. Order your Infini-D demo today!

Michael Roney needs a publication-management system for his real job as the desktop-publishing editor for Bantam Computer Books.
Have you ever wondered what your design would look like printed on a grocery bag? Okay, maybe not. But when you're working with a Phaser™ III color printer, your thoughts do tend to go a little wild.

Because you can feed the Phaser III any kind of paper, from 80 lb. bond to acetate. Even paper towels. It also takes sizes up to 12” x 18” for printing tabloid bleeds. And with 16.7 million colors delivered at 300 dpi, you get gorgeous color on any media.

It's driven by a 24 MHz RISC chip with 10 MB RAM. Fast enough for you? And with Adobe's PostScript™ Language Level 2, your message will come out loud and clear.

The only thing you need is a well-fed imagination. Call 1-800-835-6100 Dept. 21A for your free output sample.
### Table 2: Features of Publication-Management Systems

<table>
<thead>
<tr>
<th>Feature</th>
<th>CopyFlow family</th>
<th>ODMS</th>
<th>Page Director</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price (per seat)*</td>
<td>$625 to $1,840</td>
<td>$1,500</td>
<td>$1,495; Ad Director, $3,995</td>
</tr>
<tr>
<td>Front end</td>
<td>open</td>
<td>open</td>
<td>open</td>
</tr>
<tr>
<td>Back end</td>
<td>QuarkXPress</td>
<td>open</td>
<td>QuarkXPress</td>
</tr>
<tr>
<td>Database manager</td>
<td>4th Dimension</td>
<td>Double Helix</td>
<td>none†</td>
</tr>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text editor</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Dummying</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Page layout</td>
<td>QuarkXPress</td>
<td>O</td>
<td>QuarkXPress</td>
</tr>
<tr>
<td>Copy routing</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Copy fitting (H&amp;J)</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Parallel pagination</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Version control, file locking</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Scheduling</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Wire-service input</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Signatures</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Advertising</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Archiving</td>
<td>•</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marietta, GA 30062</td>
<td>(404) 973-6837</td>
<td>Northbrook, IL 60062</td>
<td>Elkins Park, PA 19117</td>
</tr>
<tr>
<td>Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odesta Corp.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4084 Commercial Ave.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northbrook, IL 60062</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(708) 498-6815</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Managing Editor Software</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8208 Brookside Rd.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elkins Park, PA 19117</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(215) 639-5074</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Prices are averages; the actual cost depends on the products selected and the number of workstations.

†Future version will have an XTension to the QuarkDispatch database manager, which will also supply other missing features.

---

### Table 2: Features, continued

<table>
<thead>
<tr>
<th>Feature</th>
<th>P.INK Press</th>
<th>QuarkCopyDesk, QuarkDispatch</th>
<th>Speed family</th>
</tr>
</thead>
<tbody>
<tr>
<td>List price (per seat)*</td>
<td>$3,800</td>
<td>$1,790</td>
<td>$795 to $9,995</td>
</tr>
<tr>
<td>Front end</td>
<td>P.INK Press</td>
<td>QuarkCopyDesk</td>
<td>DT’s or open</td>
</tr>
<tr>
<td>Back end</td>
<td>QuarkXPress</td>
<td>QuarkXPress</td>
<td>DT’s or open</td>
</tr>
<tr>
<td>Database manager</td>
<td>P.INK SQL</td>
<td>QuarkDispatch</td>
<td>DT SQL (Sun server)</td>
</tr>
<tr>
<td>Features</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Text editor</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummying</td>
<td>O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page layout</td>
<td>QuarkXPress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copy routing</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copy fitting (H&amp;J)</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parallel pagination</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Version control, file locking</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scheduling</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wire-service input</td>
<td>•</td>
<td>XTiension</td>
<td>O</td>
</tr>
<tr>
<td>Signatures</td>
<td>O</td>
<td>XTiension</td>
<td>O</td>
</tr>
<tr>
<td>Advertising</td>
<td>O</td>
<td>XTiension</td>
<td>O</td>
</tr>
<tr>
<td>Archiving</td>
<td>•</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.INK America</td>
<td>1271 Avenue of the Americas</td>
<td>Quark, Inc.</td>
<td>Digital Technology International</td>
</tr>
<tr>
<td>New York, NY 10020</td>
<td>(212) 522-7436</td>
<td></td>
<td>500 W. 1200 South</td>
</tr>
<tr>
<td>(303) 934-2211</td>
<td>(801) 226-2984</td>
<td></td>
<td>Orem, UT 84058</td>
</tr>
</tbody>
</table>

*Prices are averages; the actual cost depends on the products selected and the number of workstations.
Organize your finances
Quicken easy!

The world's #1-selling financial software organizes home and small business finances better than ever - with more than 50 major new features and improvements.

So if you still haven't tried Quicken yet, new version 3.0 is a powerful reason to stop putting it off.

A more complete financial picture.
New Quicken 3.0 does a lot more than manage your checkbook and track expenses. Now it organizes everything from checking and savings accounts to cash, credit cards, assets and liabilities.

You can also track spending, savings and progress toward your goals more precisely than ever - with pre-formatted automatic reports like Cash Flow, Budget, Itemized Expenses, Tax Summary, Net Worth and more. Plus, you can customize your own reports and save them to use again and again.

Easier than ever.
Powerful new Quicken 3.0 is actually simpler than ever to use.

Now paying your bills is as simple as typing into the on-screen check register. New Quicken 3.0 does the rest. It memorizes your regular payments and prints out checks. And now it even lets you pay bills electronically through the CheckFree® payment service.

Meanwhile, it tracks exactly where your money goes - utilities, clothes, charity, etc. - to give you complete, accurate reports and cut tax preparation time to minutes.

Controls small business finances.
You'll be amazed at how much time new Quicken 3.0 saves in your small business. It generates P&L, Balance Sheet, A/R, A/P, Payroll, Job/Project reports and more. No wonder more than half of Quicken owners use it for business.

Satisfaction guaranteed.
We offer free unlimited help by phone. And if you're not completely satisfied, you can return Quicken within 60 days for a full refund - no questions asked.

So you've got nothing to lose, but so much to gain. Try it out!

1-800-624-8742
Call toll-free 24 hours a day, 7 days a week, U.S. and Canada.

Mike Jefferys, Intuit, Inc. 1991

Yes! Send me my Quicken 3.0 for the Macintosh for just $69.95. If I'm not completely satisfied, I can return it for a full refund. Free air shipping within the U.S.

Yes! Send me my upgrade version of Quicken 3.0 for the Macintosh for just $29.95 (includes shipping). I have enclosed the title page from my Quicken Users Manual. No photocopies, please. Allow 2-3 weeks for delivery in the U.S., slightly longer in Canada.

CA & MN residents add sales tax. International shipping extra.

Mail to:
Intuit
P.O. Box 3014
Menlo Park, CA 94026
Or call 1-800-624-8742

Name _____________________________
Address ___________________________
City __________ State __ Zip __________
Day Phone __________________________

☑ Check enclosed (no COD or purchase orders)
☑ Visa ☑ MasterCard ☑ AmEx ☑ Discover

Card# _____________________________
Exp.Date __________________________
Signature __________________________

Equipment required: Any Macintosh computer with at least 1 megabyte of RAM, one or more floppy disk drives, or a hard disk, and system 7.1 or later (System 7 compatible). Guaranteed to work with all printers and monitors or your money back.

Not copy-protected. Free unlimited technical support.
Since 1985, Ehman has been a leader in providing high quality, affordable peripherals to the Macintosh market. The 19" monochrome monitor you see on the left, for example, costs just $895, and comes with a two year warranty on the monitor.

Further proof lies in our full page monitor, or the brand new 14" crystal-clear color monitor. Or any of our other monitors, including 19" gray scale and 8 and 24 bit high resolution Trinitron color units.

For some of the highest quality peripherals around, as well as some of the lowest prices, we think you should consider Ehman. As evidenced by the comments above, others do, too.

For more information on our products, or to place an order, fax 307-789-4656 or call toll free 1-800-257-1666.

Circle 172 on reader service card.
An Electronic Collage

Image-editing and painting programs can take the drudgery out of creating composite illustrations.

By Janet Ashford

The art of collage has traditionally required a steady hand and a sharp X-acto knife. But today's graphics programs provide a variety of selection, masking, and manipulation tools that greatly simplify the process of assembling diverse graphics into a single illustration. You can create interesting, imaginative collages, using tools such as ColorStudio, Digital Darkroom, Photoshop, PixelPaint Professional, and Studio/8.

New York-based artist Marc Yankus has created traditional collage illustrations for clients such as Time, Newsweek, and Vogue for more than ten years. His methods required careful knife work and the time-consuming use of colored pencils and rubdown film to add color to black-and-white images.

In 1990 Yankus discovered Photoshop, bought a Mac IIx, and never looked back. He now scans old-fashioned images, resizes and distorts them, and plays with their positioning. Applying solid and graduated color to his base art is quick and easy, with no limitation on the number of colors he can choose. Once the collages are complete, Yankus usually outputs the artwork as 4-x-5-inch transparencies.

Creating the Background

Marc Yankus uses Photoshop to create distinctive photo collages such as this book cover, part of a psychology series published by Viking Penguin. For this project, he started with scans of 18th- and 19th-century engravings, distorted some of them, and added solid and graduated color. The title type was added mechanically by the art director.

Graphic designer Janet Ashford is a contributing editor to Step-by-Step Electronic Design.
2 Adding a Sky Gradation

The pencil tool is used to connect broken lines and close gaps in the scanned image. This allows Yankus to select areas of the sky with the magic-wand tool without also picking up white areas inside the columns. By holding down the Shift key while making selections, he groups the sky areas into a single selection. The selected sky area is given a linear graduated fill that ranges from blue to white.

3 Making a Mask

Top: Yankus uses the Save Selection command to send the selected sky area to an alpha channel. This creates a mask where only the selected area (shown in white) is affected by editing changes. All other parts of the image are protected by a black mask. Yankus wants to add a purple-to-blue gradation to the columns and to reverse their lines from black to white. There’s no easy way to select all the lines, so they must be manipulated as part of the larger selection. Reversing the lines’ color thus means inverting the colors of the entire selected area. To ensure that the final colors are the ones he wants, Yankus executes a complex series of steps.

Bottom: First, he modifies the mask to protect everything except the columns and lines. To do this, the Inverse command is used to switch the selection area from the sky to the rest of the image. Then the lasso tool is used to select all the ground areas. By holding down the Command key while making selections, Yankus automatically subtracts these areas from the total selection. Finally, only the columns and lines are left. Using the Invert command, he swaps the black and white areas of the mask. Everything in the image is now masked except for the columns and lines.

4 Adding Color to the Columns

Left: Using the Load Selection command, Yankus applies the mask to the color image. He then applies an orange-to-green gradation to the columns; these colors are opposite in hue from the ones he ultimately wants. Darken Only mode is selected in the Paste Controls dialog box, so that only pixels lighter than the blend colors are altered and the black lines are left untouched.

Right: With the columns still selected, Yankus uses the Invert command to simultaneously reverse the colors of the gradation and the black lines. He has now achieved the intended effect: purple-to-blue columns with white lines.
Using the same technique, Yankus adds a blue-to-green gradation to the ground area. But how does he know which colors will reverse to produce the correct gradation, both here and in Figure 4? Yankus first fills the selected area with the blue/green blend he wants and inverts the color; the ground becomes gold/purple with white lines. The dropper tool is used to turn the beginning and end colors of the blend into the foreground and background colors. He then inverts the colors again, deletes the blue/green blend, and replaces it with a new one, using the gold foreground and purple background colors (top). He once more inverts the colors of the selected shapes, producing a blue-to-green blend with white lines (bottom).

A scanned detail of a woman's face is converted to RGB format for editing. Yankus paints the iris green, again using Darken Only mode to prevent the black areas from being affected (top). The eye is selected with the elliptical marquee tool, cut, and pasted into the color image, where it's positioned over the vanishing point of the perspective lines (bottom). To help the eye blend in with its new surroundings, a Feather Radius of 15 is specified for the marquee tool.

Yankus scans two books and creates three open-book images, each filled with a different color gradation. Using the type tool with the anti-aliasing option, he creates some large colored letters and rotates them slightly. To make the right-hand book and the letter A appear to be partially behind columns, Yankus erases the "hidden" parts while holding down the Option key. This activates the Revert option of the eraser tool so that it erases back to the last saved version of the image.

Using the techniques described here, Yankus also created photo collages for the covers of two other books in the Viking Penguin psychology series.
Support A Family Of Eight For $449.

- Installing 10BASE-T Ethernet has never been easier or more affordable, thanks to the new eight-port DaynaSTAR MiniHub™ from Dayna. A true breakthrough in price as well as technology, the DaynaSTAR MiniHub connects up to eight Macintosh, IBM-compatible or other computers, servers and printers over 10BASE-T twisted-pair wiring. At a new industry low price of just $56 per node. That’s less than half the price some of our competitors will charge you.

- The MiniHub can support a network of eight devices entirely on its own, or it can be connected to other hubs over 10BASE-T wiring to create larger networks. An additional BNC port allows the MiniHub to be connected to a thin Ethernet backbone if needed.

- All important network protocols and operating systems are supported, including AppleShare, NetWare, TOPS for Mac and DOS, Banyan VINES, PhoneNET Talk and DECnet.

- With the introduction of the MiniHub, Dayna now offers the most complete line of any vendor of Macintosh Ethernet products. Including our full line of DaynaPORT adapters and our award-winning EtherPrint for printers, netmodems and other LocalTalk peripherals.

- So when you’re looking for high-quality, affordable products to put your Macintoshes on Ethernet, let our family support yours.

- For information on the DaynaSTAR MiniHub or any of our Ethernet products, call 801-531-0600 today. We’ll give you all the support your family needs.
What do you get when you cross a Cisco high-performance router with a SynOptics hub? A rub. Or, more precisely, a RubSystem. Designed for networks of 40,000 to 50,000 users, the RubSystem will integrate router, hub, and network-management functions. The product, once it’s real, will be comarketed by Cisco Systems ([415] 326-1941) and SynOptics ([408] 988-2400).

By Henry Bortman

External Ethernet: So just exactly how are you going to connect that new PowerBook to your Ethernet network? Using Dayna’s new DaynaPORT SCSI/Link ($399), a SCSI-to-Ethernet adapter, is one way. The SCSI/Link supports thin-coaxial connections; the SCSI/Link-T supports twisted-pair. * Asanté’s new EN/SC 10T ($399) provides the same service for 10BASE-T connections. The EN/SC ($499) supports thick-coax, thin-coax, and 10BASE-T connections. * Nuvotech’s NuvoLink SC ($549) and Compatible Systems’ Ether+ ($495) also provide solutions.

File service: Finally, Banyan Systems ([508] 898-1000) has added Mac support to version 5.0 of VINES. Prices for the base product (sans Mac support) range from $2,495 for ten users to $7,495 for an unlimited number; $13,995 gets you support for multiprocessor server platforms. For VINES Option for Macintosh, add $1,995; for VINES Mail for Macintosh, add $895. * Microsoft wants in on the Mac action too. LAN Manager 2.1 supports Macs as well as DOS, Windows, and OS/2 clients. Prices for the server software: $1,995 for ten users, $995 for each additional ten; $995 per server for LAN Manager Services for Macintosh. * Alisa has ported its AlisaTalk server software, formerly available only on VMS, to three UNIX platforms: Sun UNIX, DEC Ultras, and IBM AIX. Prices for an unlimited number of users: $4,595 on Sun SPARCstations; $5,595 on SunSPARC servers, Digital DECstations/servers, and IBM RS/6000s. VINES 5.0, AlisaTalk for UNIX, and LAN Manager 2.1 should all be shipping as you read this. * IBM will support AppleShare connectivity on its OS/2 LAN Server too — eventually. But Big Blue won’t say when or reveal how much it will cost.

The alliance: Meanwhile, Apple has licensed the blue boys’ token-ring chips for use in its new Token Ring 4/16 NB Card ($999). * And if you thought A/UX would fade into the woodwork with the Apple/IBM announcement of PowerOpen, check out A/UX 3.0. It offers full System 7 functionality, including QuickTime, and runs on Mac Quadras (A/UX 2.1 doesn’t). Also new in 3.0: support for serial connections, via CSL/IP and SL/IP, and UUCP file transfer. Available in early 1992.

Remote AppleTalk: Several vendors have promised that their products will support the ARAP (AppleTalk Remote Access Protocol), starting in early 1992. TransWare ([415] 968-8888) will implement ARAP on its three-port SerialWay dial-in servers, Cisco will do likewise on its line of terminal servers, and Cayman Systems ([617] 494-1999) will offer it on an as-yet-unspecified remote-access-server product. *
Asanté. The most advanced Macintosh networking company, time after time after time.

Introducing Asanté's new EN/SC Ethernet SCSI device.

Now you can connect any Macintosh to any Ethernet media, any time. The new Asanté EN/SC connects to the Mac's SCSI port and includes ports for all three Ethernet media (thick, thin and 10BaseT). So you don't need a Mac with an internal slot to run Ethernet—good news for anyone with a Mac Classic or Mac Portable.

And it gives you the option of networking even when your slots are full or you want to save your open slots for the future—good news for everyone.

Ethernet connectivity through the Mac's SCSI port.
Single product supports all three Ethernet media.
Pass-thru SCSI port and an external SCSI ID switch.
Diagnostic LEDs.

With ports for all three Ethernet media, and two SCSI ports for simple daisy-chain connections, the new EN/SC is flexible enough to grow with your business. In fact, it's all you'll ever need. Because changing with the times is as easy as changing from one port to another. And if your Macs change location, our SCSI device follows right along. It's just the latest example of networking leadership from the number one networking company offering a full line of Ethernet cards for the full line of Macintoshes.

Asanté. We're compatible, flexible. And, above all, reliable.
In fact, every one of our products is backed by a 5-year, hassle-free warranty. So whichever Macintosh you want to network, and whenever you plan to do it, make all the right connections with Asanté.

Give us a call today at 1.800.662.9686 to find out more about our complete family of products.

Resellers: Asanté products are available from distributors Tech Data, Ingram Micro, and Merisel/Macamerica.
A new batch of traffic and protocol analyzers makes network maintenance a lot easier for beginners and pros alike.

By John Battelle

Keeping your network healthy has never been easy, and in the past, the software tools available to help you analyze and isolate network problems didn’t make the job any more enjoyable. But weary network administrators can take heart: Well-designed management software has recently been released, with new products ranging from applications that decipher the data whizzing across your network to mapping, updating, and inventory programs that help keep your network shipshape.

In this article, we look at two types of complementary tools that help you pinpoint and solve problems. Traffic analyzers — which include Apple’s entry-level Inter•Poll and Farallon’s full-featured TrafficWatch II — keep track of the transmissions that travel across your network every time two devices (such as a Mac and a printer) communicate. They tell you which devices are generating traffic, how much traffic is being generated, and when traffic is occurring during the day.

Protocol analyzers, such as AG Group’s LocalPeek and EtherPeek and Neon Software’s NetMinder products, take an in-depth look at what’s happening on a network. Rather than just looking at the traffic, they look at the data “packets” that make up the traffic. (A packet is a group of signals traveling on the network that includes user information, the control and addressing information needed to send the packet to its correct destination, and the data being sent.) By decoding the information within the packets, a protocol analyzer can pinpoint trouble down to the byte level. Good protocol analyzers also let you view where packets come from, where they are headed, and how many of each type there are. You can use the information they provide to redesign your network and make it more efficient. But beware: To use protocol analyzers, you need a good understanding of Mac networking and of the AppleTalk protocol stack in particular. Apple’s Inside AppleTalk (Reading, Massachusetts: Addison-Wesley, 1990) is a good reference to have on hand.

To round out your network-management tool kit, consider ancillary tools such as mapping, monitoring, and inventory programs. For more on these, see the “From Mapping to Monitoring” sidebar and “Maximum Mac Management,” October ’91, page 183.

Inter•Poll

The best-known — and most maligned — LocalTalk-administration software is Apple’s Inter•Poll ($129), which was designed for small (7 to 32 node) networks. Inter•Poll creates a logical map of the network that shows how many packets are being sent, where they’re going, and where they’re from. It displays lists of network zones and active network devices and provides an echo test that lets you test the integrity of the connections among those devices within a particular zone and allows you to pinpoint exact locations of network breakdowns. When a special INIT called the
Network Management

Responser is installed on Macs on a network, Inter-Poll can query workstations for information such as the version of TrafficWatch II captures and presents Inter-Poll since 1989, its excellent manual Responser is installed on Macs on a network, Inter-Poll can query workstations which monitors network traffic on both Ethernet and LocalTalk networks. TrafficWatch II captures and presents packet data graphically, with charts showing protocol use, bandwidth utilization, and types of errors.

TrafficWatch II

Inter-Poll is pretty limited in what it can do, and it doesn't give you much help in interpreting the information it gathers. A far more sophisticated tool is Farallon Computing's TrafficWatch II ($895), which monitors network traffic on both Ethernet and LocalTalk networks. TrafficWatch II captures and presents packet data graphically, with charts showing protocol use, bandwidth utilization, and types of errors.

TrafficWatch II lets you see when packets were sent and shows the send-and-receive counts for each specific node address, including broadcast. Like Inter-Poll, TrafficWatch II uses the Responder INIT to gather device-type and other system information, which you can save as text for analysis in a database or spreadsheet program (see Figure 1). To further help you analyze the information gathered, TrafficWatch II includes an Excel macro called TrafficChart.

TrafficWatch II is useful for monitoring your network, letting you know what devices are out there, what traffic problems are developing, and how you can revamped your network. This is all the help many administrators need. However, if the only way to solve your network's problems is by delving beneath the surface into the contents of the packets themselves—to find a bad connection or bad software, for example—you're going to need a protocol analyzer.

TalkStat and TalkSpy

Distributed Technologies makes a program that fills the gap between traffic and protocol analyzers. The $495 package includes two complementary products, TalkStat and TalkSpy, that are adjuncts to DTC's integrated administration-software package, TalkManage, described in the "From Mapping to Monitoring" sidebar. (For the features of Inter-Poll, TrafficWatch II, and DTC's products, see Table 1.) DTC's package looks at traffic on LocalTalk segments and offers two levels of analysis. TalkStat looks at network traffic and graphically displays network performance statistics. It also shows network bandwidth use, protocol use, and the number of packet errors. TalkSpy lets you trace problems down to the packet level: It identifies and traces packet errors on the network, gives information on packet headers (essentially the packet's instruction set), and counts three types of errors: cyclical-redundancy check (CRC), overrun, and NoAbort.

We had a couple of problems with TalkStat and TalkSpy. First, their non-intuitive interfaces may make them difficult for neophyte network managers to master (a problem compounded by the skimpy and unindexed manual). Second, the company has a frustrating copy-protection policy: You can only make two copies of the programs from the master disks. If you want to run TalkSpy from a floppy disk—to run tests from a machine on another LocalTalk segment, for example (a common network-administrator

Figure 1: TrafficWatch II provides a Device List (front) based on information from the Macs on a network on which the Responder INIT has been installed. It also lets you graph interpretations of traffic patterns in several ways, such as traffic sent and received (back).

Are We Managing Networks Yet?

Although several network-management packages are now available for AppleTalk networks, we're still not there yet. In fact, we're not even close. But before the angry letters start pouring in, let me explain.

You take the Mac. It's got a great graphical user interface. It's got a great built-in network, AppleTalk. You think, "Gee, someone should be able to put these two elements together and come up with great software for managing AppleTalk networks." But for some reason, it hasn't happened.

Why? Because Apple has been asleep at the wheel. AppleTalk is a very elegant system of network protocols, but it has no management protocols. In the absence of a standard from Apple, network hardware and software vendors have had to devise proprietary protocols to solve their network-management problems.

The result? Network-management applications are severely restricted in the range of devices they can support. To create RouterCheck, for example, Neon Software had to write custom code for each type of router it supports. And there still isn't an application that can manage different vendors' hubs. This is an absurd state of affairs.

After numerous customer complaints, Apple finally got around to working on AMP (AppleTalk Management Protocol) in the late 1980s. Then, just when AMP was almost ready, Apple changed its mind and decided to go with the more-standard SNMP (Simple Network Management Protocol).

This was actually a good move. In fact, it was a response to customer demand. Customers wanted a protocol that would let them manage Macs and AppleTalk network devices along with other computing and network devices. Macs and AppleTalk no longer live in isolated network worlds of their own, especially at large companies, and SNMP addresses this reality better than AMP would have. Sure, it's a couple of years too late, but let's hope that it's just the beginning.

— Henry Bortman

234 February 1992 MacUser
Introducing the only 16-inch displays compatible with the new Macintosh Quadra 700 and 900, E-Machines ColorPage E16 and ColorPage T16. Just plug-and-play for affordable full-page color up to 24-bits. No interface card necessary! Need more room to work with large spreadsheets, desktop publishing layouts or multimedia applications? E-Machines 16-inch color solutions are just right for the Mac IIci, IIgs, LC — The Entire Office.

Just Right For The Entire Office

High Performance Interface Cards

<table>
<thead>
<tr>
<th>Interface Card</th>
<th>8-bit up to 832 x 642</th>
<th>24-bit up to 640 x 480</th>
<th>24-bit up to 832 x 642</th>
<th>24-bit up to 1024 x 768</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOUBLE COLOR</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUTURA EX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUTURA 5X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FUTURA MX</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

accelerated color machine complete with pan and zoom, virtual screens and video output capabilities. Go ahead, experience high performance color and see how affordable 16-inch color solutions have become.

For your nearest dealer, call or write.
9305 SW Gemini Drive, Beaverton, OR 97005
Fax: 503-641-0946

1-800-344-7274
Circle 151 on reader service card.
WE'RE LOOKING FOR EVIDENCE OF INTELLIGENT LIFE.

If you have evidence of intelligence test scores which put you in the top 2% of the population—for example, 1250 or better on the SAT*—then you already qualify to join Mensa. We also accept the GRE (1250), Miller Analogies (66), Stanford Binet (132) and other tests (scores must be accompanied by a $15 evaluation fee). Send in this coupon for more information.

Name ____________________________
Address ____________________________
City/State/Zip _______________________

PROTECT YOUR COPIES of MacUser

Make your collection of MacUser a handsome addition to your office or home—and protect them for easy reference! MacUser Magazine Binders and Cases are made of durable luxury-look leatherette over quality binder board. Custom designed for MacUser, every order receives FREE gold transfer foil to personalize dates and volume numbers.

For Fast Service Call Toll Free, 1-800-825-5690

MacUser

499 East Erle Avenue-Philadelphia, PA 19134

Please send me:

□ Binders □ Cases

Payment by check or money order enclosed for $_________.*
Add $1 per case/binder for postage and handling. (Outside USA, add $3.50 per case/binder ordered. US Currency only.)
 Charge my: □ AmEx □ Visa □ MC (minimum order $15)

Card No. ____________________________ Exp. Date ________

Name ____________________________
Address ____________________________
City State Zip _______________________

* $50, if you took the test prior to September 1977.

From Mapping to Monitoring

It takes more than just traffic and packet analyzers to manage a network. Several recently introduced products focus on other less specialized aspects of network administration such as router management and network mapping.

NetAtlas. This program from Farallon Computing provides a logical map of your entire internet (by network address, not physical location) along with lists of each node's type (AppleShare client or Mac IIc, for instance), zone location, and responder information. You can print this information or save it for further analysis, and you can save the map as a PICT file. NetAtlas also lets you specify various types of devices to search for, such as workstations or printers. Farallon Computing, 2000 Powell Street, Emeryville, CA 94608; (510) 596-9100. $995.

NetMap. This mapping program works as a DA and isn't as full-featured as NetAtlas. NetMap can search for specific zones and addresses, and it provides a list of device types and their logical location on the network. It doesn't offer responder information or a graphical map of the network, however. Advanced Electronic Support Products, Inc., 1810 N.E. 144th Street, North Miami, FL 33181; (305) 448-2277 or (905) 944-7710. $99.

NetOctopus. This integrated administration tool from MacVONK provides several management tools in one package. Billed as a competitor to StatusMac, from Pharos Technologies, and GraceLAN Update Manager, from Technology Works; and Personal Status, from Pharos, NetOctopus polls the machine, the INIT/ control panel provides information about CPU and monitor type, applications, INITs and control panels, and even specific documents. Users can decide what the administrator may see.

NetWatchman. This comprehensive monitoring and alarms program from AG Group has a colorful, icon-based interface that provides a map of the network. You can configure the program to monitor your network in the background and alert you to problems such as when a server crashes, a bridge fails, or a printer goes down.

Like most other monitoring programs, NetWatchman sends a request to all AppleTalk-network devices for a response packet and collects all the responses as a network snapshot that shows services such as E-mail and file servers), nodes, and zones. You can save the device and zone lists as text files for use in network planning and analysis. AG Group, 2540 Camino Diablo, Walnut Creek, CA 94596; (510) 937-7900. $195.

RouterCheck. Geared specifically to managing routers, Neon Software's RouterCheck creates a list of all the routers on a network, including information such as the router's name, network location, and node number. RouterCheck can also display routing-table information (crucial lists of...
LocalPeek

LocalPeek, which AG Group sells either separately for $495 or as part of its $1,295 NetPatrol Pack (which includes LocalPeek, EtherPeek, and Net Watchman), is the slickest of the LocalTalk tools we tested. It has an easy-to-use interface, and its use of color and graphs is quite effective. But for an experienced network administrator, the program may be a little too slick, with several unnecessary bells and whistles that occasionally detract from its actual purpose.

LocalPeek displays packet data in a real-time collection window. If you double-click on a packet, you’ll be able to see the data inside, broken down by protocol layer. You can cut and paste this data into another program (a spreadsheet or database program, for example), a feature that’s important if you’re creating reports on the information you’re collecting. This ability to transfer information is not supported by most other programs (although most do let you save packet information as text files).

LocalPeek’s filtering options are extensive—for example, it allows for several levels of filtering based on DDP (Datagram Delivery Protocol) subcategories such as RTMP (Router Table Management Protocol) and ADSP (AppleTalk Data Stream

what devices the router recognizes and trades information with). Depending on the type of router, you can request the router’s serial number, software version, and some packet statistics, such as error counts and the number of packets routed. You can display these statistics graphically or export them as text for further analysis in a spreadsheet or database program.

You can also use RouterCheck to verify that a particular router is properly configured and is aware of the other routers on the network. If there’s a problem, it will suggest solutions. Neon Software, 1009 Oak Hill Road, Suite 203, Lafayette, CA 94549; (510) 283-9771, $649.

TalkManage. Instead of focusing on one aspect of management, Distributed Technologies’ TalkManage offers several different features. Its packet-analysis modules (TalkStat and TalkSpy) are discussed in the main article, and TalkManage also includes a slick router-monitoring function, a messaging system, an alarms function, responder information, and mapping. These features are displayed on a “dashboard” console for easy network monitoring (see Figure A). Although TalkManage’s technology appears to be solid and its feature list comprehensive, the product suffers from a sometimes confusing interface and poor documentation. Distributed Technologies Corp., 275 Wyman Street, Waltham, MA 02154; (617) 564-0660, $695.

Figure A: TalkManage takes an integrated approach to management, providing icons for various administrative functions, such as monitoring and alarms.
Now you can transform your Macintosh into a MacLabelPro Software from Avery.

Features include:
- Preset layouts for Avery Disk, Sheet, and Laser Printer Labels, including mailing, shipping, file folder, diskette and card products.
- Drawing tools and a library of clip art.
- Rotate and fill patterns.
- Serialization for sequentially numbered labels.
- Easy mail merge and graphic importing.
- On-line help.

Protocol. It also allows filtering by offset, which lets you filter on a given byte within a packet so you can zero in on specific information, and filtering based on address, which lets you isolate traffic by node (for example, all traffic going to a particular printer).

Another plus is that the program decodes the entire AppleTalk stack as well as MacIP (Macintosh Internet Protocol) and SNMP (Simple Network Management Protocol). The TCP/IP protocol SNMP is fast becoming the standard network-management protocol on the Mac (for more on SNMP, see the “Are We Managing Networks Yet?” sidebar).

LocalPeek has a slew of useful features. It can transmit echo packets to test responses from other network devices as well as create network traffic. You can flag problems with specific colors — useful for a large network where you have a lot of errors to sift through. And captured data can be displayed in real time in four types of color bar graphs: source address, destination address, node, and protocol type. LocalPeek also lets you set the amount of disk space any one capture session will take, so you can’t accidentally fill your hard disk with unneeded packet data. The manual is well designed and complete, but it lacks a glossary.

Among LocalPeek’s “bells and whistles” that are of limited use are the program’s comprehensive set of alarms. Their implementation is limited — you can access the Traffic Alarms item from the Special menu only when you have a statistics window open, for instance. The feature is set up this way because the extra processing power for identifying packets that set off an alarm can noticeably slow down the program’s performance. You can set audible (including verbal) and visual alarms that tell you when a new node or protocol is on the network, and you can add your own sounds to the program if you like.

An update to LocalPeek, which should be available when you read this, will improve LocalPeek’s ability to generate traffic and will let you save various configurations. (AG’s Ethernet product EtherPeek also includes this feature.)

**NetMinder LocalTalk**

LocalPeek’s fiercest competitor is Neon Software’s NetMinder LocalTalk ($395). Like LocalPeek, NetMinder supports color, packet analysis, protocol decoding, and sophisticated triggering and filtering, but its approach to the job is more utilitarian. The use of color is restrained, and NetMinder has fewer graphical-analysis windows than LocalPeek does. It doesn’t support echo packets or traffic generation, data isn’t displayed in real time as it comes in, and you can’t cut and paste from a packet-decode window. But these aren’t necessarily major oversights; rather, they appear to be deliberate decisions designed to make the program leaner and faster and therefore more appealing to experienced network administrators.

NetMinder LocalTalk has a more intuitive and effective filtering feature set than LocalPeek does. Successive windows guide you through the seven network layers of OSI (Open Systems Interconnection), a standard reference model for describing network protocols; as you define types of packets to be captured (see Figure 2), you can access the Traffic Alarms item from the Special menu only when you have a statistics window open, for instance. The feature is set up this way because the extra processing power for identifying packets that set off an alarm can noticeably slow down the program’s performance. You can set audible (including verbal) and visual alarms that tell you when a new node or protocol is on the network, and you can add your own sounds to the program if you like.

An update to LocalPeek, which should be available when you read this, will improve LocalPeek’s ability to generate traffic and will let you save various configurations. (AG’s Ethernet product EtherPeek also includes this feature.)

**NetMinder LocalTalk**

LocalPeek’s fiercest competitor is Neon Software’s NetMinder LocalTalk ($395). Like LocalPeek, NetMinder supports color, packet analysis, protocol decoding, and sophisticated triggering and filtering, but its approach to the job is more utilitarian. The use of color is restrained, and NetMinder has fewer graphical-analysis windows than LocalPeek does. It doesn’t support echo packets or traffic generation, data isn’t displayed in real time as it comes in, and you can’t cut and paste from a packet-decode window. But these aren’t necessarily major oversights; rather, they appear to be deliberate decisions designed to make the program leaner and faster and therefore more appealing to experienced network administrators.

NetMinder LocalTalk has a more intuitive and effective filtering feature set than LocalPeek does. Successive windows guide you through the seven network layers of OSI (Open Systems Interconnection), a standard reference model for describing network protocols; as you define types of packets to be captured (see Figure 2), you can access the Traffic Alarms item from the Special menu only when you have a statistics window open, for instance. The feature is set up this way because the extra processing power for identifying packets that set off an alarm can noticeably slow down the program’s performance. You can set audible (including verbal) and visual alarms that tell you when a new node or protocol is on the network, and you can add your own sounds to the program if you like.

An update to LocalPeek, which should be available when you read this, will improve LocalPeek’s ability to generate traffic and will let you save various configurations. (AG’s Ethernet product EtherPeek also includes this feature.)

**NetMinder LocalTalk**

LocalPeek’s fiercest competitor is Neon Software’s NetMinder LocalTalk ($395). Like LocalPeek, NetMinder supports color, packet analysis, protocol decoding, and sophisticated triggering and filtering, but its approach to the job is more utilitarian. The use of color is restrained, and NetMinder has fewer graphical-analysis windows than LocalPeek does. It doesn’t support echo packets or traffic generation, data isn’t displayed in real time as it comes in, and you can’t cut and paste from a packet-decode window. But these aren’t necessarily major oversights; rather, they appear to be deliberate decisions designed to make the program leaner and faster and therefore more appealing to experienced network administrators.

NetMinder LocalTalk has a more intuitive and effective filtering feature set than LocalPeek does. Successive windows guide you through the seven network layers of OSI (Open Systems Interconnection), a standard reference model for describing network protocols; as you define types of packets to be captured (see Figure 2), you can access the Traffic Alarms item from the Special menu only when you have a statistics window open, for instance. The feature is set up this way because the extra processing power for identifying packets that set off an alarm can noticeably slow down the program’s performance. You can set audible (including verbal) and visual alarms that tell you when a new node or protocol is on the network, and you can add your own sounds to the program if you like.
to recapture the information.

NetMinder has a few bells and whistles of its own, such as a trigger that includes a high-resolution clock, which lets you set timing in tens of microseconds (packets travel in milliseconds of a second). More useful is the ability to set triggers based on a predefined filter. You can also save multiple configuration files, a time-saver when you’ve expended a lot of effort to customize the program. You can, for example, create a configuration file that is specific to a particular network segment and place it on a disk with the program for on-the-spot troubleshooting.

NetMinder’s on-line help is well constructed. Almost every one of its windows includes a help button, and when you click on it, you get useful and concise information. This more than makes up for the sometimes clumsy manual, with its incomplete glossary.

Unlike LocalPeek, NetMinder doesn’t have configurable alarms. It does alert you, however, when the packet buffer is full or when a packet is dropped or missed. Neon takes a “circular” approach to its packet buffer. When the buffer is full, the program discards older packets as it collects new ones rather than discarding the entire buffer and starting anew. This is how high-end dedicated protocol analyzers deal with buffers.

For those who need protocol analyzers for both LocalTalk and Ethernet networks, Neon bundles NetMinder LocalTalk and NetMinder Ethernet as part of the $895 Network Management Series I package.

EtherPeek and NetMinder Ethernet

Neon Software and AG Group offered software Ethernet protocol analyzers long before they introduced their LocalTalk programs, and for good reason. Ethernet is a far more complex networking scheme, mainly because it can support many more devices on one network. Before these two products priced at much less than $1,000 hit the market, Ethernet was the domain of specialty hardware with price tags reaching up to $20,000. Both Neon’s NetMinder Ethernet ($495) and AG’s EtherPeek ($795) are similar to their LocalTalk counterparts in terms of interface and feature sets.

In addition to AppleTalk, both programs analyze most protocols that run on top of Ethernet, such as IP, ARP, NetWare IPX, SPX, DECnet, XNS, and ITPTalk. An elegant twist to EtherPeek is its modular design: When a new protocol appears, AG need provide only a new protocol interface file (available on AppleLink or free on-disk to registered users) rather than a new version of the software.

Because it can generate traffic (see Figure 3), EtherPeek can create a load of nearly 6 megabits per second on Ethernet, enough to simulate close to full bandwidth utilization (although Ethernet’s theoretical bandwidth is 10 megabits per second, throughput is rarely above 2 to 3 megabits per second).

EtherPeek includes an application called GetTheirAddress, which scans the network and loads user and service names
into its own table of AppleTalk devices. This means that you don’t have to identify packets by their areane internet address. Should new nodes appear, they’re automatically added to the same table. NetMinder Ethernet includes Roll Call (called NetMinder Addresses in version 2.0), which does the same job as GetTheirAddress but doesn’t map new nodes to the name table. NetMinder Ethernet also includes the NetMinder Diagnostics utility, which checks hardware issues such as whether the network is uto-terminated.

Although both programs support the major Ethernet cards on the market, EtherPeek’s modular design accepts new card-interface files without requiring you to install a new version of the program. Before we could use NetMinder Ethernet, we had to wait to receive an updated version of the program that recognized the Ethernet card we were using. Both programs, however, support the simultaneous use of multiple Ethernet cards, a handy feature for those who want to retain their network services by using one card while monitoring the network with another.

Since this article was written, Neon has released version 2.0 of NetMinder Ethernet (it costs $100 more than version 1.2, the one we examined). The upgrade includes an Explain button, which enhances the already useful on-line help, real-time display, SNMP support, and enhanced mapping. AG has promised an update to EtherPeek in early ’92.

The Bottom Line

The adage “for every job there is a tool” took a long time to come true in the field of Mac-network administration, but network managers finally can go to work with a complete toolbox. If you’re running a simple network of 5 to 20 nodes and all you want to know is who’s sending packets where, Apple’s Inter-Poll may be all you need. Beginners will find its manual a good introduction to networking. For a more sophisticated tool to help you manage and analyze your LocalTalk or Ethernet network on a node-by-node level, Farallon’s TrafficWatch II is a good choice.

For heavy-duty packet analysis in LocalTalk or Ethernet environments, it’s a toss-up between Neon Software’s and AG Group’s products. AG Group’s LocalPeek and EtherPeek have slick bells and whistles on the surface and solid administration and analysis tools at the core.

If you’re just starting out in the cryptic world of packet analysis, these products may be the way to go. If, on the other hand, you’re experienced with network administration, you may feel more comfortable with the no-frills approach of Neon’s NetMinder LocalTalk and NetMinder Ethernet, which are geared toward enhancing performance and reliability. Both companies’ products do an admirable job, but you pay a premium for AG’s products.

John Battelle is a San Francisco-based writer who specializes in networking topics.
Transforming files between Macintosh and PC formats can be a real beast. But there is an amazingly simple way to make PC files totally at home in a Mac environment. And vice versa.

MacLinkPlus. The world’s leading data translation package, and the only choice for complete, effortless file conversion.

MacLinkPlus is a vast resource of over 400 translator combinations for the most popular programs running under Macintosh, MS-DOS or Windows. Including Microsoft Word, WordPerfect, Excel, Ami Professional, MultiMate and dozens of other word processing, spreadsheet, database and graphics applications.

File translations are automatic with “point-and-click” simplicity, and we include DOS Mounter software so MS-DOS disks show up right on your Macintosh desktop. We even offer complete compatibility with XTND file conversion.

No matter what version of System you’re running, MacLinkPlus sets the standard in ease of use. And our new version 6.0 is packed with features that exploit System 7 innovations.

For file translations when you’re connected via a network, file server, or SuperDrive, all you need is MacLinkPlus/Translators. And for the added capability of file transfer using a cable or modem, MacLinkPlus/PC includes the same full array of translators as well as a serial cable and communications software.

Get MacLinkPlus 6.0 today. And watch all your PC files transform themselves before your very eyes. For more information, call DataViz at (800) 733-0030.

See us at MacWorld, Booth #1539, Moscone Center
All product names are trademarks or registered trademarks of their respective holders. DataViz, Inc., 55 Corporate Drive, Trumbull, CT 06611 (203) 268-0030

CIRCLE 171 ON READER SERVICE CARD.
### Table 1: Features of Network-Administration Tools

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Apple Computer</strong></td>
<td></td>
</tr>
<tr>
<td>InterPoll</td>
<td></td>
</tr>
<tr>
<td><strong>Distributed Technologies</strong></td>
<td></td>
</tr>
<tr>
<td>TalkManage (TalkSpy and TalkStat 1.6)</td>
<td></td>
</tr>
<tr>
<td>Farallon Computing</td>
<td></td>
</tr>
<tr>
<td>TrafficWatch II</td>
<td></td>
</tr>
<tr>
<td><strong>List price</strong></td>
<td></td>
</tr>
<tr>
<td>$129</td>
<td></td>
</tr>
<tr>
<td>$495</td>
<td></td>
</tr>
<tr>
<td>$995</td>
<td></td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td></td>
</tr>
<tr>
<td>Can create traffic.</td>
<td></td>
</tr>
<tr>
<td>Excellent manual.</td>
<td></td>
</tr>
<tr>
<td>Part of integrated package of administration tools.</td>
<td></td>
</tr>
<tr>
<td>Can create traffic.</td>
<td></td>
</tr>
<tr>
<td>Intuitive interface/graphs.</td>
<td></td>
</tr>
<tr>
<td>Limited utility.</td>
<td></td>
</tr>
<tr>
<td>Useful for small networks only.</td>
<td></td>
</tr>
<tr>
<td>Cannot create traffic.</td>
<td></td>
</tr>
<tr>
<td>Poor manual.</td>
<td></td>
</tr>
<tr>
<td>Not AppleTalk Phase 2-compatible.</td>
<td></td>
</tr>
<tr>
<td>Awkward copy protection.</td>
<td></td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td></td>
</tr>
<tr>
<td>Filters</td>
<td>none</td>
</tr>
<tr>
<td>Charts</td>
<td>none</td>
</tr>
<tr>
<td>Error support</td>
<td>none</td>
</tr>
<tr>
<td>Protocols</td>
<td>LocalTalk</td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td></td>
</tr>
<tr>
<td>Apple Computer</td>
<td></td>
</tr>
<tr>
<td>20525 Mariani Ave.</td>
<td></td>
</tr>
<tr>
<td>Cupertino, CA 95014</td>
<td></td>
</tr>
<tr>
<td>(408) 996-1010</td>
<td></td>
</tr>
<tr>
<td>Distributed Technologies Corp.</td>
<td></td>
</tr>
<tr>
<td>275 Wyman St.</td>
<td></td>
</tr>
<tr>
<td>Waltham, MA 02154</td>
<td></td>
</tr>
<tr>
<td>(617) 684-0050</td>
<td></td>
</tr>
<tr>
<td>Farallon Computing</td>
<td></td>
</tr>
<tr>
<td>TrafficWatch II</td>
<td></td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Table 2: Features of Protocol Analyzers

<table>
<thead>
<tr>
<th>Company</th>
<th>Product Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG Group</td>
<td></td>
</tr>
<tr>
<td>EtherPeek 1.04</td>
<td></td>
</tr>
<tr>
<td><strong>List price</strong></td>
<td></td>
</tr>
<tr>
<td>$795</td>
<td></td>
</tr>
<tr>
<td>$495</td>
<td></td>
</tr>
<tr>
<td>$495</td>
<td></td>
</tr>
<tr>
<td><strong>Pros</strong></td>
<td></td>
</tr>
<tr>
<td>Can create traffic.</td>
<td></td>
</tr>
<tr>
<td>Feature-heavy.</td>
<td></td>
</tr>
<tr>
<td>Modular design accepts new protocols easily.</td>
<td></td>
</tr>
<tr>
<td>Performance suffers because of excessive feature set.</td>
<td></td>
</tr>
<tr>
<td>Feature-heavy in some instances.</td>
<td></td>
</tr>
<tr>
<td>Cannot create traffic. No alarms or cut and pasta.</td>
<td></td>
</tr>
<tr>
<td>Cannot create traffic. Doesn't support SNMP.</td>
<td></td>
</tr>
<tr>
<td><strong>Features</strong></td>
<td></td>
</tr>
<tr>
<td>Filters</td>
<td>offset, address, protocol, hex/ASCII, error, size</td>
</tr>
<tr>
<td>Triggers</td>
<td>time, offset, address, protocol, error</td>
</tr>
<tr>
<td>Alarms</td>
<td>node, protocol, threshold, trigger</td>
</tr>
<tr>
<td>Protocols</td>
<td>AppleTalk, ARP, SNMP, IPX, DECnet, XNS, IPTalk</td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td></td>
</tr>
<tr>
<td>AG Group</td>
<td></td>
</tr>
<tr>
<td>2540 Camino Diablo</td>
<td></td>
</tr>
<tr>
<td>Walnut Creek, CA 94596</td>
<td></td>
</tr>
<tr>
<td>(510) 937-7900</td>
<td></td>
</tr>
<tr>
<td>AG Group</td>
<td></td>
</tr>
<tr>
<td>2540 Camino Diablo</td>
<td></td>
</tr>
<tr>
<td>Walnut Creek, CA 94596</td>
<td></td>
</tr>
<tr>
<td>(510) 937-7900</td>
<td></td>
</tr>
<tr>
<td>Neon Software</td>
<td></td>
</tr>
<tr>
<td>NetMinder Ethernet 1.2</td>
<td></td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td></td>
</tr>
<tr>
<td>AG Group</td>
<td></td>
</tr>
<tr>
<td>2540 Camino Diablo</td>
<td></td>
</tr>
<tr>
<td>Walnut Creek, CA 94596</td>
<td></td>
</tr>
<tr>
<td>(510) 937-7900</td>
<td></td>
</tr>
<tr>
<td>Neon Software</td>
<td></td>
</tr>
<tr>
<td>NetMinder LocalTalk 1.0</td>
<td></td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td></td>
</tr>
<tr>
<td>AG Group</td>
<td></td>
</tr>
<tr>
<td>2540 Camino Diablo</td>
<td></td>
</tr>
<tr>
<td>Walnut Creek, CA 94596</td>
<td></td>
</tr>
<tr>
<td>(510) 937-7900</td>
<td></td>
</tr>
<tr>
<td>Neon Software</td>
<td></td>
</tr>
<tr>
<td>NetMinder Ethernet 1.2</td>
<td></td>
</tr>
<tr>
<td><strong>Company</strong></td>
<td></td>
</tr>
<tr>
<td>AG Group</td>
<td></td>
</tr>
<tr>
<td>2540 Camino Diablo</td>
<td></td>
</tr>
<tr>
<td>Walnut Creek, CA 94596</td>
<td></td>
</tr>
<tr>
<td>(510) 937-7900</td>
<td></td>
</tr>
</tbody>
</table>
Microtek removes the biggest barrier to owning a Slide Scanner

If price has been the barrier separating you from high quality color scanning, take a look at the ScanMaker 1850. Another stunning price breakthrough from Microtek, the leader in affordable color scanning solutions.

The ScanMaker 1850 sports a formidable set of specs. 35 x 35mm scanning area. 24-bit color. 8-bit gray-scale. 1850 dpi resolution.

Best of all, it's so easy to use. Just drop in any slide and you're ready to start scanning.

The ScanMaker 1850 gives you everything you need to go from comps to final color separations. It even comes bundled with PhotoStyler for the PC or Adobe Photoshop for the Mac.

But wait, it looks even better when you see the price. Just $2,995 for the ScanMaker 1850 on the PC. And only $3,195 for the Mac compatible ScanMaker 1850S.

Call 1-800-654-4160 or 213-321-2121 in California for the name of the Microtek authorized dealer nearest you.

Because the only barrier between you and a 35mm color scanner now is a toll-free phone call.

CIRCLE 174 ON READER SERVICE CARD.
Okay, so maybe I'm not in MIS, but I grinned and loaded FoxBASE+ /Mac.

The next day, I showed them a sample of their PC inventory database with not just how much of anything we had, but with pictures showing exactly what it looked like.

I ran their dBASE sales analysis program (using a couple of new Mac screens I whipped out) as they watched FoxBASE+ /Mac scream through the numbers.

And then I showed them the kinds of reports they could get, using data stored in Fox or dBASE IV/III+ files on the PC.

You could have heard a pin drop.

Then they were all over me with questions, so I just handed them the FoxBASE+ /Mac manuals and smiled.

Besides not being in MIS, I'm not a professional programmer, so you can tell how easy FoxBASE+ /Mac is.

For the inventory system, I just used
FoxBASE+/Mac to read the database files they had on the PC (it reads Fox and dBASE IV/III+ files directly). I added a memo field into which I cut and pasted pictures that our DTP department had for our customer literature. Then I used the MacDraw-like screen painter to create a great color Mac output screen. The sales analysis was easy, too. I had to create new screens but FoxBASE+/Mac ran the rest of the dBASE III+ program just fine. (It typically runs as much as 95% of standard FoxBASE+/PC and dBASE III+ code with no changes.)

And I built the reports I showed them from scratch. With no programming at all. If you're looking for a better way to manage your data, call Fox Software and ask for their free demo. It limits the number of records you can store, but is the full program, so you can check it all out for yourself on your applications. Around here, MIS has been pretty busy the last few weeks. They've hooked up Macs and PCs on an Ethernet network and our information and data processing systems are looking great.

They're building Hypercard-like applications I see people using all over the place. Accounting likes all of this because the single-user version lists for $495, and the unlimited Multi-User version is only $695. And even the PC programmers are happy. I hear them talking about things like the great trace and debugging facilities, adding XCMDs and XFCNs, the dBASE-like programming language, System 7 compatibility, full file and record locking in the multi-user version, and how FoxBASE+/Mac is “so astoundingly fast for a Mac.” Everyone seems to be laughing more now, too.

Call 1-800-837-FOX2 or 419-874-0162 today for a free, full-featured demo.

(Ask for Offer MUS 201)
Nisus® is the only word processor that can reformat a mainframe file, illustrate a medical procedure, and even help you learn to read, write, and speak a foreign language.

Nisus' built-in word processing language manipulates words like databases manage data, so mainframe file conversions are easy. Nisus lets you communicate the way the Macintosh works—with words, graphics, and sound.

**Word Processing.** If you want a word processor that is as easy to use as MacWrite II but more powerful than Microsoft Word 4.0, buy Nisus.

All word processors have “find and replace.” Nisus lets you find any word you want to change, (even words with a special font, size, style, or color)—even in unopened files—and then replace or index your changes. You can select noncontiguous words or use the unlimited undo all the way back to when you opened the file.

**Graphics.** Sometimes, something as simple as a note with an arrow attached is all you need to make your point. You can “Place” any page of a Nisus file containing text and graphics into another Nisus file where it becomes a graphic. Double clicking “Placed Page Graphic” will open the original file for editing. Graphics can be drawn or pasted to three different layers: the text layer, behind the text, and in front of the text.

Nisus lets you rotate text, which is important if you are designing a two-fold three-panel self-mailer. Nisus also prints pages in pamphlet style with correct pagination for assembly.

**Built-in Word Processing Language.** Nisus has a built-in word processing language which does for word processing what built-in languages do for databases. For example, the language allows you to develop commands to index all proper names, find and correct all double words, periods, and extra spaces, or to index every word in a document except those you specifically want to exclude. You design features just right for you.

**Sound Processing in Nisus XS.** The way people communicate most often is with the sound of their voice. Now you can do just that with our new module Nisus XS. Attach sound to a character, word, sentence, paragraph, or document. You can even attach it to a graphic. Imagine being able to teach the sound of a foreign language, hear the pronunciation of technical terms, or simply attaching sound to text to teach reading.

Nisus XS takes advantage of Balloon Help, the Publish & Subscribe features of System 7, and for interapplication communication Nisus has implemented Apple Events.

**Discover why the world writes with Nisus.** Find out why *MacUser* gave Nisus its 1990 Award of Merit, *Byte* Magazine gave Nisus its 1990 Best Word Processor, *Macworld Australia* has standardized on Nisus. Now also that Nisus is available in Hebrew, Japanese, and Arabic versions. Call and ask for our new free brochure, “How Nisus compares with other word processors.” And visit us on CompuServe at our new Paragon Forum. We can’t promise sound on CompuServe, but once you use Nisus, you’ll know you made a sound decision.

**(800) 922-2993 Extension 2030**

See us at MacWorld, Booth #1737

Nisus is a registered trademark of Paragon Concepts Inc.

Other trademarks are trademarks of their respective companies.
To Tell the Truth

What's the best way to find out which of your routers are misbehaving? Just ask them.

By Kurt VanderSluis

AppleTalk routers have the marvelous ability to take a tiny "seed" of information (which networks and zones they're directly connected to) and, by exchanging this information with other routers, deduce the structure of the entire internet and intelligently route data packets through it. Unfortunately, a single misconfigured router can lead other routers astray, creating a cascade of network troubles. For example, someone enters erroneous information in one router, and other routers learn this misinformation and spread the problem. Before long, strange zones may appear in the Chooser, printers and file servers may disappear, or you may experience long delays when using network devices.

Troubleshooting in such a situation resembles the classic riddle about going to a city in which there are only two groups of people—liars and truth tellers. To figure out who belongs to each group, you must ask questions that reveal which kind of person you are talking to. The difficulty lies in the fact that the members of each group will say they are telling the truth.

A misbehaving router can give you information that's just as misleading. One way you can locate errant routers is to use Apple's InterPoll to search for clues in zone and device names (see "Rogue Routers," November '91, page 197). This low-tech method sometimes does the trick, but it can't locate subtle problems such as routers that have overlapping network-number ranges. A more advanced approach uses a protocol analyzer such as AG Group's EtherPeek or LocalPeek or Neon Software's NetMinder to capture and decode the information packets sent by different routers; by comparing this data, you can locate discrepancies (see "A Packet Full of Trouble," December '91, page 215).

Each method has its uses, but the simplest approach is to directly ask a router about the accuracy of its information. In this final segment on router-configuration problems, I'll show you a new tool, PacketSend, that can directly ask routers revealing questions. By looking at the answers with a protocol analyzer, you can quickly find the "liars," the routers that are improperly configured. Once you've identified the bad router (or routers), you can take it off-line, reconfigure it with the correct network information, and return it to action.

Because routers keep track of where all the networks and zones in an AppleTalk internet are, they are frequently asked for information by Macs as well as other routers. Routers use two internal protocols to manage network information: the RTMP (Routing Table Maintenance Protocol), which keeps track of where all the networks are, and the ZIP (Zone Information Protocol), which monitors what networks constitute what zones. Both the RTMP and the ZIP send out information packets containing this stored data whenever another device requests network or zone information (see Table 1). If a router is misconfigured, its RTMP and/or ZIP data will be incorrect and
TROUBLE SHOTS

the router will spread this misinformation to any device that asks for it.

When you open the Chooser, for example, your Mac must ask a router to provide the zone list that appears in the Chooser window. The packet that asks that question is called ZIP GetZoneList. The router responds by sending the Mac a ZIP GetZoneList Reply packet, which contains a list of all the zones it knows about. If your Mac is on a network that has more than one router, the Mac will ask for the zone list from whichever router it got an RTMP packet from last. The Mac’s choice of router shouldn’t matter, because all the routers should return the same answer. If some routers are misconfigured, however, the zone list may vary, depending on which router is queried.

As previously discussed, you can use a protocol analyzer to intercept and read the contents of routing packets to see if all the routers are providing the same answer. Unfortunately, this technique can be time-consuming and tedious—you must “eavesdrop” on the routers’ network conversations and then sort through the data to find the specific information you need. A more direct approach is to ask the routers for the specific information you need.

I’ve developed a shareware HyperCard stack called PacketSend that lets you directly query routers about their network and zone information (see Figure 1). It can be utilized on any AppleTalk network, including LocalTalk, Ethernet, and token-ring configurations. PacketSend is designed as an adjunct to network-management tools such as NetMinder and EtherPeek, and you’ll need one of these protocol analyzers to capture and decode the response packets. PacketSend can query several routers simultaneously, however, letting you gather data from all your routers in one fell swoop and quickly pinpoint discrepancies in their network and zone information.

PacketSend can send all the query packets listed in Table 1. ZIP GetNetInfo, for example, is a useful packet for troubleshooting, because it asks a router to verify a zone name. Macs on Ethernet networks (AppleTalk Phase 2 only) automatically send this packet on startup to verify that the zone name they used last is still valid. If a Mac was in the Western Sales zone yesterday, on startup it will send a ZIP GetNetInfo packet to the last router heard from to verify that Western Sales is still a valid zone name. If the router thinks that Western Sales is valid, it will return the network numbers that go with that zone. If the router disagrees, it will inform the Mac that the zone is invalid, provide the name of the network’s default zone, and supply the network numbers that correspond to the default zone.

PacketSend can send a ZIP GetNetInfo packet to all the routers on the network at the same time. Because there is more information in a ZIP GetNetInfo Reply packet for an invalid zone than there is for a valid zone, the routers that think that Western Sales is invalid send longer response packets. A protocol analyzer such as EtherPeek or NetMinder can display a list of the response packets and their lengths. By scanning this list for longer packets, you can easily pick out the routers that don’t know about this zone—a good clue as to which routers need reconfiguring.

Another useful packet is ZIP Query. Whereas ZIP GetNetInfo supplies a zone name and asks for the corresponding network number (or range), ZIP Query supplies a network number and asks for the corresponding zone name (or list). PacketSend can transmit this packet to all the routers on your backbone at the same time, letting you quickly compare the responses and spot misconfigured routers.

For example, that your Ethernet network should have ten zones available but a technician mistakenly typed just a single zone name into one of the routers. You can easily find that router, as well as other routers it has led astray, by using PacketSend to send a ZIP Query to all the routers, asking for their zone names. The misconfigured routers—those that know about only one zone name—will return shorter packets.

You can download PacketSend from Zmac, MacUser’s on-line service (look for PKTSND.SEA in Library 6 of the Download & Support Forum) as well as from other on-line services. Alternatively, you can order it directly from me at The Network Group (206) 789-3111. The shareware fee is $40. As previously noted, you need HyperCard 2.0 (or later) to run PacketSend and a protocol analyzer such as LocalPeek, EtherPeek, or NetMinder to decode the response packets.

Kurt VanderSlois is president of The Network Group, a training and consulting firm in Seattle.

Table 1: Router Q&A

<table>
<thead>
<tr>
<th>Packet</th>
<th>Data supplied</th>
<th>Answer returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZIP Query</td>
<td>Network number, Zone name(s)</td>
<td>ZIP GetNetInfo (Zone name, Valid/Invalid, network number(s))</td>
</tr>
<tr>
<td>ZIP GetNetInfo</td>
<td>Zone name</td>
<td>ZIP GetLocalZones (Zone assigned to this network)</td>
</tr>
<tr>
<td>ZIP GetZoneList</td>
<td></td>
<td>List of all zones throughout internet</td>
</tr>
<tr>
<td>RTMP RDR</td>
<td></td>
<td>List of all networks and hop distances</td>
</tr>
</tbody>
</table>
CONSIDER THESE ADVANTAGES

• Leasing is FAST and EASY!
• Get more computer for your money - Leasing costs less
• Tax advantage - payments can be a deductible expense
• Have the system you need NOW, when you need it!
• Conserve your working capital
• Equipment pays for itself
• Conserve your working capital
• Have flexibility to expand

HERE'S HOW:
Just call with your business info, trade references and bank contact. We'll quote your package and ship your order upon quick credit approval!

*$All leases are 3 year leases with 10% residual. Call for details.

Why Lease your Mac from MacFriends?
• Competitive Pricing
• Customer Package Design Assistance
• Better Performance and Warranties
• Unlimited Toll-Free Technical Support for 2 years
• Products Pre-assembled and Tested

We're the Nation's MAC Specialists!

Call MacFriends Today. The Quicker the Better!

Call Toll Free Today!
800 331-1322

Mac Friends
AMERICA'S MAC ORDERS STORE

24 HOUR QUICKFAX (503) 286-8719 LOCAL (503) 286-9350

CIRCLE 95 ON READER SERVICE CARD.
While the original LabelWriter® ushered in a convenient way to make labels, the LabelWriter II perfects it. It's about five times faster, offers twice the print resolution, and can handle 350-label rolls. And for the first time, clear labels are available.

This mighty little printer comes with powerful software that lets you create, format and print a label at any time, without interrupting your main programs. You can also combine text in any font and style with clip art and graphics.

The LabelWriter II software also manages an unlimited number of mailing lists, prints postal bar codes, bar code 39, and serialized labels. There's even a print driver that lets you print directly from your favorite programs.

For bigger jobs, there's LabelWriter II Plus. Same small size, but with the ability to print on larger 2½" x 4" and 3.5" disk labels.

The LabelWriter II and LabelWriter II Plus retail for $249 and $399 respectively, and are compatible with System 6 and 7, Adobe Type Manager™ and TrueType™. An AppleTalk® option is also available.

For more information or a dealer near you, call 1-800-4-COSTAR or 1-203-661-9700.
Remember the high-school sophomore who refused to dissect a frog on moral grounds and then took her school to court when her grade was lowered? Apple featured this student, Jennifer Graham, in a TV ad in which she "dissected" a virtual frog by using an Apple II program called Operation: Frog. Now Scholastic Software plans to bring Operation: Frog to the Mac. Maybe schools should also look at a program from The Software ToolWorks (415) 883-3000 called Life and Death ($49.95), with which you save a life rather than pick one apart.

By James Bradbury

Big to-do: If your to-do list has become so complicated that you’re thinking about moving it to a project-management program, you might want to check out In Control, a $129.95 to-do-list manager from Attain (617) 547-2188. In Control is the brainchild of Alan Albert and Dan Chadwick, the original authors and publishers of a little flat-file-database program called FileMaker. As with FileMaker, In Control’s design emphasis is on simplicity and elegance, and the result looks like the offspring of a flat-file database and an outlining program.

Powers of deduction: Tax forms seem to get more complicated annually, but one choice will be clear this year. If you want a dedicated tax program, it’s going to be MacInTax (although from a new publisher), ChipSoft (619) 587-3939, the publisher of TurboTax, acquired the original MacInTax and its publisher, SoftView, last summer. The two products have been combined under the MacInTax name. Previous users of either product can get this year’s forms for $49.95. New users can get MacInTax for $79.95 or as part of a bundle with Intuit’s excellent personal-finance program, Quicken 3.0, for $169.

Lost and found: Here’s a new option for PowerBook owners who want some added physical and legal protection for their charges. Magenta Seven (919) 787-2787 is offering the MagentaCase for $85. The blue-with-gray-trim Cordura case has an unusual twist: Each case is “uniquely coded” so that if it is lost or stolen and then recovered, the original owner can be identified. So if you find a PowerBook in a blue-with-gray-trim case, just drop it into the nearest mailbox.

Just for fun: The $54.95 Flight Simulator 4.0, from Microsoft (800) 541-1261 or [206] 882-8080), appears to be an instant hit among the virtual-piloting crowd. It has an amazing degree of realism in everything from mechanical difficulties to weather conditions. If you plan to climb into the cockpit, though, you might want to pick up a few accessories to make your time aloft even more realistic. The first add-on you should get is the $99.95 Advanced Gravis joystick, from Advanced Gravis Computer Technology (604) 434-7274. It’s the only joystick that is currently compatible with FS4, and if you buy two, you’ll be able to fly while scarcely touching the keyboard. * Although Microsoft provides plenty of detailed scenery to fly over, you can take your plane even farther by getting a scenery-upgrade disk from Mallard Software (214) 436-0044). Four disks are available for $59.95 each, offering locales from New England to Japan to Old England.
Perfect printing.
Your work deserves it and ColorMaster® Plus was specifically designed to deliver it.
ColorMaster Plus has the right resolution: 300 dpi
You get PostScript® language compatibility, and instant access to a wide range of software.
For accurate color, it’s PANTONE® approved.
Size selection? Letter or tabloid with full bleed—giving you the largest live image of any cut-sheet desktop printer.
Plenty of ports, too. SCSI, Appletalk, RS-232 and Centronics parallel so you can mix and match different computers on one ColorMaster Plus printer.
Plus, there’s something you just can’t get anywhere else: CalComp product quality and long term commitment to service, support and supplies. Our 1-year on-site warranty is only one example.

We draw on your imagination.
CalComp
A Lockheed Company

Phoenix Page Color is a trademark of Phoenix Technologies, Ltd.
© 1992 CalComp Inc. P.O. Box 3250, Anaheim, CA 92803. ColorMaster Plus and We draw on your imagination are trademarks of CalComp. PostScript is a registered trademark of Adobe Systems, Inc.
Appletalk is a registered trademark of Apple Computer Inc. PANTONE is a registered trademark of PANTONE Inc.
Come see us at MacWorld SF in Moscone Booth 907
Down to Basics

Would you consider buying the ugliest word processor, using the slowest backup method, or getting the cheapest painting program? Here's why you should.

By Steven Bobker

In the first installment of Personal Best (November '91, page 205), we looked at some of the expenses a first-time Mac buyer needs to budget for. The hardware is the most obvious component of any computer purchase, but first-year software and operating expenses frequently match or even exceed the cost of hardware. We'll continue the explorations here, with a closer look at two of the most important applications for users—backup and word processing.

First, though, one correction and an important update: When I wrote the first Personal Best article, Apple’s TrueType was preferable to Adobe’s ATM for handling screen fonts. TrueType was Apple’s new standard, and although not perfect, it was an adequate product for all but the most demanding users. As often happens in this industry, things have changed almost overnight. Apple and Adobe have patched up their typographic differences. The rift between them a couple of years ago had caused Apple to develop TrueType as a replacement for ATM. Now that the two companies are palsy-walsy again, Apple has announced that ATM technology will become part of future Mac system software. Further TrueType development has been canceled.

As a result, ATM is important software for most users. It greatly improves the appearance of screen fonts and output from QuickDraw printers, such as the DeskWriter and the StyleWriter. ATM costs about $70, but most users will spend more, because they'll want to buy additional fonts. Adobe sells font packs that are good price/performance buys for those who want lots of fonts. An even better way to get a lot of nice fonts is to buy Fluent Laser Fonts Library, from Casady & Greene (Salinas, California). For $179, you get 79 Type 1 fonts that are perfect for use with ATM.

The update information is about MasterJuggler, from ALSoft (Spring, Texas). The System 7-compatible version 1.57 is out and at such a low price that you should simply go to your dealer or call your favorite mail-order supplier and order it. It’s very nice and highly recommended for dealing with fonts, DAs, Fkeys, and sounds.

Get Your Back Up

One of the first software investments every computer user should make is to buy a backup program: The best choices are Redux ($99), from Microseeds Publishing (Tampa, Florida), and Retrospect ($249), from Dantz Development (Berkeley, California). Just owning a backup program isn't sufficient. You need to use it regularly and have a safe place to store your backed-up data. The best backup medium today is DAT tape. The tapes are inexpensive enough: $13 to $18 for a tape that holds 1.3 gigabytes (16 full backups of an 80-megabyte hard disk). Unfortunately, the necessary hardware costs at least $1,500 (although that includes Retrospect or other good software). So for now, let’s put the DAT drive on next year’s wish list.
Other choices include SyQuest, Ricoh, and Bernoulli magnetic-cartridge drives and traditional cassette-tape drives. These are also too expensive this year.

At present, the most economical choice for backup media is floppy disks, which require no additional hardware. Get 1.4-megabyte high-density disks rather than the less-expensive 800K double-density disks, and use new, high-quality disks for your backups. Buy a box of 100, and on a rainy afternoon, format them all. It’s boring but necessary. If you want to speed up the job a bit, get the $21 shareware program QuickFormat! 6.3. Be sure it’s set to verify each disk.

Next, divide your disks into sets. You’ll need about 22 disks for each 40 megalobyte of hard-drive capacity. You should have at least two full sets, which you can use alternately for backup. If possible, periodically make a full backup to a third set that you can store away from your computer’s location. This lets you keep the regular sets at home, assuming that that’s where your computer is, and the third set at work. By the way, don’t keep any of your backup sets in the same room as your computer. Don’t even store a set in the same room as the other set. This may sound paranoid and excessive, but one day such precautions will make you a much happier computer user!

**Know Your Writes**

Now that you know how to safeguard your data, let’s talk about how you’re going to create some data worth safeguarding. For most users, a word processor is their main tool for data entry—but how do you choose a word processor?

Fortunately, you have a wide range of choices. Mac word processors range from simple text editors (with correspondingly small price tags) that do only the most basic chores to pricier super power-user behemoths that boast page-layout and graphics capabilities.

First, figure out what kinds of features you need. Several high-end word-processing programs have built-in drawing and graphics modules, which seem like a waste of disk space and programming effort to me. If you need to create graphics, use a dedicated graphics program. Such programs aren’t necessarily expensive, as my Pick of the Month demonstrates.

Other word processors claim to be able to do page layout. None are precise enough for professional-caliber work, however. You might be able to knock off a quick newsletter, but if it looks really count, you’ll want a genuine page-layout program such as PageMaker, from Aldus (Seattle, Washington); QuarkXPress, from Quark (Denver, Colorado); or Publish It! Easy, from Timeworks (Northbrook, Illinois).

Other word processors make a point of their extensive dictionary and thesaurus features, but you can easily add a wonderful spelling checker and dictionary to any word processor. Get a copy of the superb Thunder 7 ($99.95), from Baseline Software (Memphis, Tennessee), which is the best spelling checker available. It can be set to open automatically in any program, not just in your word processor.

I should also comment that as a writer,
I have never found any electronic dictionary or thesaurus half as good as my hard-copy standbys (The American Heritage Dictionary of the English Language and the original Roget's Thesaurus, not Roget's II).

Once you've eliminated the gewgaws, you get down to brass tacks: basic wordsmithing. Speed counts. I'm a slow typist, but even I can outtype Taste ($149) and its higher-priced cousin MindWrite ($295), which are from Monterey, California-based Delta Point. The rest of the pack can stay ahead of me and all but the fastest typists.

That brings us to the interface, which basically determines how easy it is to learn and use a program. The programs that conform most closely to Apple's Human Interface Guidelines are WriteNow ($199), from T/Maker (Mountain View, California), and MacWrite II ($249), from Claris (Santa Clara, California). Both are excellent word processors, but I can't generate any enthusiasm for their on-screen looks. They're easy to learn, precisely because they do follow the rules, and they're easy

Mac word processors range from simple text editors that do only the most basic chores to power-user behemoths that boast page-layout and graphics capabilities.

to use, because they have a nice mix of features. MacWrite II is scheduled to acquire a high-end relative called MacWrite Pro around the time this is published. Hopefully MacWrite II will still remain on the market. WriteNow is also scheduled to be revised in 1992. The current version, 2.2, is not 32-bit clean and freezes on launch if 32-bit addressing is on. That limitation means that LC owners with 10 megabytes of RAM can use only 8 megabytes (the 24-bit maximum) if they also want to use WriteNow.

So what's left? The three word-processing heavyweights: Word, Nisus, and WordPerfect. Each one has an idiosyncratic version of the Mac interface. None of them can be called pretty, and all of them come with a steep learning curve. WordPerfect ($495), from WordPerfect Corp. (Orem, Utah), is popular among users who have already learned it on other platforms or who work for companies that have standardized on it (in the DOS world, WordPerfect is the overwhelming market leader). Outside of those groups, though, its performance and interface quirks have kept it from achieving similar success in the Mac market.

Nisus ($395), from Paragon Concepts (Solana Beach, California), has the ugliest interface of the bunch, but it's also the most powerful program. It has search-and-replace capabilities other programs can't even approach. If you must handle large quantities of text, there's no other choice.

Why isn't Nisus the overall champ? It's published by a small company and is

Now your desktop can be as pretty as your screen saver.

Why wait until you're not working to have a beautiful screen? With Wallpaper™ your monitor can bloom with color all the time, not just after dark.

Choose from one of the hundreds of included patterns. Or create your own with our complete paint tools. And when you get tired of one pattern, another is just a mouse-click away.

Wallpaper™

For SE/30 and above.

Only $59.99!

Orders/Inquiries (212) 673-9724

* New York residents add New York state and/or city sales tax: 107 University Place, Suite 10, New York, NY 10003

See us at MacWorld Expo, Booth 1940, Moscone.
unknown to most users. Its recent upgrade to System 7 compatibility was handled poorly—it was too difficult to obtain and cost too much. The program is slow at some things (launching it seems to take forever) but very fast at others (such as global search-and-replace). The manuals need a lot of work. If Microsoft or Claris were its publisher, however, Nisus would be No. 1 in the Mac word-processing arena. It is the best.

Finally we get to the real No. 1 in the Mac word-processing universe: Word ($395), from Microsoft (Redmond, Washington). This is a program users either love or hate. It’s very powerful but also has a steep and difficult learning curve. Once mastered, it’s as easy to work with as WriteNow is. There are lots of decent books to help too. Word’s best feature is its Commands command, which lets you customize menus so you can select the features you want immediately accessible and choose the menu on which those commands appear. If you want, you can mimic the menu structure of WriteNow or MacWrite.

What’s my choice? The first drafts of this column were written in Nisus, and final polishing was in Word, the program MacUser uses internally.

Pick of the Month

Color It!, from MicroFrontier (Des Moines, Iowa), is an incredible bargain. This graphics package lists for $129 but is capable of many of the effects and tricks of high-end painting and photo-retouching programs that cost four times as much. It works on black-and-white as well as color systems and can handle 32-bit graphics.

Thanks to an excellent manual, Color It! is easy to learn. It should handle the painting and photo-manipulation chores for all but the most demanding pros. And it’s a lot of fun to use.

Counterpoint

Janet H. Gallagher, of Waterloo, Iowa, disagreed with my advice in the first Personal Best column to avoid integrated packages. She’s been a Mac owner since 1984 and makes some excellent points:

“I think they’re great — whether it’s Microsoft Works, GreatWorks, ClarisWorks, or BeagleWorks. They are straightforward, without a lot of confusing power-user features that you really don’t need at first. You may outgrow some of the modules after a while, but you’ll learn what you really need.

“And that will never happen unless you dig in and use something. Everybody has a use for the basic four. Use the database module to keep your address list and household inventory. Use the spreadsheet module for a budget, to figure car payments, to summarize your tax deductions, add up wedding RSVPs, and keep track of your golf scores. Use the drawing/painting module to lay out room arrangements, put together posters, and just have fun. The word processor that comes in one of these
Word is very powerful but also has a steep learning curve. Once mastered, it's as easy as WriteNow.

packages is plenty good enough for normal home or office use. A spelling checker, a thesaurus, multiple columns, and mail-merge features are all standard equipment. In addition, there is only one package to take up memory and hard-drive space, only one manual to read, and only one upgrade fee to pay when the time comes."

The comments about upgrade price are particularly important in this day of expensive ($50 and higher) upgrades. My view of the quality of the modules is that they are, in almost all cases, less capable than equivalent low-cost commercial offerings. However, if your aims for your LC are simple — to use it as an electronic secretary to take over some basic household chores — then as Janet points out, integrated software makes sense.

Useless But Wonderful

This month, in lieu of an Easter egg, we have a program that is simply different. It doesn’t really do anything useful — or maybe it does. Its concept is close to repugnant, yet the program delights almost all who see it. Personally, I have no liking for guns and favor strict gun control, yet Madness — Rage! has a permanent place on my disks. It’s not a gun and it doesn’t make me wish I had a gun, but it sure helps me release some of my frustration when my Mac does what it wants to instead of what I want it to.

What is this thing, and what does it have to do with gun control? It’s a shareware control panel (available, as MAD.SEA, in Library 3 of Zmac’s Download & Support Forum and from all the other usual shareware sources). It lets you shoot virtual bullet holes in your Mac screen, which can be a wonderful frustration reliever (my keyboard also takes less of a pounding). The sound and visual effects are quite realistic.

The program does have its own sort of gun control: Until you’ve registered your copy, you have only one gun; registration brings a variety of additional guns, a cow, and other benefits. 

Steven Bobker is acting as sysop (system operator) for Zmac, MacUser's on-line service.

There's A New 'Tris On The Block.

If you love TETRIS, you’ll be obsessed with WORDTRIS™! In this new Soviet challenge, the falling pieces are letter blocks, and instead of just forming lines, you make words.

Every time a word is formed either vertically or horizontally, it disappears. The more words you make, and the more complex the words, the more points you earn. A built-in 30,000 word dictionary checks even the most obscure word.

But the real challenge builds as the levels go higher and the letters fall faster and faster.

WORDTRIS. Let the alphabetical adrenalin flow!

FROM THE TETRIS™ PEOPLE

Spectrum Holobyte

A Division of Sphere, Inc., 2061 Challenger Drive, Alameda, CA 94501

Available for Mac/Mac II and IBM

Available in retail stores or for Visa/MasterCard orders call toll free, 24 hours a day, 7 days a week, 1-800-665-5266 (Orders Only)

For technical questions and system requirements call 1-415-522-1164 (M-F, 9am-5pm PST)

CIRCLE 145 ON READER SERVICE CARD.

In The Beginning, It Was The Only One. In The Midst Of Its Competitors, It Is Still The Only One.

Creator

Put your advertising in the hands of a revolutionary graphic design program—Multi-Ad Creator™

MULTI-AD SERVICES, INC.

Call today 1-800-447-1950, ext. 354.

See us at MacWorld, Booth #314, Moscone

CIRCLE 64 ON READER SERVICE CARD.
Temporaries Pretrained
For Your Data Entry Formats.

Another First From Kelly.

If you have frequent, multiple or long-term requirements for data entry temporaries, our new Kelly® Customizer is ideal for meeting your needs.

By encrypting samples of your data entry screen and data entry forms on our proprietary Kelly Customizer training software, we can now assign you Kelly temporaries pretrained to handle your specific data entry formats.

Your Kelly data entry temporaries arrive on the job ready to work, not just ready to learn.

Call your local Kelly office for details.
If you’re running System 7, you’ve got a minimum of 2 megabytes of RAM (random-access memory) installed already — but if that’s all you’ve got, you’re not able to have more than one big application open at once. The solution is to beef up the amount of RAM available. That’s not as daunting as it sounds - lots of mail-order companies sell memory, and prices are getting lower every day. Do a little research before you buy, and in no time, your memory problems will be over. (For more on memory, see “SIMMple Pleasures,” April ’91, page 194.)

By Victoria von Biel

How to Buy Memory

To add more memory to your Mac, you need to install SIMMs (single in-line memory modules) on the motherboard. SIMMs come in a variety of sizes — 256K, 512K, 1 megabyte, 2 megabytes, 4 megabytes, and 16 megabytes — and speeds — 150, 120, 100, 80, and 60 nanoseconds (the lower the number, the faster the SIMM). The size and speed you need depend on your Mac. As long as you get the minimum speed your Mac can use, you’re all right — you can use faster SIMMs, but your Mac just won’t be able to make use of the extra speed.

What size and speed do you need? You’ll find all the information in Connectix’s free booklet The Macintosh Memory Guide. Get a copy by calling Connectix at (800) 950-5880 or (415) 571-5100. The Memory Guide will also fill you in on the mysteries of virtual memory and 32-bit addressing.

You can install SIMMs yourself, but by doing so, you may void the warranty of some Macs such as the Classics and the PowerBooks. Adding memory to a compact Mac (a Classic, Plus, SE, or SE/30) requires extreme care and use of a special Torx T-15 screwdriver to open the case. If you don’t feel comfortable installing SIMMs yourself in these Macs — even if they’re no longer under warranty — budget an extra $50 or so to get a dealer to do it.

You can buy SIMMs from your Apple dealer, but you’ll pay a lot less if you buy them through a mail-order company. Check the classified ads in magazines such as MacUser for brokers, and call large mail-order houses such as MacConnection and MacWarehouse. You can sometimes buy SIMMs directly from the manufacturer as well.

Prices vary widely, depending on whom you call (between $30 and $45 for 1-megabyte SIMMs at press time), but don’t automatically go for the lowest price. Compare warranties, support, and quality as well as price.

Ask whether the SIMMs are manufactured with used chips. The chips may be of good quality, but they may also have a short life. Such a practice can also indicate a company that’s cutting corners and may not be in business much longer.

Ask for SIMMs that are surface-mounted rather than through-hole — they use less power, create less heat, and are more reliable.

If a company offers a lifetime warranty on its SIMMs, find out exactly what that means. Does the warranty apply to the chips and the panel? And is it voided if you transfer SIMMs from one Mac to another? Also, a lifetime warranty is useless if the company goes out of business in a year. Ask how long the company has been around — the answer may give you some indication of how stable it is.

Ask what the company’s replacement policy is. Some companies ship out a new SIMM overnight as soon as you contact them; others wait until they’ve received the defective SIMM from you.

Ask what kind of installation advice you get with your SIMMs. Some large mail-order companies offer videos showing you how to install memory, some send written instructions, and others have telephone-support technicians who will “walk” you through the installation process.
You can automate your system with 30-year old technology, or...
If your new 9,600-bps modem seems slower than it should be, relax — it could be the cable you just bought. Standard modem cables can’t handle the hardware handshaking required by those wicked-fast modems, so you get slower speeds and less-reliable data transmission. An inexpensive solution is Celestin’s CompUnite high-speed cable, which also works with slower modems. The $14 price includes shipping and tax. (510) 835-0702.

By John Rizzo

They’re back: Font and DA managers Suitcase II and MasterJuggler were staple utilities in the System 6 world, but with the death of DAs in System 7, you may have thought you couldn’t use them anymore. Not true: You can still use both utilities to store and access sounds and fonts (both Type 1 and TrueType), uncluttering your System file in the process. Both products have recently been upgraded to deal with System 7 sounds and TrueType; another important new feature is their ability to automatically resolve font conflicts. Of the two, MasterJuggler has the better interface as well as the lower price, so now might be the right time to make a switch. Look for Suitcase II 2.0 ($79), from Fifth Generation Systems ([504] 291-7221), and MasterJuggler 1.57 ($49), from ALSoft ([713] 353-4090).

Mac, fix thyself: Help!, from Teknosys ([813] 620-3494), is a $149 utility that reports hardware and software problems and recommends solutions; Personal*STATUS, from Pharos ([513] 984-9273), can actually fix some of those problems. Personal*STATUS uses artificial intelligence to change preference settings and automatically install current versions of software. It can also tell your facilities manager to fix your hard drive. More importantly, Personal*STATUS is extensible — you can use a HyperTalk-like language to add new information about your Mac, such as bugs you may have found. Price unavailable at press time.

Speed demons: Should those of us with 68030-based Macs upgrade to 68040-based ones? Not necessarily. Preliminary tests show that 50-megahertz 68030 accelerators from Newer Technology, DayStar, and Applied Engineering are almost as fast as the 25-megahertz 68040 of the Mac Quadra and the Radius Rocket and Fusion Data TokaMac accelerators. What’s more, the fast 68030 accelerators tend to cost less than 68040 boards do and they don’t have the software incompatibilities. An upcoming MacUser lab report should settle the issue. For a mere $349, you can accelerate the 68040 processor in your Quadra from 25 megahertz to more than 33 megahertz. Newer Technology’s Quadra OverDrive sits in the Quadra’s ROM SIMM slot but provides a slot for a ROM upgrade in case Apple decides to provide one (but don’t hold your breath — Apple has never upgraded a ROM for any model). Why so cheap? The Quadra OverDrive uses your Mac’s existing CPU and adds a faster clock chip — a socket on the OverDrive enables even faster clock chips to be added later. (316) 685-4904.
Beyond Cut-and-Paste

Publish-and-subscribe is the System 7-savvy way to cut and paste. Here's a look at the new technology in action.

By Philip Bishop

If some of the wonder has worn off System 7 concept one step further by creating a dynamic link between the original data that has been published (the cut function) and the copies of it that have been subscribed to by different documents (the paste function). Rather than the data's being saved in memory (cut-and-paste's Clipboard), it's saved in the form of a special file called an edition.

When you change original data — to update a spreadsheet or freshen up a logo, for...
example — changes are sent to all subscribers to that edition, whether they’re across a network or on the same hard disk as the edition. Every subscribed copy is then updated — automatically, if you wish.

Publish-and-subscribe really comes into its own when it’s used by workgroups that need to share an edition file. For example, a company’s legal department can change a disclaimer and have it automatically updated in all relevant documents over a network.

The list of programs that support publish-and-subscribe is small; at press time, the major players were PixelPaint Professional 2.0, RagTime 3.1, Canvas 3.0, Excel 3.0, Photoshop 2.0, and Resolve 1.0. QuarkXPress 3.1 and PageMaker 4.02, about to make their appearance, will also support it. By the time you read this, many more programs that can publish and subscribe should be available. And there’s already a utility to help you manage your publish-and-subscribe editions. Tactic Software’s Traffic Controller keeps track of all your edition files and their relationships to publishers and subscribers.

Phillip Bishop is a Rhode Island-based graphic designer and writer.

5 Now that the edition has been created, it’s time for the subscriber — in this case, the layout department — to join the process. With the host document open in Canvas 3.0, the layout person selects Subscribe To from the Edit menu.

6 A dialog box similar to the Create Publisher dialog box appears, complete with preview window. When you’ve found the edition you want, select Subscribe, and a copy of the edition file is placed in the document. You can resize it to fit your layout.

7 Like the publisher, the subscriber also has options about whether an edition is updated manually or automatically each time the original is saved. The date and time of the last update are included to help you keep track of events.
**TECHWORKS**

**Memory Products**

TechWorks’ memory products are the world’s best. Each is designed, engineered, and built by bizarre, monomaniacal perfectionists in a controlled environment at our own facility. And we're one of the few major companies building the more reliable surface mount design. Because of this, we can warranty each part for life, price them far below comparable products, and offer toll-free access to our Technoids for knowledgeable technical support or science fiction trivia.

So call toll-free for today’s prices and take your Mac® to the max for System 7.0. Lifetime warranty, 30-day money-back guarantee, free installation kit, and toll-free support service are included. Corporate PO's accepted, all major credit cards honored, plus overnight delivery and volume discounts are available. Facsimile orders: 512-794-8520. Technical Support: 800-933-6113. Business line: 512-794-8533.

**PowerRAM**

Call today for price and availability on TechWorks’ PowerRAM®

<table>
<thead>
<tr>
<th>Model</th>
<th>1MB</th>
<th>2MB</th>
<th>3MB</th>
<th>4MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macintosh Plus</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh SE</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh SL/30</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh IIx</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh IIf</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh Classic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh LC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh IIfx</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Macintosh Portable</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LC 512k VRAM - Graphic enhancement for Mac LC. Displays more colors simultaneously.

Nic PowerPAC - Make your NIC scream! Cache Card plus 16MBs (four 4x8’s) of memory. Special $750! Hurry, limited quantities available.

Test drive our products at MacWorld, San Francisco—Moscone Center, Booth 104.

Toll Free 800-866-2785

Circle 105 on reader service card.
Blessed Events

Lurking beneath the surface of System 7 is interapplication communication, and it’s about to revolutionize the way you use your Mac.

By Bob LeVitus

Interapplication communication (IAC) is no big mystery. As its name suggests, it’s a technology that lets programs “talk” to one another. It’s one of the best things System 7 has to offer, but because it’s almost invisible without third-party programs to unleash its power, it’s one of the system’s least-understood and least-known features. IAC capabilities are buried deep within the system software, so don’t go looking for it on a menu in the Finder or in your System Folder. It’s there, though, running silently behind the scenes, waiting patiently for third-party software to come along and put it to work.

System 7 has a powerful built-in protocol called Apple events for sending and receiving IAC messages. This protocol lets programs communicate with one another. (To make things more confusing, the messages sent among programs are also called Apple events.) In order to take advantage of Apple events—the protocol and the messages—programs must be written (or rewritten) so they understand these messages.

Programs can have varying degrees of support for Apple events. To get the highest rating (to be System 7 savvy), a program must include, at the very least, four required Apple events—Open Application, Open Document, Print Document, and Quit Application. Beyond that, an application might support Apple events for the Cut, Copy, Paste, Save, Undo, Redo, and Revert commands and so on. More-ambitious programs contain Apple events for many other features. I recently saw a prerelease version of the animation program ProMotion, from Motion Works, that contained Apple-event support for every menu item, dialog box, and tool in the program. What does that mean? Simply that you can control any aspect of ProMotion externally, using macros or scripts created with such programs as CE Software’s QuickKeys 2, Affinity Microsystems’ Tempo II Plus, or UserLand’s Frontier.

IAC technology is most commonly seen in publish-and-subscribe, sometimes referred to as live copy and paste, which lets applications dynamically share almost any information. This means that when information is changed in the original (the publisher), it’s changed (automatically, if you wish) in all the copies of that information (the subscribers), wherever they are. Updating can even take place over a network. Publish-and-subscribe is one IAC application that’s available now. For more on how publish-and-subscribe works, see “Beyond Cut and Paste,” elsewhere in this issue.

The Microsoft Way — Ole!

Microsoft has developed a technology that’s similar to IAC, called OLE (Object Linking and Embedding). OLE uses Apple events to enable applications to appear not as separate applications but as new features of other applications. For example, Word 5.0 includes a separate equation-editing application. If you create an equation and then paste it into a Word document, it will automatically be linked to the
equation-editing application. If you need to modify an equation, you simply double-click on the equation in your word-processing document. The equation editor launches, and the equation appears in its window, ready for editing. When you've finished editing it, you choose Update from the equation editor’s File menu and the equation you pasted into your word-processing document is automatically updated. The same equation editor can be used similarly with Excel 3.0.

Although Microsoft invented OLE and will include it in many of its products, other developers can easily implement OLE in their applications. And similar program-linking techniques based on Apple events are showing up in other manufacturers’ programs. For example, Aldus’ PageMaker 4.2 has hot links to FreeHand 3.1 (also from Aldus) — when you double-click on FreeHand art in a PageMaker document, FreeHand automatically launches.

**System 7-Savvy Software**

Unfortunately, there aren’t many IAC-capable programs around — yet. The good news is that by the time you read this, there should be more. Most developers I’ve talked to recently are planning to include at least minimal Apple-events support in their products. Publish-and-subscribe is just the tip of the iceberg, however. What I find interesting are the several products that should now be available that let you control Apple events within programs from macros or scripts. At this stage, key players are CE Software’s QuicKeys 2, Affinity Microsystems’ Tempo II Plus, Simple Software’s ControlTower, and UserLand’s Frontier. QuicKeys 2.1 (which supports Apple events) has been available since mid-1991, and I’ve played with prerelease copies of Control Tower and Frontier. Here’s what you can expect from these products.

QuicKeys 2.1 supports several Finder events, such as Show Clipboard, Get Info, Open, and Print. The Open command is particularly powerful — it lets you open anything you can see in the Finder — folders, documents, applications, DAs, and control panels. It’s also capable of sending Apple events to any application that supports them and allows you to include Apple events in your macros. When applications begin to support Apple events more thoroughly, you’ll be able to use QuicKeys to send data to them, manipulate the data within those programs, and then send it somewhere else. CE Software (515) 224-1995, $149.95.

Affinity Microsystems promises that the System 7-savvy version of Tempo II Plus (version 2.1) will both receive and issue Apple events. Apple events will be able to “play” Tempo — record macros,
Food for the senses at a price that makes sense: $699*

Introducing CD Gallery™: The Interactive CD-ROM System from NEC.

Is this the offer you've been hungry for? Cash in on the sensational world of CD-ROM with seven exciting software titles for Macintosh with all the necessary hardware including the amazing NEC CDR-36 CD-ROM reader, KOSS® SA/30 amplified stereo speakers, and even stereo headphones, all for just $699* Or, if you want to upgrade to an NEC CDR-73, one of the fastest readers on the market, it's just $999* And it's all incredibly easy to set up and use. But don't chew on this offer too long because supplies are limited. Call 1-800-NEC-INFO for the nearest authorized NEC dealer to find out where you can pick up the ultimate feast for your mind.

*Manufacturer's suggested retail price, actual price may vary, call your dealer for actual pricing. Other versions available for IBM PC and 100% compatibles. © 1991 NEC Technologies, Inc. CD Gallery is a trademark of NEC Technologies, Inc. The New Grolier Electronic Encyclopedia is a trademark of Grolier Incorporated. The Software Toolworks is a registered trademark of The Software Toolworks, Inc. Time Table of History is a trademark of Xiphias, Inc. Macintosh is a registered trademark of Apple Computer, Inc.
play macros, adjust Tempo configurations, and so on. And Tempo macros will be able to issue Apple events to control applications or to reply to Apple events that called them, so a script will be able to call Tempo and Tempo will be able to call a script. In addition, scripts will be able to assign processes to another Mac on the network. This sounds like a very cool feature. If the first Mac is busy, it can try a second one, and so on, until a free machine is found.

Put an end to software piracy!
Meet the growing family of security keys from Software Security. Each one is a specialist at enforcing your license agreement in virtually any user environment you can think of. Whether it's DOS, UNIX, Macintosh or OS/2, whether it's a single user installation or a LAN. Simply connect the appropriate key to a single user computer or to a non-dedicated file server in a network, and you control all access to your protected application. Users, however, won't even know it's there. The keys are transparent and won't impact software functionality or the ability to make back up copies. Normal node and LAN operations are unaffected.

COMES SEE US AT MACWORLD, BOOTH #433

THE ULTIMATE PROTECTION FOR SOFTWARE PUBLISHERS

NOW AVAILABLE! NETWORK PROTECTION WITH REMOTE UPDATING!

Simple, unassuming. Ever vigilant. Easy to incorporate into your application package. And quite possibly the most profitable hardware investment a software developer can make.

Call 1-800-333-0407

SOFTWARE SECURITY
1011 High Ridge Road
Stamford, CT 06905
Proudly Made in the USA

This distributed processing can be used to run lengthy jobs overnight, with several machines rather than just one. Affinity Microsystems ([303] 442-4840), $169.95.

Control Tower and Frontier are examples of a new breed of scripting software made possible by the availability of IAC in System 7. They differ from macro programs in that you write text-based scripts to control Apple-event processes. Control Tower is the easier to use of the two. It lets you create at least part of your script by using a straightforward point-and-click interface. You create scripts of Apple events by selecting an application to send the Apple event to, choosing a specific Apple event within the target application, and then specifying the data to be sent along with the Apple event. Simple Software ([415] 381-2650). Price not available at press time.

Frontier is a much more powerful scripting program. In addition to giving you full script control over programs that support Apple events, Frontier can script and control almost every aspect of the operating system, including parts that don't respond to Apple events. The Finder has built-in Apple-event support for activities such as printing, emptying the Trash, and duplicating. All the macro and scripting programs I've mentioned can already script these functions, but Frontier goes beyond this by automating such actions as moving, renaming, searching for, gathering, deleting, and creating aliases. And it's smart about it: Because Frontier is a programming language, it can use logic, which lets it discern whether a file, a folder, or a folder full of files meets your criteria and then act on only the files that do.

Such power has a price, of course. Scripting in Frontier is not for the faint of heart — in fact, it's a lot like programming. On the other hand, Frontier is designed to let others write the scripts for you. UserLand expects to ship more than 100 scripts with the program, most of which will be useful without modification. UserLand Software ([415] 325-5700). Price not available at press time.

Although IAC technology is still in its infancy, it's pointing toward a multitude of options for automating tasks on the Mac. As the technology matures, you'll spend less time on routine chores and more time being truly productive. I think you're going to like it.

Bob LeVitus is the author of Son of Stupid Mac Tricks and Dr. Macintosh (second edition).
CacheOut Takes the Crash Out of Quadra

Apple's new Quadra was built for speed, but many established applications, including Microsoft Word 4.0, don't fare well with the new superfast 68040 processor. The problem is with the cache. Recognizing this, Apple shipped a utility called Cache Switch to turn the cache off, but you have to reboot to activate the option. ZiffNet/Mac has developed a better cache-control utility, CacheOut, which doesn't require you to reboot. CacheOut controls the 68040's caches dynamically, switching them on for speed and off for compatibility as you start applications and exit from them. The utility lets you run incompatible applications such as Microsoft Word 4.0 when you need them, but it switches the caches back on for full performance when you quit the application. CacheOut is available exclusively on ZiffNet/Mac in the Download & Support Forum, Library 3 (INITs, cdevs, FKEYs); the filename is CACHEO.CPT.

Handling the Handlers

HyperCard maven Danny Goodman reveals the hidden secrets inside the Home stack in this month's Power Programming stack, available on ZiffNet/Mac. These innovative scripts can aid you in stack design by providing shortcuts to common commands. As a bonus, the ZiffNet/Mac stack has custom scripts from Goodman's own Home stack. HyperCard Handlers has the filename HCHAND.SIT and is available in ZiffNet/Mac's Download & Support Forum, Library 6 (Stackroom).

Zmac Changes Name, Not Stripes

Zmac is expanding its name to ZiffNet/Mac to reflect the launch of our sibling service, ZiffNet. ZiffNet serves the Ziff-Davis family of DOS and Windows magazines—PC Magazine, PC Computing, and PC Week. ZiffNet/Mac is the electronic link to Ziff-Davis' Mac publications. You'll still see the abbreviated name Zmac, and more importantly, you'll still get an exclusively and distinctively Macintosh on-line service. So if you're on the CompuServe Information Service, you can GO ZMAC or you can GO ZIFFNET/MAC. Either will take you to the exclusive service that puts you in touch with MacUser and MacWEEK. If you're not on CIS and would like to be, you can follow the sign-up instructions below to log on.

How to Join ZiffNet/Mac

Here's how you can get access to ZiffNet/Mac:
1. If you're a CompuServe (CIS) user, just type GO ZMAC at any ! prompt.
2. If you're not a CIS subscriber, you can sign up for ZiffNet/Mac by following these directions:
   1. Call (800) 635-6225 or (614) 457-8600 to find your local access number.
   2. Set up your modem and telecommunications software with the following standard Mac settings: 8 bits, 1 stop, and no parity.
   3. Dial your local access number. When connected, press Return. You'll see the following prompts on-screen. Your responses are printed in boldface type:
      Host: CIS
      User ID: 177000.5200
      Password: Z*MAC
      Agreement Number: Z12D9014
   4. You will then be prompted for additional information, including a credit-card number for billing purposes. If you cannot bill to a credit card, call the CompuServe customer-support line listed below. Sign-up is free, but normal access time is billed at $1.25 per hour.
   5. Call CIS again with your user ID and password. A new password will arrive in the mail within ten days.
   For more information, call CompuServe customer support at (800) 848-8990 or (614) 457-8600.

CIRCLE 200 ON READER SERVICE CARD.
"Some People Don’t Picture Me Living A Full Life."

— Patricia Saunders

I have a disability, but I live life to the fullest. I not only support myself, but I stay active outside the office, educating people about disabilities. Like 43 million other disabled Americans, I am eager — and able — to contribute to community life.

But it’s not easy; our communities are filled with obstacles. Every day, people with disabilities are barred by seemingly insignificant things, like curbs, stairs and narrow doorways. And the biggest hurdle of all is invisible — discrimination.

These barriers prevent people with disabilities from participating in all aspects of life, including employment, recreation and education. The irony is that we have so much to offer. We have the skills, intelligence and creativity that most people do; we just happen to use a wheelchair or a guide dog or a hearing aid.

Help us open opportunities. Get involved in Jim Brady’s Calling on America campaign. It’s easy. Anyone can join or start a local campaign. Here’s a sample of what you can do in your area:

- Make sure businesses, churches, restaurants, theaters and motels are fully accessible
- Provide disability awareness training for employees and supervisors
- Organize a job fair; work with employers to increase job opportunities for people with disabilities
- Increase enforcement of handicapped parking ordinances
- Work with elected officials for fully accessible polling places
- Work for fully accessible public transportation

Make your town an equal opportunity community. Give people with disabilities a chance, and we’ll show you what we can do.

☐ Yes, Jim. I support your Calling on America campaign. I am willing to get involved in my community. Send me a free campaign guide.

Name: __________________________________________________________

Address: __________________________________________________________

City: ___________ State: ___________ Zip: ___________

Telephone: ______________________________

Mail to: Calling on America, National Organization on Disability
910 16th Street, NW, Washington, DC 20006.
No Place Like Home

There's buried treasure in the Home stack for HyperCard authors willing to do a little digging.

By Danny Goodman

If you're not an experienced HyperCard author, you may not be aware of the usefulness of HyperTalk handlers, especially those in the Home stack. A script is divided into individual handlers, each of which is a mini-program of its own, and the many helpful handlers in HyperCard 2's Home stack can be accessed for use in all other stacks. Most of these handlers are shortcuts you can type into the message box to trigger a lengthy process such as changing the default font in script-editor windows; others are useful utilities that aid stack design and maintenance.

In this article, I'll show you several handlers that are common to both the full and bundled versions of HyperCard. And if you'd like tips on adding your own handlers plus a couple of handlers that I've added to my Home stack, you can download a file containing them from Zmac (MacUser's on-line service).

Getting Quick Info

You can set several properties for stacks, backgrounds, and cards via the Stack Info, Bkgnd Info, and Card Info dialog boxes, respectively, which you access through the Objects menu. However, there's a quicker way of accessing these dialog boxes, using handlers. First, access the message box via the Go menu (Command-M); type the letters b (for stack info), B (for background info), or c (for card info); and then press Return or Enter.

The Stack Info shortcut handler (see Example 1) does a great deal more than issue an equivalent doMenu command. Instead, it summons help from two other handlers in the script — setUserLevelFive and restoreUserLevel — and then returns you to the precise tool and userLevel settings you were using when you requested the object's dialog box.

For experienced stack authors, this may seem like overkill, because your userLevel is probably already set to 5 (the Scripting level) and you're quite adept at choosing tools in the Tools palette. But if you're a beginner, these commands are helpful — they let you do what you want and then return you to your previous userLevel.

Where in the Window?

A utility handler often used to measure pixel counts for layouts is the xy handler, which is particularly useful if you're doing animation work that might require precise starting and ending coordinates. To start the handler, type xy into the message box and press Return or Enter. The cursor turns into a cross hair, and the message box displays coordinate information about the center spot of the cross-hair cursor. A repeat loop in the handler keeps showing you the cursor's x,y coordinates in the format accepted by several HyperCard-object properties as well as which coordinate is vertical and which is horizontal. To stop the loop, simply click the mouse button — the cursor coordinates at the mouse-click location remain in the message box.
One Label... One Printer.

If you own a laser printer, you know there is no easy solution to printing less than a full sheet of labels...until now.

Introducing the Avery Personal Label Printer, the one printer you need to produce professional labels one at a time.

The Personal Label Printer:
- prints a label in 4 seconds!
- includes FREE Avery LabelPro™ Software (a $99.95 value)
- offers scalable fonts, clip art
- on IBM® or the Macintosh®

So when you need only one label, there's only one printer...

the Avery Personal Label Printer.

Call (800) 541-5507 for a dealer near you.

Notice that if you drag the activated x,y cursor above or to the left of the window, the corresponding coordinates turn negative. The coordinates — like locations and sizes of all objects inside a HyperCard window — are relative to the window, not the screen. Also, the zero point for a window is the upper left corner of the active window area, not the window's title bar.

Neat Navigator Palette

To demonstrate HyperCard 2's palette feature, the Home stack includes the requisite resources (types PICT and PLTE) and message-box shortcut to display what is known as the Navigator palette (see Figure 1). The buttons in this palette are the same as the commands in the Go menu, and are an example of what authors can use palettes for — replacing a menu or saving space on stacks written for use on small screens, for example. To access the Navigator palette, type nav into the message box and press Return or Enter.

Palettes in HyperCard float in a different window stratum from that of card windows — palettes always stay on the top level, and card windows are in what I call the document-window domain. Within that domain, you can shuffle several HyperCard windows in any order while the Navigator palette in the palette-window domain stays in front of the HyperCard windows. To accommodate this, one of the buttons on the Navigator palette replicates the Window command, letting you cycle through open HyperCard windows while keeping the palette in front. Note that windows in the palette domain are hidden when you switch from HyperCard to another program under MultiFinder or System 7.

We're Watching

Two helpful HyperTalk debugging windows — Message Watcher and Variable Watcher — are not normally available unless you get the HyperTalk debugger running (this happens after you've encountered a script error, set a debugging checkpoint, or typed Option-Command-; while a script is running). Once the debugger is going, menu choices in the Debug menu (the one with the bug icon, of course) let you view either or both watcher windows.

The Message Watcher window, in particular, gives you an X-ray view of the inner workings of scripts as they run. As a handler churns, a list of all the messages being executed appears in the Message Watcher window. This is often a valuable debugging tool without the debugger — showing you duplicates of executions of handlers in complex scripts, for example. The Variable Watcher window is especially helpful when you're not stepping through a debugger-controlled handler, because it shows you the state of all global variables when no scripts are running.

If you want to see either of these watchers independently of the debugger, simply type mw (for Message Watcher) or vw (for Variable Watcher) into the message box and press Return or Enter. These two handlers perform no black magic — both the Variable and Message Watcher windows are opened when you start HyperCard but are hidden until you ask to see them. These handlers simply show their respective windows, but with far fewer keystrokes than typing the full commands (show window "Message Watcher" and show window "Variable Watcher").

Find That Script

In the original HyperCard Home-stack script, there was a practical utility handler that helped scripeters slice through the scripts of all objects in a stack in search of any word or phrase. That handler, searchScript, has been enhanced in HyperCard 2, and it now comes with its own shortcut handler, ss.

The searchScript (or ss) command requires one parameter and accepts a second. The first parameter is the text, in
quotes, for which the handler should search all object scripts. As an optional second parameter, you can also include the name of a stack to search, in case you want the search to be in a stack other than the one you’re currently in. If you don’t specify a stack, the handler will search only the current stack.

The ss handler is simply a shortcut to the searchScript handler. In fact, all ss does is call searchScript, passing along any parameters you’ve given the ss command.

Don’t be alarmed by the apparent length of the searchScript handler. The bulk of its work is performed inside two repeat loops—one for backgrounds and their objects, another for cards and their objects. As the handler twirls away, it systematically looks into the script of each object in the following order: stack, background, background buttons, background fields, card, card buttons, and card fields. When the text is in an object’s script, the handler opens the script-editor window to display that object’s script.

However, searchScript does not control search behavior once the script-editor window opens—that’s up to you. Fortunately, behind the scenes, the handler also puts the search text into a global variable called ScriptFindString. The script editor normally uses this variable to remember the last search performed inside a script. If you choose Find from the script editor’s Edit menu (Command-F), you’ll see your search text already entered for you. This means that when running searchScript, you can bypass the Find dialog box and simply choose Find Again (Command-G) to look for the match.

When the script-editor window opens, you also won’t know how many instances of your search text exist in the current script. Keep pressing Command-G until you hear a beep, indicating that the entire script has been searched (unless you’ve turned on Wraparound Search in an earlier script Find dialog box).

Once you’ve examined your search text and made any changes to the script, the most efficient way to let searchScript continue its pursuit is to press the Enter key. Doing so saves changes to the script, closes the object’s script, and lets the handler carry on searching in other scripts.

**Script-Editor Fonts**

Believe it or not, you’re not restricted to 9-point Monaco as the font for HyperCard script-editor windows. HyperCard 2 includes adjustable script-editor font and size properties—scriptTextFont and scriptTextSize. A Home-stack shortcut handler reduces the long typing required to change these attributes to a simple matter of filling out a pair of dialog boxes. To start the handler, type se and press Return or Enter.

Without using fancy dialog boxes with pop-up lists of fonts and sizes, this handler displays two HyperCard ask dialog boxes, which require you to type the full name and size of the font you want. The next script-editor window you open will use the new font. If you want to permanently change the font for your script editor, you can add some lines to the Home-stack script’s getHomeInfo or startup handlers to automatically set font and size properties each time HyperCard starts up.

The possibilities for adding Home-stack utility handlers to your stacks are endless, and you can easily shape your authoring environment with a few additions of your own. I’ve put together some tips on adding handlers to your scripts as well as some examples from my own scripts, which you can download from Zmac—look for the filename HCHAND.SIT in the MacUser Labs Report, 40 different 200 Megabyte hard drives are evaluated for performance, durability, price, service and support. MacUser makes buying a hard drive a whole lot easier.

**SHARING THE NEWS ON APPleshare**

MacUser unveils the long-awaited AppleShare Version 3.0—and the diligent MacUser Labs puts it through more than its share of tests. Yes, buyers will share this issue all through the year.

**MAKE WAY FOR E-MAIL GATEWAYS**

A detailed look at the benefits of E-Mail gateways and how they work. Plus, a complete directory of manufacturers. MacUser is the gateway for business buyers.

Danny Goodman is the author of The Complete HyperCard 2.0 Handbook and co-founder of Concentrix Technology, maker of the Connections personal-information manager.
"Since we started CoStar two years ago, our goal has been to eliminate unnecessary problems around the office. Labels and envelopes being the first priority, our LabelWriter and AddressWriter have each become something of a hit.

These products are obviously business products, and we chose the Macintosh market for our debut. That wasn't any compromise: the Mac's acceptance by business is enormous. Which is why we're doing so well.

"We can't afford to waste any money. When we first started advertising a year ago, we advertised in both Macworld and MacUser. We found that we got the best leads out of MacUser. So we decided to stick with the publication that gives us the most sales.

"Converting MacUser leads to sales has been great. I give half the credit to the products themselves, and half the credit to the medium we're advertising in. The MacUser audience is buying a lot of our products.

"Label and envelope printers are targeted to business. Since a high percentage of our customers come to us from MacUser, it makes sense that MacUser is being read by corporate America.

"I think the right people are contacting us through MacUser—the repeat customers. We've gotten better responses with MacUser, so for our money that's where we're going to keep advertising.

"You can read all the research you want, but success is measured in the sales you get. That's why we advertise in MacUser."
Do you have an undocumented Macintosh tip you're willing to share? MacUser pays $25 for every tip used, and the Tip of the Month earns $100.

Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

You can also contribute tips electronically via Zmac, the on-line service for MacUser. Send them to Gregory Wasson at 72511,36. Be sure to include your full name and mailing address along with the text of the tip.

Compiled by Gregory Wasson

Desktop: System 7

If you've upgraded to System 7, you can save many kilobytes of space on your hard disk by deleting your old Desktop file with a package such as CE Software's DiskTop. Alternatively, you can make the normally invisible Desktop file visible with ResEdit and then just drag it to the Trash. Be careful, however, that you don't delete the files Desktop DB or Desktop DF. These are the files System 7 uses instead of the single Desktop file used by previous systems. (Note: If you frequently switch between System 6 and System 7, don't delete the old Desktop file or you may find yourself waiting three or four minutes for your hard drive to mount when you start up with System 6.)

Sven Nielsen
Saratoga, CA

QuarkXPress 3.0

Normally, the first page of a QuarkXPress document has to be a right-hand page, but you may want to set up your document so that the first page is on the left—you may, for example, want to print a publication's back cover to the left of the front cover. To do this, create all the pages in the document except the final one. Select page 1, and start a new section with the Section command on the Page menu. In the resulting dialog box, specify that page numbering start on any even number. Page 1 will automatically move to the left side of the gutter. Now insert a page to round out the job, and start importing your text and graphics. Be careful if you're using automatic page numbers, because this technique will throw them off.

Ellen Reiser
Knoxville, TN

Tip of the Month

Excel 3.0

Because there's no easy way to enter vertical column headings in Excel 3.0, I've written a macro that does this automatically. It works by placing a vertical text box over the original cell's contents. This macro is very useful for such things as charts or tables (see Figure A).

Here's how to create the macro:
1. Choose New from the File menu, and create a new macro.
2. Type the macro exactly as shown in Figure B (or you can download it from MacUser's online service, Zmac; it's in file VTEXT.BIN in the Scripts & Templates library of the Download & Support Forum).
3. Select cell A1, and choose Define Name from the Formula menu.
4. Type the name VerticalText, click on the Command radio button, and click on OK.
5. Choose Save from the File menu to save the macro.

When you're ready to apply the macro to column headings in an open worksheet, do the following:
1. Select the columns that contain the headings you want to rotate.
2. Choose Column Width from the Format menu, Type 3, and click on OK.
3. Expand the height of the first row to fit the longest column heading by dragging on the bar just below the first row label.
4. Select the column headings, and format them as right-justified text.
5. Choose Run from the Macro menu.
6. Click on the VerticalText macro name, and then click on OK.

See Excel's Function Reference manual for details on the parameters used in this macro. You can modify some of the settings used (such as font and point size) to fit your own layout.

Tim Cimbura
Fridley, MN

Figure A: Although there's no easy way to enter vertical column headings in Excel 3.0, you can use the macro shown in Figure B to rotate and place a text box over the original cell's contents.

Figure B: Copy this eight-line Excel 3.0 macro exactly as shown to create vertical column headings in tables and charts.
**FreeHand 3.0**

Here's one way to print a FreeHand 3.0 document that has several fonts, a situation that can frequently choke a PostScript printer. All you have to do is use the Convert to Paths command from the Type menu to change the letters into outline graphics that you can fill just like any other graphic element.

The printer now doesn't have to download any unnecessary font information — instead it takes just the individual letter descriptions that you have converted to a graphic element.

This tip also helps if you're shipping documents to a service bureau that may not have the fonts you used in your document — with the text converted to graphic outlines, it no longer matters whether the bureau has the fonts or not.

Jeff Greer
Pagosa Springs, CO

**Adobe Illustrator 3.0**

Here's how to use Illustrator to make fancy borders simply and quickly:

1. Draw a rounded rectangle around the design or artwork you want to border. You can also use a custom path, but borders should generally be fairly regular and the rounded-rectangle tool is easy to use. Also, sharp corners do not work nearly as well as rounded ones.

2. With the path-type tool, click on the top center of the rectangle. You can now type text, and it will wrap to the path of the rectangle. For a fancy border, use a character from Zapf Dingbats or any other iconic PostScript font. Repeat the character until it fills the path around your border.

3. To make the characters fit the border exactly, press Command-A to select all the text.

4. Press Command-T to bring up the Type Style dialog box. Adjust the size and tracking options, and click on Apply to see how these changes affect the border's fit. Use negative units to tighten the text.

5. The border is lined up properly when the white gap between the highlighted letters disappears. Click on OK.

When printing these kinds of borders on a printer other than your own that may or may not have the fonts you used (at a service bureau, for example), use the selection tool to select the entire border and choose Create Outlines from the Type menu (this command requires that you have ATM 2.0 or later installed). This eliminates the need for the printer to have the font you used. You can also use this trick to create several borders as EPS files for later use in PageMaker or other programs.

Jon and Cary Pugh
Livermore, CA

**Microsoft Works**

Need to deal with an Apple ProDOS-to-Mac-OS translation? The most common of these translations is necessary when you're transferring an AppleWorks file to Microsoft Works. The standard way to do this is to save the AppleWorks file on a 3.5-inch ProDOS disk and then use AFE (Apple File Exchange) with Microsoft's Works-Works Translator. The problem is that

---

**Fully System 7 compatible!**

If you want to protect the files on your hard disk, use Symantec's Norton Utilities for the Macintosh, the easiest and most powerful data repair and recovery program you can buy.

There's no better way to ensure reliable, day-in and day-out protection against crashed hard drives, accidentally erased files and disks that won't boot.

The program offers a superbly integrated set of utilities and desk accessories. For starters, the Norton Disk Doctor—which provides System 7 users with drag-and-drop simplicity—is the only Macintosh utility that diagnoses and repairs the 45 most common types of disk problems.

Our exclusive UnErase utility finds and retrieves trashed or missing files within seconds.
most Apple II-family computers have only 5.25-inch-disk drives, and for AFE to do the conversion the source file must be on a 3.5-inch ProDOS disk.

Here's a workaround that doesn't require finding an available ProDOS drive. If you can get the AppleWorks file onto a Mac disk by electronic transfer, you can get the file onto a 3.5-inch ProDOS disk.

Launch AFE, put in a blank disk, and choose ProDOS Formatting from the File menu. After the disk has been formatted, use AFE to "default copy" the AppleWorks file from the Mac disk to the ProDOS disk. Then make sure that the AppleWorks to Microsoft Works translator is available and checked in the ProDOS to Mac menu, and convert the file.

Allan M. Bloom
Blacksburg, VA

---

**Tips from the Experts**

### Microsoft Word 5.0

The new version of Microsoft's popular word-processing program is now available, and if you're converting from Word 4.0 to 5.0, you'll notice that there are a few changes. Here are some tips for dealing with Word 5.0's expanded spelling checker as well as its new grammar checker:

**Turning Off Automatic Suggestions.** When checking a document's spelling, Word defaults to always suggesting an alternative word to replace the misspelled one it finds. To disable this feature, click on the Options button in the Spelling dialog box. In the Preferences window that appears, uncheck the box next to Always Suggest.

**Turning Off Grammar Rules.** You can use the same technique to customize Word's new grammar checker. Word checks each document against a selected set of grammar rules. If you decide that you want to disable some of these rules, you can easily turn them off in the Grammar Preferences dialog box. You access this dialog box either by clicking on the Options button in the grammar checker or by selecting the Grammar icon in the Preferences dialog box.

Two types of rule groups — style and grammar — can be controlled. To view each type of group, click on the appropriate type of group at the left of the dialog box, and then uncheck the box next to Always Suggest.

---

ensures safety against data loss when it optimizes your hard disk for maximum efficiency. And should you ever inadvertently erase your hard disk, Format Recover restores it for you with just a few clicks of your mouse.

We've also included KeyFinder and Fast Find—two remarkable improvements to your Macintosh's Key Caps and Find File desk accessories—as well as Directory Assistance, a time-saving shortcut to opening and creating folders.

So visit your dealer and pick up a copy of Norton Utilities for the Macintosh. Or call 1-800-343-4714, Ext. 731F for more information.

Because you really do have a lot to lose.
EXPLORE
THE FUTURE
COURSE OF
PUBLISHING

Seybold Seminars 92 is the one event that can really make a difference for anyone interested in charting computer publishing technologies.

The Conference & Showcase serve as the industry stage for ground-breaking ideas, critical issues, landmark deals, strategy announcements and product launches that have a profound impact on the entire application market.

With your participation in either the Conference or the Showcase, you will profit from emerging industry trends and products—before the rest of your industry.

CONFERENCE & SHOWCASE
February 18-21, 1992
Hynes Center
Boston, MA

Call 1-800-777-6650 and ask for ext. SS3 for more information.
Bob: Before we begin this month's festivities, I'd like to amend something I said in the September '91 issue ("Why Do I Quit Unexpectedly?", page 284). I said that an application's quitting unexpectedly is a signal that something is seriously wrong. Although this is often true, sharp-eyed reader Rich Love wrote to mention that in many cases, unexpected quitting can be fixed simply by increasing the application-memory size of the offending program.

He's right. If a program unexpectedly quits, try giving it more memory. To do this, select its icon, issue the Get Info command (Command-I), and type a larger value into the Current Size box (called Application Memory Size under System 6). Increase the memory size by at least 10 percent, and then see if the problem recurs. If it does, try increasing the size some more. This technique won't hurt anything; it'll just make that particular program use more RAM. If your application still quits unexpectedly after this, it's likely that something is seriously wrong. Try replacing the application and any support files with fresh ones from locked master disks, and if that doesn't fix things, call technical support.

One other thing: In June '91, we wrote about the system heap (page 247) — how to tell if yours is getting full and how to fix it by expanding the space for it. Since then, we've received several letters asking whether this advice applies to System 7. It doesn't. System 7 manages the system heap dynamically and therefore doesn't require that you use any additional software.

Batch Copy and Erase?

Q. The only thing I miss about my days in the DOS maze is that I could erase and copy a mess of files simply by using extensions. Now I'm in an instructional lab that uses Macs, and it's nearly impossible to keep our hard disks clean. At the end of each semester, we have to go searching through all the folders; find the documents created — and misnamed — by students; and then, one by one, throw them into the Trash. Why can't Mac users, like our DOS counterparts, issue a command such as Erase C:\*.doc? Backups would also be a simple chore if I could tell my Mac to Copy C:\*.application.

Don Nissen
Columbus, IN

Questions, anyone? Here's where to get answers from the experts. Bob LeVitus is the author of the best-selling Dr. Macintosh. Andy Ihnatko is a longtime activist with BCSMac. Together, they're ready to answer questions about everything Macintosh.

Write to Help Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Don't want to wait for an answer? Post your question online, get a reply from Bob, Andy, or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

It's only appropriate that on this, the 500th anniversary of Columbus's historic voyage, we pause to reflect upon and celebrate the lives of those noble voyagers. They lived in simpler times, without fancy radios, radar, and chemical toilets; they had only an adventurous spirit and a dysfunctional sense of direction.

To salute these brave idiots and their simpler lives, we present a historic reenactment of the sort of Mac question typical 15th-century seafarers were known to have asked:

Q. I'm a new Mac user, and I'm having problems. I work with a lot of text files (from an IBM system) but can't seem to open any files larger than 32K — TeachText keeps splitting the file back at me and refuses to work with such a large file. Is this a limitation of the Mac, or am I doing something wrong?

Hob Gadling
Knot Instructor's Mate 1st Class

Andy: Yes, you're doing something wrong — you're using TeachText as if it were a real word processor. As the name sort of implies, TeachText is just a free little program Apple wrote so that users could read text files containing the last-minute information that most developers include on program disks.

You don't get much for nothing. TeachText relies solely on a set of text-editing routines called TextEdit built in to the Mac. As is, TextEdit can deal only with 32K of text at a time, whereas full-blown word-processing programs (which sell for as much as a good CD player) use their own text-editing engines, which work around the 32K barrier.

So you're going to have to get yourself a new word processor, big guy. Any commercial program will do just fine — two economical choices are T/Mark's WriteNow and DeltaPoint's Taste — but if you really want to minimize costs, look into CONText II, a shareware word processor written by Michael Conrad. It opens large files by chopping 'em into 32K chunks, and it's right nifty. Look for CONText II in the usual places: user groups and on-line services.

I should point out, however, that if you don't care about the 32K barrier, TeachText is a wonderful little program. As a matter of fact, when teamed with Baseline Publishing's Thunder 7 (a control panel that adds a spelling checker, a thesaurus, and document statistics to almost any program), it has 98 percent of what most folks use a word processor for. What's more, it does it in an almost trivial chunk of memory. In fact, I use TeachText to write this column, and unlike word processors I've paid more than $40 for, it hasn't crashed on me even once in four years of use.

Bob: In defense of the higher-priced spread, my word processor, Microsoft Word, hasn't crashed in almost a year, a record for me and Microsoft products. Could it be that they finally got everything fixed in version 4.0? (Just in time for the release of version 5.0?) Well it costs a lot (about $400), but it has tons of features; TeachText has none.
We Get a Good Return on Our Investment.

The Nature Conservancy takes a business approach to protecting our natural world. Each day in the U.S. we invest in over 1,000 additional acres of critical habitat for the survival of rare and endangered species.

Through creative techniques like debt-for-nature swaps, we are also saving millions of acres of tropical rainforest throughout Latin America and the Caribbean.

On these protected acres, migratory waterfowl return each year. Trout return to the streams. Antelope return to the grasslands. And in many areas plant and animal species previously driven to the brink of extinction are returning to their native habitats.

Join us, and make an investment in our natural heritage. Future return: isn’t that what investment is all about?

Conservation Through Private Action

For more information, call toll-free 1-800-628-6860.
(or write The Nature Conservancy, Box PSA, 1815 N. Lynn Street, Arlington, VA 22209)
do many of the same things, albeit not as gracefully as DiskTop or DiskTools can.

Finally, you might want to consider Frontier, the first general-purpose scripting software for the Mac, from UserLandSoftware (415) 325-5700. Frontier lets you control many aspects of the operating system — you can write scripts to back up, rename, copy, and/or delete files as well as launch and control System 7-savvy applications.

Figure 1 shows a simple script you can use to delete unwanted files. This script took only ten minutes to write and debug. If you decide that what you really want is to delete only Microsoft Word documents, you just add a line or two of code to your script and run it again.

Andy: Yeah, that’s much simpler than typing DEL *.WK1. Frankly, I’d rather fire up Bat Filer, easily the niftiest concept since chocolate Pop-Tarts. Bat Filer assembles a list of files based on absolutely any combination of criteria you specify (name, type, creator, date created, date modified, locked files, files containing a specific phrase, and so on) and then does something useful with the files, such as deleting them, copying them, and concatenating them into one big file. For example, you could use Bat Filer to select a list of all text files everywhere that contain the word Bearcat or all StuffIT files created before October 2, 1991. Bat Filer is shareware and is available from on-line services (such as MacUser’s on-line service, Zmac) and user groups.

But if you’re still going to whine, Don, all is not lost: For 59 bucks, you can buy MacShell, a DOS-like command-line interface for the Mac (actually, it’s more UNIX-like, but the commands are nearly identical). Send your dough to QuickBay Technologies (make up your own joke here, and keep it to yourself), at 8768 Cottonwood Lane, Maple Grove, MN 55369; (612) 425-7025.

Windows 3.0’s Good Feature
Q. Although I agree that Microsoft Windows is a poor attempt to copy the Mac interface, there is one thing Microsoft integrates into Windows that’s definitely needed on the Mac — a full picture on the desktop instead of a limited pattern.

I know that DeskPicture in Now Utilities can do this, but I don’t want the other utilities in the package. What I’m looking for is an INIT or control panel that will put a picture on my desktop.

Jaime Christley
Ledyard, CT

Andy: I like to refer to Windows 3.0 as Solitaire Shell — most people install it, play with its solitaire program for a while, and trash it. Surely only Microsoft, with its monumental creative and financial resources, could achieve such a technological breakthrough: a graphical user interface that’s more difficult to use than a command-line interface.

But off the soapbox. Yes, Jaime, there’s a very popular INIT that’ll give you a desktop picture: Clay McAel’s venerable DeskPict. No bells, no whistles, but it works under System 6 and it’s free. I also feel compelled to mention BigPat, a System 7-compatible control panel written by Charles Dunn that lets you create desktop patterns made up of 32×32-bit elements (as opposed to the normal 8×8), and that makes for a 3D-like appearance in a brick-wall design. If you want these public-domain programs, try your user group or an on-line service.

Bob: What exactly do you have against Now Utilities, from Now Software (503) 274-2800? DeskPicture is the only System 7-compatible...
utility I know of that lets you replace your desktop with a picture. And for what it’s worth, I think Now Utilities is a fantastic deal — it includes Super Boomerang (an Open­and Save-dialog-box enhancer), Startup Manager (an INIT and control-panel manager), and Now Menus (for submenus in your Apple menu), among other things. And all for a street price that’s about the same as that of many single-function utilities.

If you still feel that Now Utilities isn’t for you, check out Wallpaper, from Thought I Could ([212] 673-9724). It’s a control panel that lets you create your own desktop pattern with pattern measuring up to 128 x 128 pixels (64 x 64 under System 6). It includes hundreds of great-looking patterns (see Figure 2), and you can create your own with its built-in-drawing tools. You can even import pictures from most Mac graphics programs.

If you’re a do-it-yourselfer, check out the January beating the System column (“ResEdit 101” page 207), in which I described how you can use ResEdit to customize your desktop pattern.

Screen Slower Under 7?

Q. Is it just my imagination, or do screen activities slow down a lot under System 7? When I use After Dark 2.0 with System 6.0.7, the movement and color changes are very smooth, but the same screen savers running under 7 are choppy, like an old movie. Is there any way around this?

Joseph Lorek
Perry, OH

Bob: Make sure you’ve got the right version of After Dark — you need 2.0v or later, as earlier versions don’t work properly with System 7. Free upgrades are available from Berkeley Systems for those who send in their master disk (2095 Rose Street, Berkeley, CA 94709; [510] 540 5353), and you can get hold of an updater from CompuServe, America Online, or GEnie as well as find one in the new collection of After Dark modules, More After Dark.

As far as whether screen activities are slower under System 7, I’m not sure. Some users report that they’re sure things are running slower; others are sure they’re not. If you’re using a machine with a slow processor, such as a Plus, SE, or Classic, you’re more likely to notice a slowdown. There are several things you can do to speed up screen display. The first and most significant is to open the Views control panel and make sure that Calculate Folder Sizes is turned off. Doing so speeds up the Finder a lot, no matter which Mac model you have. While you’re there, check to see what font you’re using in the Finder. TrueType fonts (or ATM) slow things down. Try 9-point Geneva for speediest screen updating. Small icons seem a bit faster than big ones, and if you use the list views (by name, date, size, and so on), the smallest icons seem to make things run a little faster. Finally, if you’re running in color but don’t really need it, try black-and-white.

Andy: And don’t forget: Running System 7 is like running System 6 under...
MultiFinder: things are always slower because the Mac has more balls in the air. That’s the price we pay for a color Puzzle DA.

**CD-ROM Mastery**

**Q.** I’m a college student with an idea that’s well suited for CD-ROM technology. However, I’m an intermediate Macintosh user and by no means a programmer. I would like to develop my idea myself, but I don’t know how to start. What options are available to me?

**Todd R. Nelson**

Lake Forest, IL

**Andy:** Here’s the quick answer: Most of the CD-ROM projects I’ve seen were assembled with HyperCard (for text-based information projects), MacroMind Director (for graphics and animation projects), or Aldus’ SuperCard (for projects that involve a lot of both). These programs aren’t that hard to master, so rest assured that you won’t necessarily have to spend an inconvenient eight semesters securing a computer-science degree to put together your dream project.

Next, a rough estimate of the cost: Mucho bucks. Usually you start off spending $500 for a test pressing, which needs to be checked to make sure you haven’t goofed anywhere. If the test pressing is OK, you can apply the $500 toward the cost of making a master CD, which will run between $2,000 and $3,000. Then, when you start cranking out actual CDs, you’ll pay $2 to $3 dollars a pop. Prices vary all over the place, and there may be extra setup charges for things such as silk-screened art. Anyway you look at it, though, you’ll end up spending the equivalent of two or three good used Volkswagens to get a CD in your hot little hands.

Finally, you can get some advice from people who’ve been there by giving the Boston Computer Society a call at (617) 252-0600. Its Hypermedia/CD-ROM group is full of folks who’ve produced CD-ROMs, and they can probably set you hip to all the trials and tribulations you’ll be getting yourself involved in. Try your local user group too.

**Classic to Classic II Upgrade?**

**Q.** Now that Apple has released its souped-up model of the Classic with a 68030 processor, are there any plans for an upgrade for owners of the original Classic? If so, what’s the price, is there an expansion slot of some sort, can we access System 7’s virtual memory, and does it break the 4-megabyte RAM barrier?

**Matt Milner**

Salt Lake City, UT

**Bob:** Yes, there is an upgrade, it costs about $700, there isn’t an expansion slot (but there is a socket for an optional math coprocessor), and you can use virtual memory under System 7. Even better, the upgrade breaks the 4-megabyte RAM barrier — you can have as much as 10 megabytes of real RAM.

**Andy:** Don’t forget about QuickTime either. If you want to watch the Three Stooges in a HyperCard stack, you’ll need Classic II capability, with a 68030 processor and 32-bit Color QuickDraw in ROM.

---

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

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

But that, as they say, is only the beginning. You may want to manage multiple departments. Or add a Payroll. With MultiLedger, growth is built directly into the plans.

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

Call us now at (800) 444-9922 for a free demo disk.

**MultiLedger • Payroll**

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.
SPEED!

At Third Wave, all our products offer the maximum in performance and value.

CACHE CARDS FOR II1S AND IIC1

Speed up your II1S or IIC1 by 40 to 60%! LogiCache II1S uses the IIC1 cache slot; LogiCache IIIC1 plug directly into IIC1 slot or into Dual Slot Adapters to allow use with other IIC1 expansion cards such as video or Ethernet. Both cache cards have 84K of SRAM for maximum performance.

ASANTE ETHERNET FROM $199

DayStar PowerCache 40 Mhz
DayStar PowerCache 40 Mhz w/882
DayStar PowerCache 50 Mhz
DayStar PowerCache 50 Mhz w/882
895.00
1049.00
1299.00
1549.00

Rated Number One by MacUser
5 Year Warranty

Macintosh CPUs

Classics to Quadras!
PowerBooks! Printers!

Call for pricing on new Macs.
We also accept trade ins — convert your older Macintosh system into the latest CPU. We can help you design your entire system. Just give one of our sales consultants a call.

ASANTE ETHERNET FROM $199

DayStar PowerCache 40 Mhz
DayStar PowerCache 40 Mhz w/882
DayStar PowerCache 50 Mhz
DayStar PowerCache 50 Mhz w/882
895.00
1049.00
1299.00
1549.00

Rated Number One by MacUser
5 Year Warranty

ACCELERATORS AND MATH COPROCESSORS

TokaMac 040 Accelerators rated faster than the Quadra in three out of four benchmarks.
MacWeek — 10/22/01

MACINTOSH CPUs

Classics to Quadras!
PowerBooks! Printers!

Call for pricing on new Macs.
We also accept trade ins — convert your older Macintosh system into the latest CPU. We can help you design your entire system. Just give one of our sales consultants a call.

Import high quality still video images to your Mac.
Store up to fifty images on 2 inch diskettes, camera connects to TV/VCR for previewing or taping.
XapShot camera only
XapShot w/24 bit frame grabber
Demo diskette
429.00
749.00
15.00

We carry the complete line of Canon still video.

ACCELERATORS AND MATH COPROCESSORS

TokaMac 040 Accelerators rated faster than the Quadra in three out of four benchmarks.
MacWeek — 10/22/01

CANON XAPSHOT

International Orders call (517) 837-8282 fax (517) 837-1523. We accept Visa, Mastercard, American Express and Discover.
Corporate, educational, and governmental purchase orders accepted. Most deliveries via Federal Express.
SUPERMAC, RASTEROPS, RADIUS, ILKEGAMI, SEIKO AND SONY.

DAT

All of our DAT drives include a copy of Retrospect 1.3, one DAT cassette, one DAT cleaning cassette, and your choice of SCSI cable.

Drive Prices guaranteed to be at or below listed prices. Call for latest.
SyQuest, Optical, and DAT available internally for Quadra 800!

STORAGE SYSTEMS
A MacWorld Favorite!
“Quietest” — March ‘91
“Highest SCSI Eval. Read/Write” — Sept ‘91
“One of the best manuals” — Sept ‘91

DISK DRIVES

<table>
<thead>
<tr>
<th>INTERNAL</th>
<th>EXTERNAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>52 MB</td>
<td>208.00</td>
</tr>
<tr>
<td>105 MB</td>
<td>320.00</td>
</tr>
<tr>
<td>210 MB</td>
<td>628.00</td>
</tr>
<tr>
<td>320 MB</td>
<td>1088.00</td>
</tr>
<tr>
<td>425 MB</td>
<td>1298.00</td>
</tr>
<tr>
<td>650 MB</td>
<td>1398.00</td>
</tr>
<tr>
<td>1000 MB</td>
<td>1899.00</td>
</tr>
</tbody>
</table>

Portable CD ROM (Toshiba) includes Matlab CD.

Memory Upgrades

MEMORY UPGRADES

MEDIA AND SOFTWARE

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 MB Tape for Teac</td>
<td>17.00</td>
</tr>
<tr>
<td>150 MB Tape for Teac</td>
<td>24.00</td>
</tr>
<tr>
<td>SyQuest 45 MB cartridge</td>
<td>69.00</td>
</tr>
<tr>
<td>SyQuest 88 MB cartridge</td>
<td>125.00</td>
</tr>
<tr>
<td>DAT cassette 60 meter</td>
<td>18.00</td>
</tr>
<tr>
<td>DAT cassette 80 meter</td>
<td>38.00</td>
</tr>
<tr>
<td>Optical cartridge (GS) 512 kb/sector</td>
<td>125.00</td>
</tr>
<tr>
<td>Optical cartridge (GS) 1024 kb/sector</td>
<td>125.00</td>
</tr>
<tr>
<td>Optical cartridge for Teac</td>
<td>298.00</td>
</tr>
<tr>
<td>Optical cartridge 128 MB</td>
<td>69.00</td>
</tr>
<tr>
<td>KayShi video diskette</td>
<td>8.00</td>
</tr>
<tr>
<td>Maxima 2.0 memory upgrade software</td>
<td>45.00</td>
</tr>
</tbody>
</table>

Optidisk 800
Optidisk 1000
Optidisk 128 "NEW"
45 SR (SyQuest) w/cartridge
45 SR (Dual SyQuest) w/2 cassettes
88 SR (SyQuest) w/cartridge
88/45 SR (Dual SyQuest) w/2 cassettes
150 MB Teac Tape Streamer
DATdrive 26B
DATdrive 56B

Removable Media

Prices change often, call for latest.

DISPLAY SYSTEMS

SuperMac, RasterOps, Radius, Ikegami, Seiko and Sony.

13, 16, 18, 21 inch monitors
Accelerated Video cards.
Call for latest prices!
### Accessories

<table>
<thead>
<tr>
<th>Brand</th>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABCOM</td>
<td>Carry Case GL CX.S.L. M/A/W</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>Carry Case REPLUS EXTEND KB</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>PowerBook Case</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Dust Covers from</td>
<td>15</td>
</tr>
</tbody>
</table>

### HARD DISK TOOLKIT

Hard Disk Tool Kit includes hard drives, removable and optical drives with complete formatting, partitioning, password protection, encryption, benchmarking, and more. Powerful professional features like high-speed SCSI copy, microcode control, SCSI-2 support and comprehensive diagnostics make Hard Disk Tool Kit a "must have" utility for all users.

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>POCKETHAMMER DRIVE 50 MB</td>
<td>387</td>
</tr>
<tr>
<td>POCKETHAMMER DRIVE 100 MB</td>
<td>792</td>
</tr>
<tr>
<td>POCKETHAMMER DRIVE 200 MB</td>
<td>1198</td>
</tr>
</tbody>
</table>

### COMMUNICATIONS

- **DOVE** (DOVERUX PLUS) 355
- **HAYES** (PERSONAL MODEM 2400 PLUS) 148
- **SMARTMODEM 2400 & SMARTCOM & ULTRA 9800 MODEM & SMARTCOM 3.3-5 92
- **MICROCOM 45 plus + Mouse** 92
- **MINITEL 44+ 2400 V.42 & Mac/Cr/Novell** 128
- **2400/9600 FAX MODEM** 265
- **9600/9800 Plus V.32/42 MNP-5** 365
- **ULTIMA 14 2400 MODEM** 465

### Printers/Scanners

- **AB-ATON** Laser/Writer Lx Printer 1589
- **Burr** (BP 4000 LASER PRINTER) 1399
- **CASIO** (TIPTOP PRINTER) 469
- **CHROMIX** (CD ROM SCANNER) 966
- **DETS** (3000 COLOR SCANNER) 696
- **KODAK** (DICTION PRINTER) 369
- **LOGITECH** (SCANNER SCAN) 299
- **MARTESK** (MASS 800 MAC HD HAND SCANNER) 299
- **MICROTECH** (COLOR ARTIST HAND SCANNER) 579
- **MICROWRIGHT** (SCANNER 150 MEG) 209
- **MICROTECH** (SCANNER 90 MEG) 198
- **MIDORI** (PHOTOS 6032 SCANNER) 198
- **PRISM ORDER** (PHOTO 6032 SCANNER) 797

### Monitors & Boards

- **MONITOR** 21" 500 MHz BOARD 129
- **MACRON** (MACRON 45 plus) 252
- **MICROTECH** (NOVA 200) 1145
- **MICROWRIGHT** (NOVA 320) 1260
- **MICROWRIGHT** (CARD 32X CRADLE) 45
- **MICROWRIGHT** (45 CRADLE) 79
- **MICROWRIGHT** (CRADE 40) 659
- **MICROWRIGHT** (CRADLE 40) 586
- **MICROWRIGHT** (CRADLE 40) 561

### Business

- **BASELINE PUBLISHING** 70
- **CATC** (CATC OMP) 500
- **CLARITY** (CLARITY 2.0) 250
- **FOREVER** (FOREVER 3.0) 250
- **CERES SOFTWARE** (CERES SOFTWARE 3.0) 169
- **CHIPSET** (MACINTOSH 90) 169
- **STORAGE** (STORAGE 50) 117
- **DUNA** (DUNA 50) 379

### We Take Care Of You

Lowest Prices

### New Features

- **EASY ALARMS 1.5**
- **PRINTERS/SCANNERS**
- **MONITORS & BOARDS**
- **COMMUNICATIONS**
- **BASELINE PUBLISHING**

---

### Special Offers

- **V-42 MINIPLUS**
- **90MB TRANSPORTABLE BERNOLLI DRIVE**
- **MACINTOSH**
- **MICROTECH**
- **MICROWRIGHT**
- **MICRON**
- **MACROCOLOR II 24 BIT VIDEO CARD**
- **IONIC**
- **8X11 DISPLAY BOARD**
- **24X11 ACCELERATED BOARD**
- **MULTITOUCH GS SERIES**
- **RATERS**
- **V-42 MINIPLUS**
- **90MB TRANSPORTABLE BERNOLLI DRIVE**
- **MACINTOSH**
- **MICROTECH**
- **MICROWRIGHT**
- **MICRON**
- **MACROCOLOR II 24 BIT VIDEO CARD**
- **IONIC**
- **8X11 DISPLAY BOARD**
- **24X11 ACCELERATED BOARD**
- **MULTITOUCH GS SERIES**
- **RATERS**

---

### Contact Information

**CALL DR. MAC 1-800-825-2677**

---

### Additional Information

- **Wealth Builder** 94
- **Software Discoveries** 56
- **IBM** 3.0
- **SYMTECH** 149
Quantum Drives include a TWO Year Warranty

3.5" Half Height drives are the PRO series. 3.5" Low Profile drives are the LPS series.

*3.5" Low Profile, Low Power drives for the Mac Classic, LC, and Ilsi. approximated, actual capacities may vary. All prices subject to change without notice.

Maxtor Drives include a TWO Year Warranty

Maxtor 40 and 80 are perfect for the Mac Classic, LC, and Ilsi.

Fujitsu Drives include a FIVE Year Warranty

Maxtor-40 and 80 are perfect for the Mac Classic, LC, and Ilsi.

Seagate Drives include a ONE Year Warranty

Internal Drives fit the Mac II, IIX, and IIXx. HH = Half Height, FH = Full Height.

SyQuest Drives have a TWO Year Warranty!
Includes one cartridge, all necessary cables, and SCSI Director™ Formatting Utility.

1-800-854-MACS

New Address! New Address!

ClubMac • 3 Musick Irvine, CA 92718 • Sales (800) 854-6227 • 24 Hour Fax (714) 768-9354 • Int'l (714) 380-0816

CIRCLE 46 ON READER SERVICE CARD.
We’re proud of our reputation.

“...The Good Housekeeping Seal. I’m now taking the safer course of buying from corporate-owned companies such as Quantum-backed La Cie...”

MacWeek, February 1991

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

Bill Ringé, Philadelphia, PA

“La Cie offers the leading combination of software and performance.”

Macworld, March 1990

The La Cie tradition of pride.

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

To order or for more information, call toll-free

800-999-0143

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

International 503-691-0771 Fax 503-691-5590
When size really counts.
As a Quantum Company, La Cie offers customers the advantages of $489 million in assets. Deep-pockets R&D. State-of-the-art technology. Superior value. And, the assurance of long-term support. Yet for all our size, La Cie's smallest achievements still make our biggest headlines.

Introducing the PocketDrive™
Portability in the palm of your hand.
Pack it in your pocket, purse or briefcase. La Cie's new 40MB and 80MB power-packed PocketDrives offer ounces of convenience, not pounds. Using Quantum's new 2½" drive, the PocketDrive offers 19ms seek time, whisper-quiet operation and La Cie's exclusive switchable termination and SCSI ID.

Desktop docking.
La Cie's PocketDrive eliminates the hassle of fumbling with cables at the back of your Macintosh every time you connect or disconnect the drive. Instead, the PocketDrive comes with a unique PocketDock™ desktop docking cable that lets you plug in the PocketDrive in seconds. With a second PocketDock (only $99), you can have fast and easy connection at work and at home. There's even a miniature T-connector (only $59) for connecting to other Macintosh systems.

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

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

Space consciousness.
Smaller, faster and less expensive than conventional optical drives, La Cie's MicroOptical uses cartridges that are the same size as 3.5" floppies, but store eighty-eight times more data that high-density floppy disks. Engineered to fit within our space-saving, award-winning Cirrus case, the MicroOptical offers the reliability of optical media, 30ms seek times and the economy of removable cartridges.

Lose Weight. Lose Wait.
Until now, optical technology had a reputation for being slow. MicroOptical drives at 30ms are faster than the conventional opticals. La Cie's MicroOptical leaves the others in the dust.

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

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

MacWeek

La Cie MicroOptical Drive

$1699

To order or for more information, call toll-free

800-999-0143

To order or for more information, call toll-free

800-999-0143

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

International 503-691-0771 Fax 503-691-5590
The drive to satisfy.
At La Cie customer satisfaction is the driving force behind everything we do. From our innovative product design to our capable, courteous customer support, La Cie goes the extra mile to assure you quality, service and value.

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

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

- 50MB-1.6GB Internal
- 50MB-1.6GB ZFP
- 50MB-400MB Cirrus
- 50MB-400MB Tsunami
- 50MB & 100MB Bacster™
- 40MB & 80MB PocketDrive

Drive the La Cie Express™

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

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. La Cie, Ltd., all rights reserved, printed in U.S.A. © Copyright 1991. 19532 99th Court, Tualatin, OR 97062. Phone: (503) 691-0771, fax: (503) 691-5590.
Economical, versatile, ideal for archival backup, La Cie's comprehensive line of removable media options includes:

- Removable cartridge drives
- ExpressDrive
- 3 1/2" & 5 1/4" magneto opticals
- CD ROM

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

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

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

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

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

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

Taped drives from $649

To order or for more information, call toll-free
800-999-0143
6 a.m.-6 p.m. PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590
Image is everything.
We believe quality is a priority. Our image as a company that produces quality products is well known. We’re so confident in the quality of our scanner image that we are willing to compare it to other scanners right here. Compare for yourself.

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

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

Lay it on the line.
When comparing line art, the Silverscanner really shines! At 1200 dpi you get what amounts to an electronic stat. The comparison is incomplete, however, because some scanners don’t have hi-res capability (too bad). But even if you compare at 400 or 600 dpi, it’s clear how much better the Silverscanner is, especially bundled with Color It!

Price does not include shipping. Add 5% surcharge for American Express. Add sales tax where applicable. La Cie is a trademark of La Cie, Ltd., a Quantum Company. All other trademarks are the property of their respective companies.

*Price advertised in Macworld, Sept. 91. **From Howtek price list, effective 3-1-91. All specifications, terms, descriptions, products and services herein are subject to change without notice or recourse. Bundles in U.S.A. only.

Ad design and production by Graphic Witness. Subject photos by Dennis Caney. © Copyright 1991 La Cie, Ltd., 19552 SW 90th Court, Tualatin, OR 97062. Phone: (503) 691-0771, Fax: (503) 691-5590. All rights reserved. Printed in U.S.A.
Software to die for!
We're proud of our image when it comes to quality software, too. La Cie has always had a reputation for powerful, well-written software. La Cie's exclusive plug-in modules for Photoshop, ColorStudio, Digital Darkroom, Enhance, ImageStudio and RagTime have been hailed as some of the best software ever written for flat-bed scanners. Enjoy features like fast dynamic color previews, independent color/brightness controls, nine scan modes, savable scan settings, color dropout, magnified previews, proof scans, 25% to 400% scaling in 1% steps, and 25 dpi to 1200 dpi in 1 dpi steps.

All scans were done at default settings with no corrections. The color images were separated using Adobe Photoshop. The logo was scanned as grayscale and as line art. This entire ad was done on the Macintosh using Silverscanner, Photoshop, Quark XPress and a PostScript Imagesetter. The entire production cost was $145.

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

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

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

To order or for more information, call toll-free
800-999-0143
6 a.m.-6 p.m.PST Mon.-Fri.
International 503-691-0771 Fax 503-691-5590

$1899
La Cie Silverscanner with Photoshop and ColorStudio
We're proud of our value.

<table>
<thead>
<tr>
<th>Storage</th>
<th>Price Int.</th>
<th>Price Ext.</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>50MB</td>
<td>$299</td>
<td>$339</td>
<td>155MB Tape Drive</td>
<td>$649</td>
</tr>
<tr>
<td>100MB</td>
<td>$429</td>
<td>$479</td>
<td>600MB Tape Drive</td>
<td>$1199</td>
</tr>
<tr>
<td>120MB</td>
<td>$529</td>
<td>$579</td>
<td>1.2-2.0GB DAT Drive</td>
<td>$1799</td>
</tr>
<tr>
<td>200MB</td>
<td>$729</td>
<td>$779</td>
<td>128MB MicroOptical</td>
<td>$1699</td>
</tr>
<tr>
<td>400MB</td>
<td>$1399</td>
<td>$1499</td>
<td>ExpressDrive</td>
<td>$Call</td>
</tr>
<tr>
<td>1.2GB</td>
<td>$2749</td>
<td>$2899</td>
<td>Silverscanner</td>
<td>$1399</td>
</tr>
<tr>
<td>80MB PocketDrive</td>
<td>$649</td>
<td></td>
<td>Silverlining</td>
<td>$149</td>
</tr>
</tbody>
</table>

Call for products not listed.

You'll be delighted at La Cie's competitive prices. Especially when you consider what you get absolutely free. Like our acclaimed Silverlining software. Five megabytes of public domain software. A 2-Year Limited Warranty on Quantum mechanisms (extendible to 5 years). 72-hour turn-around on warranty service. Prompt, courteous, competent service.

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

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

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

DISPLAY SYSTEMS

Colorpage E16 ................ 1089#
Colorpage T-16 & 8X ......... 2914#
RasterOps 24XLI .......... 4906#
Supermac Spectrum 24 .... 6578#
Supermatch 24 ........... 4906#
Publisher 15" Series ....... 538#
Publisher 15" Series ....... 685#

PRINTERS & SCANNERS

CANON 6500 .......................... 499.00
NOVA 50 ............................. 599.00
NOVA 20D ........................... 1099.00
NOVA 400 ........................... 1599.00

INPUT DEVICES

COPIER

TINGRAY TRACKBALL ....... 85.00
EMAC keyboard ............... 85.00
KEYBOARD

TURBO MOUSE .................. 105.00
KEYBOARD

MAC PRO PLUS KEYBOARD .. 130.00
MOUSE SYSTEMS

LITTLE MOUSE ................. 199.00
WACOM

GRAPH TABLET .................. 499.00

SOFTWARE

Hewlett-Packard

Deskwriter with cable ...... $399.00
Deskwriter C with cable .... $325.00

3-YEAR WARRANTY

Mac CPUs

Mac Classic II 2/40 ......... CALL
Mac Classic II 2/80 ...... 179.00
Mac IIci 1/60 ............... 199.00
Mac IIci 5/120 ............. 219.00
Mac IIx 7/66 ................. 219.00
Quadtro 840 3Mb ........... 349.00
PowerBook 100, 140, 170 ... CALL

Call for other configurations.

O U R  P O L I C I E S

30 DAY NO-FAULT RETURN POLICY IS APPLICABLE TO DESIGNATED MANUFACTURER'S PRODUCTS ONLY. CALL CUSTOMER SERVICE AT 1-800-548-2512 FOR A RETURN AUTHORIZATION. ALL RETURNS WITHOUT AN AUTHORIZATION NUMBER MAY BE REFUNDED ONLY IF RETURNED IN UNOPENED ORIGINAL CONDITION AND PACKAGING AND MIB. THE CUSTOMER IS RESPONSIBLE FOR FREIGHT CHARGES, ALL RELATED TAXES AND SHIPPING COSTS. ALL AUTHORIZED PRODUCTS ARE SUBJECT TO DISCONTINUATION WITHOUT NOTICE. ANY PRICES MENTIONED UP TO 10% OFF ARE SUBJECT TO DISCOUNTS AND MAY INCLUDE SPECIAL栢ECKS AND DUES. PRICES ARE SUBJECT TO CHANGES AND ARE DISCOUNTED AT 30% OF OUR LIST PRICE. PRICES ARE SUBJECT TO DISCOUNTS AND MAY INCLUDE SPECIAL栢ECKS AND DUES. PRICES ARE SUBJECT TO DISCOUNTS AND ARE DISCOUNTED AT 30% OF OUR LIST PRICE.

Corporate, educational, and government purchase orders accepted.

Circle 52 on reader service card.
Syquest
External
44MB w/Cart $419
Add’l Cartridges $66
88MB w/Cart $549
Add’l Cartridges $99
- 30 Day 100% Guarantee
- Two year instant replacement on Maxtor and “Q”uick Series
- One year instant replacement on Syquest, Conner and Seagate
- Call For Quadra Prices
- Lifetime toll-free tech support
- Government and University PO’s accepted
- No credit card surcharge on Visa–MC–Amex
- Same day shipping on most products

(800) 338-4273
FAX (303) 442-7985

MacTown
1431 S. Cherryvale Rd.
Boulder, CO 80303

Macintosh IIsi
IIsi, 5mb RAM, 105mb Hard Drive, Standard Keyboard, 16"ColorPage E-16, with 8 bit color.

Call for Price
Mac Quadra System
Quadra 700, 8mb RAM. 426mb Hard Drive. Extended Keyboard, ColorPage E-16, 852x624 Resolution, 8 bit color.

Only $7,169

Classic 4/40 Sale
Classic, 4mb RAM, 40mb Hard Drive, Standard Keyboard.

1-800-925-2622 MacSource

Some Pros Say This Company's Multimedia Products Are The Best.
MacroMind Director

The industry standard for authoring high-impact, professional multimedia presentations, animations and interactive applications. Current MacroMind Player technology enables interactive playback on Windows 3.0, Macintosh and soon, other leading computer platforms. Create, combine and synchronize text and animations with audio and video. Add full interactivity with buttons and scripts. Incorporate 3D models from Swivel, animation from MacroMind Three-D, sounds from MacRecorder as well as all standard Mac file formats.

Version 3.0. Suggested list, $995.

MacroMind Accelerator

Speeds MacroMind Director and PICS animations to professional levels of up to 60 frames per second for smoother action and less screen flicker. Features tempo control for easy synchronization of audio and animation. Includes XCMD for HyperCard® stacks.

Version 3.0. Suggested list $195, buy direct from us.

MacroMind Windows Player

Converts fully interactive MacroMind Director productions created on the Macintosh to Microsoft® Windows® 3.0 for playback. Supports Windows Multimedia Extensions for complete interactive control of CD-Audio, digitized sound and video. Includes a license-free distribution policy for projectors.

Version 1.0. Suggested list $995, buy direct from us.

ModelShop II

Create and manipulate realistic spatial models with this completely interactive design and presentation tool. Quickly create models in hidden surface perspective with CAD-like accuracy. Add professional animation with MacroMind Three-D for real-time walk-through of architectural models, landscapes and visualizations.

The perfect tool for architects and design professionals.

Version 1.2. Suggested list, $895.

Swivel 3D Professional 2.0

Model, move and handle objects with this complete modeling and design environment. Hierarchically link object parts. Export 3D views and vector-based 2D drawings. Swivel 3D models are compatible with MacroMind Three-D and MacroMind Director for adding advanced animation to 3D models. Supports 24-bit color, full screen display, Pixar MacRecorder™ output, AutoCAD™ DXF output, EPS, Adobe® Illustrator®, PICT and PICS files.

Version 2.0. Suggested list, $695. Upgrade for just $75. See order form.

SwivelMan

A special version of Swivel 3D Professional 2.0 that includes Pixar® MacRecorder™ 1.1. Documentation and tutorials are included to present the applications as one integrated solution. Users can create 3D models and render those models by applying photorealistic textures and shaders in one application.

Suggested list, $895. Upgrade for just $175.
MacroMind Three-D®
A professional tool for creating high-quality 3D animations and photorealistic images for use in video and multimedia productions. Imports a model file formats and provides a time-line for easy animation of shapes, lights and cameras. Import models from Swivel 3D and export animations to MacroMind Director. Supports video animation controllers, image special effects (bump and texture maps, etc.), 3D text from TrueType fonts and RIB.
Suggested list, $1,495.

ClipMedia™
NEW!
A high-quality, royalty-free collection of 250 sound effects, 75 animations, 50 digital video sequences, 50 music pieces and 75 graphics. Use these multimedia elements as needed in business presentations and video productions. Available on CD-ROM for Macintosh and Windows users. Volume 1 for Business & Technology.
Suggested list $395.
Special introductory offer; order direct from us and save 40%. See order form.

MacroMind MediaMaker™
The application of choice for assembling and synchronizing video, CD-Audio with Macintosh graphics, sound and animation. Create video productions and presentations on the Mac. Control external devices: videotape recorders, camcorders, videodisc and CD-ROM players. Compatible with popular Macintosh video overlay cards for video-in-window, titling, transitions and special effects. Fully automated Print-to-Video command allows accurate, easy output to videotape.
Version 1.0. Suggested list $695.

MacroMind TitleMaker™
Create professional-looking, animated titles and credits to increase the impact of business, education and home videos. Includes over 150 customizable templates. Replace template text and graphics with your own. The perfect complement to MacroMind MediaMaker. Version 1.0.
Suggested list $149, buy direct from us.

Magic
MacroMind-Paracomp Magic™ is an exciting, entry-level multimedia program that features a draw-like environment and tool palette. Simple concepts of “actors,” “stages” and “scenes” help novices create moving text and graphics with sound. Includes sophisticated Bezier path/object modification, transparency, pre-defined templates, support for ATM™ and TrueType™ fonts, and interactivity via on-screen buttons.
Version 1.0. Suggested list, $395.
We Couldn't Agreed More.
Since the beginning of Macintosh® time, nearly three out of four multimedia packages have had one of two names on the box:

- MacroMind. Or Paracom.

So if you don't already own a few of our products, you probably know a lot about us anyway.

Still, we thought you'd like to know that we've merged.

What's more, we've just acquired MacRecorder® and SoundEdit from Farallon.

Which means that all your favorite multimedia packages—plus a few new ones—can now be had in one place.

So take a look at our full line of products to the right.

And take advantage of this month's great upgrades and special introductory prices.

Call us at 1-800-248-4477, Ext. 200.

You can order the upgrades and specials direct. Or get free product info.

For just $24.95, you can get a Multimedia Info Kit®—complete with videos, demo disks, configuration guides, detailed how-to booklets. And more.

If you'd like to see our products firsthand, just visit your nearest multimedia dealer.

Ask them what's best.

They'll show you MacroMind. Or they'll show you Paracom. It's all the same to us.
Macromind

FOR PROFESSIONALS ONLY?

Multimedia can spice up day-to-day presentations and add to your sales tools arsenal—without turning you into a multimedia maniac.

Put the words “presentation” and “computer” into one sentence and most of us think of two distinct kinds of people.

Multimedia professionals who use high-powered software and the latest high-tech hardware to produce large scale presentations for a living.

And business people who, in the course of making a living, use static presentation packages like PowerPoint and Persuasion to create overheads and slides.

Well, those distinctions are blurring fast.

Because two new products—Action! and Magic—have created a happy gray area between the pros and the rest of us.

Now, previously humdrum day-to-day presentations can come to life with animation and sound.

And professional looking multimedia shows can be created with a minimum of knowledge and equipment.

Lights, computer, action.

Action!, a new Windows product from Macromind • Paracomp, is designed for business people who use their desktop, portable or laptop PCs to create and deliver presentations.

By using Action! and a PC to present, you get the added impact of motion, sound and interactivity—without the hassles of setting up projectors and fumbling with overheads.

Action! even lets you create interactive presentations you can customize as you go. If someone in the audience has a question, you can branch off to a different part of the presenta-

Action! includes 120 professionally designed templates set up for bulleted lists, charts, graphics and more. You can select an appropriate template. Put in your own text and graphics. And quickly get the show on the road.

Action! lists for $495 and runs on IBM PCs and compatibles with Windows 3.0. Does not require Multimedia Extensions.

Multimedia made easy.

Like Action!, Magic doesn't require extensive multimedia knowledge or lots of extra hardware.

But make no mistake, this is a multimedia package—perfect for everything from interactive advertising kiosks to whiz bang presentations for stockholder meetings.

Magic includes full animation capabilities, support for sampled sound, object transparency and Bezier path/object modification.

If you or the people you work with don't know what that means, don't worry.

When you open Magic for the first time, you'll see a desktop that looks just like the drawing and painting packages you're used to.

To simplify the creation of moving text and graphics with sound, Magic uses “actors”, “stages” and “scenes”—intuitive concepts that are easy to grasp without reading the manual.

Magic runs on any Macintosh SE, SE/30, LC or any Mac II with 2 MB RAM.

List price is $395.

ACTION! WINS MVP AWARD AT COMDEX

Although Action! has just recently been introduced, it has already won a major industry award.

At this year's Fall Comdex, Action! captured PC/Computing's coveted Most Valuable Product Award, which is given to products that combine new technology with real usability.
Here are two pieces of news you'll definitely want to hear about.

MacRecorder® Sound System—the package that gives you everything you need to add sound to your multimedia productions—is now a MacroMind • Paracomp product.

And if you call us before March 31st, we'll send you MacRecorder Sound System 2.0 for just $199.

If you think saving $50 sounds good, just wait till you hear what this famous sound product can do.

You can sample different sounds—voice, music or effects—with the MacRecorder digitizer mike.

Or edit any sound, adding reverb, filtering, looping and more, with SoundEdit™ 2.0.

And juice up your presentations, animations, HyperCard stacks—even E-mail—with the impact of audio.

So call us at 1-800-248-4477 Ext. 200. And ask for MacRecorder.

At this special introductory price, it's the only sound thing to do.
**Order direct at great savings.**
Order today and get great prices on software upgrades, ClipMedia and SwivelArt.

**Want to know more?**
Check here for free information on MacroMind • Paracom multimedia products, or a Multimedia Intro Kit, complete with videos, demo disks, configuration guides, how-to booklets and more, just $24.95!

**Upgrades**
Swivel 3D Professional Registered Owners: Save money and upgrade today.

- Swivel 3D Professional 2.0 Upgrade for just $75
- SwivelMan Upgrade for just $175

**Call, or send this order form to:**
MacroMind • Paracom, Inc. 600 Townsend, San Francisco, CA 94103

**Product Name** | **Quantity** | **Cost—Each** | **Total**
--- | --- | --- | ---

Enclose my check for $__________
Or charge my ____ MasterCard __ VISA __ Diners __ AMEX

**Shipping & Handling**

**Exp. date:**

**Name**
**Address**
**City**
**State**
**Zip**
**Telephone**

---

**1-800-248-4477 Ext. 200**
Move Over SyQuest, Optical Just Got Affordable.

Introducing the DGR Technologies 3.5" 128MB Read/Write Optical Drive

"With their high capacity, imperviousness to magnetic fields, and small size, 3.5-inch erasable optical drives promise to be a superior alternative to magnetic SyQuest, Ricoh, and Bernoulli drives." – MacUser, November '91

SyQuest revolutionized hard disk storage with portability and speed. Now, DGR Technologies ups the ante: 128 megabytes of removable, erasable optical storage on fast, ultra-reliable 3.5" disks. The 128REM™ represents substantial media savings over SyQuest 45MB and 88MB technology – do the math. The real savings, though, is peace of mind. Optical storage spells reliability: No more head crashes and no more magnetic data corruption. Above all, the 128REM™ is built to perform: 9 millisecond average short seek time and a built-in 128K buffer translate into significant improvements in current removable standards – giving you the capacity and performance you’ve been waiting for. The 128REM™ is built with the future in mind, conforming to both ANSI and ISO standards, ensuring future compatibility.


$1,499

128 megabyte optical cartridge
9ms short seek access time
3.5" erasable disk cartridges
1yr direct replacement warranty
30 Day Money Back Guarantee

Order Direct 800-235-9748

DGR Technologies • 1800 Rio Grande, Suite 205 • Austin, Texas 78701 • 512/476-9855 • Fax 512/476-6399

© DGR Technologies Inc. All brands and product names are trademarks of their respective holders.
Thanks for helping us make the move...

Thanks to our loyal customers, we’ve moved to the front of MacUser. Now even more people will learn about the discount mail order prices and friendly service we’ve been offering for over 6 years!

HARDWARE that FITS
1-800-972-3018

See our 2 ads (pages 128-129 and 150-155) for other great values!!!

Several members of our management team (left to right): Barbara, Jim, Lew, Real.

WE ONLY SELL NAMES YOU CAN TRUST.

RasterOps
MICROTEK
Æ
Applied Engineering®

RealTech™

ASANTE

TEXAS INSTRUMENTS

PLI

$340 EtherPrint
$1429 Microtek Scanner

$5819 RasterOps 24XLT TV
21" Color System
$3845 Mac IIci 14" Trinitron

$219 QuickSilver Ilsi Cache Card w/PDS Adapter
$1995 RealTech Laser

Prices are subject to change without notice. Satisfaction guaranteed or we’ll refund your purchase price (minus consumables, for printers). Before returning merchandise, we must ask that you call our Customer Service Dept. to receive a returned merchandise authorization number (RMA). This number must be included with any printer you return. No C.O.D. returns, please.

CIRCLE 198 ON READER SERVICE CARD.
**Hard Drives and Storage**

<table>
<thead>
<tr>
<th>Model</th>
<th>Cost</th>
<th>Leased Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>40MB Hard Drive</td>
<td>$199</td>
<td>$6</td>
</tr>
<tr>
<td>52MB Quantum low profile</td>
<td>$239</td>
<td>$8</td>
</tr>
<tr>
<td>103MB Quantum low profile</td>
<td>$369</td>
<td>$14</td>
</tr>
<tr>
<td>210 MB Quantum</td>
<td>$699</td>
<td>$24</td>
</tr>
<tr>
<td>300MB Seagate</td>
<td>$1399</td>
<td>$45</td>
</tr>
<tr>
<td>300MB Wren Runner</td>
<td>$1650</td>
<td>$54</td>
</tr>
<tr>
<td>600MB Seagate</td>
<td>$1899</td>
<td>$60</td>
</tr>
<tr>
<td>600MB Wren Runner</td>
<td>$2199</td>
<td>$69</td>
</tr>
<tr>
<td>1.2GB Seagate</td>
<td>$2695</td>
<td>$85</td>
</tr>
</tbody>
</table>

**MagicDrive Accessories**

- Double-Up compression: $175, Leased: $6
- Magic SCSI II Accelerator: $899, Leased: $27

**Magic Syquest Removable Drives**

- Includes 2 Year Warranty and the Magic 30 Day Money Back Guarantee.
- 40 watt power supply, Cable & Software.
- Magic Syquest 4SR: $449, Leased: $14
- Magic Syquest 88R: $599, Leased: $24
- Syquest Cart 45MB: $69, Leased: $2
- Syquest Cart 88MB: $119, Leased: $4

**Magic Removable Optical Drives**

- The 128MB REM has a seek time of less than 35ms and a burst mode of 9ms.
- Includes MagicDrive case with a 40watt power supply, SCSI cable, software, and One Year Warranty. Internals available for Mac Quadra 900 and PC users.
- Magic 128B REM: $1499, Leased: $45
- Magic 128BREM 3.5" Cart: $79, Leased: $3
- 600 MB Ricoh ISO: $2399, Leased: $78
- 600 MB Sony Maxtor: $3199, Leased: $96
- 1 GB Tahiti Maxtor: $3995, Leased: $120
- Optical Cartridges: Call

**Magnetic Tape Backup**

- Includes Retrospect, 2 year warranty, and Magic 30 Day Money Back Guarantee.
- 40 watt power supply, Cable & Software.
- Magic Tape 1.5MB: $699, Leased: $21
- Magic Tape 2.5MB: $999, Leased: $30
- Magic Tape 1.3GB DAT: $1695, Leased: $51
- Magic Tape 2.0GB DAT: $1695, Leased: $51
- Magic Tape 2.4GB 8mm: $2895, Leased: $87
- Magic Tape 5.0GB 8mm: $4499, Leased: $135

**CD ROM Drives**

- Magic CD ROM (Toshiba): $529, Leased: $19
- Many CD-ROM software titles available!

**Storage Options**

- Bernoulli Removable 90: $969, Leased: $29
- Pinnacle RE0130 Optical: $1849, Leased: $81
- PLI Infinity Turbo 88: $899, Leased: $41
- Micronet 88 Removable: $899, Leased: $36

---

**128MB Storage for only $79. The new $1499 Magic 128REM Optical!**

128MB of storage on a removable 3.5" disk! No bigger than a floppy! MacProducts does it again with a price of only $1499!
MacProducts USA Carries Over 9,000 Products for Your Macintosh
Affordable leasing available for the entire MacProducts USA inventory. Leasing prices are denoted in the gray shaded area.

Magic 2400/1200/300 BAUD MODEM
100% Hayes compatible.
Includes 2 year warranty. .....$69 ..... $3

Magic 2400/9600 SEND/FAX MODEM
100% Hayes & Group 3 compatible
Includes 2 year warranty. .....$99 .....$3

Magic 2400 V.42 Bis MNP-5 MODEM
2400 V.42 bis MNP-5 Modem. Transmit data up at speeds up to 9,600 baud.
Includes 2 year warranty. .....$149 .....$6

Magic 9600 V.32/V.42bis MNP-5 MODEM
Transmit data at speeds up to 38.4k baud. 2 year warranty. .....$99 .....$12

Macintosh Systems

THE NEW MAC'S! Call for pricing!
Macintosh PowerBook 100...Call...Call
Macintosh PowerBook 140...Call...Call
Macintosh PowerBook 170...Call...Call
Macintosh Classic 4/40. ...$1237...$37
Macintosh Classic II...Call...Call
Classic II or LC 68822...$99...$3
Macintosh LC ........$1625...$54
Macintosh IIsi ........$2299...$72
Mac IIsi 2 Slot Adapter...$49...$2
Macintosh IICl ........$2850...$98
Macintosh Quadra 700...Call...Call
Macintosh Quadra 900...Call...Call
Quadra VRAM...$49...$2
Extended Keyboard...$99...$3

Networking Solutions

MacProducts carries networking solutions from APPLE, ASANTE, CAYMAN, SHIVA, FARALLON, STITKA, MORE
MagicNet (localtalk)...$19...$1
Magic EtherNet...$199...$6
Farallon PhoneNet...$30...$1

Video Solutions

“For a good deal on 19-inch Begams...check out the MacProducts Magic-View™ -MacWorld Oct 91
MacProducts USA carries a complete line of Video from RasterOps, Radius, E-Machines, SuperMac, NEC, and More!
MAGIC VIDEO SOLUTIONS
Magic 19 or 20" 24-bit card. Block mode & accelerator compatible...$1299...$39
Magic 13" 8-bit color card II...$269...$9
Magic 20" Trinitron...$2099...$63
Magic 19" or 20" 8-bit card...$49...$15

Scanners

Wide Selection of Scanners Available
SPECIAL MICROTEK PRICING!
MacProducts carries UMAX, Sharp, Microtek, Atabon, Canon, and More!
WHOLESALE HARD DRIVES

**Quantum**

- 52LPS 9ms: $209 ($269)
- 105LPS 9ms: $329 ($379)
- 210PRO 10ms: $615 ($675)

*PRO series drives are 3.5" half-height. LPS series drives are 3.5" Low Profile.*

**Seagate**

- 60Mb 28ms: $219
- 80Mb 20ms: $259 ($315)
- 337Mb 11ms: $1199
- 676Mb 15ms: $1579
- 1 Gig 12.9ms: $1999

*Internal drives fit the Mac II, III, and IIX.*

**Maxtor**

- 80Mb 17ms: $269 ($329)
- 125Mb 16ms: $349 ($429)
- 210Mb 15ms: $589 ($649)
- 340Mb 14ms: $939 ($999)

**Micropolis**

- 320Mb 14ms: $1099
- 660Mb 16ms: $1499
- 1000Mb 14ms: $2099
- 1354Mb 14ms: $2699

**CONNER**

- 200Mb 16ms: $599 ($655)

**SYQUEST**

- 44Mb Removable Drive with Cartridge: $419
- Additional cartridges: $66
- 88Mb Removable Drive with Cartridge: $595
- Additional cartridges: $115

**CONSUMER ELECTRONICS, INC.**

EXTERNAI: 800-755-3943  TOLL-FREE IN U.S. AND CANADA

- Zero-footprint solid metal case, dual SCSI ports for daisy-chaining, external LED, SCSI cable, power cable, ONTRACK formatting/partitioning software.
- Mounting brackets, SCSI cable, ONTRACK formatting/partitioning software.

mailto:Address: 2415 S. Roosevelt, Tempe, Arizona 85282. Code (602) 350-1171. Fax (602) 350-1171. Policy: Prices, terms & quantities subject to change without notice. All products are NEW. All products carry a standard manufacturer's warranty. No returns on opened software. BULK: No charge for MasterCard & Visa. ADDITIONAL CODE: UPS or FedEx only. ALL SOURCES carry a standard manufacturer's warranty. Warranty: no returns on opened software. BULK: No charge for MasterCard & Visa. ADDITIONAL CODE: UPS or FedEx only. ALL SOURCES carry a standard manufacturer's warranty.

**WHOLESALE SAM'S**

- One of the oldest names in the storage business.
- LOWEST PRICES AVAILABLE!
- ALL NEW EQUIPMENT!
"System seven software; super service."—Mac

Workspace
Ark Visual project organizer, document manager and automatic time tracker that will simplify working on your Mac. Access all your applications and projects from one place! Multiple rooms let you select from three offices, with more offices available in the future.

Bemoulli Transportable 90 Meg
IOMEGA IOMEGA, long known for reliability, now offers fast, 19 millisecond access time, and affordable removable storage with a 5-year warranty. Durable in design and built for speed.

Far Side Calendar
Amazelnc Your favorite Far Side characters make random on-screen appearances, but this light-hearted organizer does more than entertain. Features a cartoon a day, day/week/month/year at a glance, audio alarm and more.

DayMaker
Pastel Development Get all your personal information together with DayMaker. Information tools include advanced schedule and to-do list management, categories, priorities, alarms, tickler reminders, address books, phone dialing, Gantt charts, import/export, and calendar output to Filofax pages.

QuicKeys 2.1
CE Software The System 7 savvy version of the leading macro product for the Macintosh. In addition to being fully 32-bit clean and offering Balloon Help, QuicKeys 2 can "drive" applications that support Apple® Events through its Apple Events Extensions.

More After Dark & After Dark/M.A.D. Bundle
Berkeley Systems Over 25 incredible new displays for After Dark, including Berkeley contest winners Mowin' Man, GraphStat, and Tunnel, plus many beautiful new fish. Includes Virex-D® virus detector module from Microcom. Requires After Dark (order the bundle and save!).

ColorPage T16 Trinitron
E-Machines An affordable full-page 16-inch display with 72 dpi resolution. Features Sony Trinitron technology for sharp, high quality picture. Uses the built-in video on the new Mac Quadra/040. MacUser five-mouser for three years in a row. Ask about rebates!

Painter/Wacom Tablet
Fractal/Wacom Personal Publishing's painting product of the year! Painter delivers real natural media effects, brushes, pens, chalks, and paper grains (22 included). The Wacom tablet has the premier pressure sensitive stylus.
Our people use most ever

Access CD Allegro
Optical Access Intl.  The fastest CD-ROM drive available with a 310 ms. access time. Includes SuperCache® software for lightning speed access to large amounts of information. Features headphone jack, stereo RCA type audio connectors, and deluxe desk accessory. Includes cable, sample CD, and one caddy.

$648

Call

PowerBook RAM
Mac's Place  PowerBook RAM
Now available! RAM for your Powerbook 100, 140 or 170. Expand to 4, 6 or 8 megabytes Available from Mac's Place. Call for pricing today.

Sherlock Holmes Consulting Detective CD
ICOM  Match your wits with the super-sleuth! Over 90 minutes of full-motion video let you take Sherlock and Watson through the streets of London to interrogate suspects and solve three murder mysteries. Unbelievable fun!

$44

PowerBundle
T/Maker  A collection of specially selected software for Mac PowerBooks bundled together in a high quality custom carrying case. Includes WriteNow, ClickArt for Faxes, AddressBook Plus, Business Expense Reports, and America Online. A $588.80 value!

$158

Showplace/MacRenderMan CD-ROM
Pixar  This CD-ROM is packed with plenty of programming. First, there's Showplace and MacRenderMan. Plus online documentation for both products, a gallery of images created with Pixel products, a sample of Pixar animations, and information about Pixar and its products.

$644/448

Nautilus Backpac
Discovery  Sample top-selling Mac CD ROM products! Backpac trial subscription includes six CD ROM issues of NAUTILUS with over 2 gigabytes of software including game sound effects, music tracks, MIDI, digitized photos, Hypercard® stacks, multimedia presentations and more.

$44

Hard Drive TuneUp Includes System 7!
Software Architects  Everything—and we mean everything—you need to switch to System 7. Includes The System 7 Book by Craig Danuloff and exclusive Hard Disk TuneUp software that lets you prepare your hard disks for System 7 safely and easily. Allows you to upgrade your drive to take advantage of new System 7 features. Makes your drive run faster and safer too! Supports Apple and most third party hard drives. Includes 3-month membership in Corvallis Macintosh Users Group, incl. newsletters. get all this and CMUG gives you System 7 free. Limited time offer—order today.

$59

DTPro CD ROM
FM Waves  Well over 500 professional EPS images for the discriminating designer. Borders, Icons, Arrows and Design elements for newsletters, magazines, office memos, faxes and all of your creative projects. Graphic Originals—Clip Art with an Attitude: For Distinctive documents, fascinating forms and notable newsletters pick from one of 15 collections between $28 and $58 each set.

$88

“System seven software

Mac's Place Call 1-800-367-4222 or Fax your P.O. 1-206-881-3090
2 System 7 Compatible  2 System 7 Savvy  2 30-60 Day Money Back Guarantee
Ray Dream Designer and Jag
Ray Dream © Ray Dream Designer is 3D illustration software, designed to produce high-resolution, full-color graphics with illustration tools like Beziers, curves. Supports CAD software with 3D export. Jag gets rid of the jagged edges in artwork created in any Mac color paint, photo-retouching, multimedia or 3D software (PICT/PICS).

MICRO PLANNER Manager
Micro Planning Intnl. © The ultimate in power, presentation graphics, and ease of use for managing projects of up to 1,500 tasks. Features PERT, GANTT, Outline, or Table formats. Plus custom screens, reports, and chart symbols.

$589/68

PowerKey 2.0 w/QuickKeys Lite
Sophisticated Circuits © Turns on your Macintosh and peripherals from the keyboard. Programmable with an on/off schedule. New open architecture allows access from other applications such as MicroMat's MacEKG. Remote option lets you turn on your system with a single phone call. Works with all ADB equipped Macs. Supports Apple events.

$75

FolderBolt
Kent Marsh Ltd. © Here's simple, effective desktop security. FolderBolt lets you password protect any single folder or group of folders, including the system folder. Creates drop, read only or completely locked folders.

$78

MacEKG
MicroMat © Now includes a new utility called REActivator, which interfaces to Sophisticated Circuits PowerKey 2.0, allowing technicians to REALLY test all the of the Mac's facilities. Virtually a "diagnostic dashboard" for your Mac.

$63

Easy Alarms 1.5
Essential Software © Like having a personal secretary! Easy Alarms organizes your schedule, maintains your "to do" list and reminds you of events. With network-wide calendar access, user scripting, AppleEvents sending and receiving, and Notify Pager (beeper) support.

$32

FolderBolt
Kent Marsh Ltd. © Here's simple, effective desktop security. FolderBolt lets you password protect any single folder or group of folders, including the system folder. Creates drop, read only or completely locked folders.

$78

"Call today. Use it tomorrow."—Mac
ThoughtPattern

BananaFish Software 70 Get organized and work more efficiently with ThoughtPattern, the information manager that lets you integrate notes and files. Features automatic cross-referencing, powerful searches, alarms, priorities and direct launching of other applications.

DiskTwin and TwinIt

Golden Triangle 00 Continuously back up your hard disk to another storage device to eliminate downtime. DiskTwin provides simultaneous backup for file servers and mail servers and requires no network downtime in the event of a primary drive failure. TwinIt offers low-cost software mirroring.

Star Trek Sounds

Sound Source Unlimited 0 Set your Mac on stun with these exciting new Star Trek sounds—just in time to celebrate the tv show's 25th anniversary. Two volumes of high-quality digital recordings: Volume One, "The Logical Collection", includes everyone's favorite dialog, sound effects, and music cues. Volume Two, "The Final Frontier," features sounds ideally suited to the hard-core Trekkie.

Tesserae and Mutant Beach

InLine Design 00 Stunningly beautiful Tesserae, a refreshing, exasperating full-color puzzle that's both beautiful and addictive. 1991 Mac World Game Hall of Fame Winner! Take your Mac to Mutant Beach! The fully-animated, full-color interactive action adventure that's state of the art.

ORDER INFO

Mac's Policies

Visa, Mastercard, American Express, and OPTIMA gladly accepted.

Your credit card is never charged until your products ship.

When a partial order is shipped, no additional freight is charged for shipments that complete the order (U.S. only).

Most items carry the manufacturer's 30-60 day Money-Back Guarantee (M6G). Mac's Place has a 30 day M6G on all hardware (USA only). We maintain the right to limit quantities on M6G returns. Ask for details when ordering.

120 day limited warranty on all products, some hardware items carry 90 and two year warranties. Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion. Loan drives subject to availability (USA only).

Min. personal and company checks accepted upon receipt to insure immediate shipment. For non-standard checks and checks over $1,000, allow ten working days for clearance.

No sales tax (except WA residents and 8.2% to total, including shipping).

All returns must have an authorization number. Please call 800-367-4222.

All prices & promotions subject to change without notice. All items subject to availability. Not responsible for typographic errors.

Orders USA: Orders placed weekdays by 7:30 pm E.S.T., 4:30 pm PST, for "in stock" items shipped same day (depending on item, carrier, etc.) for overnight delivery via Airborne Express. Our $3.00 shipping charge includes insurance at no extra charge. Rural locations may require an additional day for delivery. Areas not serviced by Airborne will be sent via U.S. Postal Service. Second Day Alaska & Hawaii orders ship UPS 2nd day air. Alaska customers outside metropolitan areas pay full shipping charges, and for taxes.

Purchase Orders: Government, School, and Institutional P.O.'s cleared immediately. Corporate P.O.'s subject to credit approval.

Full shipping charges apply, prepaid and added. International Orders: Call 206-883-8312. We also ship throughout the free world via Airborne Express International. Contact Mac's Place for information. Mail, FAX or electronic orders gladly accepted. Electronic Mail Orders: Compuserve (76635.660), Gemini (PLACE), America Online (MacPlace). Mac's Place uses CE Software's QuickMail™ to check your mail each hour.

Phone: 800-367-4222, 206-883-8312, FAX 206-881-3090 (©1991 Mac's Place, Inc). Like all aspects of Mac's Place's operation, this ad was entirely designed and assembled using Macintosh technology. No paste-up. No stencils.

Mac's Place: 8461 NE 156th Ave NE, Redmond, WA 98052

Mac's Policies:

• Visa, Mastercard, American Express, and OPTIMA gladly accepted.
• Your credit card is never charged until your products ship.
• When a partial order is shipped, no additional freight is charged for shipments that complete the order (U.S. only).
• Most items carry the manufacturer's 30-60 day Money-Back Guarantee (M6G). Mac's Place has a 30 day M6G on all hardware (USA only).
• We maintain the right to limit quantities on M6G returns. Ask for details when ordering.
• 120 day limited warranty on all products, some hardware items carry 90 and two year warranties. Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion. Loan drives subject to availability (USA only).
• Min. personal and company checks accepted on receipt to ensure immediate shipment. For non-standard checks and checks over $1,000, allow ten working days for clearance.
• No sales tax (except WA residents and 8.2% to total, including shipping).
• All returns must have an authorization number. Please call 800-367-4222.
• All prices & promotions subject to change without notice. All items subject to availability. Not responsible for typographic errors.
• Orders USA: Orders placed weekdays by 7:30 pm E.S.T., 4:30 pm PST, for "in stock" items shipped same day (depending on item, carrier, etc.) for overnight delivery via Airborne Express. Our $3.00 shipping charge includes insurance at no extra charge. Rural locations may require an additional day for delivery. Areas not serviced by Airborne will be sent via U.S. Postal Service. Second Day Alaska & Hawaii orders ship UPS 2nd day air. Alaska customers outside metropolitan areas pay full shipping charges, and for taxes.
So many products. So little information. Too few facts and too much hype. With so many Macintosh products crowding today's market, how do you choose the ones that work best for you? Simple. You ask the experts at Mac's Place. You see, since we run our company entirely on Macs*, you can bet we know exactly what works...and what doesn't. Take System 7. We've made it our business to know what software is compatible, so you can upgrade without wasting any of your money or time. Our customers keep marvelling at how well we listen and answer questions. Why discover later that you've ordered the wrong product? Just one short phone call can point you the right way.

Our Hours: Monda y through Frida y 6AM-10PM PST and Sa t/Sun 6AM-6PM PST  Call 1-800-367-4222 US & Canada

*Here at Mac's Place we run our company on Macs. Completely. We understand Macintosh products better than anyone because we use them every day. And since our salespeople aren't on commission like other companies we know, we'll guide you to exactly the right products without wasting your time and money. That's what customer service is all about. Right?
Accountant Inc./Multi-User
SoftSync $568
"The most complete integrated accounting and financial-management package for the Mac..." (MacUser) now supports multi-user networks. Includes invoicing, accounts receivable & payable, inventory, checking, payroll, general ledger and financial reporting.

Specular $647
Integrated 3D modeling, rendering, animation with an interface so easy you'll create stunning photo-realistic graphics within hours. Includes 250 surface libraries, full tutorial, animation viewer. Version 1.1 supports System 7, True Type fonts.

Timeslips III 2.1
Timeslips $192
NEW! Complete time keeping and billing package. TSTimer DA captures time data. TSReport extracts that data and generates custom invoices and a wide variety of reports. Handles up to 250 users, 250 activities, 3000 clients and 128 projects per client.

In Control
In Control Corporation
$94
Are projects getting out of hand? Stay in control with this indispensable application that organizes, categorizes and prioritizes your "to do" list. You get the flexibility of an outline with the power of a row-and-column format.

Flight Simulator Scenery Upgrades
Mallard $30

Deadly Games $31/ea

MouseStick (ADB)
Advanced Gravis $39/59
Only joystick fully compatible with MS Flight Simulator 4.0. Take advantage of Flight Sim's advanced controls for single or dual stick play. Program buttons to execute any Flight Sim. keyboard command, for the most fun in flight.

WristSavers
L.B. Innovators, Inc. $12/ea
Give your wrists a rest! The contoured pad by your keyboard supports your wrist; helps reduce the risk of Carpal Tunnel syndrome. The mousepad also incorporates a contoured wrist pad. Both are neoprene with washable nylon coverings.

Call 1-800-367-4222 US & Canada • Visa/MC/AMEX accepted
service and delivery.” —Mac
Get Ready!

E-MACHINES

16/" ColorPage Display
Always perfect for LC, Ilci, Illc & Quadra built-in video

$1,095

E-MACHINES TX
16" Two-Page Sony
Trinitron Color Display

$1,750

E-MACHINES T19
19" Two-Page Sony
Trinitron Color Display

$2,795

Now the Award-winning
T16 is "Quadra-Ready"

Pick a Card. Express Direct is E-Machines' largest retailer worldwide (over 100 Display Systems in stock!) So whether it's 8-bit or 24-bit, 16" or 19", let our consultants advise you on the right Color Card and the right Display perfect for your application needs. (Depending upon your particular Mac, some of these displays may require the purchase of a video card. Call for details.)

Pick a Mac. Now get Norton Utilities for the Macintosh FREE when you purchase a Mac cpu with a display! Norton Utilities version 1.1, now supporting System 7.0, has even more powerful features than ever. Note: market fluctuations & magazine deadlines don't always allow us to advertise our latest price. So call us before you buy from just anybody!

Classic, 2/40...$1,049
Mac Ilci, 5/0....$2,799
Quadra 700, 4/0...$4,399
Mac Ilci, 3/40......Call
while quantities last
Quadra 900, 4/0...$5,595

The Express Advantage. Mac Systems in stock - many ready for same day shipping E Unlimited Toll-Free Telephone Support E Experienced, knowledgeable Macintosh Sales Professionals E Exclusive ExpressCare™ Service Agreement E Leasing Terms available on most products.

"The Mac Systems Company"

1801 West Larchmont Ave. • Chicago, Illinois 60613 USA • 312.549.0030 • FAX 312.549.6447

International Orders Shipped Daily • FAX 312.549.6447

Credit card orders are not charged until product is shipped. Prices subject to change without notice. All warranties on Macintosh or Apple brand products sold by Express Direct will be honored by Express Direct or its authorized agents only. All other manufacturers' warranties still apply.
FREE SHIPPING
Most orders shipped via 2-day air
GREAT PRICES
On the latest versions of your favorite products

- Microtek TrueLaser $1480
- Syquest 88MB rem dr $699
- QMS-PS 410 300 dpi Laser Printer (4-ppm) with Serial, Parallel or AppleTalk auto switching for $1,695
- QMS-PS 815MR 300 dpi & 600 dpi Laser Printer (8-ppm) with Serial, Parallel or AppleTalk auto switching for $4,195

Let's Be Sure Our Children Grow Up Smart And Fit.
There's another part of our children's education that's just as important to their future as the "3Rs"—physical education. The healthy hearts they develop now will go a long way toward helping them grow into healthy adults. And best of all, the good fitness habits they learn can stay with them for a lifetime.

Let's Be Sure
Our Children
Grow Up Smart
And Fit.

GREAT PRODUCTS
Choose from more than 4,000

- Memory
- Fax/Modems
- Printers
- Scanners
- OCR Devices
- Music & MIDI
- Business Presentation
- Kitchen Sinks

GREAT SERVICE
60-day money back guarantee on most defective items
Free shipping—1 to 3 days delivery on most items

3.5" Double Side Disks
- 3M $7.19
- Sony $7.19
- Maxell $7.19
- Verbatim $7.19
- KAO $6.89
- BASF $6.59
- TDK $6.49
- Nashua $6.29
- Precision $4.79
BULK (Sony No-Logo) $0.49 ea.

3.5" High Density Disks
- 3M $11.99
- Sony $11.99
- Maxell $11.99
- Verbatim $11.99
- KAO $11.59
- BASF $10.99
- TDK $10.79
- Nashua $10.79
- Precision $9.29
BULK (Sony No-Logo) $0.89 ea.

"Call" for Data Cartridges, 4mm & 8mm Backup Tapes, Ribbons, Fax Paper, Laser Toners, Optical Disks, & 3M Office Products

Let us quote you on the QMS-PS 825MR or the QMS ColorScript 100 of your choice. Ask about our Leasing Terms & warranties.

DISKETTE CONNECTION
WAREHOUSE LOCATIONS NATIONWIDE
PO BOX 1674, BETHPANY, OK 73005

EAST
1-800-451-1849

SOUTHEAST
1-800-940-4600

MIDWEST
1-800-654-4058

WEST - HAWAII & ALASKA
1-800-621-6221

Minimum Order $20.00 NO SURCHARGE on VISA / MC orders add $1.75. Shipping charges determined by items and delivery method required by customer. (Prices are subject to change without notice.)

FAX Order Line (405) 495-4598

CIRCLE 122 ON READER SERVICE CARD.
### CALL FOR POWERBOOK RAM

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seiko CM-1445</td>
<td>$539</td>
</tr>
<tr>
<td>LC Math 68822 FPU</td>
<td></td>
</tr>
<tr>
<td>or 512k VRAM</td>
<td>$79</td>
</tr>
</tbody>
</table>

### DGR 128MB Removable 3.5" Erasable Optical $1499

- Erasable Optical Drive with 35ms access.
- 3.5" 128MB Cartridges only $99

### NETWORKING

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>QuickMail 10 User</td>
<td>$285</td>
</tr>
<tr>
<td>Sierra Ethernet / FastPort</td>
<td>$150</td>
</tr>
<tr>
<td>Sierra Assistant/FP Bridge</td>
<td>$150</td>
</tr>
<tr>
<td>Tintu/Remote Access Pkg</td>
<td>$150</td>
</tr>
</tbody>
</table>

### HARDWARE

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIMMs all types/best prices</td>
<td></td>
</tr>
<tr>
<td>Apple 13&quot; High End R/g</td>
<td>$697</td>
</tr>
<tr>
<td>Apple LaserWriter I 2MB</td>
<td>$276</td>
</tr>
<tr>
<td>Apple LaserWriter II 25MHz/600</td>
<td>$503</td>
</tr>
<tr>
<td>Apple StyleWriter</td>
<td>$425</td>
</tr>
<tr>
<td>Apple StyleWriter Ret. + 2xPkg</td>
<td>$180</td>
</tr>
<tr>
<td>Apple Personal LaserWriter LS</td>
<td>$915</td>
</tr>
<tr>
<td>Apple Personal LaserWriter NT</td>
<td>$1750</td>
</tr>
<tr>
<td>Adcon 300 Scanner + PhotoShop</td>
<td>$1949</td>
</tr>
<tr>
<td>ATTO Ici Cache Card</td>
<td>$149</td>
</tr>
<tr>
<td>Card Type/Plus Graphics</td>
<td>$425</td>
</tr>
<tr>
<td>Chinese CD-ROM</td>
<td>$325</td>
</tr>
<tr>
<td>Counter 9000-32 MNP-5</td>
<td>$999</td>
</tr>
<tr>
<td>Datadisk Keyboard 1011</td>
<td>$115</td>
</tr>
<tr>
<td>DigiVideo Color TV/Amiga</td>
<td>$189</td>
</tr>
<tr>
<td>E-Machines 11.2</td>
<td>$189</td>
</tr>
<tr>
<td>E-Machines 11.4</td>
<td>$257</td>
</tr>
</tbody>
</table>

### SOFTWARE

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MacWrite Pro</td>
<td>$249</td>
</tr>
<tr>
<td>Office Pro</td>
<td>$315</td>
</tr>
<tr>
<td>Office 2</td>
<td>$315</td>
</tr>
<tr>
<td>Office 3</td>
<td>$315</td>
</tr>
<tr>
<td>Office 4</td>
<td>$315</td>
</tr>
<tr>
<td>Office 5</td>
<td>$315</td>
</tr>
<tr>
<td>Office 6</td>
<td>$315</td>
</tr>
<tr>
<td>Office 7</td>
<td>$315</td>
</tr>
<tr>
<td>Office 8</td>
<td>$315</td>
</tr>
<tr>
<td>Office 9</td>
<td>$315</td>
</tr>
<tr>
<td>Office 10</td>
<td>$315</td>
</tr>
</tbody>
</table>

### MICROTEK TRUELASER

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>RISC boxed up to 3.5MB RAM</td>
<td></td>
</tr>
<tr>
<td>$1248 On Site Warranty</td>
<td></td>
</tr>
</tbody>
</table>

### QMS PS-410 $1629

- 300 DPI Postscript
- Auto PC-Mac Switching
- 45 resident Fonts
- 2MB RAM
- With Toner Cartridge
- QMS 2MB Upgrade $210
- QMS 4MB Upgrade $360

### QUARK XPRESS 3.1 $511

Ask about our wide selection of Quark XTensions.
TURBO MICRO LASER PS/35 $1949
9 ppm engine • Postscript Level 2 RISC processor
Appletalk interface included on all models
16ppm Turbo microLaser PS/35 XL $3129

RASTEROPS

NEW! RasterOps CorrectPrint $7250
RasterOps 364 24-bit Video Frame Grabber $724
RasterOps 24/TV $1152
RasterOps 244 $658
RasterOps Video Frame Grabber... $486
RasterOps 244/TV $269
RasterOps 8XU 4-bit $1299

SHIVA NET MODEM v.32
ZOOM 24196 SendiRecive Fax
TI microlaser PS XL 17
TI microlaser PS XL 35
TI Envelope Feeder
WacomTablet-All Models Call
DiskFit 2.0

DRIVES & TAPES

NEW! PowerCache for the LC, SE/30, II, IIsi, IICx, & IIci
33 MHz PowerCache...... $624
40 MHz PowerCache...... $817
50 MHz PowerCache...... $1282
50 MHz PowerCache with 68822 Coprocessor... $1006
NEW! FastCache IIi...... $249

NEW! Faster exclusively with RasterOps

CALL FOR MORE INFORMATION

HOW TO ORDER: Visa, MasterCard, Discover (no surcharge), check, and CODs. 6% sales tax on GDPs. Texas residents add 8% sales tax. Prices and items subject to change and availability. International: 5% surcharge on international orders. Mail to: Order accepted with a $50 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. Returns must be in original condition and package and require an RMA. Neal 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 typograpgy or photography.
America's Largest Macintosh Hardware Source

**Quantum**

**Hard Disk Drives**

Internals:
- 52MB: $229
- 105MB: $339
- 210MB: $639
- 425MB: $1199

Exterals:
- 52MB: $289
- 105MB: $389
- 210MB: $689
- 425MB: $1299

**SyQuest Removable Hard Disk Drives**

<table>
<thead>
<tr>
<th>Drive Type</th>
<th>Capacity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>44mb Removable Drive</td>
<td>44MB</td>
<td>$399*</td>
</tr>
<tr>
<td>88mb Removable Drive</td>
<td>88MB</td>
<td>$599*</td>
</tr>
</tbody>
</table>

*Cartridge Not Included

**Cartridges**

<table>
<thead>
<tr>
<th>Type</th>
<th>44MB</th>
<th>88MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single Cartridge</td>
<td>$66</td>
<td>$109</td>
</tr>
<tr>
<td>5 Pak - Each</td>
<td>$64</td>
<td>$105</td>
</tr>
<tr>
<td>10 Pak - Each</td>
<td>$62</td>
<td>$99</td>
</tr>
</tbody>
</table>

**Combination Units**

<table>
<thead>
<tr>
<th>Combo</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>SyQuest 44/SyQuest 44</td>
<td>$799</td>
</tr>
<tr>
<td>SyQuest 44/SyQuest 52</td>
<td>$699</td>
</tr>
<tr>
<td>SyQuest 44/Quantum 105</td>
<td>$799</td>
</tr>
<tr>
<td>SyQuest 44/Quantum 210</td>
<td>$1,099</td>
</tr>
<tr>
<td>SyQuest 44/Quantum 425</td>
<td>$1,499</td>
</tr>
<tr>
<td>SyQuest 88/SyQuest 88</td>
<td>$1,199</td>
</tr>
<tr>
<td>SyQuest 88/Quantum 52</td>
<td>$899</td>
</tr>
<tr>
<td>SyQuest 88/Quantum 105</td>
<td>$999</td>
</tr>
<tr>
<td>SyQuest 88/Quantum 210</td>
<td>$1,299</td>
</tr>
<tr>
<td>SyQuest 88/Quantum 425</td>
<td>$1,699</td>
</tr>
</tbody>
</table>

To Order Call 1-800-333-3353  Customer Service Call 1-800-388-3118
MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282  (602) 820-5802
24 Hr. Fax: (602) 345-2217
Microtek
TrueLaser
• 300dpi
• PostScript® Clone
• 35 Resident TrueType Fonts
• RISC Processor
$1,349

QMS
PS410
• 300dpi
• 35 PostScript® Fonts
• Auto-Switching: Mac/PC
• 4 ppm Print Speed
$1,699

QMS
815MR
• 300 or 600 dpi
• PostScript® Compatible
• Auto-Switching: Mac/PC
• 8 ppm Print Speed
$4,250

NEC
Silentwriter 2 MODEL 90
• 300dpi
• 35 PostScript® Fonts
• 6 ppm Print Speed
• 2mb RAM
$1,599

RasterOps
CorrectPrint 300
• 300dpi
• Dye-Sublimation
• Photorealistic Color Printer
• Introductory Price
$7,499

Hewlett Packard
Deskwriter
• Thermal Inkjet Method
• 300dpi
• Letter, Legal, Envelope, Transparency
$419

QMS
815MR
• 300 or 600 dpi
• PostScript® Compatible
• Auto-Switching: Mac/PC
• 8 ppm Print Speed
$4,250

QUME
MacPublisher
• RISC Processor
• 2MB RAM
• PostScript® Compatible
• 6ppm
• 300dpi
$1,599

Hewlett Packard
Color Deskwriter C
• Letter, Legal, Envelope, Transparency
$769

QUME
CrystalPrint Pub II
• RISC Processor
• 6ppm
• PostScript® Compatible
• 3MB RAM
• 300dpi
$1,995

QUME
CrystalPrint Express
• RISC Processor
• 12ppm
• 300dpi
• PostScript® Compatible
• 3MB RAM
$2,995

To Order Call 1-800-333-3353 Customer Service Call 1-800-388-3118
MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217
MONITORS

ORION TECHNOLOGIES

MacScan ULTRA
*14" Color Multiscan Monitor
Your Price ........$369

GOLDSTAR

1450 Plus
*14" Color Monitor
Your Price ........$349

SEIKO

CM1445
*14" Trinitron Color Monitor
Your Price ........$589

E-MACHINES

T-16 Trinitron
*16" Color/8 Bit Bundle
Your Price ......$1,995

Lapis Technologies, Inc.

ColorServer LC-17..$379
ColorServer LC-21..$509

ColorServer PDS/30-17 ........$379
ColorServer PDS/30-21 ........$509

ColorServer II-17.....$379
ColorServer II-21.....$509

Full Page Display/Card Bundle
Two Page Display/Card Bundle
$489       $899

MAGNAVOX COLOR MONITOR BUNDLES

14" Color Monitor/ 24 BIT Video Card (II) ..............$929
14" Color Monitor/ 24 BIT Video Card (SE30) ............$1,069

20" Color Monitor/ 8 BIT Video Card (II) ..............$1,999
20" Color Monitor/ 8 BIT Video Card (SE30) ............$1,999

MAGNAVOX

9CM080
*14" Color Monitor
Your Price.......$469

MagnaScan/20
*20" Color Monitor
Your Price.......$1499

NEW! From
ORION Technologies

MacScan ULTRA
14" Color Multiscan Monitor
$369

MICROTEK

600zs Color Scanner
*600dpi Scanning
*Includes Photoshop 2.0
Special Price
$1399

NEW!
MICROTEK

ScanMaker1850s
*1850dpi Slide Scanner
*Includes Photoshop 2.0
Special Price
$2,199

To Order Call 1-800-333-3353 Customer Service Call 1-800-388-3118
MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802
24 Hr. Fax: (602) 345-2217
## MEMORY CONNECTIVITY

**PSI Integration**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>PSI MultiColor 8/16 bit Color LC Video SIMM</td>
<td>$105</td>
</tr>
<tr>
<td>Crunch-it!</td>
<td>$119</td>
</tr>
<tr>
<td>LC Bundle MultiColor and Crunch-it! bundled</td>
<td>$199</td>
</tr>
<tr>
<td>030 Adapter Card</td>
<td>$299</td>
</tr>
<tr>
<td>Ilsi Extender Card w/ FPU &amp; Cache socket</td>
<td>$129</td>
</tr>
<tr>
<td>Cache-it! 64k, 20MHz Cache SIMM</td>
<td>$199</td>
</tr>
<tr>
<td>Cache-it! Bundle 030 Adapter Card and Cache-it! Bundle</td>
<td>$309</td>
</tr>
<tr>
<td>COMstation 1 Modem Ext. 9600bps s/r fax, 2400bps s/r data</td>
<td>$239</td>
</tr>
<tr>
<td>COMstation 2 Modem Ext. 9600bps s/r fax, 2400bps s/r data w/ V.42, V.42bis, V.23, MNP5</td>
<td>$289</td>
</tr>
<tr>
<td>COMstation 4 Modem Ext. Networkable 9600 s/r fax, 2400 s/r data</td>
<td>$459</td>
</tr>
</tbody>
</table>

**Ethernet Cards for Macintosh**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACCON+II64 (Mac II Thick/Thin w/64k)</td>
<td>$299</td>
</tr>
<tr>
<td>MACCON+I1ET 64 (Mac II Thick/10BaseT w/64k)</td>
<td>$299</td>
</tr>
<tr>
<td>MACCON+LC w/ FPU (MacLC Direct Slot: Thin/10BaseT)</td>
<td>$379</td>
</tr>
<tr>
<td>MACCON+30IET (Mac SE30 Thin/10BaseT)</td>
<td>$299</td>
</tr>
<tr>
<td>MACCON+30IET64 (Mac SE30/SL 10BaseT w/64k)</td>
<td>$299</td>
</tr>
</tbody>
</table>

**Ethernet Adapter Cards...Lifetime Warranty!**

<table>
<thead>
<tr>
<th>Model</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nubus Thin/10T/AAUI</td>
<td>$219</td>
</tr>
<tr>
<td>SE/30 10T/Thin</td>
<td>$219</td>
</tr>
<tr>
<td>Ilsi 10T/Thin (Includes: PDS/30 Adapter w/ FPU Socket)</td>
<td>$279</td>
</tr>
<tr>
<td>LC 10T/Thin</td>
<td>$219</td>
</tr>
</tbody>
</table>

**Other Great Deals!**

<table>
<thead>
<tr>
<th>Product</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kensington Turbo Mouse ADB</td>
<td>$109</td>
</tr>
<tr>
<td>MacPro Keyboard</td>
<td>$139</td>
</tr>
<tr>
<td>Daystar FastCache Iicr</td>
<td>$269</td>
</tr>
<tr>
<td>ZoomExt. 24/96 S/R Fax Modem</td>
<td>$149</td>
</tr>
<tr>
<td>Abaton Interfax 24/96 Modem</td>
<td>$299</td>
</tr>
</tbody>
</table>

**Payment Methods Accepted:**

- MasterCard
- VISA
- Discover
- Macland

C.O.D.'s payable with Cashier's Check or Money Order.

To Order Call 1-800-333-3353 Customer Service Call 1-800-388-3118

MacLand, Inc. 4685 S. Ash Ave., Tempe, AZ 85282 (602) 820-5802

24 Hr. Fax: (602) 345-2217

CIRCLE 150 ON READER SERVICE CARD.
The MICRODISK from Micropolis...
Large Capacity, High-Performance
External Drives

According to Byte magazine's extensive tests, the Microdisk is the fastest MAC drive available. With record-setting effective access times as low as 3.9 milliseconds and data transfer rates as high as 10.0 megabytes/second, the Microdisk is the drive you need for high-performance applications.

And, the Microdisk tops the list for reliability with a 150,000 hour mean-time-between-failure rating. Combine all this with a five-year disk drive warranty and you have the best drive for your money.

MICROPOLIS

If You Need High-Capacity, Speed and Reliability...
Call Us Today!

DIRECT/TECH
800-279-5520

CIRCLE 33 ON READER SERVICE CARD.
POWER PRICED

NEW LOWER PRICES

POWER PACKED

POWER Drive

HARD DRIVES

Seagate 28mb...$219 $249
Quantum 17...$249 $299
Maxtor 17...$279 $339
Quantum 16...$349 $399
Maxtor 15...$599 $679
Quantum 16...$629 $689
Maxtor 14...$999 $1049
Micropolis 14 NA $1199
Microvision 16 NA $1599
Maxtor 13 NA $2199
Quantum 13 $1299 $1799
Micropolis 14 NA $2699

REMOVABLE HARD DISK

SyQuest 44Mb...$449
Includes 46Mb cartridge. Extra Cartridge $79
SyQuest 88Mb...$649
Includes 88Mb cartridge. Extra Cartridge $119

OPTICAL STORAGE

CD-ROM...$539

TAPE BACKUP

2.0Gb 4mm DAT...$1495
Includes Retrospective software, box, 1 cartridge & cables.
250Mb SANKYO...$549
External. Includes tape & backup software.
Extra 150Mb Tape...$49

MEMORY

1Mb (5V-50ns)...$39
4Mb (5V-50ns)...$159

POWER PRICED

NEW super low prices
We buy quality components in huge volume & pass the savings to you!

POWER PACKED

Choice of brand name hard drives
Super FAST access time: 12ms - 28ms
50,000+ hours MTBF
Whisper-quiet fan
50-pin connectors to daisy-chain
Steel case for low heat & support

POWER Drives
By the experts at HDI, since 1987
Compatible with ALL Mac Systems
Toll-free technical support
Step-by-step Manual included
30-day "Worry-Free" Guarantee
1 & 2 Year Replacement Policies
This printer is so fast it gets speeding tickets!

**microLaser Turbo**

- Waitex RISC processor
- Postscript Level 2
- 35 Adobe scalable fonts
- 2.5 Meg RAM standard
- Upgradable to 10.5 Meg RAM
- Mac & PC compatible
- 3 Interface Ports: AppleTalk, RS-422, RS-232-C
- Automatic switching between ports - all ports are hot

**microLaser Turbo XL CALL!**

- Automatic emulation switching
- Free Paper Tray Management Software
- Optional envelope feeder
- Optional 500 sheet second paper drawer
- Hewlett-Packard Laserjet Series II emulation
- 6 Times Faster Than Other Postscript Printers

**NEW! microLaser Plus**

- The microLaser is now the microLaser Plus, with a 9 page per minute engine!

**microLaser Plus**

- PS17: $47/mo* $1265
- PS35: $58/mo* $1565
- XL PS17: $90/mo* $2425
- XL PS35: $100/mo* $2725

**microLaser XL CALL!**

- 16 pages per minute

**POSTSCRIPT PRINTERS**

- LabelWriter II/II Plus
  - $189/$299
- AddressWriter Envelope Printer
  - $479

**NEW! microLaser Accessories & Supplies**

- 110 & 220 Volt MICROLASERS AVAILABLE

**SCANNERS**

- Caseo TYPIST
  - $465
- Sharp
  - $489 SPECIAL
- UMax
  - UC630 Color (600 dpi) $1395

**DATA MODEMS**

- 2400 bps
  - Computer Peripherals, Inc. 5 Year Warranty $79
  - ViVa 24 $125
  - ViVa 24m (MNP 5) (free software & cable) $179
  - Global Village Teleport Call $129
  - Prometheous $139
  - ProModem 2400Mini Plus V.42bis $695
  - US Robotics Dual Standard V.32bis $895

**FAX MODEMS**

- Abaton InterFax 24/96 Networkable! Ask For Details $279
- DoveFax $249
- DoveFax Plus $325
- DoveFax Lan Call

- Global Village
  - TelePort $179
  - TelePort PowerPoint V.32 Call
  - Prometheous $599
  - Ultima 14.4/9600 V.32bis, V.42bis $689

- US Robotics Courier
  - “Fastest V.32bis modem” InfoWorld $695

- 800-950-3726 FAX 512-476-3726

- Prices valid 1/1/92 - 1/28/92

- MacCenter 1991, 1992

- MacCcenter THE CENTER OF THE MACINTOSH UNIVERSE™

- Upgrade your MICROLASER or MICROLASER XL to a Turbo CALL!
CLASSIC ACCELERATION!
Tired of the big Macs kicking sand in your face? Get a Classic Accelerator™ with the unparallelled speed, power and productivity of the 68030 for the Mac Classic! It has it all: 16 MHz 68030 CPU, 20 Megabytes of RAM using 4 meg SIMMs, optional 68882 co-processor, System 7.0 compatibility, bootable RAM Disk, optional video adaptors permitting use of up to two page monitors, and optional Virtual 3.0 from Connectix. And now with new low pricing, it's a better deal than ever before!

Classic Accelerator™ Faster than the Classic II!

Your SE, Plus, 512K growing mass on it’s north side? Get the accelerators MacWorld called the “Best Value” in compact Mac Acceleration! $569

SE 16 MHz 68030 Faster than most 25’s $399
SE 25 MHz 68030 Faster than most 33’s $679

REMOVABLE DRIVES
EAGLE™
The Only Removable Drives With A Five Year Warranty!

Eagle SyQuest
$499

Eagle 88
$795

IMomega
Sermaculi 90mb Cartridges for $145 $799

PLI Infinity 40 Turbo Calli
Infinity 88 Turbo $995

MONITORS
Ikegami CT20™ Sony Trinitron
w/ 8 bit card $2565
w/24 bit card $2895
w/24 bit accelerated Calli

NEC FG Monitors
Calli

RasteRops Systems
Calli

Seiko CM-1445 14”
with RasterOps 24S $597
with RasterOps 264 for SE/30 $1175

Hard Drives

Five-Year Warranty!

385 mb 4.4 ms $999 $1099
765 mb 4.6 ms $1399 $1499
1.2 Gb 4.1 ms $1999 $2099
1.5 Gb 4.1 ms $2599 $2699
1.6 Gb 11.5 ms $2899 $2999
2 Gb 3.9 ms $3399 $3499

Drives are SCSI-2, System 7.0 & A/A UX compatible, carry a Five-Year Warranty, include brackets or metal cases, universal power supplies, cables, formatting software and 1.5 MB of shareware.

Thirty-Day Money Back Guarantee!

MacCenter™ also carries the drives from GCC, Quantum, Hewlett-Packard, Monoprice and Seagate.

INSTALLABLE CARTRIDGE

$125

$999

SuperMac
19” SuperMatch

$1799

SUPERMAC

19" Platinum Monitor (Grey Scale/Mono) $999
Spectrum/89/24 PDQ $999
Monochromate Card $349

One Card Fits All!

DayStar again leads the Mac world by delivering incredible power, convenience and cross-platform transportability for the Mac. Buy one card now and transfer it to your new Mac when you trade up. Triple your performance. Optional math coprocessor available.

PowerCache 33 Mhz, 40 Mhz & 50 Mhz available for Mac II, Ilx, Ii & SE/30!

$699

$895

$1195

$999

FastCache Card For Both the Ili & Ii

Call $269 & $299

RAM PowerCard

DayStar’s RAM PowerCard will make your disk intensive tasks scream!

Please up to 16 standard 1 Meg, 4 Meg or 16 Meg SIMMs on this NuBus card for up to 256 Megs of memory.

$499

EQUIPMENT RENTAL

Macintosh Systems
MacCenter Buys and Sells New and Used

SYSTEMS

This ad is too small for us to list all the Macintosh hardware we carry, so if you don’t see it, list us!

Advantages Of Dealing With The Center Of The Macintosh Universe

People answer our phones. We don’t like automated answering systems. Call and talk to someone, instead of seeing video.

No Surcharge On Mastercard and Visa.

Your Credit Card is not charged until your order is shipped.

Personal Checks, Company Checks, money orders and cashier’s checks are accepted. Money orders and cashier’s checks should immediately, please allow ten days for personal and company checks to clear.

APO and FPO Orders are accepted with no minimums or surcharges.

Purchases Over $500.00 are accepted with thirty (30) day terms upon credit approval. There is no minimum or surcharge for purchases over $500.00.

International Orders are accepted. We, at MacWorld, ask that your order include a California sales tax, freight charges, and a letter of credit for all orders in excess of $5000.00. We do not require minimum orders or impose any surcharge for international orders, whether shipped by sea, air or helicopter.

No Sales Tax, except for Texas residents.

Shipping US shipments are charged in the usual manner and are shipped by UPS. Foreign shipments are charged in the usual manner and are shipped by Fedex.

Payment Terms: Cash, Check or Money order.

Money Back Guarantee! Most products carry a manufacturer’s 30 or 60 day money back guarantee. Please ask for details when ordering.

All prices, postage and product availability are subject to change without notice. We regret we cannot be responsible for typographical errors and cannot guarantee the stock or availability of all products.

All returns must have an authorization number. Please call 512-476-2444. All returns or refused shipments are subject to a restocking fee.

Free Catalog when you order in your reader service card.

Hours:
8:00 am - 6:00 pm CST Monday thru Saturday
10:00 am - 4:00 pm CST Sunday; Call, we may get you.

MacCenter
812 South Antonio Street; Suite 406 & Austin, Texas 78701-2224

800-950-3726
FAX 512-476-3726

International Orders 512-476-7466

©MacCenter 1991, 1992

Circle 1 on Reader Service Card.
All 3.5" Drives are available in zero footprint (including a 40 watt power supply, and dual AC outlets), or micro cabinets as well as internal for all Mac's.

All 5.25" Drives are available in zero footprint external (including a 65 watt power supply, cables, and ext. terminators) or as internals for the Mac II, llx, and llfx.

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>330 MB</td>
<td>$1148</td>
<td>$1248</td>
</tr>
<tr>
<td>425 MB</td>
<td>$1248</td>
<td>$1348</td>
</tr>
<tr>
<td>520 MB</td>
<td>$1348</td>
<td>$1448</td>
</tr>
<tr>
<td>680 MB</td>
<td>$1288</td>
<td>$1388</td>
</tr>
<tr>
<td>1.2 Gig</td>
<td>$1988</td>
<td>$2088</td>
</tr>
</tbody>
</table>

**Hitachi Drives**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>425 MB</td>
<td>$998</td>
<td>$1098</td>
</tr>
<tr>
<td>1.6 Gig</td>
<td>$2798</td>
<td>$2898</td>
</tr>
</tbody>
</table>

**SyQuest 44MB & 88MB Removables**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>44MB Removable</td>
<td>$448.00</td>
<td>$648.00</td>
</tr>
<tr>
<td>88MB Removable</td>
<td>$598.00</td>
<td>$798.00</td>
</tr>
</tbody>
</table>

**CD ROM Drives**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toshiba 3301</td>
<td>$568</td>
<td>$768</td>
</tr>
<tr>
<td>Chinon CDC-431</td>
<td>$598</td>
<td>$798</td>
</tr>
</tbody>
</table>

**Sharp 35 Font Laser Printer**

<table>
<thead>
<tr>
<th>Printer</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 Font Postscript Printer</td>
<td>$1298</td>
</tr>
</tbody>
</table>

**Quantum Drives**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 52 MB 3.5&quot; LPS</td>
<td>$298</td>
<td>$398</td>
</tr>
<tr>
<td>Q 105 MB 3.5&quot; LPS</td>
<td>$398</td>
<td>$498</td>
</tr>
<tr>
<td>Q 120 MB 3.5&quot;</td>
<td>$448</td>
<td>$548</td>
</tr>
<tr>
<td>Q 170 MB 3.5&quot;</td>
<td>$598</td>
<td>$698</td>
</tr>
<tr>
<td>Q 210 MB 3.5&quot;</td>
<td>$698</td>
<td>$798</td>
</tr>
<tr>
<td>Q 425 MB 3.5&quot;</td>
<td>$1298</td>
<td>$1398</td>
</tr>
</tbody>
</table>

**14" Monitors!**

<table>
<thead>
<tr>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>GoldStar Color</td>
<td>$388</td>
</tr>
<tr>
<td>NEC Color</td>
<td>$438</td>
</tr>
</tbody>
</table>

**19" Monitors!**

<table>
<thead>
<tr>
<th>Monitor</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philips Color System</td>
<td>$1498</td>
</tr>
<tr>
<td>Ikekami Trinitron Color</td>
<td>$2398</td>
</tr>
<tr>
<td>Ikekami Grey Scale System</td>
<td>$1998</td>
</tr>
</tbody>
</table>

**Hitachi Special!**

Hitachi 420MB Int. $998
Hitachi 1.6 Gig Int. $2798
- 5 Year Warranty
- 150,000 Hrs MTBF
- 12 to 14ms access time!
- Incredibly Reliable!
- Perfect for the Power User

**CDM Drives**

<table>
<thead>
<tr>
<th>Drive</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q 52 MB 3.5&quot; LPS</td>
<td>$298</td>
<td>$398</td>
</tr>
<tr>
<td>Q 105 MB 3.5&quot; LPS</td>
<td>$398</td>
<td>$498</td>
</tr>
<tr>
<td>Q 120 MB 3.5&quot;</td>
<td>$448</td>
<td>$548</td>
</tr>
<tr>
<td>Q 170 MB 3.5&quot;</td>
<td>$598</td>
<td>$698</td>
</tr>
<tr>
<td>Q 210 MB 3.5&quot;</td>
<td>$698</td>
<td>$798</td>
</tr>
<tr>
<td>Q 425 MB 3.5&quot;</td>
<td>$1298</td>
<td>$1398</td>
</tr>
</tbody>
</table>

**Technical Service and Order Tracking call: 312-664-8225**

60 East Chestnut - 145, Chicago, IL 60611
Visa, Mastercard, Amex, COD, Telecheck approved checks, Gov., Corp., Univ., P.O.'s welcome. All new Drives, Preformatted with latest stable system software. Factory warranty. Bracket, cables and software included. 30 Day money back Guarantee on all drive products. Prices, terms and availability subject to change without notice.
You Can’t Afford to Miss

Aim with MacTel for your Apple solutions. MacTel Technology Corporation is a global corporation specializing in the design, manufacturing and distribution of a wide array of Macintosh peripherals. Our state-of-the-art surface-mount manufacturing facilities are located in Austin, Texas, which also hosts the hard drive assembly line, research laboratories and testing center.

Index Memory Modules

GO FOR THE GOLD

MacTel manufactures and tests our memory modules in-house to ensure the highest possible quality and reliability. All our SIMMs are gold traces and contacts for greater conductivity and durability. Our field test failure is less than 1%. In fact, we have so much confidence in our memory products that we back them with a lifetime warranty.

1 Mb surface mounted/low profile, 7090 ns……..$37.95
1 Mb fx & LaserWriter II NTX SIMM, 7090 ns……..$38.95
1 Mb x 9 SIMM, 7090 ns……..$43
3 Mb Classic memory……..$99
Mac LC V-Ram upgrade……..$65
4 Mb surface mounted SIMM, 80 ns, Illc, Illc, Illc, Illc, Illc and LC
1 Mb TX microLaser $1755 & XL upgrade……..$69

ACCELERATOR BOARDS

Only Index Gold boards offer you the additional benefit of gold contacts & traces for greater durability, conductivity and reliability.

New
- Index Mac IIci 030 Direct Slot Interface $99.00
On-board 68882/20 MHz math co-processor with adapter for Macintosh IIi. Benchmark software included.

New
- Index LC Mathmate $69.00
Accelerate multi-intensive operations on your LC operations by up to 39% with a 68882/16 MHz math co-processor — and get a 15% overall CPU improvement. Benchmark software included.

New
- Index CachePro / Mac IIci……..$119.00
Increase the speed of your Mac IIci up to 33% with MacTel’s new CachePro card.

New
- Index Classic II Mathmate……..$99.00

Contact the professionals at MacTel now for additional information. We handle only the best in Macintosh hardware, systems and peripherals, with names like Apple, RasterOps, Wacom, Sharp and our own top-quality VisionPro and Index brands. Call or fax for a free catalog.

3007 North Lamar, Austin, Tx 78705
512 / 451-2600 512 / 451-3323 FAX
To order from Europe 512 / 451-2600
Swiss office: 042/36-44-33
Singapore 2550880

Ordering:
No surcharge for Visa or MasterCard. European banking service available. University, government, military NET 30 and corporate (on approval) purchase orders accepted. Please allow 10 days for personal and company checks to clear. Returned merchandise must be authorized. To expedite processing, call 512/451-2600 for RMA number. Defective merchandise will be replaced or repaired at MacTel’s discretion. Shipping and handling charges are not refundable. Product must be in original shipping container including all packing materials. All products are subject to a 5% restocking fee. All products subject to availability. All prices are subject to change. Technical support M-F 8-5 M.S.T., S.

INDEX HARD DRIVES

The Index HD formatter is System 7 compatible and supports partitioning, password protection and is A/UX compatible.

Quantum drives Index 3.5”
- 52 Mb, 12 ms, Slimline……..$249 $299
- 105 Mb, 12 ms, Slimline……..$349 $399
- 210 Mb, 12 ms……..$619 $679
- 425 Mb, 12 ms……..$1349 $1399

Imprimis drives Index 5.25”
- 320 Mb, 16 ms……..$1149 $1199
- 330 Mb, 10.7 ms (Runner)……..$1299 $1399
- 640 Mb, 16 ms……..$1399 $1499
- 650 Mb, 10.7 ms……..$1699 $1799
- 1.2 Gb, 16 ms……..$1999 $2099

Index and Vision Pro are registered trademarks of MacTel Technology.

Index Memory and Vision Pro are registered trademarks of MacTel Technology.

800 • 950 • 8411
Index and Vision Pro are registered trademarks of MacTel Technology.

MACINTOSH CPUS

- Mac IIx 340……..$3497
- Mac IIx 5mb……..$3297
- Mac LC……..$Call
- Mac PowerBooks 100-140-170-SCall
- Mac Quadras……..$Call
- Mac Classic II……..$Call
- Mac IIx……..$Call

New
- MacTel phone net……..$12.99

New
- TelNet

INDEX RAM MODULATIONS

- 3 Mb Classic memory……..$99
- Mac LC V-Ram upgrade……..$65
- 4 Mb surface mounted SIMM, 80 ns, Illc, Illc, Illc, Illc, Illc and LC
- 1 Mb TX microLaser $1755 & XL upgrade……..$69

STORAGE SOLUTIONS

MacTel offers you a number of storage and backup solutions, including a complete line of Index hard drives. Three of our drives have been rated 4 mice by MacUser Labs: the MacTel 45R drive (1991), the Index 1.2 Gb drive (1991) and the MacTel 2 GB DAT drive (10/91).

REMOVABLE - OPTICAL - TAPE

- Index 45R w/ cartridge ………..$479
- Index 88R w/ cartridge ………..$699

With Backmate and AutoSave

- SyQuest cartridge SQ 400……..$69
- SyQuest cartridge SQ 800……..$119
- 2 GB DAT drive w/retrospect software and 1 tape ………..$1499
- 1.3 GB DAT Tape……..$35

New
- 1 GB Tahiti optical drive w/1 cartridge ………..$3699
- 1 GB Optical cartridge……..$249
- 650 mb Optical cartridge……..$129

ACCELERATOR BOARDS

- Index Mac IIci 030 Direct Slot Interface $99.00
- Index LC Mathmate $69.00
- Index CachePro / Mac IIci……..$119.00
- Index Classic II Mathmate……..$99.00

KEYBOARDS

MacTel’s Index line of ADB extended keyboards have an 805 key layout, 15 function keys, cursor control keys and number pad. The foreign language keyboards are bundled with their respective system software.

- Index English……..$99
- Index French, German, Swiss (French & German)……..$119
- Index Spanish……..$119

Ordering:
No surcharge for Visa or MasterCard. European banking service available. University, government, military NET 30 and corporate (on approval) purchase orders accepted. Please allow 10 days for personal and company checks to clear. Returned merchandise must be authorized. To expedite processing, call 512/451-2600 for RMA number. Defective merchandise will be replaced or repaired at MacTel’s discretion. Shipping and handling charges are not refundable. Product must be in original shipping container including all packing materials. All products are subject to a 5% restocking fee. All products subject to availability. All prices are subject to change. Technical support M-F 8-5 M.S.T.

Circle 154 on reader service card.
Make that SE or SE/30 a Page Layout Powerhouse  $799

High-resolution, black and white Macintosh display system featuring:

- Ultra-low cost-to-features ratio.
- One-year monitor-for-monitor replacement warranty.
- Full-line compatibility with Macintosh “Nubus” and “PDS” machines.
- Allows dual-screen operation with Mac SE and SE/30 models.
- Full System 7.0 compatibility and operation.
- Twenty inch diagonal monitor with 1024x768 pixel resolution, 72 dpi.
- Ideal display size for many desktop publishing or CAD/CAM applications.

Hit the road with an APS Portable DAT

Compact size and a light weight! Based on Archive’s Python 3.5-inch DAT mechanism, the APS Portable DAT weighs in at less than 4 pounds.

- Extremely high capacity – 2.0 Gigabytes on the 90-meter DAT cartridge.* Compatible w/ both 60- and 90-meter cartridges.
- High speed random access to any file on the tape.
- Uncorrectable error rate of less than 1 in $10^{15}$ bits.
- Four Direct-Drive motors (4DD) eliminate belts and mechanical mode changes.
- Unequalled back-up flexibility with Retrospect® by Dantz Development.*

*Included.

2 Gb Portable DAT

1-800 235-2750  $14999
**Quantum**

170mb $499

**Maxtor**

213mb $579

---

All external drives available in your choice, Zero-Footprint or Compact Portable case.

<table>
<thead>
<tr>
<th>MB</th>
<th>INTL</th>
<th>EXTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>$229</td>
<td>$299</td>
</tr>
<tr>
<td>105</td>
<td>339</td>
<td>429</td>
</tr>
<tr>
<td>170</td>
<td>499</td>
<td>589</td>
</tr>
<tr>
<td>210</td>
<td>629</td>
<td>699</td>
</tr>
<tr>
<td>425</td>
<td>1299</td>
<td>1399</td>
</tr>
</tbody>
</table>

*Special Purchase. Available only While Quantities Last.

For a limited time, with any drive purchase, you can buy Redux, Init Picker or Rival by Microseeds Publishing. Any one, $20; any 2, $33.95; all three, $44.95.

<table>
<thead>
<tr>
<th>MB</th>
<th>INTL</th>
<th>EXTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>$259</td>
<td>$359</td>
</tr>
<tr>
<td>120</td>
<td>359</td>
<td>439</td>
</tr>
<tr>
<td>213</td>
<td>579</td>
<td>679</td>
</tr>
<tr>
<td>340</td>
<td>999</td>
<td>1099</td>
</tr>
<tr>
<td>535</td>
<td>1599</td>
<td>1749</td>
</tr>
<tr>
<td>760</td>
<td>1649</td>
<td>1799</td>
</tr>
<tr>
<td>1.2G</td>
<td>2299</td>
<td>2499</td>
</tr>
</tbody>
</table>

All external drives available in your choice, Zero-Footprint or Compact Portable case.
## Product Information

### Toshiba CD ROM

**Model:** 3301  
**Price:** $579  
**Includes:** free "Nautilus" CD  
**Description:**
- 600MB  
- 1.2GB

### SyQuest

**Model:**  
**Price:** $699  
**Features:**  
- 88MB  
- 600MB  
- 330MB  
- 300MB  
- 600MB  
- 630MB  
- 425MB  

### Tape

**based sub-systems**  
**Includes:** one cass. & Retrospect  
**Add'l cass.:** $17-$24  
**Models:**
- TEAC  
- WangDAT  
- WangDAT  
- Python  

### 2-Page Monitor

**Model:**  
**Price:** $799  
**Features:**  
- 20" Wide w/cast

### Quality & Economy

**Toll-free Support**  
**1- & 2-Year Warranties**

### Technical Support

**Toll-Free:**  
- U.S. & Canada: 1-800-235-2750
- M-F 7AM-9PM CT. SAT 10AM-4PM CT
- TOLL FREE UK: 0800-897-545. TOLL FREE AUSTRALIA: 0014-800-125-875

### Payment Options

- AMEX  
- VISA/MC  
- DISCOVER  
- NO SURCHARGE

---

**Alliance Peripheral Systems, 2900 S 291 HWY. LOWER H. INDEPENDENCE MO 64057**

**Alliance**

**Peripheral**

**Systems**

**www.alliance peripheral.com**

**Call Toll Free U.S. & Canada 1-800-235-2750**
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.

Automobile Power Adapter - $99.95
Charge and operate the PowerBooks in your car

External Battery Charger for the 100 - $149.95
Charge your extra battery in the car or at your desk

Auxilliary Power Pack - $189.95
Increase operating life over four times

Lind Electronic Design
6414 Cambridge Street
Minneapolis, MN 55426
fax: (612) 927-7740
1-800-659-5956

Making your portable more portable™

If you Print, you need LaserMerge!

LaserMerge is revolutionizing the printing process by allowing you to merge graphics and text from your favorite applications at the printer, without re-feeding paper.

If you have ever copied logos, letterheads, footers, page numbers, classification marks, DRAFT/PROOF, or viewchart frames into your artwork or word processing text—just to print them, then you need LaserMerge...

LaserMerge can insert PICT, PostScript, or EPS images as layers in the output of your application with perfect registration... and you have complete control over their origin, scale, rotation, clipping, and gray level.

LaserMerge gives you continuity across multiple jobs, thumbnail imaging, master pages, time and date stamping, and smaller spool files. It can drastically reduce your print time on invoices, letterheads, logos, mailing labels and other repetitive printing tasks.

With LaserMerge, you no longer store your logos, letterheads, and other graphics in each and every piece of artwork. This saves disk space, time, and money, and produces perfect and consistent copy, keeping with your company’s image.

Call 1-800-MGT-6840 for our free brochure!... for a limited time $95

Feature help even without System 7 (bundled)

LaserMerge works with LaserWriter, Color PostScript printers, and with Macintosh Plus and up, and with all RS-120 printers and LaserJet printers.

LaserMerge © & TM Lind Designs. All rights reserved. LaserMerge is a trademark of MindGate. List price $1200.

Now that you can afford a color Mac™ — Where are the affordable 32 bit color paint programs?

Your search is over!

MicroFrontier, the maker of Enhance 2.0 now offers

Color It! with no System 7 limitations!

Color It! has advanced image processing and painting features that until now were only found in programs like:

Photoshop™
Studio 32™
Pixel Paint Professional™
Oasis™

For a price you can afford.

Color It! offers Professional Quality—at $119.95

Lind Electronic Design
6414 Cambridge Street
Minneapolis, MN 55426
fax: (612) 927-7740
1-800-659-5956

Making your portable more portable™

Call 1-800-MGT-6840 for our free brochure!... for a limited time $95

Feature help even without System 7 (bundled)

LaserMerge works with LaserWriter, Color PostScript printers, and with Macintosh Plus and up, and with all RS-120 printers and LaserJet printers.

LaserMerge © & TM Lind Designs. All rights reserved. LaserMerge is a trademark of MindGate. List price $1200.

Now that you can afford a color Mac™ — Where are the affordable 32 bit color paint programs?

Your search is over!

MicroFrontier, the maker of Enhance 2.0 now offers

Color It! with no System 7 limitations!

Color It! has advanced image processing and painting features that until now were only found in programs like:

Photoshop™
Studio 32™
Pixel Paint Professional™
Oasis™

For a price you can afford.

Color It! offers Professional Quality—at $119.95

Lind Electronic Design
6414 Cambridge Street
Minneapolis, MN 55426
fax: (612) 927-7740
1-800-659-5956

Making your portable more portable™

Call 1-800-MGT-6840 for our free brochure!... for a limited time $95

Feature help even without System 7 (bundled)

LaserMerge works with LaserWriter, Color PostScript printers, and with Macintosh Plus and up, and with all RS-120 printers and LaserJet printers.

LaserMerge © & TM Lind Designs. All rights reserved. LaserMerge is a trademark of MindGate. List price $1200.
### Hardware

<table>
<thead>
<tr>
<th>Category</th>
<th>Premier</th>
<th>Classified</th>
<th>Business Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerator Boards</td>
<td>346</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Bar Code</td>
<td>346</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>CD-ROM</td>
<td>346</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>346</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Computer Systems</td>
<td>346</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Data Acquisition</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Data Recovery</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Disk Drives</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Diskettes</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Input Devices</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Memory Upgrades</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Networking</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Peripherals</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Printers</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Scanners</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
<tr>
<td>Used Equipment</td>
<td>347</td>
<td>356</td>
<td></td>
</tr>
</tbody>
</table>

### Software

<table>
<thead>
<tr>
<th>Category</th>
<th>Premier</th>
<th>Classified</th>
<th>Business Card</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounting</td>
<td>348</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Bar Code</td>
<td>348</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Business</td>
<td>348</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Business Time Management</td>
<td>349</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>CAD/CAM</td>
<td>349</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>CD-ROM</td>
<td>349</td>
<td>353</td>
<td></td>
</tr>
<tr>
<td>Database Publishing</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Desktop Publishing</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Educational</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Emulation</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Entertainment/Games</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Financial</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Fonts</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Genealogy</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Government</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Graphics</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Health</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Language Tools</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Legal</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Lottery</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Mail Order</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Medical/Dental</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Music/MIDI</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Networking</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Programming Tools</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Public Domain</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Recreational</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td>Recreation</td>
<td>350</td>
<td>357</td>
<td></td>
</tr>
<tr>
<td></td>
<td>298</td>
<td>357</td>
<td></td>
</tr>
</tbody>
</table>

### Media

- **Religion**
- **Sales Marketing**
- **Scientific**
- **Security**
- **Shareware**
- **Stackware**
- **Statistics**
- **Taxes**
- **Utilities**
- **Word Processing**

### Miscellaneous

- **Accessories**
- **Books/Catalogues**
- **Business Opportunities**
- **Data Conversion Services**
- **Desktop Publishing Services**
- **Diskette Copy Services**
- **Furniture**
- **Insurance**
- **Mailing Lists**
- **Novelties**
- **Services**
- **Slide Imaging Services**
- **Supplies**

### Classified Advertising Staff

- **Paul Stafford**, Vice President, Classified Advertising  
  - Vickie Preby, Classified Advertising Director
- **Anne R. Brockington**, Production Director  
  - Paul A. Fusco, Sales Manager
- **Chris Meyer**, Production Coordinator  
  - Napreil Foster, Advertising Coordinator

---

**MacUser** FEBRUARY 1992
More Than Just An Accelerator.

The Aztech Merida upgrade kit for the Macintosh Plus and SE enables you to upgrade to a modular system with large screen display and accelerator for just $1,345.

If you do not have a Macintosh to upgrade we offer the 25MHz 030 Merida Workstation with Two Page Display, 8MB of RAM and optional internal hard disk for $2,595.

Call for information about our Emprean Tower Enclosure and slot expanders for the Macintosh LC and II series computers.

Aztech Micro Solutions, Inc.
130 McConnick #103, Costa Mesa, CA 92626
(800) 524-3500

CIRCLE 250 ON READER SERVICE CARD

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 DiskManagerMac® hard disk installation utility for Macintosh.

- Create customized partitions.
- Complete with utilities to manage and secure your data.
- Available with or without a hardware installation kit.

Completely System 7 Compatible

1-800-752-1333
International: 612-937-1107 • Fax: 612-937-5815
6321 Bury Drive, Eden Prairie, MN 55346

CIRCLE 251 ON READER SERVICE CARD

THE 10 BEST REASONS TO SHOP UCOMPUTE!

1. 12 MONTHS FREE ON-SITE SERVICE*
2. FREE ON-SITE INSTALLATION*
3. FREE SYSTEM 7.0 TRAINING VIDEO*
4. 30 DAY MONEY BACK GUARANTEE
5. NOT A MAIL ORDER COMPANY
(Over 4500 Sales Reps Nationwide)
6. EXCELLENT PRICING
7. OVER 80,000 DIFFERENT PRODUCTS
8. FREE SHAREWARE SOFTWARE
9. ORIGINAL APPLE SERIAL NUMBERS
10. AUTHORIZED TRAINING & SERVICE

We Accept Checks, Visa, MC, Amex & Discover
5% Surcharge for Amex Only!

MAC • NEXT • IBM

Just a few of the Manufacturers we are Authorized to carry:

Printware: Nikon, GCC
NeXT: HP, Radius
TI: Maxtor, NCR
Microtek: QMS, Sigma
Sharp: Sony, Seiko
Magnavox: Agfa, ATTO
RasterOps: Kodak, Abatan
Cannon: Outbound, Mobius

1-800-788-5818

MACAcademy Training Videos
PowerBook 100 (New) $1995
Mac LC 520 (New) $1399
Mac IIci 340 (New) $2199
Mac Quadra 700/4105 (New) $5242
Mac IIci Monitor & Exh, Kybd $389
Mac HCl 5105 (New) $3290
Mac Quadra 900/4160 (New) $5779
LaserWriter Hg $239
Radco Color Pivot $1380
QMS PS410 $1629
Atarist Lx-2.5 meg $4457
Scan 300 Color w/Photoshop $1159
Emac Silhouette Trackball $75
MacAcademy Video $29.95
HP Deskwriter C $730
PLI Infinity 85 $799
Berouni 90 $850
Seiko 14" 24Bit Bundle $969
Toshiba 17" Color Monitor $1525

Install a partition virtually any SCSI drive
Create customized partitions.
Install a partition virtually any SCSI drive
Create customized partitions.

2 WEEK RENTAL
MacAcademy Training Videos
as low as $6.00 each

We Offer A Complete Selection of New & Used Hardware, Software & Peripherals for:

MAC • NEXT • IBM

CIRCLE 253 ON READER SERVICE CARD
For That Critical Moment
When Only the Best Will Do

Call Ontrack Data Recovery

• FAST Turn Around.
• 95% SUCCESS Rate.
• PROFESSIONAL Clean Room.
• EXPERTISE in Macintosh, SyQuest, and removable media plus Novell, DOS, OS/2, Unix, Xenix, Bernoulli, Sun Banyan Vines and more!

1-800-872-2599

International: 612-937-5161 • Fax: 612-937-5750

6321 Bury Drive, Eden Prairie, MN 55346

Ontrack

THE AFFORDABLE WAY TO STANDARDIZE YOUR SYSTEM

Drive7

MaxOut
External 50
TakeOut1

You may format, update, or eject this disk.

• Replaces Multiple Formatters
• Choice of Icons with Optional SCSI ID
• Updates Apple & Third Party Drives
• Virtual Memory on Syquest Drives

Casa Blanca Works, Inc. 415.461.9227 • FAX 415.461.9249
148 Bon Air Center • Greenbrae, CA 94904

TMS PRO HARD DRIVES

Each hard disk carries TMS’ 2 Year Full Warranty

<table>
<thead>
<tr>
<th>Model</th>
<th>Int. LpS</th>
<th>Ext. LpS</th>
<th>Int. Lps</th>
<th>Ext. Lps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pro 52 LPS</td>
<td>520</td>
<td>10ms</td>
<td>$239</td>
<td>$319</td>
</tr>
<tr>
<td>Pro 105 LPS</td>
<td>1050</td>
<td>10ms</td>
<td>$599</td>
<td>$689</td>
</tr>
<tr>
<td>Pro 170 LPS</td>
<td>1700</td>
<td>10ms</td>
<td>$1329</td>
<td>$1399</td>
</tr>
</tbody>
</table>

Authorized Quantum Dealer

TMS REMOVEABLE SUBSYSTEMS

Each removable hard disk carries TMS’ 2 Year Full Warranty

<table>
<thead>
<tr>
<th>Model</th>
<th>Int. LpS</th>
<th>Ext. LpS</th>
<th>Int. Lps</th>
<th>Ext. Lps</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMS Pro R45 20ms</td>
<td>$479</td>
<td>$649</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TMS Pro R90 20ms</td>
<td>$729</td>
<td>$999</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extra cartridges $68 & $120

TMS TAPE BACKUP SYSTEMS

Each tape backup system carries TMS’ 2 Year Full Warranty

<table>
<thead>
<tr>
<th>Model</th>
<th>Int. Lps</th>
<th>Ext. Lps</th>
<th>1 Year Full Warranty</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMS Pro T155 &amp; 1 tape</td>
<td>1550</td>
<td>10ms</td>
<td>$499</td>
</tr>
<tr>
<td>TMS Pro T155 &amp; 2 tapes</td>
<td>3100</td>
<td>10ms</td>
<td>$1099</td>
</tr>
</tbody>
</table>

FastCache IIci $239 or IIsi $259

TMS IIci 64K FastCache Card

AE QuickSilver $219 • w/ 68882-20MHz FPU $279

SIMMs

<table>
<thead>
<tr>
<th>Size</th>
<th>Price</th>
<th>Upgrade</th>
<th>Upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1Mb</td>
<td>$38</td>
<td>$141</td>
<td>$139</td>
</tr>
</tbody>
</table>

TMS Peripherals—great products, prices & service!

Please call today about the TMS “Shadow To Go” upgrade policy!

1-800-872-2599
Extra Storage at an Extra Low Price!

QuicKor 40

- Genuine Apple Mechanism
- 40 MB Low Power Mechanism, 1/3 Height
- HD Set Up and Backup Software
- Zero Footprint
- Cables

$288 Just Complete!

Running out of space on your hard disk? The QuicKor 40 gives you Apple quality for less than a no name clone. Call toll free today... The QuicKor The Better!

800 338-9951

CIRCLE 258 ON READER SERVICE CARD

MacBARCODA

for Bar Codes that don't fail

LABEL DESIGNER

The ultimate in label printing

Two great time and cost savers. Both technically outstanding and easy to use

MacBARCODA
- Eliminates film masters
- More precise adjustment than fonts
- Easier to use than fonts
- Producing bar codes in EPSF
- Compatible with popular page design packages
- Also available with color
- A state of D.A.'s.
Prices from $149.

LABEL DESIGNER
- Used daily to produce all types of labels on a PostScript printer
- For $245 look what you get:
  - Total flexibility - any label size or sheet layout
  - Text, lines, PICT & EPSF graphics and bar codes
  - Incrementing bar codes and numbers
  - Imports data easily from your word processor or database via ASCII text files
  - Code 39 and Postnet included. Also with Code 128, UPC, ITF, ISBN & EAN options
- Ideal for mailing labels, BCC's, product/carton labels, asset/file tracking labels

CIRCLE 259 ON READER SERVICE CARD

Bar Code Fonts

- Code 39 • UPC/EAN • ISSN • Int 2 or 5 of 8 • POSTNET
- Compatible with almost any application
- Bars code readers starting at $395

Sales 1-800-BEAROCK
(916) 922-4840
FAX (916) 822-4775

Bear Rock

Technology

6069 Enterprise Drive • Diamond Springs, CA 95619

Frazzzzled by HR Record Keeping?

Abra 2000 for Employees
- For 10 to 10,000 employees
- Top selling HR system, Mac & PC
- Over 100 Reports • Report Writer
- Starting at $595 for up to 75 emp.

AbraTrak for Applicants
- Find the right candidate - Fast
- Auto letter generator
- 80+ reports, incl. EEO & Costs
- From $995 for Single User

Real Working Demo and Manual $25 / product

CALL 408-737-9454

CIRCLE 261 ON READER SERVICE CARD

PLANMaker, Powerful Business Plan Software

- Self-contained Business Plan software for the Mac
- Expert narrative describes your business at its best
- Sophisticated Financial Forecasts build credibility
- Create your Business Plan and/or earn excellent profits creating Business Plans for other entrepreneurs as a Business Plan Consultant

Launching or expanding a business can mean exciting profits. Bankers and investors now require a professional Business Plan. PLANMaker takes you step by step, page by page, from Executive Summary through Financial Forecasts. Easy entry boxes and an extended section of narrative make customizing easy. Three complete and diverse business plans in memory; import part or all, then edit. All calculations and formatting are automatic with PLANMaker.

Call/write for Brochure or order 1-800 865 3337

Self supporting, requires no other software $129 + $3 s/h (US)
PlanMaker 1920 S Broadway Dept 6 St. Louis, MO 63104 Visa/MasterCard/AmEx Orders: 1-800 955 3337 FAX 1-314 421 0668 Worldwide: 314 421 0670

CIRCLE 262 ON READER SERVICE CARD

HIGH-PERFORMANCE GOOD LOOKS!

That's the start-finish combination you buy with Premier, the dynamite section where your enhanced image fuels top response from 335,000 Macintosh Business Buyers every month!

MacUser Premier

800-825-4237

CIRCLE 263 ON READER SERVICE CARD

CIRCLE 264 ON READER SERVICE CARD

CIRCLE 265 ON READER SERVICE CARD
Do your Electronic Design on a Macintosh Computer!

High Yield CDs.

Name your flavor. These discs are large libraries of great Macintosh shareware and public domain programs. Everything from artworks and music to utilities, games, fonts, ...the works. Plus the latest System 7 software for the newest Macintosh computers, and plenty of new System 7 compatible shareware and PD programs.

Quantum Leap delivers great value.

Call toll free 1-800-762-2877 for the dealer nearest you.
Phone: (305) 885-9985 • Fax: (305) 885-9986

The Treasure Chest of Utilities™

Why wait for overnight delivery when all the best utilities for your Macintosh are now on a CDROM?

The new Treasure Chest Of Utilities™ from Quantum Leap offers you a revolutionary, simple way to evaluate and purchase your favorite programs on demand. Instantly. What could be easier?

The Treasure Chest Software Series is your key to unlocking a wealth of great Macintosh software.

Blueprint: Professional CAD

Under $300

Now you can have professional CAD no matter what Mac you own. Blueprint Supports the Mac Classic and new 64 dpi monitors. Converting files? Blueprint comes with a built-in DXF translator.

Call today and ask for the Blueprint Special: free overnight UPS delivery and a Smart Mouse t-shirt for only $295. Thirty-day no-hassle money-back guarantee. Graphsoft: for five years we've been the leader in Mac CAD.

Graphsoft

8370 Court Ave., Suite 101 • Ellicott City, MD 21043
(410) 461-9488 • FAX (410) 461-9345

Jackpot.

The original, most-affordable Mac shareware CD.
Never wait for a printer, never make a printer wait... Running on any Macintosh, Print Central publishes itself as one or several Chooser-level printer(s) over your AppleTalk network. It receives jobs (any application, including PageMaker) from multiple workstations and spools them to one or several PostScript printers, all simultaneously! Complete queue control and auditing are standard with Print Central!

Print Central 2.0 adds remote control and status from any Mac on the network, as well as printer hiding and increased security.

PostScript Language Interpreter and Utilities

- Outputs PostScript® documents to Apple (incl. StyleWriter, Laser LS), HP, GCC, Canon, Epson, Mitsubishi and others
- PostScript® to TIFF converter, variable resolution up to 2000 dpi color
- Supports all PostScript® fonts
- Previews PostScript® files
- Chooser level & AppleTalk compatible
- System 7.0 and TrueType compatible

T-Script *145, Basic *85, Deluxe *495

TeleTypesetting
474 Comm. Ave., Boston, MA 02215
(617) 734-9700 Fax: (617) 734-3974

The original animated crossword game

Make Words Out Of Falling Letters
THREE games in one
Built-in Dictionary
Race the clock
MULTILINGUAL

Educational Tool
Enter, edit spelling lists
Improve Language Skills
Children’s game - match the letters
1-800-551-6061

The HyperGlot Software Company
The Leader in Foreign Language Software for the Macintosh in Spanish, French, German, English, Russian, Italian, Japanese, and Chinese featuring extensive digitized sound or CD audio!

WHERE THE LOOKING’S GOOD!

Premier’s cooking with proven results for advertisers who’ve decked out their messages in affordable full color. Place your ad where image wins results—with 335,000 Macintosh Business Buyers!

MacUser Premier
800-825-4237
Bible Study Superiority. Only $97.

Looking for a better way to study the Bible?

"...macBible is the superior product—it's fast, flexible (and) easy to use." It's the perfect choice for fast, complete Bible Study. For a limited time, get the New International Version for 25% off the $129 retail price. Plus macBible has a 60-day money-back guarantee. Available at Christian bookstores everywhere. 1-800-727-7759

Zondervan Publishing House
Software and Electronic Products

Bible Study made Fast, Easy and Fun!

HyperBible: a comprehensive Bible study system based on the Thompson Chain-Reference Bible comes complete with maps, word and topic searches, pronunciation, and much more for $159 (NIV or KJV).

Gems of the Word: brings the Bible to your daily life with a 2000 verse topical index and a verse of the day for $39.95 (NIV or KJV).

Begat: takes the ho-hum out of Bible genealogies for just $30.

Mention MacUser when you purchase HyperBible and get a free Gems or Begat!

1-800-777-1841

Beacon Technology, Inc. PO Box 49788-U Col. Spgs., CO 80949

CIRCLE 277 ON READER SERVICE CARD

Share Large Mac and DOS Files on the Same Disk Drive or Cartridge!

FormatteFive partitioning and file transfer utility gives you the power to:

• Move large files from PC to Mac and back easily
• Mount DOS volumes on your Mac desktop
• Read DOS formatted cartridges on your Mac
• Create Mac and DOS partitions on the same drive

Supports most popular hard drives, optical and removable cartridge drives: $195.

Call (206) 487-0122
FAX (206) 487-0467

SOFTWARE
ARCHITECTS

CIRCLE 278 ON READER SERVICE CARD

"CALC+ is ++++

Since we started shipping Calc+ we've received lots of great comments, but the one above says it all. Thanks Dave. Calc+ is a better, more productive calculator for your Mac, with professional decimal and desktop publishing features not found in the standard Mac calculator. It's got a LARGE DISPLAY that you can resize, scroll and edit — even change the display font and size, PAPER TAPE PRINTOUT for backup and audit trails, % KEY, CLEAR ENTRY KEY, MINIMIZE BUTTON and more. But Calc+ is really 2 calculators in one, because it can also do DESKTOP PUBLISHING CALCULATIONS in inches, centimeters and pica's with INSTANT CONVERSIONS between any of these units. So pick up a copy of Calc+ today. We'd like to get your comments. Available from catalogs and dealers everywhere. Suggested retail $79.

Abbott Systems Inc. All our products come with free customer support. 1-800-552-9157 or 914-747-4201, fax 914-747-9115.

CIRCLE 279 ON READER SERVICE CARD

MacUser February 1992 351
Who's on First?

What job is printing now? Who's job will print next?
Solve these common problems with The Blue Parrot.

- CDEV displays the queue for each printer.
- Eliminates confusion: avoids reprinting.
- Works with all networked printers.
- Saves time, money, and frustration.

For viewing at your printer, use Radar™, the remote LCD display!

Casa Blanca Works, Inc. 415.461.9227 Fax 415.461.2249
CLASSIFIED

HARDWARE/ACCELERATOR BOARDS

Classic II FPU 16MHz $89
Classic II FPU 20MHz $109
Mac LC FPU 16MHz $89
Mac LC FPU 20MHz $109
68882 FPU 20MHz $74
68851 PMMU 16MHz $109

FPU/PMMU

Classic II FPU 16MHz $89
Classic II FPU 20MHz $109
Mac LC FPU 16MHz $89
Mac LC FPU 20MHz $109
68882 FPU 20MHz $74
68851 PMMU 16MHz $109

BAR CODE

Bar Code & Magnetic Stripe Readers for Macintosh Plus, SE & II

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
415-856-8833 1-800-526-5920
Telefax: (415) 856-3843
FAX: 415-856-3843

CIRCLE 308 ON READER SERVICE CARD

COMPUTER SYSTEMS

MacBYTE
22775 Pacific Coast Hwy, Malibu, CA 90265

Buy • Sell • Trade Macintosh Computers
Cash For Your Mac or Peripheral
Low & High End Custom Setups
Preowned Macs with Warranty

FAX 213-317-1583

CIRCLE 310 ON READER SERVICE CARD

Bar Code

Bar Code Readers

• Top rated by independent review!
• Complete with steel wand — $399
• 64K Portable with wand — $799

"The WDP Reader is highly reliable and easy to use." Brett Field, Bitstream Inc.

WORTHINGTON 
207 Hope Street
SATEL SOLUTIONS
Santa Cruz, CA 95060

Portable Bar Code Readers

TimeWand I $249
TimeWand II $349

DataColumn and Accuscan, a company, and extremely accurate when using Videx, portable bar code readers.

CIRCLE 309 ON READER SERVICE CARD

Best Mac Buys

When it comes to used Mac's, we're the best. As the Nation's largest buying force, we stock over $1 million in used Mac's, unmatched anywhere and at the lowest prices around. When we say refurbished, that's exactly what we mean, not just erased and sent. Our quality control department assures you the best Mac available for the money—or your money back—guaranteed.

For Free Catalog Call Anytime
1-800-821-3221

CIRCLE 312 ON READER SERVICE CARD

MacUser Marketplace

(212) 503-5115
or (800) 825-4483

CIRCLE 313 ON READER SERVICE CARD

MacUser MarketPlace

MacUser February 1992 353
WANTED: USED MAC'S
WE BUY YOUR USED MAC EQUIPMENT FOR TOP DOLLAR. CALL US TO REFURBISH MAC'S AT DISCOUNT! CALL FOR QUOTE. RENTEX INC. (800) 545-2313, (617) 423-5577

EXSEL DIRECT
1-800-624-2001
In NV: 716-272-8770
Refurbished Macs!
Mac LC 2400 $ 299
Mac Plus $ 549
Mac SE Dual Floppy $ 899
Mac SE/20 $ 999
Mac SE/30 40MB $ 1999
Mac II 140/40 1999/2100
Mac II CX 80/40 $ 2399/2599
Mac II ci 1.40 $ 3399
Mac BGS $ 545
Mac Portable 40MB $ 2199
ImageWriter I/1 229/299
ImageWriter LQ 399
Laser Writer Plus $ 1199/1399
Laser Writer INT/NTX $ 2645/2995
Radius Monitors, Memory, Parts CALL.

EXSEL
2280 Brighton Henrietta Townline Rd.
Rochester, NY 14622
315-665-5000
All units refurbished with 90 Day Warranty, VISA, MasterCard, good condition, sold as is. Prices subject to change. We buy MAC's!

1-800-334-KIWI
Mac LC 2400b...1119
Classic II 2400b...$1549
Classic II 410mb...$1849
Mac LC 410mb with 14" color monitor...$2099
Mac LC 4105mb with 14" color monitor...$2399
PowerBook...$3299
Mac IIci 3/40mb...$3999
Mac IIci 5/105mb...$4199
Mac Quadra...$4199
H.P. Deskwriter...$450
H.P. Deskwriter C...$750
Personal Laser LS...$899
Personal Laser NT...$1749
All items new, 1 year warranty.
Most items in stock today.

KIWI COMPUTERS
P.O. Box 678
Los Angeles CA 90067
US & Canada (800)634-5494
In California (213)553-4507
Fax (213)286-9667
Mon-Fri 8:30am-4:30pm PST

EXSEL DIRECT
1-800-624-2001
In NV: 716-272-8770
Refurbished Macs!
Mac LC 2400 $ 299
Mac Plus $ 549
Mac SE Dual Floppy $ 899
Mac SE/20 $ 999
Mac SE/30 40MB $ 1999
Mac II 140/40 1999/2100
Mac II CX 80/40 $ 2399/2599
Mac II ci 1.40 $ 3399
Mac BGS $ 545
Mac Portable 40MB $ 2199
ImageWriter I/1 229/299
ImageWriter LQ 399
Laser Writer Plus $ 1199/1399
Laser Writer INT/NTX $ 2645/2995
Radius Monitors, Memory, Parts CALL.

EXSEL
2280 Brighton Henrietta Townline Rd.
Rochester, NY 14622
315-665-5000
All units refurbished with 90 Day Warranty, VISA, MasterCard, good condition, sold as is. Prices subject to change. We buy MAC's!

1-800-334-KIWI
Mac LC 2400b...1119
Classic II 2400b...$1549
Classic II 4105mb...$1849
Mac LC 410mb with 14" color monitor...$2099
Mac LC 4105mb with 14" color monitor...$2399
PowerBook...$3299
Mac IIci 3/40mb...$3999
Mac IIci 5/105mb...$4199
Mac Quadra...$4199
H.P. Deskwriter...$450
H.P. Deskwriter C...$750
Personal Laser LS...$899
Personal Laser NT...$1749
All items new, 1 year warranty.
Most items in stock today.

KIWI COMPUTERS
P.O. Box 678
Los Angeles CA 90067
US & Canada (800)634-5494
In California (213)553-4507
Fax (213)286-9667
Mon-Fri 8:30am-4:30pm PST
MAC CLASSIC 2/40 .... $1100
MAC II 1/40 .... STOCK
MAC IIci 2/05 .... STOCK
MAC LC 2/40 .... $1575
MAC LC 4/80 .... $1829
MAC SI 5/80 .... $2299
MAC SI 5/105 .... $2349
MAC SI 5/120 .... $2399
MAC IIci 4/80 .... $2399
MAC IIci 4/120 .... $2399
MAC II FX 4/80 .... $4349
NEW QUADRA 700 .... IN STOCK
NEW QUADRA 900 .... IN STOCK
NEW POWERBOOKS IN STOCK
PERSONAL LS/NT .... $379/1729
LASERWRITER IIG .... IN STOCK
LASERWRITER II F .... IN STOCK
APPLE STYLEWRITER .... CALL
14" VGA COLOR .... $349
EXT. 101 KEYBOARD .... $122
GCC PLP II .... BEST
GCC PLP II S .... PRICES
GCC BLP ELITE .... IN STOCK
RADIUS COLOR PIVOT .... $1269
RAIDIUS MONO PIVOT .... $699
PRECISION 24 BIT CARD .... $CALL
SONY 1304 (NI 25 DA) .... $569
QMS PS 410 .... $1699

WE SELL ONLY BRAND NEW COMPUTERS
1-800-227-6888
NO CREDIT CARDS PLEASE
(213) 473-2535 FAX (213) 473-6236
CIRCLE 324 ON READER SERVICE CARD

Macs & Upgrades!

Used Macs!
Mac IIfx 0/0/0 .... $3999
Mac Iicx 0/0/0 .... 2799
Mac IIc 0/0/0 .... 2799
Mac II 2/0/0 .... 1799
SE-20 w.kbd & LM .... 949
Logic bds & Power Supplies

Upgrades!
Il to IIfx ....... $2299
SE to SE-30 .... 849
Ilnt to Ilntx .... 799
Parts! Parts! .... Call

Shreve Systems
Call for Catalog!
3804 Karen Lane Bossier City, La. 71112
800-227-3971
800-227-3971
CIRCLE 325 ON READER SERVICE CARD

We Buy Macs!

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!
**COMPUTER SYSTEMS**

CRA Systems Inc.  
700 S. University Parks Dr.  
San  
Waxahachie, TX 75167

**SUPER DEALS ON USED / NEW MACS!**

**CLEARANCE SPECIALS**

**MARKETPLACE**

- Macintosh Data Recovery
- Repair any Mac Hard Drive
- Optical/SyQuest Recovery
- Fast Nationwide Service

**3-D Pamarmon Way**

**NOVA C49**

**MAC USERS & MACCARE**

- **FAX (415) 848-3623**
- **415-888-4232**

**CIRCLE 327 ON READER SERVICE CARD**

**disk drives**

**MEMORY HARD DRIVES SYQUEST Removable**

- **8 MB reCard** $599
- **Card** $105
- **44 MB reCard** $429
- **Card** $64

**Extrimal Removable for PC Compatible**

- **4 MB** $205
- **8 MB** $365
- **170 MB** $685
- **210 MB** $715
- **50 MB** $325
- **105 MB** $345

**SIMMS**

**1 MEG X 8** $39
**1 MEG X 16** $53
**1 MEG X 32** $97

**For MAC LC 256 Color $399**

**1024 X 768 CTX**

**Internal Hard Drive Kit for MAC HD**

- **$25**

**AXONE Computer Systems Inc.**

14 West Avenue  
Wynnewood, Pennsylvania 19096

**1-800-955-0388**

**Unretired & Corporate Orders Welcome**

**CIRCLE 330 ON READER SERVICE CARD**

**data recovery services**

**MACCHORD DATA RECOVERY & REPAIR**

- **3-D Pamarmon Way**
- **NOVA C49**

**CIRCLE 330 ON READER SERVICE CARD**

**disk drives**

**FORMATTED DISKETTES BASF, VERBATIM, SONY**

- **160 MB** $44
- **320 MB** $52
- **500 MB** $69
- **1 GB** $125

- **FREE FORMATTING on first order**
- **FULL SLEEVE & Sealed Labels Included**
- **COLORED MOUNTS Please Add $2 each**
- **PRIVATE LABELING Available**
- **SAME DAY processing**
- **MONEY BACK GUARANTEE**

- **800-255-3142**

**Diversified Systems Group Inc.**

PO Box 1114, Issaquah WA 98027

**CIRCLE 333 ON READER SERVICE CARD**

**general**

**1111 REPAIRS BY MAIL!!!**

Low cost, fast turnaround. Macs + SE Logic Board swaps. $25.00 & S/H. One year war- ranty. Power Supplies as low as $100 + S/H. Keyboard repairs as low as $12.50 + S/H. Open 12 to 10 Eastern Time. We buy dead Macs, PCs, Apple. Arminius & Prods, Inc.

**P.O. Box 1025-419 Orchard**

**Merchantville, N.J. 08118**

(609) 662-3420

**CIRCLE 331 ON READER SERVICE CARD**

**MacUser Marketplace**

is a special economical section for product and service listings.

**Tell Your Source!**

I Found it in MacUser Marketplace
INSURES YOUR COMPUTER
SAFEWARE provides full replacement of hardware, media and purchased software. As low as $45 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. 2929 N. High Street, P.O. Box 2211 Columbus, OH 43202 (800) 848-3469 (NAT) or (614) 822-0559 (OH)

Memory Upgrades

RAM Cards and Big Screen Video for the Mac PowerBooks.

The Macintosh PowerBooks bring a new era of flexibility to Mac computing. Now you can have a real Mac the size of a book that fits in your briefcase. To make those mighty ideas grow, you need more RAM and a big screen. Here they are:


2. BookRAM™ DRAM memory card. Deft circuit design yields low cost and low power drain for a 4 meg card. Maintains battery life.

3. BookView™ An adapter for a second external screen in addition to the current screen. A dealer installed adapter that duplicates the visual display on the built-in LCD screen and interfaces to major displays.

4. BookView™ Imperial. Adds 4 megs of DRAM and provides color or grey scale monitor output for the 68030 models and monochromatic output for the 68000 model. Supports standard and full page VGA, Apple monitors, NTSC and overhead projectors.

Call for prices on 1 meg, 2 meg and 4 meg SIMMs, Softstep® and Two Step™ memory expansion modules, Pac RAM™ for the Portable, Video Mac Pac for the Portable, and Mac Rescue™ upgrade board for Enhanced 128K & 512K Macs.

See us at MacWorld in Booth 5710, Brooks Hall.

Let Your Source Know You Found it in MacUser Marketplace
Memory Upgrades

The LLB Company
300 • 120th Ave NE • Bldg. 7, Suite 108 • Bellevue, WA 98005
Phone (206) 454-7258 • Fax (206) 454-7302

Energize your Macs with:

**SIMMs**

1 x 8 - 80 ns -
as low as:
Quantity Pricing per Mb
sold in 2 Mb sets

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 8 x 80ns</td>
<td>$36</td>
</tr>
<tr>
<td>4 x 8 x 80ns</td>
<td>$36</td>
</tr>
<tr>
<td>8 x 8 x 80 ns</td>
<td>$36</td>
</tr>
<tr>
<td>16 x 8 x 80 ns</td>
<td>$36</td>
</tr>
<tr>
<td>16 x 8 x 80fx</td>
<td>$36</td>
</tr>
<tr>
<td>1 x 8 x 70 ns</td>
<td>$36</td>
</tr>
<tr>
<td>1 x 8 x 70fx</td>
<td>$36</td>
</tr>
<tr>
<td>1 x 8 x 100 ns</td>
<td>$36</td>
</tr>
<tr>
<td>1 x 8 x 100fx</td>
<td>$36</td>
</tr>
<tr>
<td>1 x 8 x 80fx</td>
<td>$36</td>
</tr>
</tbody>
</table>

**Always low prices on the removable you trust**

44 MB SyQuest Cartridges
NEW! 88 Mb Cartridges from ........$119

**DayStar Universal PowerCache**
33, 40, or 50 Mhz

**Lexus Turbo Modem**
Compact 2400 baud modem. Easy to install

**Applied Engineering Quadralink**
Quadralink is the answer to clogged serial ports! Fully compatible with the Mac's Communication Toolbox and System 7.0.
5 year warranty.

**Applied Engineering QuickSilver**
Includes FPU. QuickSilver gives your llsi a slot extender, cache card and math co-processors. The extender enables cards created for the SE/30 to fit neatly inside the llsi case. 5 year warranty.

**68882 Math Co-Processor Boards and chips**

**68030 Accelerators**
with optional math chips for SE, Plus, Classic.

**Compare our low shipping prices:**
• 16 overnight shipping by Airborne Express - 3 ground shipping by UPS
• Orders received before 7:30 PM Eastern time weekdays ship the same day
• All Educational and governmental PO's accepted upon approval
• Bank cards accepted. Your card is not charged until the order is shipped.
• We export to most countries in the world
• Quantity pricing for dealers

All Government and Educational PO's accepted
Fax your orders 24 hours a day. Call between 7 am and 6 pm Pacific Time

1-800-848-8967 Ext. ML

CIRCLE 238 ON READER SERVICE CARD
### Memory Upgrades

<table>
<thead>
<tr>
<th>SIMMS</th>
<th>1MB to 16MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>for: Plus / SE / SE30 / Classic / LC 11 / 12 / IICl / IIE / IIGS / UMX</td>
<td>Portable 1MB - 8 MB LaserWriter NTX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CACHE CARD</th>
<th>IIci &amp; IIsi</th>
</tr>
</thead>
</table>

**Accelerator Card**
- 128, 512, 1024, PLUS, SE, CLASSIC
- **Fax / Data MODEMS**

To order call:
**1-800-292-7771**

For Instant Product Information via ROBOFAX
Call: 1-800-424-FAXX  Day or Night

**ADD ON AMERICA**
433 N, Mathilda Ave., Sunnyvale, CA 94086

Phone: 408-746-1590  Fax: 408-746-1593

**CIRCLE 339 ON READER SERVICE CARD**

### Memory Direct

"Don’t pay retail...buy direct"

<table>
<thead>
<tr>
<th>Accelerators for your Mac</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAC/IIx, MacOS, up to 68040 Mac Only</td>
</tr>
</tbody>
</table>

**Cache Cards**
- 256K PowerCache $749
- 512K PowerCache $1119

**2x2 Card**
- $335
- $360

**32x32 Card**
- $315
- $335

**SIMM**
- 1MB - 8 MB

**Memory Upgrade for your Macintosh**

<table>
<thead>
<tr>
<th>CLASSIC</th>
<th>MAC PORTABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MB-9MB</td>
<td>10 MB-16 MB</td>
</tr>
</tbody>
</table>

**MAC II, IIx**
- 4 MB-16 MB
- 14 MB-32 MB
- 32 MB-64 MB

**MAC IIx, IIfx**
- 4 MB-16 MB
- 14 MB-32 MB
- 32 MB-64 MB

**MAC FX & LaserWriter II NTX**
- 8 MB SIMMS
- 16 MB SIMMS

### Hard Disks

<table>
<thead>
<tr>
<th>QUANTUM</th>
<th>Internal</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>5MB</td>
<td>$259</td>
<td>$329</td>
</tr>
<tr>
<td>10MB</td>
<td>$469</td>
<td>$539</td>
</tr>
<tr>
<td>20MB</td>
<td>$529</td>
<td>$599</td>
</tr>
<tr>
<td>30MB</td>
<td>$679</td>
<td>$759</td>
</tr>
<tr>
<td>50MB</td>
<td>$829</td>
<td>$909</td>
</tr>
<tr>
<td>120MB</td>
<td>$1,599</td>
<td>$1,759</td>
</tr>
<tr>
<td>210MB</td>
<td>$2,069</td>
<td>$2,249</td>
</tr>
</tbody>
</table>

**Syquest**
- 2MB $279
- 4MB $295

**FPU**
- $459

**Network Products**
- NullPlus Adapters (MACII, IIx, IICl, IIc, IICl, II, LC)
- Mac Comm 1x ET (Thin & Thick) $239
- with FAX $319
- PDS Adapter (MAC II, IIx, SE, III)
- Mac Comm 1x ET (Thin & Thick) $239
- with FAX $319
- Adapter For Mac II LC
- Mac Comm 1x ET $239
- FDD (20 MB) $399
- 300 MB $799

**Cache Card**
- 32K Mac II, IIx $159
- 64K Mac II, IIx $259
- 128K Mac II, IIx $429
- 256K Mac II, IIx $559

**Upgrades**
- 68030 Accelerator - Call 512K - Plus $255
- Syquest Cartridges
- Mac LC Video SIMM
- Mac LC 68882 Math FPU

 Peripheral Outlet • (800) 332-6581
314 S. Broadway • Ada, OK 74010 • 405-332-6581 • Fax 405-436-2245

**CIRCLE 341 ON READER SERVICE CARD**

### MacUser Marketplace

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

---

**MacUser Marketplace**

Gives you the versatility you need to get your product the most attention. Our options include:

- Second and third color options
- Flexible ad sizes available to meet your needs
- Frequency and advance payment discounts that let you get the most from ad dollars

---

**1-(800) 486-CHIP (2447)**

**CIRCLE 340 ON READER SERVICE CARD**

---

**MacUser Marketplace**

For additional information call Account Representatives:

Dennis Leavay  Thomas Koletas  Laura Salerno  Lawrence Johnson

Call (212) 503-5115 or (800) 825-4ADS
### Video Packages

All Packages include Monitor, Video Board & Cable!

- **19" Grayscale - 256 Shades** ............... 799
- **19" Color - 256 Colors** .................. 999
- **19" Color - 16-Million Colors** .......... 1,899
- **19" Trinitron - 256 Colors** .......... 1,999
- **19" Trinitron - 16-Million Colors** .... 2,899

**16 Million Colors!**

- **19" Trinitron** includes 19" Trinitron,
  24-Bit Video Board, & Cable - Complete!

**$2,899**

### Hard Disk Drives

- **105 Meg. $349**
  Complete System - all cables and software included.
  Vista Case - Seagate ST112N, 15 ms.
  Special Purchase - for a limited time only!

  **Internal** | 52 Meg. - Quantum LPS, 11 ms. | 219 | 279
  --- | --- | --- | ---
  **External** | 105 Meg. - Seagate, 15 ms. | 289 | 349
  --- | 105 Meg. - Quantum LPS, 18 ms. | 339 | 399
  --- | 120 Meg. - Maxtor, 17 ms. | 439 | 499
  --- | 170 Meg. - Seagate, 15 ms. | 539 | 599
  --- | 180 Meg. - Fujitsu, 20 ms. | 599 | 659
  --- | 210 Meg. - Quantum, 12 ms. | 639 | 699
  --- | 300 Meg. - WREN, 16.5 ms. | 1,099 | 1,159
  --- | 330 Meg. - RUNNER, 11 ms. | 1,299 | 1,359
  --- | 600 Meg. - WREN, 16.5 ms. | 1,439 | 1,499
  --- | 660 Meg. - RUNNER, 12 ms. | 1,739 | 1,799
  --- | 1.0 Gig. - WREN-7, 15 ms. | 1,939 | 1,999
  --- | 1.6 Gig. - WREN-8, 15 ms. | 2,689 | 2,749

### 24-bit Color Scanner

**$1,099**

16-Million Colors! Epson Engine

Available with Color Studio LE and Scan-Do software. Why purchase an 8-bit color or grayscale scanner when you can have this high-quality scanner which operates in 24-bit mode for only $1,099? Scans over 16,000,000 colors and 300 x 600 resolution!

- Scanner Only (110 V) .................. 1,099
- Scanner with Software Bundle .......... 1,249

### SyQuest - 44/88 Meg.

SyQuest's 88 Megabyte removable cartridge drive offers speed and a higher capacity! 2-year warranty.

- Mobile 44 Vista - includes cartridge .... 429
- 44 Megabyte Data Cartridge ............... 68
- Mobile 88 Vista - includes cartridge .... 599
- 88 Megabyte Data Cartridge ............... 119

### CD-ROM Drives

**Toshiba CD-ROM $579**

Complete System - includes cables, carrier, and software.

**CD-ROM Vista - Toshiba** ............... 579

Pioneer 6-Disc CD-ROM Player ........... 999

### Rewritable Optical

**Rewritable Optical**

Complete System - includes cables, one-cartridge, and software.

- 600 Meg. Optical ISO - RICOH E-1 .... 1,899
- 600 Meg. Optical ISO - RICOH E-II ..... 2,799
- 600 Meg. Optical Cartridge ............... 129
- 600 Meg. WORM - Pioneer ............... 3,199
- 600 Meg. WORM Cartridge ............... 119
- 1.0 Gig. Optical ISO - Maxoptix Tahiti. 3,999
- 1.0 Gig. Tahiti Cartridge ............... 269

### Tape Drives

**160 Meg. $529**

Transportable backup solution for the Mac.

- Tape Vista - TEAC .................. 429
- Tape Sierra - TEAC .................. 529
- 2.0 Gig. DAT Tape Sierra - Archive .... 1,359
- 2.2 Gig. Tape Vista - Exabyte .......... 2,099
- 5.0 Gig. Tape Vista - Exabyte .......... 3,329

**510-471-6112**

We will BEAT any competitor's price for comparable product - call for details!

### Classification

- **Price:** Our price allows us to purchase at the lowest possible cost, and we manufacture in our own factory. Then we pass the savings on to our customers.
- **Performance:** Our business and professional users demand top performance, the WREN Reels from Quantum and Quantum high-speed cartridges 3-7/2 drives.

We offer more than 300 different products for the IBM, Macintosh and SUN. From the SyQuest 88 Megabyte portable hard disk to 24-bit Trinitron video packages we offer more of what you need. Call for 1992 catalog.

We offer the highest quality products that you can find. And if for any reason you are not 100% satisfied we offer a 30-day money back guarantee - 100% Customer Satisfaction!
MacUser Marketplace

Gives you the versatility you need to get your product the most attention. Our options include:

- Second and third color options
- Flexible ad sizes available to meet your needs
- Frequency and advance payment discounts that let you get the most from ad dollars
The Best Products, Prices and Service
1-800-626-1889
Specializing in Desktop Publishing, Presentation and Video.

MacUser Direct, Inc.

FastCache Ilci $255
SCSI PowerCard $1065
FastCache Ilci or with FPU $295 / $365
Dual Port Ilci or with FPU $95 / $165
PowerCache II, Ilx, Ilcx, Ilci, Ilsi, LC, SE/30...
33MHz or with Math Chip $695 / $895
40MHz or with Math Chip $895 / $1095
50MHz or with Math Chip $1395 / $1675

MacUser Special

BEZIER BP4040 Personal PostScript Laser Printer $1495
(RISC processor, TrueImage, TrueType, AppleTalk, 4ppm)

We are Authorized Dealers for all of the products we carry. All of our products are NEW. Business Leasing is available.

6113 South 380 West, Salt Lake City, Utah 84107 (801) 265-2882

SOFTWARE/ACCOUNTING

Point of Sale
"The POS System that Apple users love!"

POS•IM
This superior system exceeds all the expected POS features and provides the user with reports to make effective sales and inventory management decisions.

For Product and Reseller information, call Epson Systems, Inc.
(801)354-6161 / Fax(801)354-6490

Inventory Management

INVENTORY-POS
SHOPKEEPER PUB. INT'L. INC.-SPI
3711 Shumock West Suit 110
Tallahassee, FL 32309
USA 904 222-8800 • Canada 800 345-2902

PRINTERS

600X600 dpi POSTSCRIPT LIQUIDATION
$2495.00
Starting at: $2495.00

- 7 mgs of RAM
- Canon RIP Laser Printer Engine
- Advanced AMD 29000 RISC Processor
- Up to 10 times Faster than the Int'l
- 33MHzlie35MHz PC or Mac Printing
- Application, B3232, SCSI Interface
- Dual Page Processing

1-800-275-9000 • 1-817-754-2120

Print Multipart Forms on Mac
135 Artist View Drive
Winston, N.C. 27504
(702) 462-2473 (415) 467-8148 (800) 472-7444

PERIPHERALS

CD ROM
Category begins on the next page.

MacUser Marketplace
is a special economical section for product and service listings

MacUser MARKETPLACE

BUSINESS

BizPlanBuilder
Organize your ideas, coordinate your plans - competitive tools to support you. Intuitive, logical business & marketing plan template on Apple Mac. For launching new product/service, company, industry. 90 pages of outlines, headings, written text, tables, formatted into 3 MacWrite™ & MSWord™ files. Follows industry standards. 12 pages reference includes important info about getting money from banks, the SBA, investors. Integrated financial worksheets in Excel (35%). As formatted: detailed budget, income statement, balance sheet & cash flow projections. Break-even analysis. Calculate your boss, banker, & investors. (2000-word -> $129 each)
• BizPlanBuilder could be exactly what the business doctor ordered. I don't often use credible literature, but in this case, I am a believer. You owe it to yourself and your company to own and use BizPlanBuilder." - Lewis Warren, Software Publisher

MACUser Marketpace
Leverage Your Time & Macintosh

800.346.5426 call-free
415.941-9191 worldwide
MC/Visa/Amex 90 Day Guarantee

Circle 359 on Reader Service Card

Circle 358 on Reader Service Card

Circle 349 on Reader Service Card

Circle 347 on Reader Service Card

Circle 342 on Reader Service Card

Circle 339 on Reader Service Card

Circle 338 on Reader Service Card

Circle 337 on Reader Service Card

Circle 305 on Reader Service Card

Circle 263 on Reader Service Card

February 1992
363
We'll meet or beat any advertised price on CD-ROM products.

EDUCORP 1-800-843-9497

Get the Illustrated Encyclopedia, Time Table, World Atlas, Beethoven's 9th, Cosmic Osmo, Desert Storm, & Cinderella (Discs) bundled with the NEC Interset CDR-36 #C1977 for only $499, or bundled with the Interset CDR 73 #D1978 for only $769.

NEC 11 CD-ROM Drive Bundle

Get the Illustrated Encyclopedia, Time Table, World Atlas, Shakespeare, Sherlock Holmes, Birds of America, Mammals, Beethoven's 9th, Cosmic Osmo, Desert Storm, & Cinderella (Discs) bundled with the NEC Interset CDR-36 #D1977, for only $575, or bundled with the Interset CDR 73 #E1978, for only $849.

CD-ROM Drives

Your choice of cable, FREE! All drives come with driver software and cable. Specify #882 SCSI to SCSI or #881 Mac to SCSI cable.

1981 CD-Tech Porta Drive 325ms/64K buffer $599 Multimedia HANDisc included free w/purchase.
1983 Toshiba XM3001 325ms/64K buffer ......$699
1981 Chicon CDR-431 350ms/32K buffer ......$799
EDUCORP CD-2 0 included free w/purchase.
1987 NEC CDR-73 300ms/64K buffer ......$679
1997 NEC CDR-36 600ms/64K buffer ......$479

Get 7 CD-ROMs for only $199 Buy any drive and get the illustrated Encyclopedia, Time Table, World Atlas, Shakespeare, Sherlock Holmes, Birds of America, and Mammals for only $199! #1599.

Other Drive Bundles

Intersect CDR-73 Bundle Special
B1978 NEC CDR-73 w/Type Gallery PS ......$129
C1978 NEC CDR-73 w/Type Gallery PS, Clip Art 3-D, and Image Gallery ......$1200

Intersect CDR-30 Bundle Specials
B1977 NEC CDR-36 w/Type Gallery PS ......$479

CD-ROM Titles

Education
1590 Desert Storm ......$33.00
1566 Dictionary of the Living World .......$199.00
1582 FindIt Webster w/ Pronunciation ......$69.95
1503 Japanese for Everyone ......$279.00
1261 Learn to Speak Spanish v1 ......$79.95
1234 Learn to Speak French v1 ......$79.95
1581 Linguat- ROM II ......$599.00
1570 LifeSaver - Learn first aid ......$99.00
1584 The Orient ......$149.00
1606 Peter Rabbit (Discs Books) ......$74.95
1626 Svin ga: : An Introduction to Swedish ......$74.95

Desktop Publishing
1805 Aquatic Art ......$149.95
1567 Classic Business v1 ......$349.00
1389 Desktop Publishing CD 2.0 ......$99.95
1587 Donatelli Portfolios: Lingerie ......$129.95
1578 Image Database A-Type/Vendor ......$129.95
1628 ImageCELS: 1,100 seamless textures ......$399.00
1581 International Graphics Library ......$299.00
1585 Ocean Imagery ......$99.00

800K disks as low as $4.99 each

4414 MacConcept
3-D graphics program.
2129 ResEdit/CICN Editor
Edit and manipulate all resources, from icons and dialog boxes to menus.
2128 Essential INITs
Contains MacPassword Demo for security and virus protection, INIT, SCF, SCIS Probe 3.0.
4601 SoundMaster 1.6.4
Control all Mac sounds: startup, restart, shut- down, and more! Works with System 7.
4043 Startup Screens
29 terrific startup screens.

2122 Virus Stompers
7 virus utilities.
4271 Beard Games
Backgammon, 3D checkers, and 11 others.
7204 Clip Art Stack
Over 490 high quality bitmapped clip art.
4270 Thinking Games
11 games to stimulate your mind.
4034 Clip Art Extravaganza
100 high quality bitmapped clip art.
3431 Preschool Education
8 programs including a great dot-to-dot con- struction set, fun math tutors and more!
4612 Speech Synthesis
MacTalk and much more.

EDUCORP 1-800-843-9497

80K disks #1687, $19.95
1606 Peter Rabbit (Discs Books) ......$74.95
1570 LifeSaver - Learn first aid ......$99.00
1584 The Orient ......$149.00
1606 Peter Rabbit (Discs Books) ......$74.95
1585 Ocean Imagery ......$99.00

80K disks as low as $4.99 each

4414 MacConcept
3-D graphics program.
2129 ResEdit/CICN Editor
Edit and manipulate all resources, from icons and dialog boxes to menus.
2128 Essential INITs
Contains MacPassword Demo for security and virus protection, INIT, SCF, SCIS Probe 3.0.
4601 SoundMaster 1.6.4
Control all Mac sounds: startup, restart, shut- down, and more! Works with System 7.
4043 Startup Screens
29 terrific startup screens.

2122 Virus Stompers
7 virus utilities.
4271 Beard Games
Backgammon, 3D checkers, and 11 others.
7204 Clip Art Stack
Over 490 high quality bitmapped clip art.
4270 Thinking Games
11 games to stimulate your mind.
4034 Clip Art Extravaganza
100 high quality bitmapped clip art.
3431 Preschool Education
8 programs including a great dot-to-dot con- struction set, fun math tutors and more!
4612 Speech Synthesis
MacTalk and much more.

EDUCORP 1-800-843-9497

80K disks #1687, $19.95
1606 Peter Rabbit (Discs Books) ......$74.95
1585 Ocean Imagery ......$99.00

5-disk sets $24.95 each

1706 System 7 Tools- NEW!
7 True type fonts, utilities, 80 color icons, SCIS Probe, ResCompare, INITLoader, more!
1151 Best of Games v.1.1 fun games.
1224 Best of EPS Clip Art
100 high resolution EPS pictures.
1155 Best of Education v.1
60 of our best educational programs.
1709 Type 1 Fonts Set
40 Adobe Type Mgr compatible Type 1 fonts.

Shareware Disks

Over 200 titles in stock.

See us at the San Francisco MACWORLD Expo.
Booth #1507
Telematics Software for Success in Business

"The runaway leader in sales, marketing, and telemarketing software." (Datapro Report)

"...better than any similar sales management tool we've seen." (NewWorld)

Telematics is so easy to learn and use, you'll make more sales immediately!
Runs on all popular computers, laptops, and networks.
Recall Ticker, Appointments, Formители, Auto Dial, Reports, Order Entry, and More.

Remote Control International
800-992-5952
203 Pacific Ct. #130
Culver City, CA 90230

CIRCLE 360 ON READER SERVICE CARD

Educational

Business

Invoicing/Order Processing

National Tele-PeR
P.O. Box 98
Newton Centre, MA 02159
(1-800) 498-6998

CIRCLE 358 ON READER SERVICE CARD

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 213-466-5533

CIRCLE 359 ON READER SERVICE CARD

Civil Engineering

The runs on telemarketing make more sales immediately!

Marketplace

EDUCATIONAL

MORE TEACHING, LESS PAPERWORK! SAVE $145

ClassMaster
Enter student profiles, grades, attendance. Graph class & student performance. Print reports, import/export data.
1991 Technology & Learning Mag. Award of Excellence.
"...one of the most impressive classroom management programs that we've seen.
Electronic Learning 5-6/91

415-752-6515 - Fax: 415-752-6595 - 298 4th Ave. #401, San Francisco, CA 94118

CIRCLE 355 ON READER SERVICE CARD

The Absolute Best in Testing!

LXR-TEST 414 is the most advanced and complete testing system available for your Mac.
- Item Cataloging
- Test generation
- Full graphic placement
- Scoring & analysis
- Paper & Interactive
- Computer gradebooks
- Multiple pagebook
- Multiple reader support
- Student mastery

(714) 980-0946 Fax: (714) 987-0766

CIRCLE 356 ON READER SERVICE CARD

IBM 3164 and VT100 File Transfer and Terminal Emulation for the MAC

MAC TO PC - MAC TO MAC - MAC TO MAINFRAME

800-262-RCOM
CONNECT TO THE IBM WORLD

FREE TRIAL

CIRCLE 357 ON READER SERVICE CARD

Entertainment/Games

You have ever wanted to shoot your MACP!

Mad Dog
Black toons + 80's Stingers
The Police Arrested
4 Nighthawks + More!

$19.95 (+ $1 S&H)
Fax: (415) 546-9387

CIRCLE 360 ON READER SERVICE CARD

BodyCello

Flx-at-a-Click Catalog

CIRCLE 361 ON READER SERVICE CARD

Tell Your Source! I Found it in MacUserMarketplace.

MacUser February 1992 365
ENTERTAINMENT/GAMES

For the Businessman on the "Go"!
"Learning to play Go well is tantamount to a senior-level course in strategic thinking."

"Go Jan.5" Best introduction to Go yet developed." MacWold, 2.91

(800) TOYOGO-9
(808) 396-4126 fax

$35 Ed. Junior $49 Go Master $139 Deluxe Toolkit + $10.50 S&H

CIRCLE 365 ON READER SERVICE CARD

MARKETPLACE

MacUser
366 February 1992 MacUser

MacUser Marketplace
To place your ad call (212) 503-5115 or (800) 825-4ADS

GRAPHICS

AdArt

Fax us your Logo

We'll return-fax you a quote to create a high quality EPS file in Illustrator, Freehand and PICT format.

Mac or MS-DOS

MacPOWER

FAX 800-765-4504
Voice (609) 653-0696
FAX 800-765-4504

CIRCLE 374 ON READER SERVICE CARD

CIRCLE 372 ON READER SERVICE CARD

FULL PAGE BACKGROUNDS (EPS)

New!! People-1 Yet

Mac or MS-DOS

Ardas

CIRCLE 375 ON READER SERVICE CARD

CIRCLE 372 ON READER SERVICE CARD

NEW!!

68000, COP800, PIC16Cxx versions!

μASM™

Cross Assemblers for the Macintosh™

Text editor, cross macro assembler and communications facility in a complete integrated development environment.

$149.95 ea

Plus S/H

Micro Dialects, Inc.
DEPT. MG, PO BOX 20014
CINCINNATI, OH 45201

CIRCLE 372 ON READER SERVICE CARD
**LOTTERY**

**MacLotto® for all Macs**

- $115.5 Million Dollar Lotto
- JACKPOT was CRACKED!!
- Using Odds Improvement Multiplication™
- Web Order: MacLotto Lottery Primer Book!
- Lottery Players Magazine - A Must!
- Complete MacLotto Guided Tour on Disk!

**Public Domain**

**FREE**

**MAC SOFTWARE CATALOG**

24 Pages! ASP Member

SOFTSHOPPE, INC.
P.O. BOX 3679
ANN ARBOR, MI 48106
Tel: (313) 761-7638
FAX: (313) 761-7638

Toll-Free—24 Hrs.

**1-800-829-BEST**

CIRCLE 276 ON READER SERVICE CARD

**REAL ESTATE**

**PROPERTY MANAGEMENT FOR MACINTOSH**

Comprehensive software for managing residential and commercial properties, and condo associations. Includes GL, AP, AR, check writing, recording charges and expenses, and over 70 financial and management reports. Over 1000 property management systems sold! Prices range from $595.00 to $2495.00 (networking). Also available in Windows and MS-DOS versions.

1-800-272-4663

GoodSoftware Corporation

CIRCLE 379 ON READER SERVICE CARD

**RELIGION**

**10th Anniversary Celebration!**

Ten years at the top! Version 5.0 VERSE SEARCH now offers full mouse support, unlimited windows and instant access to every word or verse. Our Family of Bible study products includes: NIV, RSV, KJV or NKJV text, Bible Concordance, Bible Dictionary, Thesaurus, Chain References, Personal Commentary, Greek / Hebrew translators, Topical Bible, Chronological Bible. Memory resident VERSE TYPIST transfers verses directly to your word processor. Our $5 demo disk shows why we have sold more products than any other Bible program!

Bible Research Systems - 800-423-1228
2013 Wells Branch Parkway #304 • Austin, Texas 78728

Toll Support (512)251-7541 Call for a free Catalog. Satisfaction Guaranteed.

CIRCLE 380 ON READER SERVICE CARD

**SHAREWARE**

**FREE**

**8 ASSORTED PACKAGES OF OUR BESTSELLING SOFTWARE FOR MAC**

1. GAMES
2. EDUCATION
3. HYPERCARD
4. BUSINESS
5. RELIGION
6. FONTS
7. CLIP ART
8. UTILITIES

PAY ONLY $5.00 SHIPPING
• CREDIT CARDS ONLY •
• EACH PACKAGE CONTAINS 6/3.5" DISKS

SMC
SOFTWARE PUBLISHERS
619 931-8111
EXTENSION 511

CIRCLE 381 ON READER SERVICE CARD

**NETWORKING**

**Tell Your Source!**

I Found it in MacUser Marketplace

**MacUser Marketplace**

To place your ad call
(212) 503-5115 or (800) 825-4ADS

**MacLotto Magazine, August 1990**

- Teaches intervals, chords, melody, rhythm
- Interactive staff notation - Scores written
- High quality sound - MIDI compatible
- Historical & computer-generated melodies
- Custom cue training modules
- Includes textbook - Beginners to advanced

$125.00 • Call Toll Free 800-445-4866

CIRCLE 377 ON READER SERVICE CARD

**Great Performances Demand an Encore**

To find out how you can have your article or review elegantly reprinted**, call or write today:

Claudia Crichlow
Reprints Manager
Ziff-Davis Publishing Company
One Park Avenue
New York, NY 10016,
212-503-5447

*Minimum quantity 500 reprints.
MARKETPLACE

STACKWARE

MacFlash Cards
Effective Expandable Affordable

Vocabulary tools for all Macintosh computers: French German Russian Spanish Latin Czech

Over 2000 foreign words and 1000 more foreign synonyms. Only $25 each. Compare our prices and save! ORDER TODAY!

Cyrillic & Czech fonts available! Call/write for more information.

The Language Quest Software Co.
101 First Street Suite 420
Los Altos, CA 94022
800-622-3574 or 415-949-2876

STATISTICS

NEW Power Designed To Fit Your Needs

MINTAB offers a broad range of statistical functions, quick and efficient menu interface, and command option.

• Basic & Advanced DOE Statistics
• Control Charts
• Hi-Res Graphics

Mac models except 128k, II, IIc, IIics, & IIgs

CALL 800-448-3555 MINTAB

CIRCLE 382 ON READER SERVICE CARD

MISCELLANEOUS/ ACCESSORIES

MacFlash Cards
The Language Quest

prices

Cyrillic & Czech
Vocabulary tools for all

Macintosh computers:

French German Russian Spanish Latin Czech

Only $25 each. Compare our prices and save! ORDER TODAY!

Cyrillic & Czech fonts available! Call/write for more information.

The Language Quest Software Co.
101 First Street Suite 420
Los Altos, CA 94022
800-622-3574 or 415-949-2876

DUST COVERS

ALL FABRIC

High Quality - Made in America - 100% Satisfaction Guaranteed!

For Macintosh & IBM Desktops

All Macintosh & IBM Desktops, 400dpi Graphics in Black, Beige, Navy, Green, Red, White or Brown!

Macintosh models: Classic, SE, II, IIc, IIgs, IIcx, IIci, LC, LC II, LC III, Quadra, Quadra 700 & 950, Performa, Powerbook, Color Classic, Power Macintosh 7100 & 9000 Series

CALL 800-448-3555 MINTAB

CIRCLE 383 ON READER SERVICE CARD

DATA CONVERSION SERVICES

TAPE/DISK CONVERSIONS

Conversion services for your Macintosh to over 3000 computer systems. Capabilities include converting to or from:

• MacWrite, MacWrite II, & MacWrite Pro
• Word Processor/Typewriters

Data can be supplied in over 450 software packages. OCR scanning also available.

Pivac Computing Services, Inc. #MUI
165 Arlington Heights Rd.
Buffalo Grove, IL 60089
800-CONVERT

CIRCLE 384 ON READER SERVICE CARD

DESKTOP PUBLISHING SERVICES

Universal CAD Graphics Importer
for Macintosh Publishing

Having trouble getting editable CAD images into your Mac publishing software?

CAD to Mac™ moves images from virtually any workstation or PC based CAD system which supports HPGL and converts them to editable PICT format.

Eliminate cutting, pasting or redrawing.

• image rotate, scale and print images before translation
• device compatibility not required

$495 plus $0 0 S&H

CALL (513) 730-6000

CIRCLE 385 ON READER SERVICE CARD

SLIDE IMAGING SERVICES

SlideImagers

$4.95

POSTSCRIPT SLIDES

All Major Mac and PC Packages

Slides • Overheads • Color Prints

Canon CLC 500 Color Lasers

Beautiful 400 dpi color prints...directly from your files!

22 Seventh Street 1-800-232-5411
Atlanta, GA 30308

CIRCLE 387 ON READER SERVICE CARD

We Image

Or We Design It

MAC
MAC
MAC
MAC
MAC

MACINTOSH
MACINTOSH
MACINTOSH
MACINTOSH
MACINTOSH

MACINTOSH ONLY
MACINTOSH ONLY

In NY State Call
212-989-2727
Outside NY State Call:
800-445.9002

Nextwave Productions, NYC, NY

$5 Film PostScript, $10 PostScript Volume discounts available.

CIRCLE 388 ON READER SERVICE CARD

SLIDES

TRUE ADOBE POSTSCRIPT SLIDES

35mm, 4X6, 8X10 Transparencies

• 4K/8K Resolution
• All Major Mac/PC Software
• Canon Color PostScript
• Volume Discounts
• Linol Output

1-800-68-LASER ext. 12
32737

CIRCLE 389 ON READER SERVICE CARD

24 Hour Support/ Same Day Service

MacUser Marketplace

To place your ad call
(212) 503-5115 or (800) 825-4ADS

MacUser Marketplace

CIRCLE 390 ON READER SERVICE CARD

FIND A BARGAIN?

Let Your Source Know You Found it in MacUser Marketplace

CIRCLE 381 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

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 Crichlow—Reprints Manager;
Ziff-Davis Publishing Company,
One Park Avenue, New York, NY 10016, 212-503-5447.

**Minimum quantity 500 reprints.
MacUser's BusinessCard section is a forum for innovative, hard-to-find and low-cost MAC products and services. Ads are listed by product category and include Reader Service numbers to allow fast, easy response.

RATES:
1 issue-$420, 3 issues-$1260, 6 issues-$2355, 12 issues-$3800.
Multiple-ad per issue rates also available.
Prepayment must accompany each insertion. AMEX/VISA/MC welcomed.

Ad Format:
MacUser will design and typeset each BusinessCard ad. Advertisers should furnish typewritten copy. Ads include: 1) Headline (line, initial caps-30 characters max, all caps-25 characters max), 2) Descriptive copy (5 lines, 225 characters max), 3) Company name (same specifications as headline), and 4) Address and telephone number (2 lines, 40 characters per line). No logos, artwork or camera-ready ads. Publisher reserves the right to edit supplied copy to meet section specifications.

DEADLINES:
MacUser is published 12 times a year. The BusinessCard closing is approximately two months prior to issue date. Please send copy and payment to MacUser BusinessCard, One Park Avenue, 3rd Floor, New York, NY 10016, ATT'T: Paul Fusco. For more information, call Paul Fusco at 800-325-1237 or 212-503-5866. FAX: 212-503-5860.

HARDWARE/COMPUTER SYSTEMS

APPLE-OPUS-APPLE-PRINTERS
• CDO Purchasing at any volume
• High inventory at all times
• Selling Direct & indirect at any volume
• Exporting & importing at any volume
• Our high volume makes our low price possible
Gulf Technology Los Angeles, CA 818-785-2800 FAX: 818-908-5334

SOFTWARE/ACCOUNTING

JOB COST / TIME BILLING

SATORI SOFTWARE
2815 Second Ave. #295, Seattle, WA 98121 (206) 443-0165

DATA RECOVERY SERVICES

MAC DATA RECOVERY SPECIALISTS
Your Data is special. Let the Company that specializes in SCSI Data Recovery and Hard Drive Repair provide you with expert service. CPR has been recognized in many computer pubs as a leader in SCSI Data Recovery.

Computer Peripheral Repair
7270 S. US Hwy 1 Hypoluxo, FL 33462
800-765-9322 407-586-0011 (FL) 582-7252

INSURANCE

Insure Your Computer
SAFEWARE's Computers insurance coverage provides replacement of hardware, media and purchased software. As little as $49 a year covers theft, accidents, power surges and more.
Call TOLL FREE 1-800-648-3469
Safeware The Insurance Agency Inc.
PC Box 22211 2629 N High St.
Columbus, OH 43202 800-848-3469

PRINTERS

LOW COST PRINT SOLUTIONS
Specialists in laser printing, low cost, hires B&W printers by OMR, NCR, XEROX. Color printers by QMS, Brother, SOKHO from $4499. Used printers bought, sold, traded.
We guarantee best price available.

MICRO-MANIA
246 Cummings Park, Woburn, MA 01801 617-932-3356 FAX: 617-932-9113

SCANNERS

Scan 3D With Your Hand Scanner
Scan - put life back into your photos for those hand scanners which enable the scanning of small objects. Compatible w/fully-elevated scanners by: Logitech/Maestro/Computop/Canon, $49.95-$99.95. CA Res and tax. (MC/VISA/Discover wanted).

FACILITUM
8410 El Camino Real, Suite X
Atascadero, CA 93422 Ph/FAX (805) 461-5530

GOLF & TENNIS SOFTWARE

Lower your golf score with Golf Pin Shot. Package includes Golf Shot, GolfTip (clip art images in HYPERCARD & MacPaint formats) & golf manual. Tennis package also available. $59.95 each. Requires HARDWARE & HYPERCARD.

FYI Publishing
P. O. Box 150661, DEPT 32 Ft. Worth, TX 76108 817-993-3362

EDUCATIONAL

FINANCIAL

ADULT GRAPHICS
WE OFFER THE BEST IN ADULT-ORIENTED GRAPHICS FOR YOUR MAC. IF YOUR AGE IS 18 OR OLDER. REQUEST OUR FREE CATALOGUE OF SIZZLING ADULT SOFTWARE.
VISA AND MASTERCARD ACCEPTED.

CLEARLIGHT SOFTWARE
P. O. BOX 1441 DEPT. M
Merrimack, NH 03252
(603) 862-2166

I SAVED $7801. REFINANCING
Your savings depends on goals, age, amount, term, rate points combo, tax bracket. 3 fixed rate options. 10 charts, guides. Easy use. Makes decision obvious. WHY GUESS? Maximize savings NOW before rates rise. Only $29

PERSONAL FINANCIAL ANALYSIS
82 Tucker Lane, Dept. UR-1
Dartmouth, MA 02747 508-994-4711

BUSINESS

MACPINEP CALENDAR
MacPinep combines 16 incredible images of beautiful women in swimsuits with an 18 month calendar and screen saver all in one program for $19.95 per copy. Available. From Beach Babes, Blondes, Brunettes, & Surf Babes.

R&R COMPUTER SOLUTIONS
1501 E. Chapman #168, Fullerton, CA 92631
(714) 639-6516 (800) 323-6545

ENTERTAINMENT/GAMES

ATHLETIC SCHEDULING SOFTWARE
Athletic Scheduling Software for Apple Macintosh now available. Schedule leagues or tournaments, seeded or round robin, even facilities all without conflict. Stat. Management Software also available for most sports. Works for any sport.
Amalgamated Soft Works, LTD.
1600 NE 18 Ave. PO Box 18044 Miami, FL 33181
(212) 649-4481

BUSINESSCARD

CIRCLE 442 ON READER SERVICE CARD

CIRCLE 434 ON READER SERVICE CARD

CIRCLE 438 ON READER SERVICE CARD

CIRCLE 439 ON READER SERVICE CARD

CIRCLE 440 ON READER SERVICE CARD

CIRCLE 441 ON READER SERVICE CARD

CIRCLE 442 ON READER SERVICE CARD

CIRCLE 443 ON READER SERVICE CARD

CIRCLE 444 ON READER SERVICE CARD

CIRCLE 445 ON READER SERVICE CARD

CIRCLE 446 ON READER SERVICE CARD

CIRCLE 447 ON READER SERVICE CARD

CIRCLE 448 ON READER SERVICE CARD

CIRCLE 449 ON READER SERVICE CARD

CIRCLE 450 ON READER SERVICE CARD
MacUser MARKETPLACE

One Park Avenue
Third Floor
New York, NY 10016
Attention: Paul Fusco

For more advertising information, call 212-503-5115
or 1-800-825-4237.

BLOG SOFT DISK $3

FEDERAL JOB LINK-SF171
A forms software package for completion of the
SF 171. It provides forms on screen and produces
unlimited copies of the 171. The forms are near
perfect quality. Also contains a comprehensive
user's guide. Only $62.95. Requires MacDraw.

MULTISOFT RESOURCES
P.O. Box 235 Washington Grove, MD 20880
301-977-0972

CIRCLE 447 ON READER SERVICE CARD

NUTRITION/MEDICAL DIAGNOSIS
The Leader in Nutrition & Exercise Software!
Analyzes Recipes, Diets, & Exercise Programs.
Allergy, Differential Diagnosis, & Veterinary
Diagnosis (including Fish/Small Animals). Over
300,000 sold. MAC & IBM. Call for Information.

N-Squared Computing
3040 Commercial Street SE, Suite 240
Salem, OR 97302 (503) 364-9118

CIRCLE 448 ON READER SERVICE CARD

SOFTWARE FOR HIKERS
Browse/print trail descriptions in the Pacific NW
with Best Foot Forward™ for MAC. Fast and fun for
all levels of experience! WA and OR databases
each contain 700+ trails. CA soon! Program plus
1 db $89.95 plus tax/shipping.

GRIZZLYWARE
16837 NE 176th St., Woodinville, WA 98072
Call 1-800-258-HIKE today!

CIRCLE 450 ON READER SERVICE CARD

DEMONIANS INTERNATIONAL
PO Box 2351, Montclair, CA 91763
714-621-0973 OR 714-621-2117 FAX

CIRCLE 447 ON READER SERVICE CARD

FULL COLOR ON DESKWRITER!
Also works on Stylus/Writer. Now you can have high
color printing at a very low cost!
Full color print kit for only $44
Single color print kit (2 refills) - $18
Black ink kit (2 refills) - $15.50

CONSUMER COMPUTING
2481 Mission St. San Marino, CA 91108
(818) 799-2290 • FAX: (818) 446-1071

CIRCLE 452 ON READER SERVICE CARD

MACUSER FEBRUARY 1992 371

ADVERTISING
ACCOUNT REPRESENTATIVES

Account Representative
Lawrence Johnson 212-503-5138
AL, AR, IA, IL, IN, KS, KY, LA,
MI, MO, MS, NE OH, OK TN,
TX, WI, CANADA, OVERSEAS

Account Representative
Tom Koletas 212-503-5136
CT, DC, DE, FL, GA, MA, MD,
ME, NC, NH, NJ, NY, PA, RI,
SC, VA, VT, WV

Account Representative
Dennis Leavoy 212-503-5111
AK, CA (209, 408, 415, 510, 707,
805, 916), HI, ID, MN, MT, ND,
NV, OR, SD, WA, WY

Account Representative
Laura Salerno 212-503-5140
AZ, CA (213, 310, 619, 714, 818),
CO, NM, UT

MacUser MARKETPLACE

ONE PARK AVENUE
THIRD FLOOR
NEW YORK, NY 10016
ATTENTION: PAUL FUSCO

FOR MORE ADVERTISING INFORMATION, CALL 212-503-5115
OR 1-800-825-4237.

BUSINESSCARD
ACCOUNT REPRESENTATIVE
Sherrie Graddie 212-503-5152

NATIONAL ADVERTISING STAFF

Vice President
Classified Advertising
Paul Stafford

Classified Advertising Director
Vickie L. Pinsky

Sales Manager
Paul A. Fusco

Advertising Coordinator
Nepreil Foster

Production Director
Anne Brockinton

Production Coordinator
Chris Meyer

MacUser MARKETPLACE

ONE PARK AVENUE
THIRD FLOOR
NEW YORK, NY 10016
ATTENTION: PAUL FUSCO

FOR MORE ADVERTISING INFORMATION, CALL 212-503-5115
OR 1-800-825-4237.
Failing Grades

Recently encountered a proposal from my local school district that concerned upgrading the elementary school's student-computer system. Essentially, the proposal writers and the steering committee wanted to buy more Apple IIe machines and burden the school with a dead-end technology that even Apple now discourages. It was obvious to me that the Mac should be the machine bought for today's schools.

Apparently the nation suffers from a terrible lack of understanding about desktop-computer technology and where it's headed. I collected several observations from various magazines that explored the state of computer education in schools. What I read was pretty depressing.

There are more than 1,200 recognized teacher education programs in the country today. How many of them adequately prepare future teachers to use technology across the curriculum? The common answer, according to the education school deans, faculty, and computer coordinators contacted by Electronic Learning Magazine, is that technology does not permeate a student's typical pre-service education experience, and that is a major impediment to technology use once they become teachers.

— Electronic Learning, March '91

But I suspect that another difference between the use of computers by the military and industry, and in education, is that the former introduce computers on a systematic and large scale while the latter does so in a small, haphazard way.

— Electronic Learning, May - June '90

The descriptions of some courses highlight software as a way to remove the mystery surrounding computers, but classes often do the opposite. A teacher-training class was fascinated with the ability of computers to alphabetize lists, and a student asked how the computer could do this. Shrugging her shoulders, the instructor responded: "I don't know. How does it know to be a word processor? It's magic!"

— Technology Review, January '91

The reality is that personal computers in the 1980s have not prompted the sort of sweeping changes in how we learn that many people anticipated during the late 1970s, when PCs began to take hold in business. Idealistic visions of a computer on every desk, innovative software in all areas of study, and a new generation of computer-trained, computer-enthused teachers and students have not materialized for the vast majority of our schools. Indeed, all but a few schools are far from achieving anything so grand.

— Personal Computing, October '89

I suppose I could go on and on with citations telling the same sad tale: 'The schools are getting little benefit from their computers. I'm not slanting the basic theme. Virtually no articles extoll the computer or cite benefits or success stories. Most telling is the comment that computers have aided science, business, the military, and industry but not education. It makes you wonder what the problem is in the schools. Are we saying that it's impossible for schools to benefit from computers in the classroom? If you read enough of the criticisms, you'll discover that some critics go so far as to say that computers in the classrooms are just a waste of money. They claim that students don't really learn anything about them beyond how to turn on the power and insert a floppy disk. This "skill" can be learned at any time, and it's not important to the curriculum. Well, that's probably true if computers are used at such a superficial level that they are simply glorified game machines. This will quite likely be the case if the Apple II continues to dominate classrooms. The truth is, the Apple II has to be junked until educators figure out that they are not benefiting from computer technology. Apple II continues to dominate classrooms. The truth is, the Apple II has to be junked until educators figure out that they are not benefiting from computer technology. The reasons were twofold: members of the Apple II clique in Cupertino jealously clung to their education-market stronghold because they realized that it was going to be their last stand. At the same time, the marketing types who labored for years to make the Mac an acceptable business alternative to the DOS standard feared that the word educational would tarnish its reputation as a "serious" computer. Well, Apple finally admitted defeat a year ago when it brought out the Classic and the LC, the latter of which can emulate an Apple II. But the message has been slow to reach educators. Obviously, the Apple II won't get junked until educators figure out that they are not benefiting from computer technology. In business and industry, computers improve efficiency and save money. Schools should be striving for both goals.
If a growing network makes you think of this:

Farallon offers two words of advice:

Think again.

Does the thought of expanding your network leave you feeling tied up in knots?
You're probably not alone.
So we'd like to tell you about the PhoneNET StarController™. A simple yet intelligent alternative to what you may have in mind.

StarController LocalTalk and Ethernet hubs use telephone wire — the kind already installed in your walls — to create a network that never needs rewiring. In fact, adding a new Macintosh or PC to the network is as easy as plugging in a new telephone.
Our newest LocalTalk hubs are available with either 12 or 24 ports. And they offer the same reliability and network management capabilities that have made Farallon the industry leader.

We've also added some new features. For example, you can use our enhanced StarCommand™ 3.0 software to manage hubs over the network or through a fault-tolerant bus. And if you ever do have a problem, StarCommand tells you where it is and, perhaps more importantly, how to fix it.

Of course, if you're thinking about growth, you may be considering Ethernet. Farallon's StarController Ethernet hub lets you add 10BASE-T when and where you need it most.

You can manage our Ethernet and LocalTalk hubs with the same copy of StarCommand.
And all of our hubs are designed for even further expansion.
You can mount any StarController you buy today in the PhoneNET® concentrators now under development.

So if network growth is on your mind but you aren't sure what to do first—or what to do next—remember this: PhoneNET from Farallon.
Because when it comes to networking, it pays to think ahead.

For a free Macintosh demonstration disk of StarCommand software, call (800) 344-7488.

Circle 175 on reader service card
At Mirror, we build quality, reliability and value into every single product so we've got power users all over the country talking about them. It's the kind of talk we love to hear.

"Unarguably the best products in the Mirror line."
— Don Rittner

Don Rittner, president of M.E.C.C.A., thinks that monochrome monitors are Mirror's best products. But members of his own users' group disagree.

It's possible that Don may be right. After all, we've just introduced a new 21" two-page and a 15" full-page display. Use them with a built-in video port on some Macs or with a Mirror monochrome video card for a sharp, bright view of your work.

The 19" two-page display comes with a monochrome video card for the SE, Classic, LC, SE/30, MacII or Quadra.

All three systems feature high-contrast, razor-sharp images, reduced VLF and ELF emissions, and built in ADB ports for reduced cable clutter.

Stephen Frantz prefers Mirror's color monitors because there's one for every need and budget. Like the 14" for example.

"Mirror's 14" color is under 400 bucks, and it looks great."
— Stephen C. Frantz

...But What Do

Stephen Frantz prefers Mirror's color monitors because there's one for every need and budget. Like the 14" for example.

"Mirror's done it again. This is a real breakthrough, a 16" Trinitron for $1399."
— Hilary Koppel

Stephen is not the only one excited about Mirror color systems. Hilary loves the 16" Trinitron. Designed for the pro who demands the highest quality, but can't justify the high cost, the Mirror 16" Display has 832 X 624 resolution for comfortable viewing of two-page layouts or large spreadsheets.

Use Mirror's 16" Trinitron with the built-in video port on Ilsi, Iici or Quadra, or our optional video card for any MacII.

If you need a no compromise two-page color display, Michael advises checking out the Mirror ProView.

Available in 8-bit or 24-bit models, the ProView is "a real bargain" according to the May '91

Michael Levy, member

Stephen Frantz, Ph.D., member

Hilary Koppel, member
issue of MacUser magazine. Featuring world class Trinitron quality so your most critical projects look flawless, the ProViews are still affordably priced.

“The ProView can handle my most demanding applications with ease; and best of all, I can afford it.”

— Mike and Terry

The Mirror color scanner, according to Nancy, is a remarkable product; 600 dpi 24-bit scanning for only $1299. It has more features and higher quality than competing models, yet is priced far less.

“This would be a good scanner for $2000; for $1299 it’s unbelievable.”

— Nancy M. Benz

In December 1991 MacUser gave this scanner 4 mice, saying, “the quality of the hardware is excellent.” and it "produced the best images.”

If you need to get color or gray-scale images into your work, the Mirror color scanner is for you.

“Mirror’s 88 MB SyQuest drive solved my growing storage problem.”

— John H. Galligan

Mirror offers hard drives from 30 MB to 1 Gigabyte, and each one has the quality features that won John over: top quality drive mechanisms, rugged steel chassis, external termination and address switch, convenient outlets and a two year warranty. Whether you need a 2.50- footprint drive, a super compact portable drive, or an 88 or 45 MB Syquest drive, Mirror’s got the right stuff.

Tough customers all over choose Mirror products for quality, performance and value. We offer a complete line of Macintosh peripherals including hard drives, displays, scanners, printers, CD-ROM drives, and tape back-up units.

Call for our free catalog to read what the experts say about Mirror peripherals. Superior products, superior value, all backed by our famous 30-day, “love it or return it” guarantee.

Members of Macintosh Enthusiasts Club of the Capitol Area

To Order Direct, Call 1-800-654-5294
Media: 1000

CIRCLE 118 ON READER SERVICE CARD.
“Don Says Mirror’s New Monochrome Displays Are Clearly Their Best Product...”

$449 for built in video
(call for other options)

19” $799 with card.
21” $999 with card.

Don Rittner, President of M.E.C.C.A.
Editor of MUG News Service