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The Macintosh™ Magazine

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“Microsoft Excel is unquestionably the most powerful spreadsheet program available on any personal computer.” Lon Poole, *Macworld*, September 1985

“In terms of features and ease of use, Microsoft Excel makes 1-2-3 look rather pale.” *The Seybold Outlook On Professional Computing*, October 20, 1986

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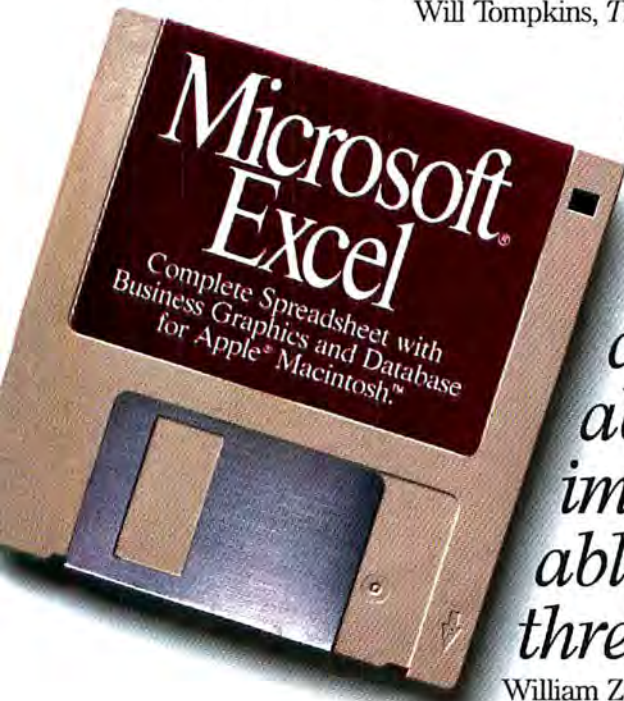
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Jerry Pournelle, *Byte*, April 1986

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Will Tompkins, *The MACazine*, Vol. 2, No. 10



“A powerful spreadsheet program with equally powerful data-base and charting (or graphics) capabilities, it offers substantial improvements over comparable PC-DOS programs in all three areas.”

William Zachmann, *Computerworld*, December 8, 1986

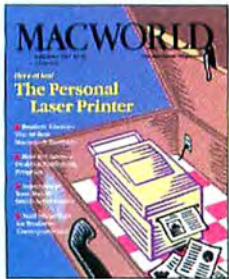
It seems we underrated it.

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MACWORLD

September 1987

The Macintosh™ Magazine



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

Introducing Totem.[™]

A rather revolutionary Bering 20 mb Bernoulli compact disk drive system for Macintosh computers. And, the first truly *portable* 5¼" system. One that lets you tote around 10,000 pages of data on a sleek cartridge about the size of a piece of bread.

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

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

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

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

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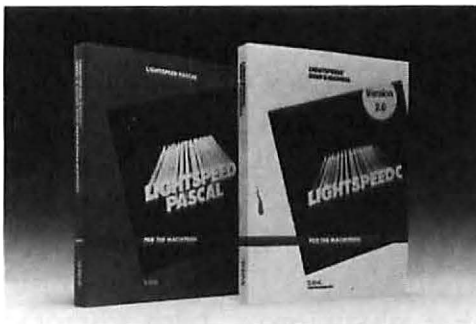
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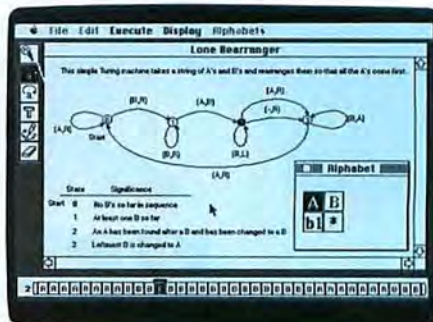
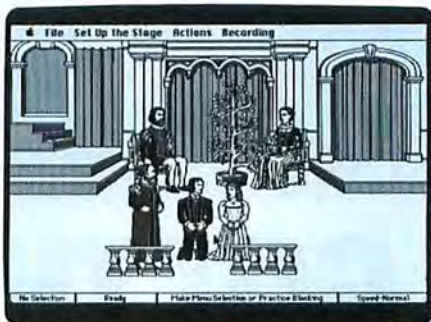
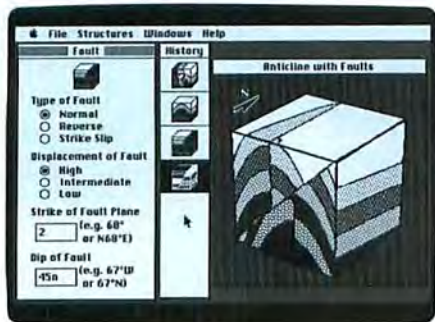
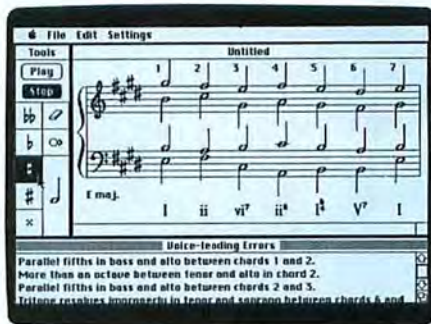
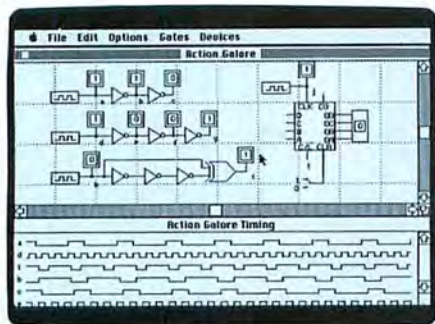
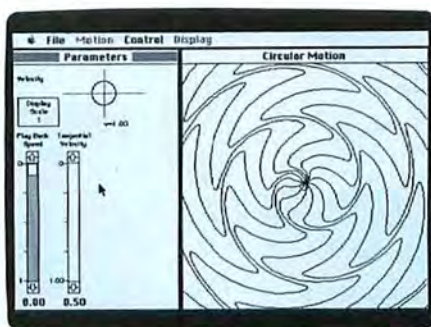
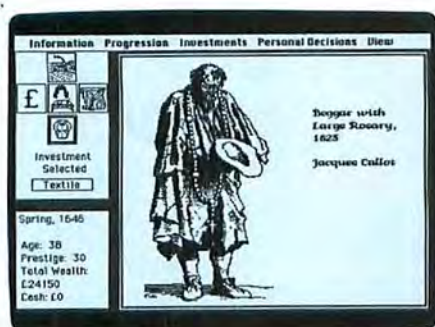
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Our Smartmodem 2400 and Smartmodem 1200 are also compatible with all versions of the Apple Macintosh™, including the Macintosh Plus, Macintosh SE and Macintosh II. There's even a specially bundled package for the Macintosh that contains a Smartmodem 1200, modem cables and Smartcom II® software. Smartcom II is our award-winning software specially designed to take advantage of the power and graphics capabilities of the Macintosh.



Last but not least, there's another feature that Hayes 2400 and 1200 bps modems offer that will make them even more compatible with Apple computers, and that's a new low price.

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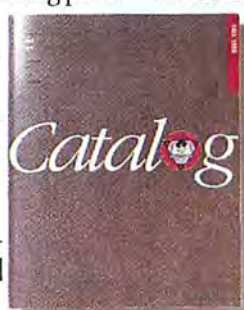


Now teachers don't have to go strictly by the book.

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System Tricks

► Had any trouble with System Folders you've copied from a hard disk onto a fresh floppy? System versions after 3.2 don't include the Macintosh boot blocks on disks they initialize; the change was made to handle situations in which network users must access an application on an alien computer's disk—say an IBM or an Apple IIGS.

To solve the problem, drag the file labelled System 4.1 Boot Blocks onto the floppy disk and double click on the file. If your System Tools disk doesn't include this file, contact your Apple dealer for a copy. As a stop-gap measure, you could resort to *Fedit's* Right Boot Blocks modification, but the simplest fix is to drag an application program onto the disk and start it up; the application assigns the right boot blocks when it opens. If that doesn't work, first copy System 3.2 and Finder 5.3 onto the disk, throw them away, and then drag on the current System and Finder.

Style on the Menu

► If you've ever changed the font throughout a document, only to realize too late that you had meant Boston instead of Oxford, a new desk accessory called *MenuFonts* (\$17 postpaid) may be for you. The DA from Tucson-based Beyond Utilities (602/323-4547) shows each name on the Font menu in its own typeface rather than in the standard Chicago font. It works on Macs with 512K or

more of memory but functions only with applications or other desk accessories that use the standard Font menu, such as *MacWrite*, *WriteNow*, and *MindWrite* (not, for example, *Microsoft Word*, *MacAuthor*, *Word Tools*, *Ragtime*, or *miniWriter*). A pictorial font obscures the font above it on the menu, but you can still click on both.

AppleShare 1.1

► Apple recently released a free upgrade for its *AppleShare* network server software. It's faster and more responsive than the original, according to Apple. Other new features include automatic optimization of the server's RAM cache, display of user passwords at the time they are defined, and multiple foreground processing to allow users to concurrently run programs such as printer spoolers and automatic server backup utilities. The new version runs on the Macintosh Plus, the SE, and the Mac II, but it doesn't prevent individual network users from kidnapping public folders and hiding them away in password-protected folders, a source of some grumbling by users (and competitors). Apple representatives claim that's not a bug, saying that network administrators must simply learn how to lock the root directory. *AppleShare* 1.1 is available through Apple dealers.

Educational Exchange

► For the first time ever, developing courseware—educational programs created as instructional aids—has become a paying proposition because of royalty payments offered to authors by Kinko's. The chain of 320 copy shops has been distributing more than 100 programs on 22 campuses nationwide through its Academic Courseware Exchange, helping fill the void of software for higher education.

Through the Kinko's network, students at the University of Utah and other participating schools can buy, for roughly the price of a textbook, programs dreamed up for classes on other campuses, such as Drexel University's *Molecular Editor* for chemistry majors or *Treaty of Versailles*, which lets students make the international boundary decisions that faced the Allies after World War I. A leading source of courseware, Philadelphia's Drexel University keeps 60 percent of the royalty and gives 40 percent to the individual student, staff person, or faculty member who authored the software.

PC-to-Mac Made Easy

► Dayna Communications of Salt Lake City recently released a new product that drastically improves upon its previous MacCharlie and FT100 IBM PC-to-Mac products. DaynaFile, a SCSI external disk drive for IBM floppy

disks and accompanying translation software, makes transferring files from the PC as easy as dragging an icon from one disk to another. The IBM disk's directory turns into a disk icon on the Mac desktop, its subdirectories arrive in the form of folders, and files take the shape of document icons. That means Mac users can copy, open, or edit files from IBM programs such as *1-2-3*, *WordPerfect*, *dBase III*, and *PageMaker PC* without even once confronting the dreaded MS-DOS A> prompt.

The package starts at \$595 for a single 5¼-inch drive with 360K capacity. Buyers can choose a second IBM drive in 5¼-inch 1.2MB format or a 3½-inch drive formatted for either the PC Convertible or the PS/2. The latter option may lead to an ironic twist of fate: the Mac could end up as the tool of choice for companies converting their IBM PC files to the new PS/2 system.

Dynamac Plus

► The Golden, Colorado-based company that produced the first laptop Mac by gutting a Mac Plus has announced the Dynamac GP, a portable Mac with a 512- by 342-pixel gas plasma display. The \$3995, 17-pound unit is similar to the original Dynamac EL (\$4995), which comes with an electroluminescent 640- by 400-pixel display. The EL screen has a finer pitch and supports the E-Machines large screen without any internal adjustments.

(continues)

The Finder Evolves

► Transforming the current Macintosh system into one that runs multiple applications is no easy feat. This month Apple plans to ship MultiFinder (previously known as Juggler), the next major step in the evolution of Mac operating system software.

With MultiFinder you can run multiple applications in separate windows on the desktop. Although many applications are visible at once, only one program can be active at a time; you jump from one to another by selecting the desired window.

While MultiFinder doesn't turn the Mac into a true multitasking operating system, specially written programs can run in the background, leaving the Mac free to do other things. The first of these background programs to appear is a laser printer spooler that comes with MultiFinder. Expect to see other such programs, like terminal emulators that let you download files in the background. MultiFinder is slated to ship as a four-disk set for between \$50 and \$75.

Speeding Up Network Access

► Announced at the Macworld Expo in August, the EtherTalk board from Apple Computer allows the Mac II to take advantage of the 10-megabit-per-second throughput speeds possible on Ethernet networks—about five times faster than AppleTalk. Essentially, EtherTalk is AppleTalk running on Ethernet cables and with Ethernet protocols. Users can choose AppleTalk or EtherTalk from the Control Panel. Because

the network protocols differ, Apple has developed the AppleTalk Address Resolution Protocol to translate between them. Apple is working closely with third-party developers such as Kinetics, maker of AppleTalk-to-Ethernet gateways for the Mac Plus and SE, to ensure product compatibility.

VersaCAD Meets the Mac

► VersaCAD, one of the most popular computer-aided-design programs in the IBM PC world, is slated to come out in a Macintosh version by the end of the year. At the Boston Macworld Expo, VersaCAD Systems of Huntington Beach, California, developer of the program, demonstrated a prerelease edition. "This is not just a quick port to the Mac," said spokesperson Scott Harlin. "We've reprogrammed it entirely, making use of the Macintosh interface."

HyperCard Thinks Like You

► Now you have the best reason of all to own a Macintosh: it can "think" like you do. When you think, you use logical connections and specific information peculiar to you. A new program by MacPaint designer Bill Atkinson lets you organize information any way that seems natural to you.

It's called *HyperCard*, and it consists of four disks of programs and ideas. Apple Computer introduced it at the Macworld Expo in Boston.

HyperCard will be packaged with every Macintosh and will also be available through Apple dealers, user groups, and bulletin boards.

Here's how *HyperCard* works. You write or paint your ideas on a card displayed on the screen—maybe a few free-form notes about something you're reading. After a while, you have a "stack" of cards that you can instantly search for just the material you want. In addition, cards can be linked to other cards. Since you create these logical links, your stack closely parallels the way you process information. *HyperCard* stacks could even become products that are licensed, sold, or given away.

In fact Atkinson figured he'd start the ball rolling at the Boston Expo by giving away 1000 disks that contained his personal stacks.

A Power Supply Safety Net

► Dove Computer, maker of Mac memory add-ons and other hardware, has introduced the Power Miser (\$499), a 2MB memory expansion product for the Mac Plus that uses a custom gate-array design to increase memory while decreasing power consumption. The idea is to protect the Mac power supply—a vulnerable part of the Mac design, according to reports from many Mac owners. The result: "No more smoking Macs," according to Rick Greene, vice president of the Wilmington, North Carolina, company.

Dove also released FastNet (\$999 to \$1499), a SCSI device and accompanying software that allows the Mac to be recognized as an end node in a DECnet network.

A New ImageWriter

► Shoring up the middle ground in its line of printers, Apple is introducing a high-resolution dot matrix printer, the 15-inch ImageWriter LQ (under \$1500). Faster and more versatile than the existing ImageWriters, the LQ also produces better-looking type. Its 27-pin printhead produces roughly twice the resolution of its predecessor's 9-pin printhead. To go along with type good enough for business correspondence, the LQ improves paper-handling to make it easier to print envelopes, labels, and forms.

Mac SE Glitches?

► Online give-and-take among Mac users on CompuServe and elsewhere indicates that some new Macintosh SEs may have slight distortion of on-screen images. Noisy fans have also generated complaints from users.

The reported distortion includes images that don't quite line up squarely on the screen and images that look somewhat pinched—apparent especially when a Mac Plus and an SE sit side by side.

At press time Apple had not commented on the reports.

The Mac Learns Chinese

► Pulling the latest international trick out of its hat, in June Apple introduced a Chinese-language operating system for the Mac, called Zhongwen Talk. □

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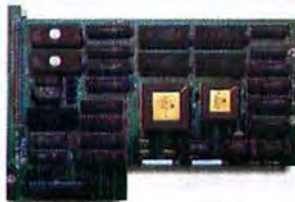
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The Online Brain Drain



If it has its way, the Federal Communications Commission will change the slogan of the Information Age from "Don't commute, telecommute" to "Telecommute, pay tribute."

Its recent proposal would have the effect of drastically increasing rates for computer owners who communicate via modem over long-distance phone lines.

Don't let the FCC do this to us.

The measure is aimed at private telephone networks such as Tymnet and Telenet, as well as online information facilities like CompuServe, The Source, Dow Jones, and others. The FCC wants to charge these networks a special "access fee" of \$4.50 to \$5.40 an hour for long-distance service.

But guess who's going to be stuck with that extra fee? The customer, of course. We'll end up paying about 50 percent more than we're paying now. As usual.

If enacted, the proposal will go into effect January 1, 1988. Before that happens, however, the FCC is opening the matter up to public comment. So here goes.

I think a little straight talk is in order. Some judicious arm-twisting of our senators and representatives in the nation's capital may not be a bad idea, either.

But just for the record, I'm not entirely unsympathetic to the FCC's concerns. This may surprise you. In fact, I had a very nice chat with an FCC attorney, Ruth Milkman, who explained why the FCC is doing this.

"The problem," Milkman told me, "is that computer users are not paying anything right now for the use of the local exchange, as they do when they make a regular long-distance call."

Cast your minds back to 1984 when Ma Bell's giant telephone monopoly was broken up into regional Baby Bells. Long-distance companies like AT&T, MCI, Sprint, and others began using those regional Bells to connect customers to long-distance lines.

Subsequently, so-called "packet switchers" like Tymnet and Telenet appeared on the scene, offering long-distance services to people wishing to access online

computer information. These services make highly efficient use of lines leased from the telephone companies, shooting "packets" of data bits through phone lines at the incredible rate of 56,000 bits per second. Users now pay only for the local call to connect to these networks. Thus they avoid paying regular long-distance fees.

"So who's paying for all those long-distance calls?" I asked Milkman.

"Somebody is," she said. "It's probably all the other long-distance customers. It then becomes a question of 'Should Aunt Minnie subsidize Joe Computer User?'"

Milkman explained that when the FCC first introduced the system of access charges in 1983, it was concerned about what effect a sudden increase of rates might have on a fledgling telecommunications industry. "So we decided to give the enhanced-service providers a temporary exemption—to give them time to figure out how to deal with the situation," she said.

"Why now? Why make them pay now?" I asked.

"It's always been commission policy that anyone who uses the local exchange to provide interstate service should pay for the use of the local exchange," she replied. "They've sort of had a freebie for a while, but now we're proposing to eliminate the exemption. Otherwise consumers will get the wrong signals about how expensive it is to use the telephone system—and about what the real costs are."

Now, there are wrong signals and there are inconsistent signals. I happen to think that the government, in proposing to charge fees for online access, is sending an inconsistent signal to consumers.

I share this view with Charles McCall, president of CompuServe, one of the aggrieved parties in this telecom witch-hunt.

"On one hand, you have the Justice Department telling [District of Columbia]

(continues)

The FCC has proposed to double online costs by imposing a steep access fee. Good grief! Don't just stand there—sit down and write your congressman.

Decisions, I



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David Bunnell

Judge Harold Greene that he should break up the Bell operating companies so that they can help promote the home information service, the videotex-type business," McCall notes. "On the other hand, you have the FCC trying to raise these rates to the point where it would kill that business."

McCall is absolutely right. The fees would kill that business—and if they didn't, then they would cripple it and otherwise render it senseless.

I believe that the pricing of these computer networks is crucial to the development of our information culture and society. I would even venture to say that The Source and CompuServe, which now charge about \$6 per hour at a 300-baud rate, are still probably priced too high to be broadly popular. Raising that fee to \$9 or \$10 would put those information services even further out of reach for most people.

We're talking about a potential online brain drain, when people stop using information services or telecommunicating because they can no longer afford to do so.

I'm not so concerned about medium- and large-size businesses in this case. They can absorb the increase, probably even pass the extra costs on to their customers. No, I'm mainly worried about users. This money will have to come out of their personal pocketbooks. It's going to have to come from the same hard-earned dollars they use for going to the movies, buying milk, and otherwise staying alive.

By keeping the doors open, by not charging an access fee, the FCC would be encouraging the development of the entire computer industry and of the whole mode of electronic communications.

Just look at any of those online services and observe the enormous amount of creativity that's going on. Putting a surcharge on long-distance access to online bulletin boards and data services would stall this creative momentum. It would also adversely affect sales of modems and communications software.

Not only would the established computer industry be damaged by the FCC's proposal, but at least one fledgling information industry may bite the dust before it's even had a chance to spread its wings.

I'm referring to the advent of videotex services in this country, modeled after France's hugely successful Minitel system. To date, the French phone company, PTT, has installed about 2.5 million of these small, inexpensive videotex terminals in French households at a cost of about \$10

(continues)

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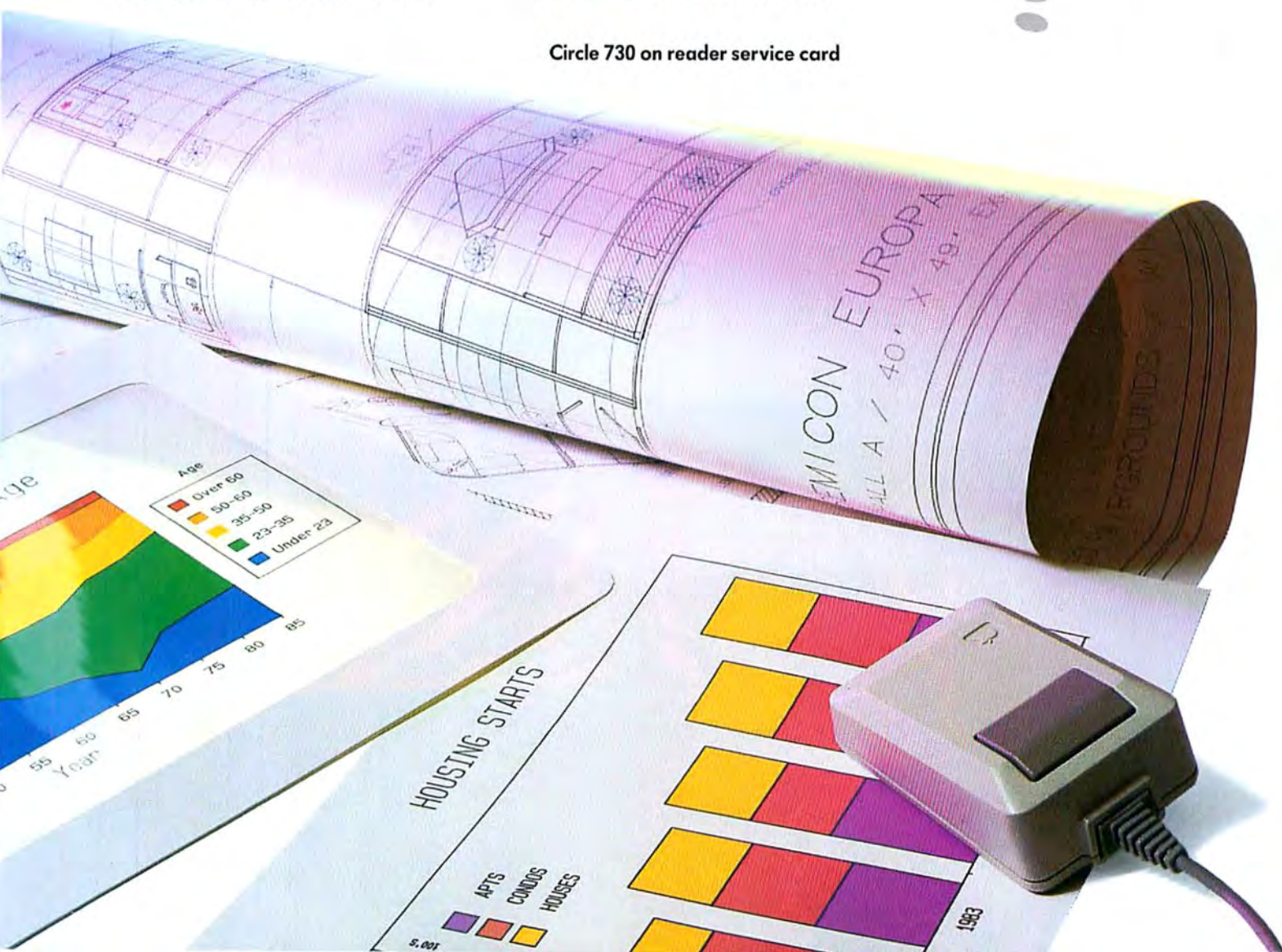


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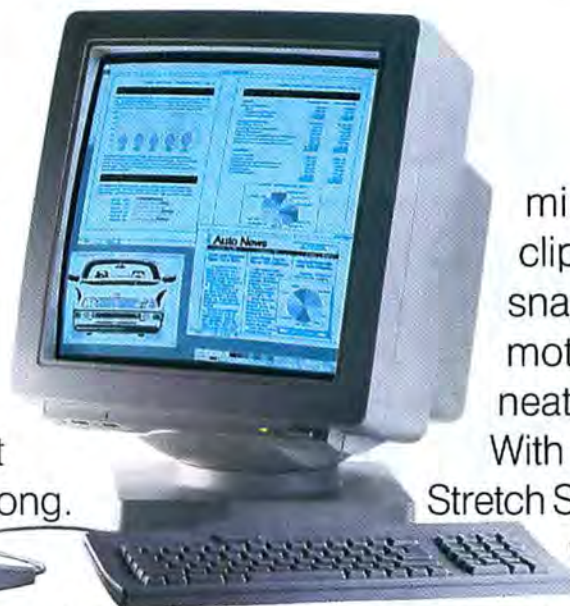
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David Bunnell

per month. It's proven to be a financial bonanza. Last year Minitel generated about \$135 million in revenues for service providers, not to mention \$94.3 million worth of telephone traffic—on top of who knows how much in untallied packet-switching revenues—for the French state-owned telephone company.

Impressive, *n'est-ce pas?* And, ooh-la-la, the array of services that are being gobbled up by French consumers! I was looking at a recent issue of the French computer magazine, *Science & Vie Micro*, which listed the "300 best services." Among them: dog club bulletin boards, electronic message services, plane and train reservations, local municipal information, tax services, weather and traffic information, various money management services, even horse-race betting.

There's a phone jack in the back of the Minitel terminal, and within ten minutes of basic familiarization, you're on. These machines don't even look like computers, although it's possible to run PC applications on specially configured models. The American version of the Minitel even has a retractable keyboard to disguise the computerlike appearance of the machine. In other words, this could be the breakthrough item to captivate the next big wave of computer users—the Aunt Minnies of America, if you will.

But now the FCC wants to roll us back to the baudless Middle Ages by imposing its horrendous access fees.

I was sitting in the office of Nicolas El Baze, a young Frenchman who heads the San Francisco branch of Paris-based Softway, Inc. This international marketing and engineering firm represents French computer companies in America. On one corner of his desk he had an original Minitel—the first one, in fact, to be made according to U.S. standards, a real collector's item, with serial number 000009. A couple of his clients have been on the verge of launching their own Minitel services here, but now they're faced with the FCC dilemma.

El Baze was shaking his head disconsolately. "I think it's a shame," he said, referring to the proposed surcharge. "When you see how this works in France, how much people are getting out of it...I can't imagine not having a similar system in the U.S. where people are even more ready to use these types of terminals and services than we are in France."

He gave a Gallic shrug. "The people

(continues)

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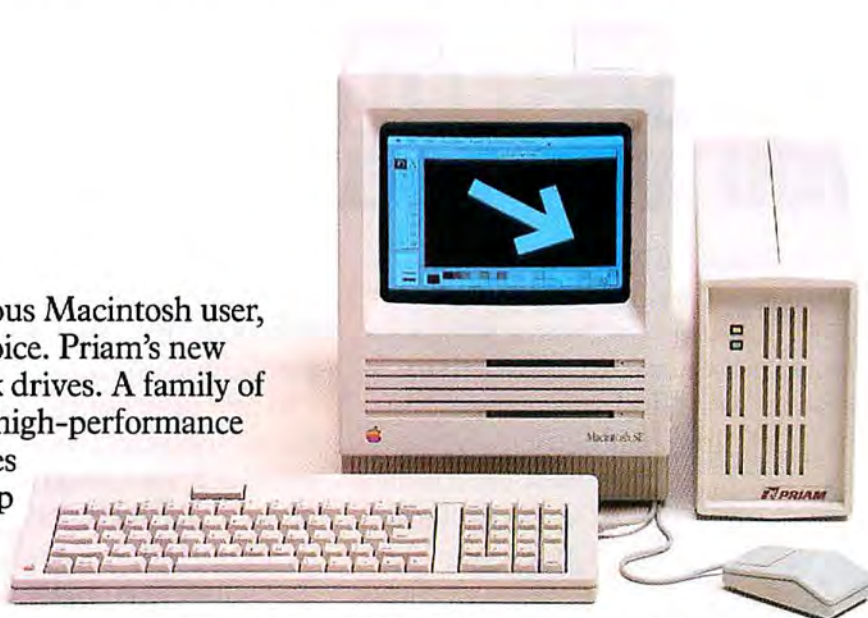
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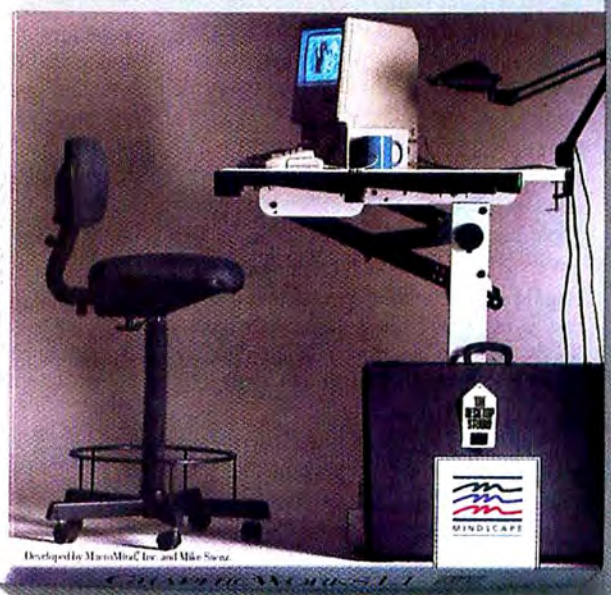
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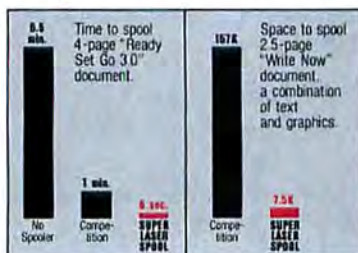


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David Bunnell

who stand to lose the most, of course, are all those people at home who have never used a computer. They're going to suffer even more, but they don't know it yet. There will be so many services they won't be able to access. Or if they are, it will be at such a cost that they won't want to."

Can America afford to fall behind France and other countries—Switzerland and Singapore, to name two—that currently use videotex services? Doesn't it make more sense for the government to stimulate our economy by adopting a laissez-faire attitude toward online access to information services? Just think of what Minitel has done for the French economy. We could be enjoying an economic and electronic boom of our own. It might do wonders for our balance of payments.

I think the FCC should put off its access charges. I'm not insensitive to its problem. But for now, the FCC should think of free access as an investment—an investment in America's high-tech future, as well as in our domestic economy.

So this is David Bunnell's proposal to the FCC: I urge you to delay the imposition of these access charges for online computer use for a period of ten years. Give the telecommunications industry a chance to really develop. I'm not sure that we've come such a long way since the breakup of giant Ma Bell. Looking at my own phone bills over the past few years, I can't see that my long-distance charges have gone down significantly. So what was all that fuss?

On the positive side, the cat's already out of the bag. Hundreds of thousands of home modem users are now using various online services and contributing to the development of online technology. With luck, there's already a critical mass, so that the growth of online use cannot be stunted.

I urge you, and all concerned and potential users, to contact your representatives in Congress. Let them know you oppose the FCC telecom surcharge.

I would also have urged you to send your E-mail to the FCC's electronic bulletin board, but as Ruth Milkman revealed: "Are you kidding? We still have rotary dials and black telephones. Talk about the Stone Age of the information industry!"

It figures.

So write the FCC instead: The Secretary, Federal Communications Commission, 1919 M St. NW, Room 222, Washington, DC 20554.

Give them your opinion. You want to know what mine is? It's "Give 'em the boot, don't pay tribute!" □

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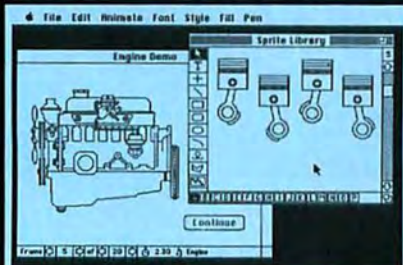
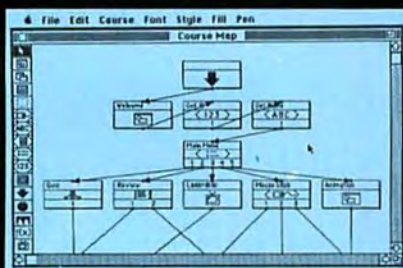
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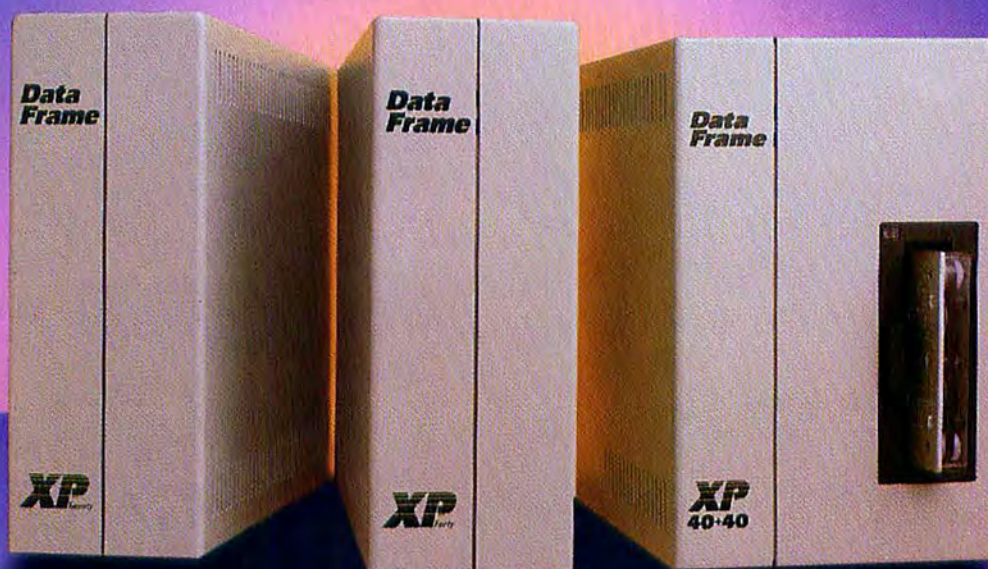
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Super your Mac:

How to give your 512, Plus, or SE the hard disk performance of a Macintosh II.
DataFrame *highest performance* drives.

The new Macintosh II features a disk technology called 1:1 interleaving for highest performance.

The DataFrame XP family of hard drives has delivered that same 1:1 performance, to any Macintosh, for over a year now.

Who needs faster disk performance?

Everyone. The faster the disk, the faster the Mac system. Faster program loading, faster operation, faster saves. You work faster, because you wait less. That's why InfoWorld concluded DataFrame's speed "shows just how good the Mac can be."

"... leaves the others in the dust."

InfoWorld compared. After measuring the DataFrame to be *significantly* faster than the Macintosh SE internal hard drive, they went on to compare DataFrame to the fast-

est drive they'd seen for any computer. The result: "It left that pony in the dust, too."

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Letters

A forum for Macworld readers

The Challenge of Chinese Computing

Despite the many different coding schemes used for Chinese characters ["The Polyglot Macintosh," *Macworld*, May 1987], there is in fact an emerging standard. The USMARC character set, developed by the ICCI in Taiwan, has been adopted by the United States Library of Congress and Department of Defense and is endorsed by the governments of China, the Republic of China (Taiwan), Japan, and Korea.

Also, the number of known Chinese characters is more than 74,000, not 30,000 as mentioned in the article, and the number of frequently used characters is not 3000, but 13,000. There are at least 9177 Chinese characters for last names alone, which must be part of any working system.

One of the major hindrances to developing a Chinese computer is inadequate hardware. The minimum acceptable resolution for a Chinese character is 24 by 24, so a Chinese computer would need a resolution of at least 2048 by 1536 pixels, compared to the Mac's 512 by 346.

In short, Chinese computing is much more complicated than you described in your otherwise excellent article.

*Timothy Huang
International Information, Inc.
Portland, Oregon*

Corrections

The Hebrew word processor MouseWrite ("The Polyglot Macintosh," *MacWorld*, May 1987), also known as Achbar, is available from Davka Corp., 845 N. Michigan Ave. #843, Chicago, IL 60611, 312/944-4070, 800/621-8227.

Mechanical Intelligence, maker of the MI-4 parallel-processing development system for the Mac (*Macworld News*, June 1987), can be reached at 619/436-1455.



MICK WIGGINS

More Mac Language Skills

In addition to French, Spanish, Italian, and German ["The Polyglot Macintosh," *Macworld*, May 1987], the Mac also "speaks" Portuguese (the tilded *ã* and *õ*, both upper- and lowercase, are not part of the IBM extended ASCII character set but are and have always been standard on the Mac). Swedish, Norwegian, and Finnish characters also can be generated on the Mac. The Swedish *ä* and the Danish-Norwegian *æ* and *ø* are listed in the Keyboard Accents chart in the article. Finnish has no characters that differ from those of the German alphabet.

*Gabe Bokor, President
Accurapid Translation Services, Inc.
Poughkeepsie, New York*

Price-War Patriotism

In *Verbatim* [May 1987] Ash Jain, vice president of AST Research, stated, "Buying market share by lowering prices is a disservice to the consumer," adding that companies that cut prices might not exist at the end of 1987.

Mr. Jain's statement is contrary to the free enterprise system, the backbone of the United States. The one who wins in a price war is the consumer. Lower prices are a welcome change from the [rates charged

by] corporate monsters that have enjoyed substantial profit margins since the introduction of the Macintosh. Market forces will eventually push the price of Macintosh-compatible hard disk drives down to where they will be affordable for every Macintosh owner. If AST's prices don't come down, it might very well be one of those companies in trouble at the end of 1987.

*John M. Altman
Spokane, Washington*

Mac Programs for M.D.s

Do you know of any medically related software that can be used on the Macintosh?

*Vincent J. Vaccaro, M.D.
Utica, New York*

A few user groups, such as the Los Angeles Macintosh Group, have special-interest groups for medical professionals. To find out about user groups near you, call the Apple user-group hotline at 800/538-9696 ext. 500.

One user group specifically for health professionals is Focus, the computer society for doctors. Among other ser-

(continues)

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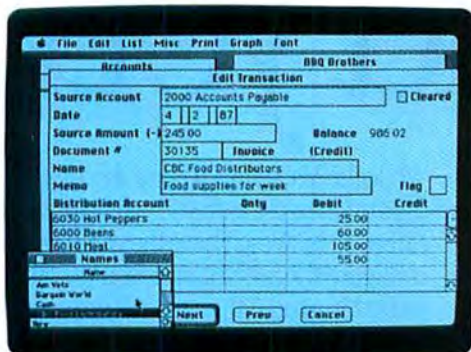
All of which means they have more time to do what they do best: which is make the best chili in the whole doggone state.

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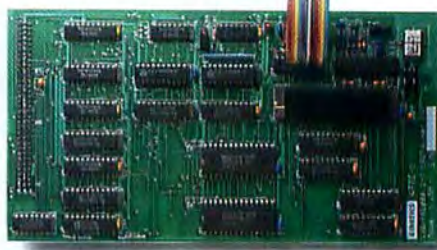
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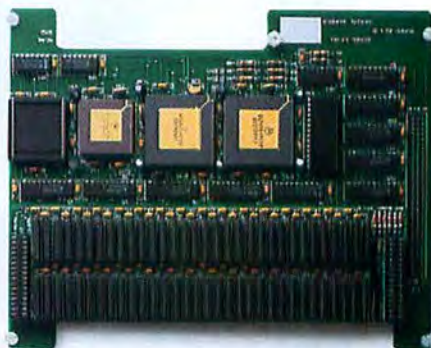




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How to build your

You've heard about them. You've read about them. By now, you've probably even seen them.

Our latest leaps in technology, the new Macintosh™ SE and Macintosh II personal computers, have been getting their share of press.

But to add to what you may already know, we'd like to tell you more about their most powerful feature: expandability.

It's something we made possible by adding expansion slots. So you can easily customize your Macintosh to meet the demands of any business.

You can, for example, set up a system that's perfect for major-league number crunching. Or add features to give you even greater power for Apple Desktop Publishing, like displays as big as 21 inches.

The SE sports one expansion slot.

While the Macintosh II takes the idea of expansion to the extreme—with six 32-bit NuBus slots. Which have the good sense to configure themselves, and require you to do nothing more than plug in the options of your choice.

Such as an 80286 co-processor card that lets you run programs written for MS-DOS computers. And a video card that produces near-photographic images

Presenting the Apple Extended Keyboard. Complete with 15 programmable function keys, as well as separate cursor and numeric keypads.

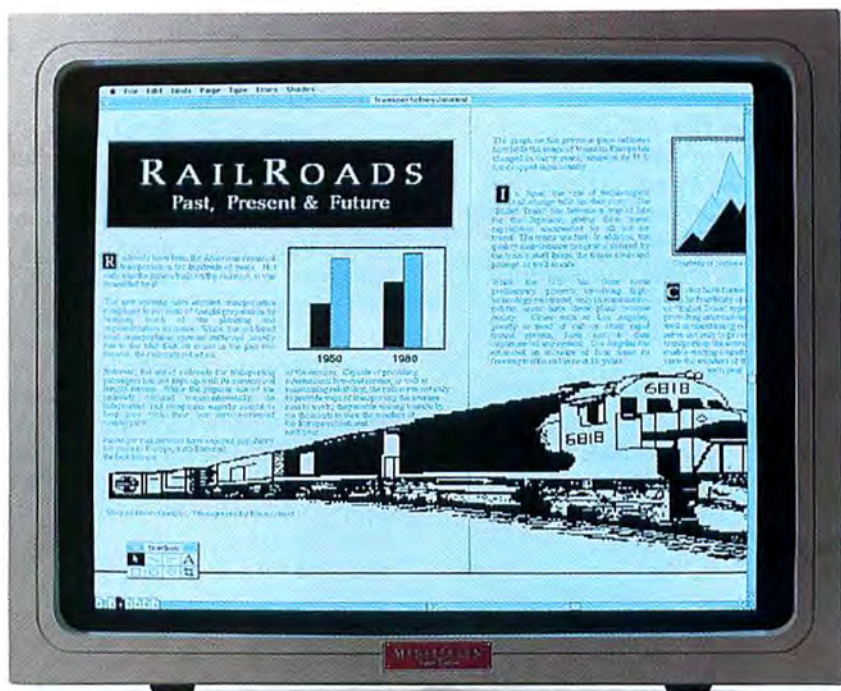


Via the expansion slots, you can add an AST co-processor card to either the SE or Macintosh II.

ing one of the II's six slots, you can tie into the company intranet or an office network like Ethernet.



Build yourself a power station. The Macintosh II has a lightning-fast 32-bit Motorola 68020 processor, a 68881 co-processor and six NuBus expansion slots.



With either the SE or the II, a large-screen monitor (available from other manufacturers) can give you the big picture. And show you up to two pages at once.



If you lose it, you can't use it. The Apple Tape Backup 40SC safeguards the work on your hard disk. Pronto.



The Macintosh II Video Card can generate colors 256 at a time, at up to eight bits per pixel. Using a palette of over 16 million colors.

own Macintosh.

from a palette of over 16 million colors.

The new Macintosh computers are built to be customized in other ways, too.

You can set up your SE with up to four megabytes of memory, so it has the power to run the most sophisticated programs. And configure the II with up to eight megabytes of memory on the main board, or a whopping 1.5 gigabytes using the expansion slots.

As for storage, there's plenty. With either computer, you get the option of an internal hard disk. Or an external one that can store up to 80 megabytes.

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Letters

vices, Focus offers medical software reports that evaluate Mac software (and software for other computers) based on polls of current users. Membership, which is open to any health professional, is \$95 per year. For further information, contact Focus at International Technology Center, 50 Fremont St., 31st Floor, San Francisco, CA 94105, 415/626-4600.—Ed

Where to Share

I'm a new Mac user and therefore naive about certain things. I have read several references to shareware and public domain software. They seem like good ideas, but how do I get them?

Lowell Dietz
Gainesville, Georgia

Public domain software (distributed for free) and shareware (also free, but if you like the program, you're asked to contribute a small fee to the programmer) are available through user groups and software distribution groups. See the introduction to Macworld's Where to Buy section for addresses of some major sources.—Ed.

BASIC Disagreement

In Jim Heid's article "BASIC Choices" [Macworld, May 1987], he wrote, "The debut of BASIC compilers is great news for programmers who prefer BASIC's versatility to the rigid confines of Pascal and C."

I program in C most of the time, using Pascal on occasion, and I would not go back to BASIC for anything short of \$50,000 a year. With Pascal and C you can create customized menus, customized dialog controls, and many other things that are next to impossible in BASIC without pages of POKE statements. That is not what I would call "rigid confines."

Alan T. Goates
Salt Lake City, Utah

Too Much Mouse

Has anything been done to circumvent the use of the mouse with the Macintosh? I love the computer, but as I am a very fast typist, it slows me down to remove my hands from the keyboard. I have used the Mac Plus keyboard with the directional keys on the right, but even that necessitates removing my fingers from the keyboard.

Darshi Deane
Roanoke, Virginia

The trend in Macintosh word processing packages is toward more Φ -key equivalents for menu commands. Some programs, like Microsoft Word 3.0, designate keys for moving around in a document, though with most software it is still necessary to use the directional keys on the Mac Plus keyboard or the mouse.—Ed.

Acta Underestimated

I appreciated seeing my program *Acta* mentioned in your review of *Voila* ["Voila! Another Instant Outline," Macworld, May 1987]. But if a perceptive reviewer could miss one of *Acta*'s features, some of your readers probably have, too. Here's how to convert a *MacWrite* or *Word* document into an outline with *Acta*: Select the text in your application and copy it to the Clipboard. Bring the *Acta* window to the front, hold down the Option key, and select Paste. *Acta*'s "smart paste" feature works with Clipboard text from any program.

David Dunham
Goleta, California

(continues)



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"We needed a faster, more economical way to service our clients."

"We decided to automate our production."

"Weissberg Associates wanted an in-house computer-text-and-graphics system to cut down on production costs and to enhance the quality of their output. I primarily started with Macintoshes because of their graphics capabilities.

"Then I had to choose output devices that could produce extraordinary text and graphics, and were still completely compatible with the Macintoshes. I knew Linotype had the right equipment available but it had only recently been introduced.

"We purchased the Series 100 equipment including the PostScript™ RIP, the ML-314 Processor and of course the Linotronic 300 laser imagesetters, which can set both text and graphics."

"We got much more than we bargained for."

"Naturally we had high-quality output immediately. But with Linotype's Series 100 system, our artists could cut down on time and materials, too. Before, the artist only prepared the layout, but now he can do his own mechanicals – on screen! He can see the type, play with it, rejustify it – even move it around a million ways if he wants to.

"Our artists create images on the computer and do the work in one to two days at the most, with no outside cost. And if they want to make revisions, it's easy. Everything is internal so we have more control, and cost- and time-savings are phenomenal. And because we can offer lower costs to clients as a result, we have an edge on the competition.

"With in-house output, our clients profit from savings in time, cost and materials, and we come out one step ahead of other agencies. Linotype has helped us bring our production in-house very economically, and that 'one step' has become the foothold for our future growth."

If you'd like to know more about the Linotronic 300, 100 or the Linotronic 500 wide-line (108-pica) laser imagesetters, contact: Linotype Company, 425 Oser Avenue, Hauppauge, NY 11788. Or call (516) 434-2016. In Canada, (416) 890-1809. And let our quality speak for itself.

This ad was composed on a Macintosh computer and output on a Linotronic 300 laser imagesetter.

Linotype

The next computer revolution.

If you can hold a pen, you can use a computer. Forget about punching keyboards or chasing a mouse. With the Personal Writer system, all you do is write on paper and your words appear typewritten on screen, instantly!

Whether you want to write text, input figures, or create graphics, you simply pick up your pen and write your computer. Add, delete and correct with the flick of your pen. It even comes with a built-in 100,000 word dictionary that corrects your spelling in a flash.

Personal Writer is the system that's as natural as your signature. And as easy to use. Its powerful character recognition software learns to read your handwriting and

makes interaction with your computer a breeze.

Whether your needs are in word processing, spreadsheets, data base management, or graphics, the Personal Writer system works for you. Fully compatible with virtually any software on the Mac market, Personal Writer's ease of use will follow you in all your applications. So don't worry

about tedious typing. Use the power of your own handwriting.

Call us toll free today for more information at (800) 322-4744 or write us at Anatex Inc., 1801 Avenue of the Stars, Suite 507, Los Angeles, CA 90067. (213) 556-1628. Dealer inquiries invited.

Pen and paper.



Personal Writer is comprised of a tablet and software.



Come visit us
at Mac World Expo!
We'll be at booth #459.



**P E R S O N A L
W R I T E R**

Circle 760 on reader service card

Yes! I want to know more about the next computer revolution. Please send more information on Personal Writer today.

Name

Address

City, State, Zip

Phone ()

Anatex Inc., 1801 Avenue of the Stars
Suite 507, Los Angeles, CA 90067

Call us toll free at (800) 322-4744

Not Quite Ready for Review

Thank you for reviewing SoftSync's *Accountant, Inc.* ["Not-Quite-Ready Accounting," *Macworld*, May 1987]. However, the reviewer's criticism of some aspects of the program comes a bit too late. He reviewed version 1.0, but our current release is version 1.9. Many of the suggestions he made were already made by customers and incorporated in subsequent versions.

Registered users can order upgrades for only \$9.50.

*Kenneth P. Currier
SoftSync, Inc.
New York, New York*

At the time our review was written, version 1.0 was the latest release, but due to space limitations, the printing of the article was delayed. See Updates in this issue for more on the new features in Accountant Inc.—Ed.

Digitizing Debate

In her review of clip-art packages ["Art to Go," *Macworld*, December 1986], Erfert Nielson preferred the pretty and exotic over simpler, digitized clip art. Although the images available in the packages she

prefers are fine to look at, they are not practical for my everyday needs.

Ms. Nielson suggests that instead of buying digitized clip art, people should purchase and use a digitizer. She obviously doesn't realize how much time (not to mention talent) the digitizing and clean-up process takes.

*Jim Gomez
Denver, Colorado*

Programming Mainstay

I was glad to see your review of *V.I.P.* by Mainstay ["A Very Important Program," *Macworld*, May 1987]. In your review, however, you cite as a drawback the fact that no literature is available about the program except the manual. *Mac Tutor*, a Macintosh programming journal, has run at least two articles by Bill Luckie on programming with *V.I.P.* The first article, which appeared in November 1986, gave a short lesson in general programming with *V.I.P.*, and the April 1987 issue carried an article on programming with C.

*Steven Falb
San Jose, California*

Back issues of Mac Tutor are available for \$4 from Mac Tutor, P.O. Box 400, Placen-

tia, CA 92670, 714/630-3730. (Add \$1.25 for first class postage.)—Ed.

Software Hotline

Recently I have become interested in writing COBOL programs for computer systems other than the Macintosh, but I have had little success in locating COBOL software. Can you give me some idea as to the quality and price of the different compilers available and where I can buy them?

*James D. Belland
Hershey, Pennsylvania*

We can't tell you about the program's quality, but Micro Focus (2465 E. Bayshore Rd. #400, Palo Alto, CA 94303, 415/856-4161) sells a COBOL compiler called MacCOBOL for \$495.—Ed. □

Letters should be mailed to Letters, Macworld, 501 Second St., San Francisco, CA 94107, or sent electronically to CompuServe 70370,702 or The Source BCW440. Include a return address. We reserve the right to edit letters. All published letters become the property of Macworld.

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Clone Your Modem

For less than the cost of another modem, you can offer telecommunications services to everyone on your AppleTalk® network. With ComServe™, you no longer need a modem at each Macintosh™—with all the accompanying wiring complexities and line charges.

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- Save, at \$195 per server. Share expensive, high-speed modems.

Call now or ask your dealer for ComServe. From Infosphere, the only full-family AppleTalk software vendor.

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Still the Best for Small Nets

Still only \$250 per hard disk server for as many user nodes as you like — still the only file sharing solution that offers "Bulletproof" Automatic Crash Recovery so users never lose data. MacServe™ is the most practical choice for small AppleTalk® networks. And that's why MacServe is still the leader with over 30,000 installations.

- Forget dedicated Macs. MacServe runs in the background.
- Grow a network transparently. Add Macs, PCs, hard disks, servers, printers, modems and E-Mail, as you need them.

Call now or ask your dealer for MacServe. From Infosphere, the only full-family AppleTalk software vendor.

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**FINALLY,
A \$2600 LASER
PRINTER
THAT PRINTS
LIKE A \$5000
LASER PRINTER.**

The newsletter
of personal
money
management

THE PRUDENT Investor

Vol. V
No. 2
July 1987

Time to Return to Gold?

There's probably no better hedge against inflation. Gold is the internationally recognized medium of exchange. It's completely portable. And, unlike paper money, it has inherent value. But is it for you?

In times of economic or political turmoil people turn again and again to gold.

That's what makes gold prices go up in times of inflation. And why gold moves up when world peace is threatened.

As an investor, you have five basic ways to purchase gold.

1. Gold futures, like all futures contracts, are basically closed-ended speculations intended for sophisticated traders.

2. Gold stocks. Shares in mines are traded on all major exchanges. Some, especially South African mine shares, pay substantial dividends. (This is due to the volatile political situation there.)

3. Gold bullion can be bought at all large brokerage houses. These firms also store and insure bullion.

continued on page 12

Technical Analysis: Science or Sorcery? See page 6

Picking Your Stockbroker

If you happen to be picking a stockbroker for the first time, a good way to begin is with some solid recommendations.

Ask your lawyer, accountant, or banker for the name of a stockbroker, or a brokerage firm, that could take on your account.

Some investors suggest choosing several brokers from different firms and let them handle a part of your portfolio until you decide on the right one.

The broker you choose should have a philosophy about investment that is close as possible to your own. Find out how *continued on page 5*

The Rising Fortunes of the Humble Apple

Consumer demand has mushroomed in recent months for fresh fruit and produce.

What are the best plays in this trend for investors?

Dr. Vic Scallione, of the Washington State Department of Agriculture says

continued on page 3

Avoiding Wall Street's blind alleys: A Prudent Investor Special Report. See p. 9

Amex Stocks	4 Real Estate
Commodities	8 Special Report
NYSE	13 Technical Analysis
OTC Stocks	13 Treasury Issues

INTRODUCING THE PERSONAL LASERPRINTER.

As the documents shown here demonstrate, the General Computer Personal LaserPrinter™ (PLP™) concedes nothing in printing capability to systems that sell for

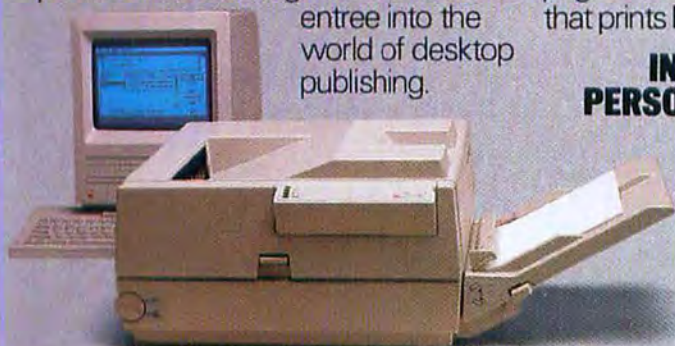
twice its price. If that still seems hard to believe, consider this. Until now, anyone who bought a laser printer was also buying a computer. Because laser printers have always needed a processor, memory and other expensive hardware to create a printable page. Our laser printer, on the other hand, eliminates much of this expensive hardware in favor of ingenious software.

Software that allows the printer's imaging to be performed by the computer you already own: the Macintosh. (Either the 512E Macintosh with optional RAM cartridge, Mac

WHICH WAS PRINTED ON A \$5000 LASER PRINTER? WHICH ON OURS FOR \$2600?

To the thousands of Macintosh™ users who find themselves wishing there was a personal printer that lived up to their personal computer.

Including the executives, entrepreneurs, academics and other professionals looking for an affordable entree into the world of desktop publishing.



THE PRUDENT Investor

Time to Return to Gold?

There's probably no better hedge against inflation. Gold is the internationally recognized medium of exchange. It's completely portable. And, unlike paper money, it has inherent value. But is it for you?

In times of economic or political turmoil people turn again and again to gold.

That's what makes gold prices go up in times of inflation. And why gold moves up when world peace is threatened.

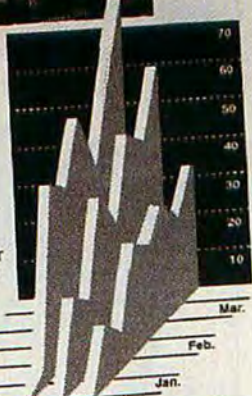
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continued on page 12



'85 '86 '87
Technical Analysis: Science or
Sorcery? See page 6

Picking Your Stockbroker

If you happen to be picking a stockbroker for the first time, a good way to begin is with some solid recommendations.

Ask your lawyer, accountant, or banker for the name of a stockbroker, or a brokerage firm, that could take on your account.

Some investors suggest you choose several brokers at different firms and let each handle a part of your portfolio until you decide on the right one.

The broker you choose should have a philosophy about investment that is as close as possible to your own. Find out how he

continued on page 5

The Rising Fortunes of the Humble Apple

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*Avoiding Wall
Street's blind
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Report. See p. 9*

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OTC Stocks	13	Treasury Issues	12

Plus, SE, or Mac II with any hard disk.) This arrangement also means the PLP is more compact than other laser printers. (An almost diminutive 16"x16½"x9") And having fewer parts, much less likely to need repairs.

THE PROOF IS IN THE PRINTING.

As you can see, a case could easily be made for buying the PLP on economics alone. But that would be selling it short.

Because the ultimate measure of any printer is how well it prints.

Like vastly more expensive laser printers, the PLP allows you to print scanned photos and illustrations, high-

resolution graphics created with software like MacDraw® and Microsoft's Excel, and otherwise juggle words and pictures until you have them exactly where you want them.

But it also provides assistance even these vastly more expensive printers don't.

Including a choice of Bitstream® fonts limited only by your hard disk's capacity to store them. (Fonts you can easily adjust to any point size, or fraction thereof.)

A preview feature that lets you review each page before you print it.

And a draft mode that lets you rapidly print out works-in-progress

for editing and revision by others.

Then, once all the revisions are complete, the PLP quietly provides extraordinary finished output.

Near-typeset quality presentations, newsletters, memos and reports produced with software like Microsoft's® Word and Aldus' PageMaker.® All printed with a new generation of laser technology that turns out richer contrasts than ever before.

AN INVITATION TO SKEPTICS.

In other words, the PLP does for printed communications what the Macintosh did for personal computing.

It provides a sophisticated, yet affordable tool for anyone who needs to manage large amounts of information—and wants to work smarter and more creatively in the process.

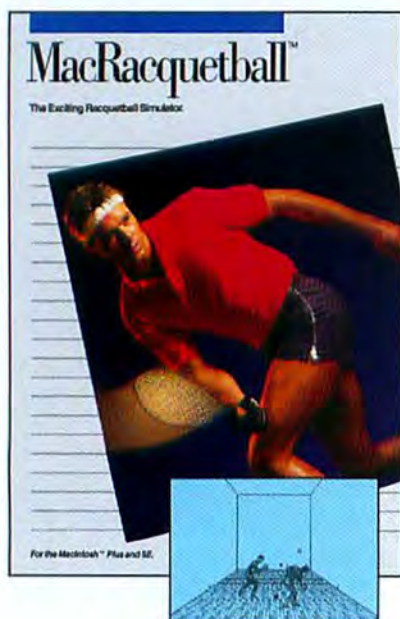
So to answer the question we began with: the PLP printed the document that appears on the right. But you don't have to take our word for it.

We invite you to make your own comparisons through a PLP demonstration at any authorized General Computer dealer. Where you'll also be able to compare another pair of documents that are far easier to tell apart:

A Personal LaserPrinter price tag. And that of any other laser printer of equal quality.

For the name of the dealer nearest you, call (800) 634-9737.*

**GENERAL
COMPUTER**

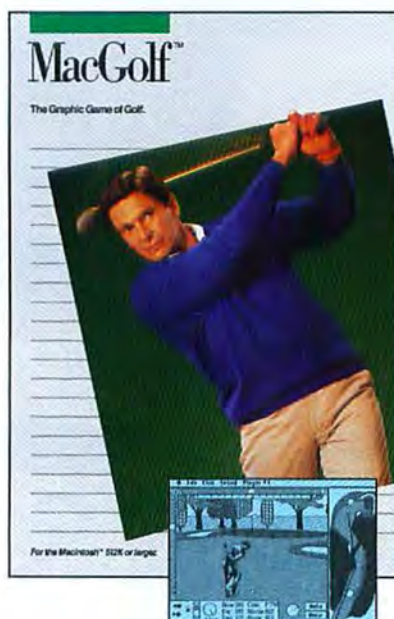


**The hottest sport
on a court —
the hottest game
a Macintosh™ can handle.**

Even if you've never been on a racquetball court, you'll spark to the excitement of this challenging simulation.

MacRacquetball turns your Macintosh screen into a full perspective 3-D display of court, players and ball. With the mouse, you have complete control of player position, ball placement, ball speed and shots. Two people can play the same game over AppleTalk® or modem.

Superb graphics give MacRacquetball completely convincing realism. There are more than 1000 frames of ultra high speed digitized animation. It's one racquetball court that's always open when you're ready to play.



**Enthusiastic players
everywhere have made
MacGolf the best selling
Macintosh game ever.**

MacGolf puts you in the picture, a full perspective 3-D simulation of realistic golf action. You match your skills against fairways, roughs, bunkers, water hazards, sand traps and trees.

MacGolf gives you a player's eye view of the course, in any direction, and an aerial overview of each hole. You have complete control of your position, ball placement, ball speed and direction, and selection of all 14 clubs. Digitized graphics and sounds add to the excitement.

MacGolf is so close to the real thing it will improve your golf game. And by the time you've reached the eighteenth hole you'll know you've been in a real contest.



**When you have
the best selling Macintosh
game in the world,
what do you do for an encore?**

Here's new turf for adventurous MacGolfers. These are courses to conquer for mouse wielding pros who have taken the measure of the original MacGolf courses.

If you liked MacGolf, you'll love what MacCourses brings to the screen. Four new 18 hole, par 72 courses: Cedar Creek, Golden Sands, Thunder Ridge and PCAI International. The fairways, traps, hazards, and putting greens of MacCourses are in a whole new league.

If you thought MacGolf was good training for the outdoor game, MacCourses should turn you into a pro. Get MacCourses now, use it when you're ready — you never know when you'll need the challenge.



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Technology and Issues

One hundred Mac engineers talk over the challenges they face every day

Early this summer *Macworld* sponsored a conference for members of the technical community—designers and developers who work with Macintosh computers. In two and a half days of meetings, the Technology and Issues conference shed light on forthcoming products and pointed the way for Macintosh developments in the near future.

Not suprisingly, discussions of technology are always colored by market activity: companies bought and sold, new companies emerging, older ones fading. Much as I would like to have it remain a personal computer company, Apple is evolving into a supplier of personal computers for business. Similarly, companies that have developed products for the Macintosh are becoming more important on a national scale. Aldus, Microsoft, Adobe, and others have become public companies, subject to the scrutiny of the SEC and no longer able to pursue products just because they represent interesting directions for technology. We can have hope, however. There's still a spark of innovation in Cupertino that may prevent the company from becoming like Burroughs or Digital Equipment Corporation—companies that are successful but not likely to change the course of humankind.

Our conference covered the areas of communications, graphics, programming, hardware, and system software. System software raised the most interesting issues—including discussions both of Juggler [MultiFinder at press time] and of System 6.0 (for lack of a better name). Juggler, introduced formally in Boston at the August Macworld Expo, is Apple's first step toward multitasking and multiprocessing on the Macintosh. Often compared to Andy

Hertzfeld's *Switcher*, Juggler should stand on its own as a slightly flawed but very impressive first effort at a multitasking operating system. Juggler's first use will most likely be allowing us to print in the background while continuing to use another application. Communications will be another early use; we'll be able to transmit documents without leaving an application.

System 6.0 was not explicitly discussed. Rather, one of the sessions at the conference focused on a proposed "electronic document architecture," the blueprint for some future so-called compound document architecture. EDA has already become the focus of a working group of Apple engineers and third-party developers; the group will explore standards to allow future Macintoshes to support documents that contain sound, text, graphics, and animation. IBM, Xerox, and Hewlett-Packard all have their own proposals for such architectures, but Apple is unique in having the ability to actually put one in place.

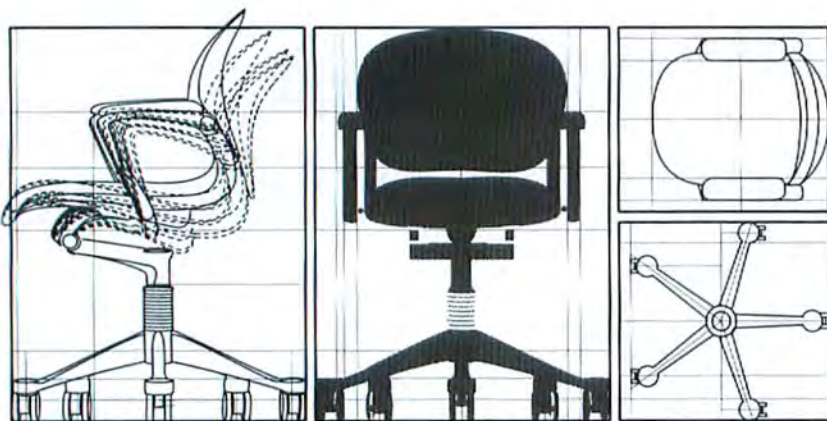
Three sessions covered computer graphics. In one, several developers showed programs that are among the first to take advantage of the Mac II's color; Cricket Software's Jim Rafferty demonstrated a color presentation package that outputs to color printers and cameras; MacroMind's Marc Canter showed *VideoWorks II*'s new sound and animation capabilities. Apple technical staff members Ernie Beernink and Galyn Sussman demonstrated features of the Mac II's color manager and palette manager—new features in the ROM for color mapping—and discussed alternatives for color palettes.

The next-generation color video card from Apple is under design; Toby Farrand, Apple's graphics hardware doyen, chaired a discussion about the problems with speeding up QuickDraw. The present graphics card, although far ahead of similar cards from IBM, still needs improvement if Apple is to stay ahead in the graphics realm. Ani-

(continues)



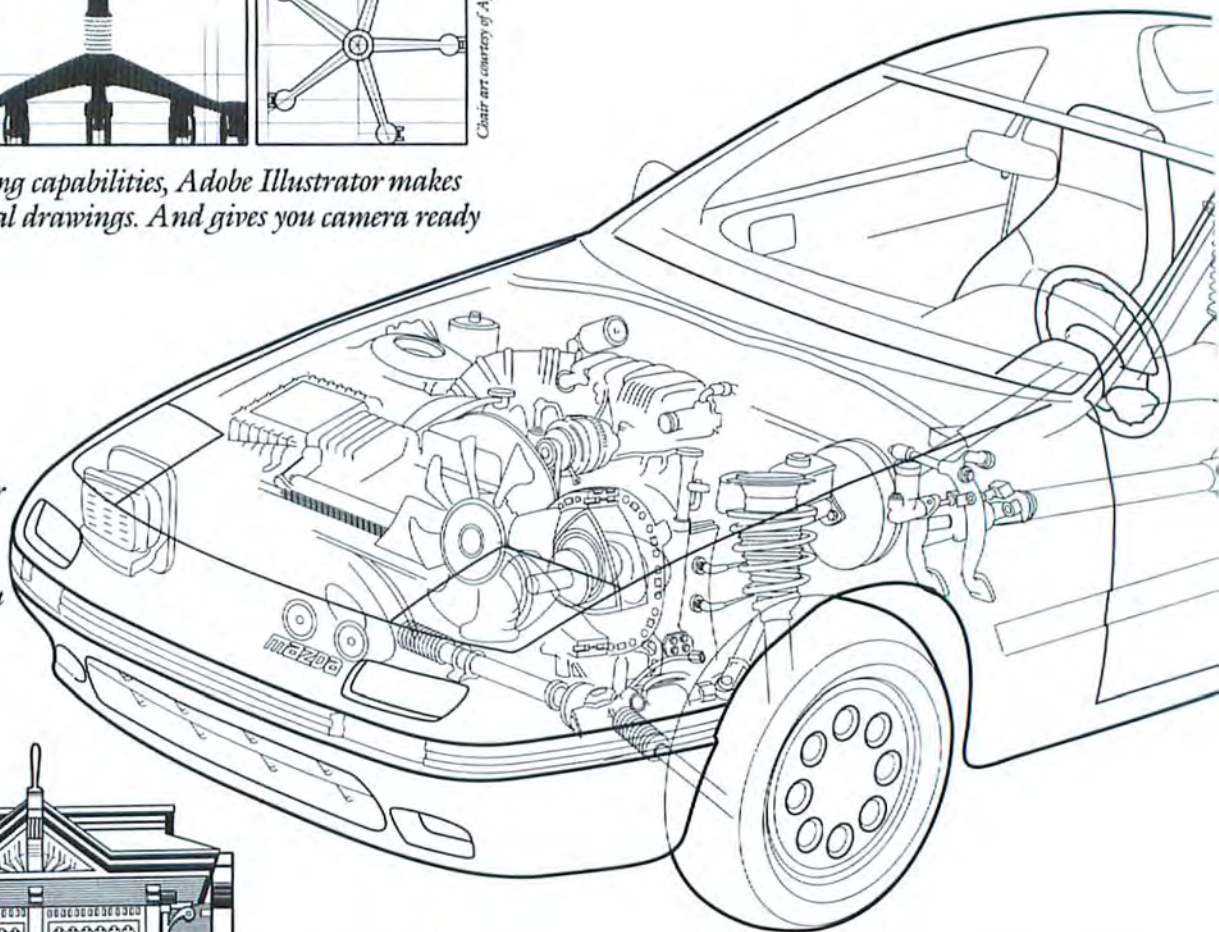
Networking developers Steve Nelson of Kinetics (left) and Kee Nethery of Farallon Computing; behind them, Richard Moore of Apple and Chuck Geschke of Adobe.



Chair art courtesy of Apple Computer, Inc.

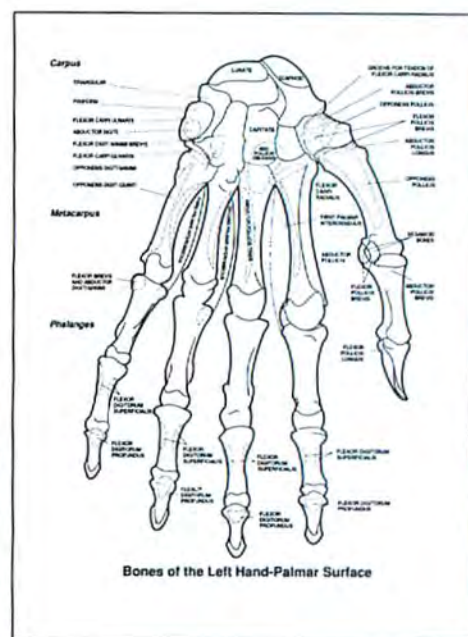
With its powerful curve drawing capabilities, Adobe Illustrator makes short work of the most technical drawings. And gives you camera ready output right at your desk.

Share your drawing with other users. And if anyone wants to change it—no problem—the Adobe Illustrator can give you another perfect original. Fast.

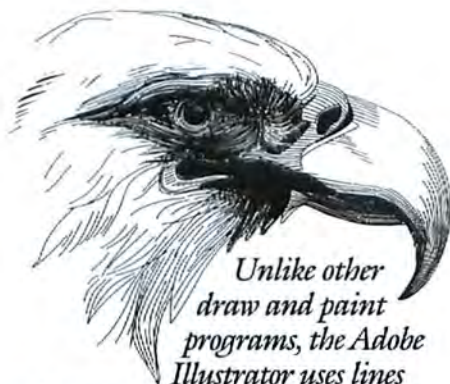
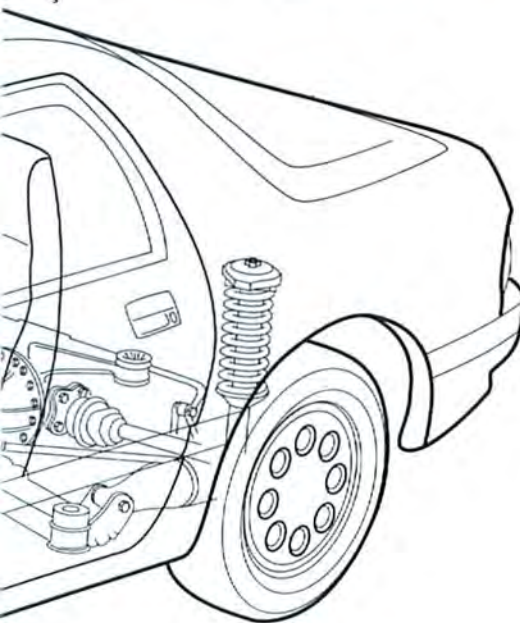


Start with a blueprint or just a dream and the Adobe Illustrator can help you build out the rest. Straight and true.

For producing the finest details, all kinds of line weights, even typeset captions with precise control, no other program can touch it.



Other draw and paint programs also let you add captions. But none of them can put those captions next to the sharpest, cleanest lines and curves on the map.



Unlike other
draw and paint
programs, the Adobe
Illustrator uses lines
and curves to form an image,
instead of dots. So there's really no limit
to the ideas you can hatch. Or cross-hatch.

**-GRAB A BITE-
TONIGHT**

Change is the name of the game in logo design.
And the Adobe Illustrator can make changes in
a fraction of the time it would take by hand.
And not a big fraction, either.

NOW A WORK OF ART DOESN'T HAVE TO BE A LOT OF WORK.



Introducing Adobe Illustrator.™

A new software program designed to produce high quality illustration with the smoothness of a french curve, the versatility of a pencil and the speed of a computer.

Here's how it works.

Unlike other programs, the Adobe Illustrator doesn't build an illustration dot by dot. It uses precise *lines and curves* instead.

Secondly, nothing has to be drawn from scratch. You and your Macintosh Plus,™ SE™ or II™ can start with the scanned image of a photograph, logotype, blueprint, something from your scrap file, even a rough sketch.

Once in the computer, this scanned image becomes your guide. You trace over it to construct the new image. Then, once you have the image you want, you can manipulate it in ways possible only with a computer—scale it, rotate it, even combine it with other Adobe Illustrator images.

From an artistic point of view, then, the Adobe Illustrator is a powerful, new medium.

But it's also a powerful new production tool. One that automates the art production process.

Imagine, if you will, getting camera ready art out of a Macintosh. (We did. You're looking at it.)

Or being able to change that art radically—as easily as you'd edit a letter—and getting new art, literally, within minutes.

Imagine keeping every image in small electronic "art files," and being able to recall, refine, combine or change images, at any time, in any way.

Without any of the usual production headaches.

And just picture what you can do when you combine the Adobe Illustrator with the most popular page layout systems.

It also drives each and every POSTSCRIPT®-equipped printer, from the Apple® LaserWriter™ to Linotype's® Linotronic™ 300 typesetter.

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ReadySetGo! is a novice or experienced publisher's dream. Buy it and find out how easy professional desktop publishing can be.

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reliable and friendly supplier of the latest and best Mac-related products.

Put Icon Review to work for you and take advantage of our extensive research of the Mac marketplace. Each and every product we carry is evaluated for quality and value, then offered at the lowest possible discount price. Pick up the phone and order today. You'll be glad you did!



Icon Review

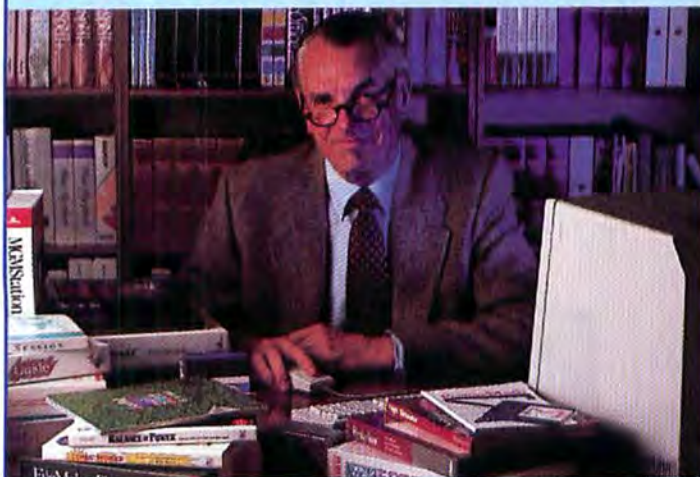
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MacDraw	33.75		
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Microsoft (complete line)...	Call!		
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Sony DisksSS/1.05 DS/1.58	
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IBM Library Coming Soon!

Commentary/Jerry Borrell



Marc Canter of MacroMind (left), Stu Berman of Apple (standing), and Eric Zocher of Silicon Beach confer over dinner.

mated discussions took place over how to introduce a broader selection of colors, how to make the next generation of cards faster, and how to provide an interface to standard video so that television monitors and videotape recorders can be used.

Arguably one of the most heated controversies in the Macintosh community today revolves around the growing number of developers who are avoiding the QuickDraw standard and writing directly to PostScript. In the light of Adobe Systems' intent to popularize PostScript as a driver for screen displays as well as for printers, there is a genuine concern that Apple may lose control of part of its own operating system environment. Apple engineers admitted the limitations of QuickDraw, and there are signs that Apple itself may address future technologies that preclude the use of PostScript. Apple plans further improvements to its QuickDraw standard and hopes developers will continue to rely on it so that they can take advantage of future Apple hardware.

Aldus's Steve Carlson chaired an informal session in which scanner manufacturers considered a standard file format for scanned graphics and text files. (Apple did not participate in this session because it plans to introduce its own scanner.) TIFF—

(continues)

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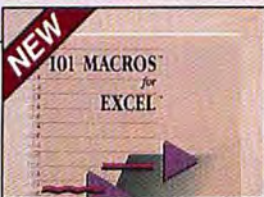
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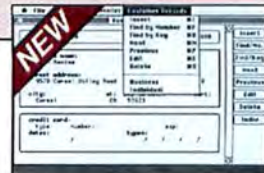
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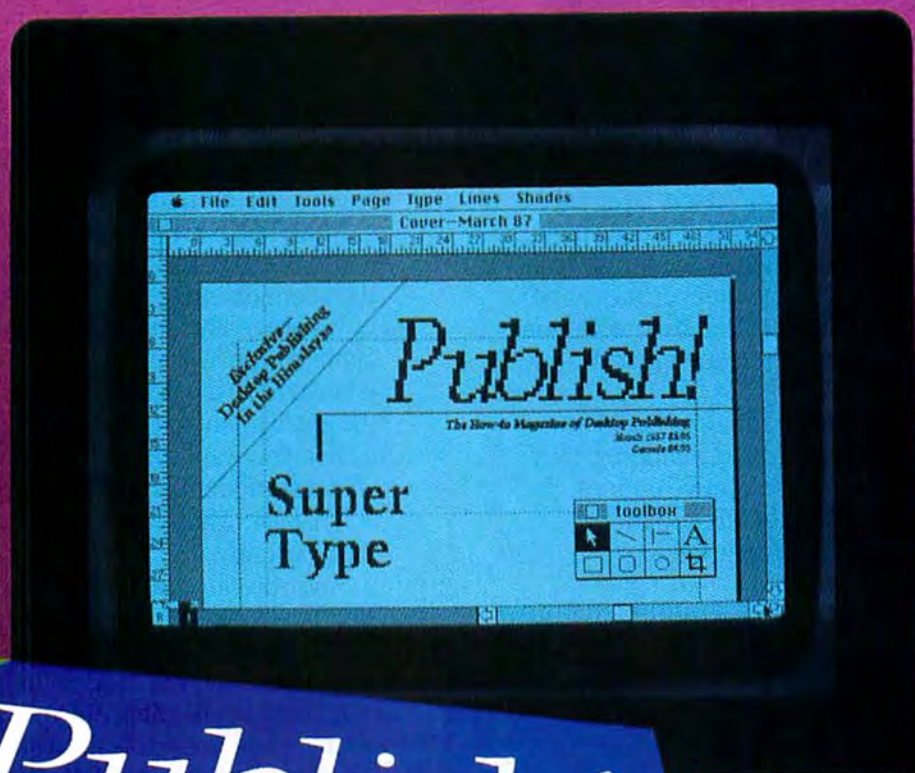
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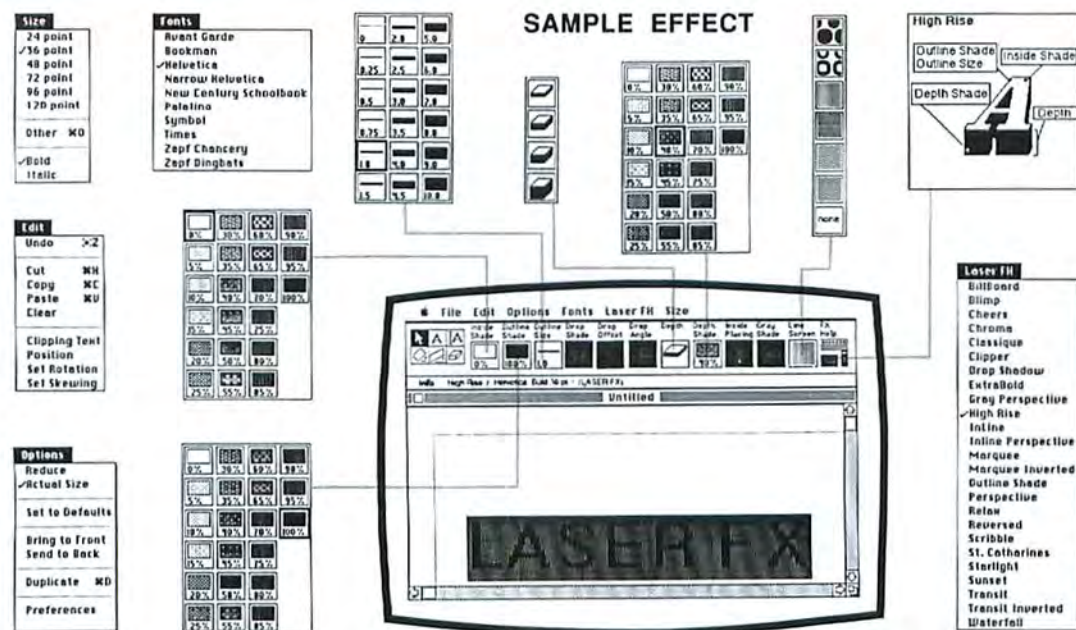
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In informal discussion: Jim Rafferty of Cricket Software (left) and David Nelson of Niwo Labs face Mark Cutter of Apple.

Tagged-Image File Format—has already emerged as the only current universal graphic image file formats allow functions like the Scrapbook to work, but the PICT formats aren't powerful enough for the current

generation of graphic scanners and software that handles complex graphic images. TIFF, promulgated by Aldus, is the de facto standard for graphics storage. But even TIFF has problems: it allows for enough file-format variation from application to application so that data is not completely interchangeable, and it has no ability to store color or gray-scale images. So the need remains for defining and implementing a standard file format for graphics that will allow the transparent use of different programs and scanners.

Part of the Mac II's promise is that it will open new markets for Apple while providing cheaper workstations for professionals such as engineers, scientists, and programmers. Clearly, its success in these areas will depend on UNIX and graphics cards more powerful than those now available—and Apple is working toward both. Less clear is whether Apple is evangelizing software developers from outside its customary band of supporters and bringing them into the Mac community. Another key to entering those markets: communications.

Two sessions at the conference addressed plans for more powerful communications. While it is important that Apple

make clear its intent to work with communications environments such as OSI and SNA, most of us are more concerned with how Apple can improve upon the bandwidth and functionality of AppleTalk. The EtherTalk card for the Mac II and the adaptation of AppleTalk to operate over Ethernet are among the most promising signs of this direction. The Ethernet implementation raises the data transfer rate of AppleTalk to several times that of the current rate. Cards from third-party developers, such as Kinetics, allow the SE to take advantage of Ethernet implementation.

One of the most encouraging aspects of the conference was the continued spirit exhibited by a group of technical managers who have been with Apple since the Mac's announcement. Over the years, most have retained the vision of the original Macintosh. I left the conference thinking that perhaps the Apple community has the right composition to move to the next generation of computers—the ones that will inspire us as much as the original Macintosh did. □



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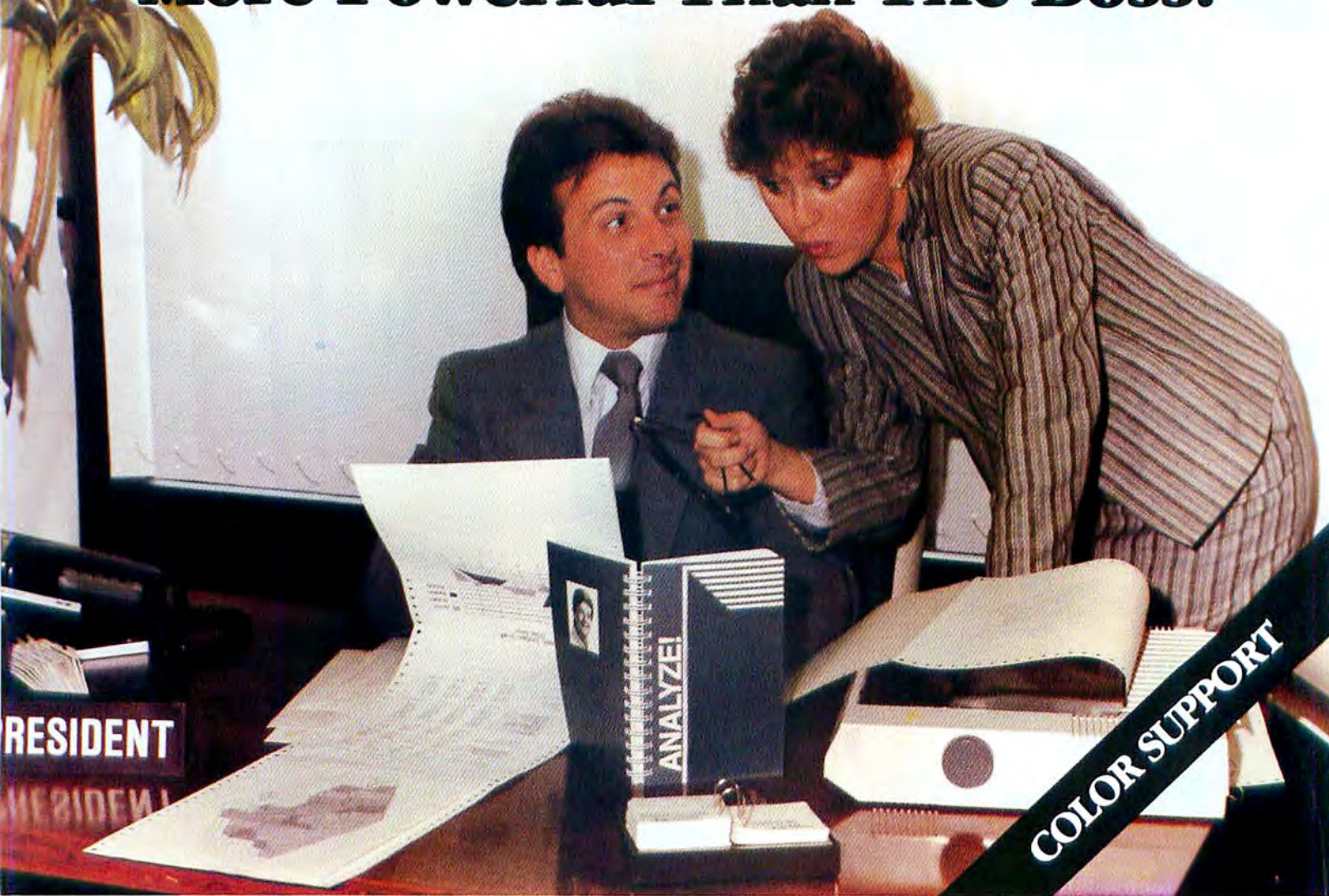


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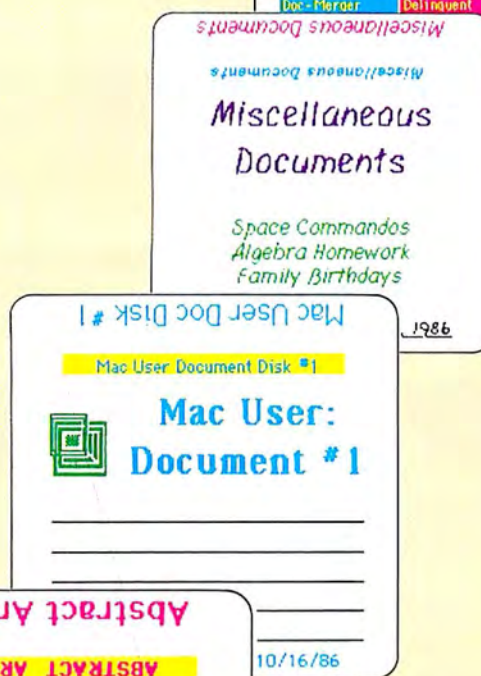
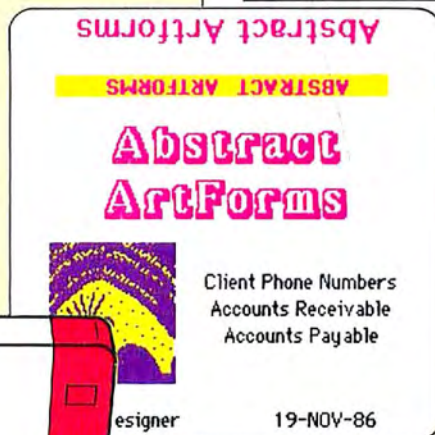
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Contributors Notes

Dale Coleman ("Mac Communications Tools") is coauthor of *The Macintosh Bible*, published this year by Goldstein & Blair. For years he has explored the by-ways of user bulletin boards, including several stints as a sysop for private BBSs.

Jim Heid ("The Desktop Publishing Shopper") is a contributing editor of *Macworld*. He has been writing about the Macintosh since its introduction and has recently completed his second Macintosh book, *dBASE Mac in Business* (Ashton-Tate Publishing, 1987).

Prasad Kaipa ("Beefing Up the SE") teaches at the University of Utah and offers his advice through *MacWiz Consulting* in Salt Lake City.

Erfert Nielson ("Desktop Design") was a founding member of the *Macworld* staff. She put her art-school training to work and quickly became a Mac graphics specialist.

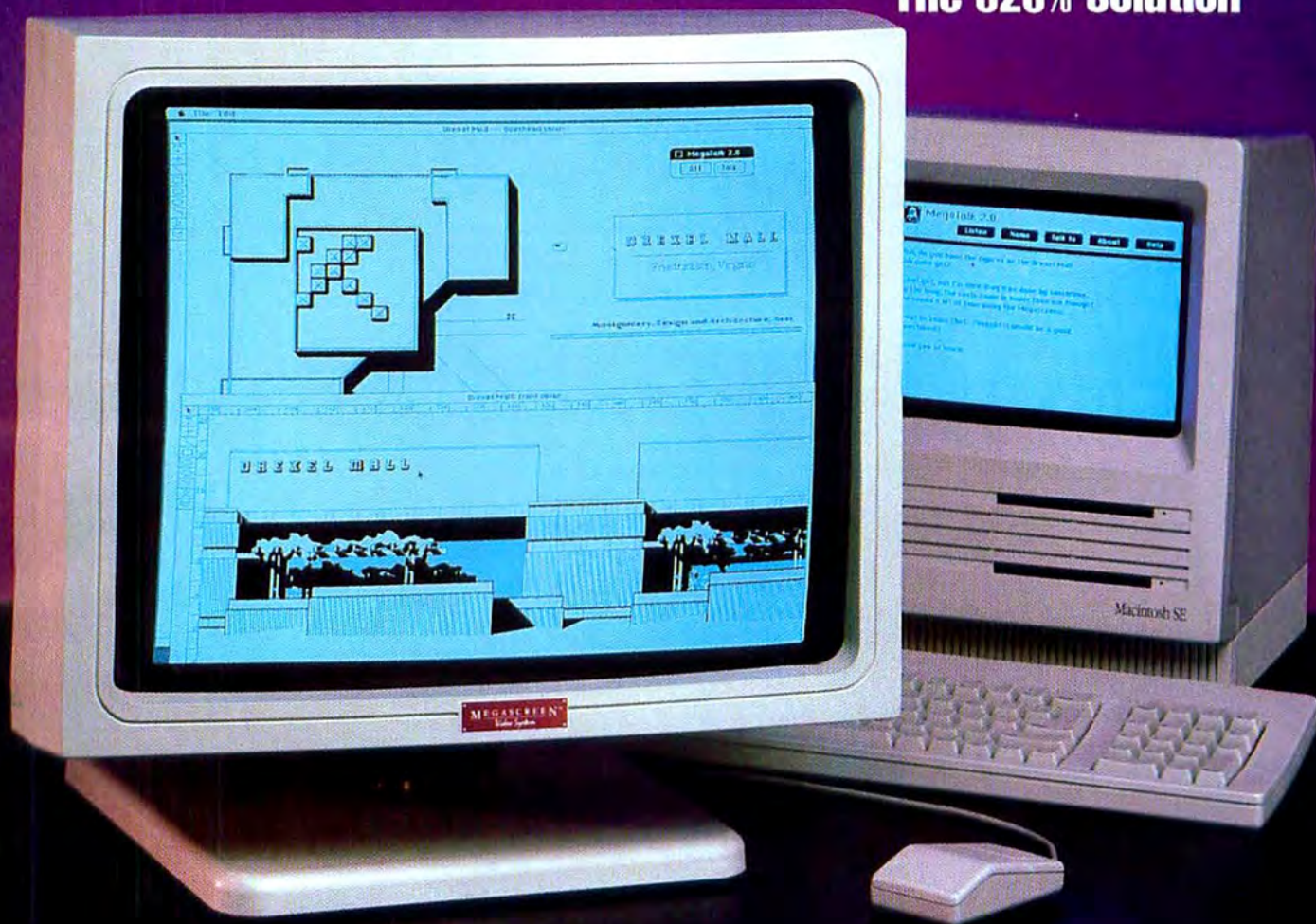
Lon Poole ("The QuickDraw Solution") has been educating Macintosh users since the machine was introduced. Every month he answers readers' questions in his *Quick Tips* column; a book of his tips, *Mac Insights*, was published this year by Microsoft Press.

Charles Seiter ("Mastering Mail Merge") is a chemistry professor turned computer writer whose books on computer topics include two works on Pascal published by Addison-Wesley. He is the only author who has ever submitted a manuscript to *Macworld* written in a programming language.

Bruce Webster ("Beefing up the SE") is a widely published writer who specializes in personal computer topics. His first Mac was a 128K, single-drive (400K) system; his latest Mac was still under construction at press time. □

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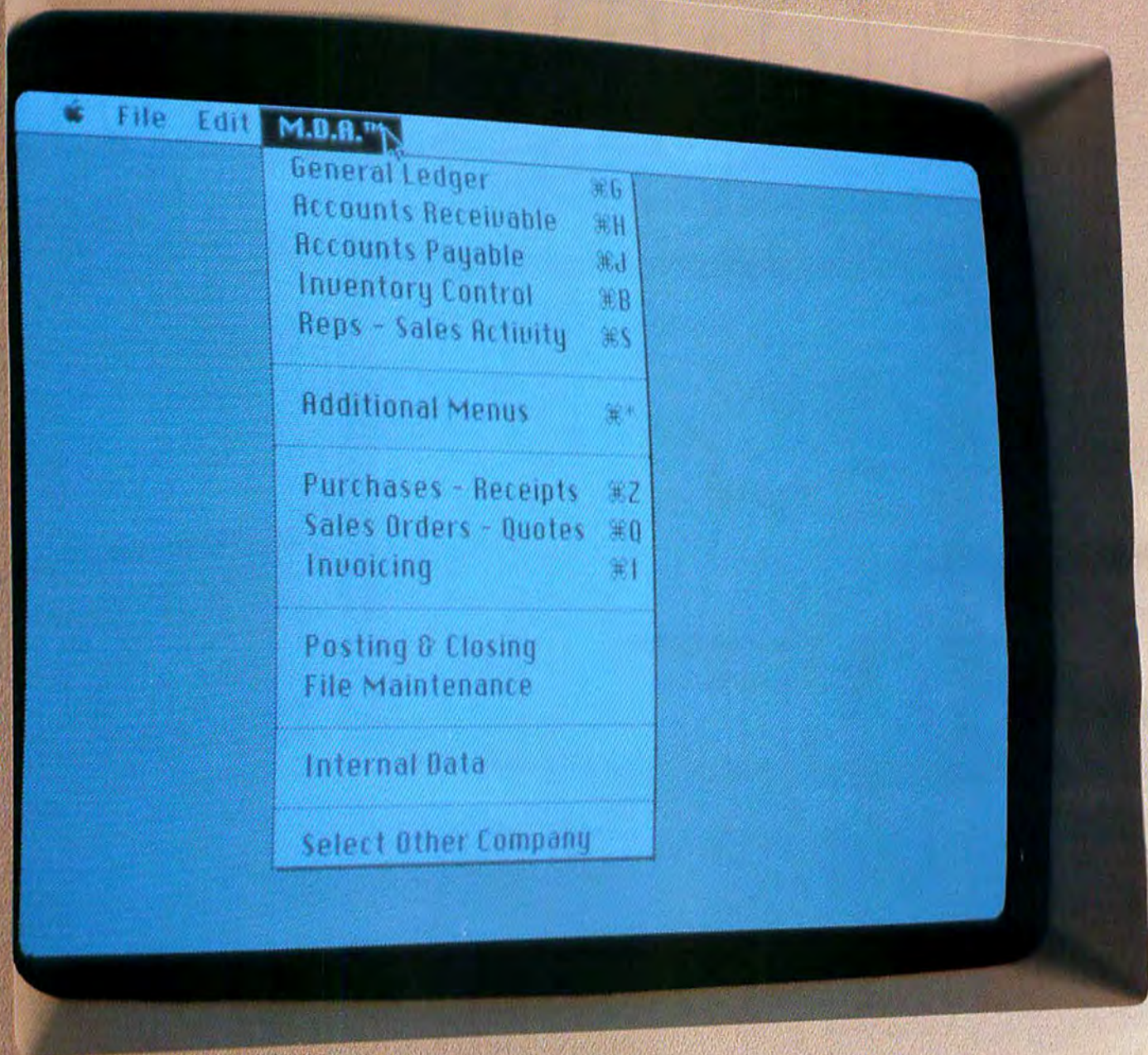
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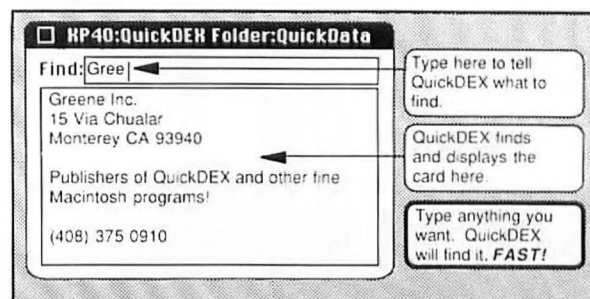
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Macintosh SE: The Great Compromise

*The hidden agenda behind the new,
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What are we to think of the Macintosh SE? We learned about it as a sidebar to the much sexier story of the Macintosh II, yet Apple described it as the computer destined to be the mainstay of the entire line. Apple boasted that it has only one part in common with the Macintosh Plus (the monitor), yet it was designed to *behave* like a Plus. Clearly the SE is more than just a Mac with a slot. But what? We are told we cannot upgrade our present Macs to an SE: should we be indignant at this? What are we missing? What was the need for an intermediate computer between the Plus and the II?

Is it a must? Or is it a botch?

Many will sound the soul of the Macintosh II, but the SE, I suspect, will prove a more elusive creature. The only way to get under its skin—without violating the warranty—is to get hold of one and take it through its paces: drum its keyboard, shove data into its drives, stare balefully into its screen, and maybe, mesmerized by the relentless hum of its fan, you will dislodge its secrets, if indeed any exist. At least that was my purpose in procuring one of these beasts. And after several weeks submerged in the caverns of SE computing, I have returned. Not only alive, but impressed. Though only mildly.

And although I attempted to conjure up answers, I discovered that some of the questions posed in the first paragraph of this column were as hardy as New York cockroaches.



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SE? It works.

By Apple's standards, the SE is a job well done. Charles Oppenheimer, Apple's SE spokesperson, recently explained to me that in early 1986, after Apple successfully introduced the Macintosh Plus, Mac users were finally given the power and performance they required. Those with huge needs would be satisfied with the Open Mac, well under way at that time. So what was the future for the standard-sized Mac?

Apple perceived that users still wanted two things from the Mac. An internal hard disk drive. And a slot—a direct hardware access that would enable users to connect all sorts of goodies, from accelerator cards to MS-DOS coprocessors. So the next iteration

of Macintosh would fill that short wish list. In addition, Apple would try to improve on the Plus in other ways, ranging from tiny details like a larger on/off switch to some significant changes like a new keyboard, as well as yet another increase in speed.

This was all to be accomplished while maintaining maximum compatibility with previous Macintoshes. This was not, like the Macintosh II, something that would render useless much of the software on the user's shelf. So while everything about the SE—except the monitor—is different, what

(continues)

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Mainstay V.I.P. (Visual Interactive Programming)	85.	TML Systems TML Pascal V2.0	68.
Microsoft		TML Source Code Library	58.
Microsoft Basic Interpreter 3.0	64.	TML DataBase Toolkit	64.
		Zedcor, Inc. ZBasic	64.

Communications Software

Apple Computer MacTerminal	99.	Software Ventures Microphone	58.
Compuserve		Think Technologies, Inc. InBox-Starter Kit V2.0	
Compuserve Starter Kit	24.	(3 Personal Connections)	239.
DataViz MacLink Plus with Cable	149.	InBox-Additional Personal Connections	89.
Hayes Microcomputer Smartcom II	88.		

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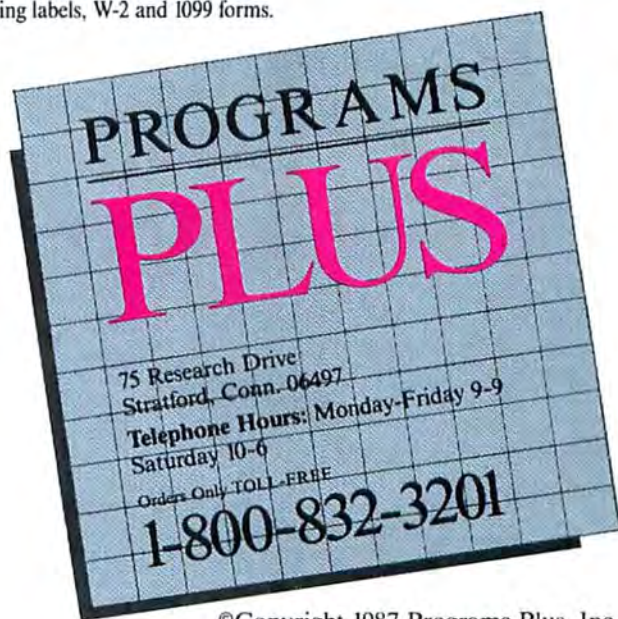
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Central Point		All MacMemory products carry	
Central Point 800K External		a full two year warranty!	
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Dove Computer Corporation		w/MaxRam/MaxPrint/MaxChill)	329.
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MacSnap Model 548		Chips-Hyperdrive Compatible)	519.
(512K to 2MB Upgrade)	Special 359.	MaxPack (MaxPlus and	
MacSnap Model 548S		MaxSave Bundle)	379.
(512K to 2MB Upgrade		MaxPort ("SCSI" Port	
w/SCSI Port)	Special 469.	for your Mac 512K)	139.
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to 2MB Upgrade)	Special 249.	Magnum 800K External Drive	
MacSnap Plus 2H		(Available in Beige or Platinum)	209.
(MacPlus or SE to 2MB		Personal Computer Peripherals	
Upgrade w/1MB Chips)	Special 569.	Available in Beige or Platinum Color	
MacSnap Toolkit		MacBottom HD-21	859.
(Wrench, Case Cracker		(20+Mb SCSI Hard Disk)	
& Grounding Set)	14.	MacBottom HD-32	995.
Ehman Engineering		(32Mb SCSI Hard Disk)	
Available in Beige or Platinum		MacBottom HD-45	1285.
Ehman 800K External Disk Drive	195.	(45Mb SCSI Hard Disk)	
Iomega		MacBottom 20 (20+Mb	
Dual Cartridge Drives		Serial Hard Disk for	
Bernoulli Box 2-10MB w/SCSI	1419.	Mac 512K & MacPlus)	859.
Bernoulli Box 2-20MB w/SCSI	1849.	Rodime Systems Rodime 20 Plus	
10MB Cartridges (3 Pack)	159.	Hard Disk (MacPlus SCSI)	759.
20MB Cartridges (3 Pack)	239.	Western Automation Labs	
Head Cleaning Kit	69.	Dasch External RAMdisk (2048KB)	429.

Modems

AST Research		InterBridge	
High Quality Modems for the		(Connect Appletalk Networks)	599.
MacPlus, Mac SE, & Mac II		Prometheus Promodem 1200	
AST-1200 (1200 Baud Modem)	349.	(Hayes Compatible)	239.
AST-2400 (2400 Baud Modem)	489.	Promodem 2400	
Hayes Microcomputing		(Hayes Compatible)	299.
Smartmodem 1200	299.	Mac Pack w/Procom M and Cable	49.
Smartmodem 1200 Mac		(Specify Mac or MacPlus)	
w/Smartcom II & Cable	359.	U.S. Robotics Courier 1200	199.
Smartmodem 2400	449.	(Hayes Compatible)	349.
Transet 1000-128K	269.	Courier 2400E (Hayes Compatible)	409.
Transet 1000-512K	359.	Courier 9600 (Hayes Compatible)	729.
Transet 1000 Mac Accessory Kit	29.		

Digitizers

AST TurboScan (Optically Scans		MacScan (High Speed Image	
& Digitizes at 300 Dots-Per-Inch)	Call	Scanner at 300 DPI)	1399.
Impulse Impulse (MacNifty)		Summagraphics	
Audio Digitizer V2.0 w/SoundCap	149.	MacTablet 6x9 size	289.
Koala Technologies Corp.		MacTablet 12x12 size	379.
MacVision (Digitizer)	175.	ThunderWare	
New Image Technology		Thunderscan V4.0 with Power Port	
Magic Digitizer (Mac 128/512K	249.	(Mac 512K, 512K Enhanced,	199.
or MacPlus, and Macintosh SE)		MacPlus, and Macintosh SE)	

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Single Sided 3 1/2" Diskettes		Double Sided 3 1/2" Diskettes	
BASF 3 1/2" SS/DD Disks (box of 5)	8.	BASF 3 1/2" DS/DD Disks (box of 5)	9.
Bulk (Sony) 3 1/2" SS/DD Disks (10)	12.	Bulk (Sony) 3 1/2" DS/DD (10)	16.
Sony 3 1/2" SS/DD Disks (box of 10)	14.	Centech 3 1/2" DS/DD Color Disks	19.
Centech 3 1/2" SS/DD Color Disks		(box of 10)	19.
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Fuji 3 1/2" SS/DD Disks (box of 10)	16.	Fuji 3 1/2" DS/DD Disks (box of 10)	20.
Maxell 3 1/2" SS/DD Disks (box of 10)	13.	Maxell 3 1/2" DS/DD Disks (box of 10)	20.
Verbatim 3 1/2" SS/DD Disks (box of 10)	13.	Verbatim 3 1/2" DS/DD Disks (box of 10)	21.
3M 3 1/2" SS/DD Disks (box of 10)	22.	3M 3 1/2" DS/DD Disks (box of 10)	25.
C.Itoh Color Disks SS/DD (box of 10)		C.Itoh Color Disks DS/DD (box of 10)	

Accessories

A.M. Products		A/B Box (MacPlus Only)	64.
3 1/2" Head & Computer Cleaning Kit	18.	Disk Case (holds 36 Mac disks)	19.
Bech-Tech Fanny Mac	69.	Disk Drive Cleaning Kit	20.
Cambridge Automation		External Disk Drive Cover	8.
Numeric Turbo	99.	ImageWriter or ImageWriter II Cover	9.
Curtis Manufacturing		Macintosh (Plus) Dust Cover	9.
Diamond-Surge Suppressor-SP1	29.	Mouse Cleaning Kit w/Pocket	17.
Emerald-Surge Suppressor-SP2	36.	Mouse Pocket	8.
Ruby-Surge Suppressor-SPF-2	55.	Mouseway (Mousepad)	8.
Sapphire-Surge Suppressor-SPF-1	47.	Polarizing Filter (Beige or Platinum)	34.
Ergotron MacTilt or MacTilt SE		Starter Pack (includes Tilt/Swivel)	59.
(Platinum Color)	74.	Surge Protector	34.
Mouse Cleaner 360°	15.	Tilt/Swivel (Beige or Platinum)	22.
MacBuffer 512K	329.	Control Center	64.
MacBuffer 1024K	429.	Printer Stand	18.
Impulse		Universal Copy Stand	24.
MacNifty Stereo Music System		Printer Muffler 80	39.
MNS-300 (Dolby, Bass, Treble)	99.	Printer Muffler 132	55.
Innovative Concepts		Moustrak	
Flip 'n' File/Micro	9.	MousePad 7"x9" Size	8.
Flip 'n' File II/Micro	18.	MousePad 9"x11" Size	9.
I/O Design		MPH Computer Products	
Mac Luggage Available in Navy		MAC-B-COOL	89.
or Platinum Gray		Ribbons Unlimited	
Macinware Plus Carrying Case	69.	Available in Black, Blue, Brown, Green,	
Macinware SE Carrying Case	79.	Orange, Purple, Red, Yellow, Silver & Gold	
Imageware II Carrying Case	49.	ImageWriter Ribbon-Black	4.50
Kalmar Designs		ImageWriter Ribbon-Color	5.
Teakwood Roll-Top Disk Cases:		ImageWriter Rainbow Pack (6 Colors)	25.
Micro Cabinet (holds 45 disks)	14.	ImageWriter II-Four Color Ribbon	12.
Double Micro Cabinet (holds 60 disks)	21.	The Madison Line	
Jumbo Micro Cabinet (holds 135 disks)	29.	Professional Series Carry	
Kensington System Saver Mac		Cases In Black Ballistic Nylon	
(Beige or Platinum)	64.	Mac(Plus) Carry Case	79.
Turbo Mouse	85.	ImageWriter I (II) Carry Case	75.

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DataBase Management

Ashton-Tate dBase Mac	299.	Nantucket Corporation McMax	219.
Blythe Software Omnis 3 Plus	259.	(Run dBase Programs on the Mac)	275.
Omnis 3 Plus Multi-User		Odesta Double Helix	
(MacServe, Tops Network,		ProVUE Development	
Corvus, or Appleshare Network)	499.	OverVUE 2.1	149.
Borland Reflex	59.	Software Discoveries	
Forethought FileMaker Plus	159.	RecordHolderPlus	45.
Microsoft Microsoft File 1.05	110.	MergeWrite	32.

Business Software

Apple Computer MacProject	159.	Lotus Jazz (Version 1.A)	119.
Batteries Included		Micro Planning Software	
Isgur Portfolio System	125.	Micro Planner Plus	299.
Time Link	32.	Microsoft	
Bravo Technologies MacCalc	85.	Microsoft Works 1.0	189.
Cricket Software		Microsoft Multiplan 1.11	110.
Cricket Graph	125.	Microsoft Chart 1.02	72.
Data Tailor		Microsoft Excel 1.04	224.
Trapeze (Spreadsheet/Color		Satori Software	
Report Generator)	169.	Legal Billing	359.
Forethought PowerPoint	209.	Legal Billing II	519.
Layered		Project Billing	429.
Notes For Excel, PageMaker,		Bulk Mailer 3.0	Special 89.
or Microsoft Works (each)	42.	Bulk Mailer Plus	Special 199.
Legisoft/Nolo Press		Target Software Memorandum	
WillWriter V2.0	31.	(Attach Electronic Notes to Files)	55.

Word & Outline Processors

Ann Arbor Softworks		OWL International	
FullWrite Professional	169.	Guide	79.
Apple Computer MacWrite	99.	Guide Envelope System	99.
Firebird Licensees Laser Author	109.	Symmetry Acta V1.2	Special 35.
Living Videotext More	149.	Target Software Voila!	55.
Microsoft Microsoft Word 3.01	239.	T/Maker Company WriteNow	98.

Spelling & Grammar Checkers

Aegis Development		Lundeen & Associates	
Doug Clapp's Word Tools	45.	WorksPlus Spell	Special 35.
Aegis Speed Speller	29.	Working Software Inc.	
Word Tools Combo Pack	65.	Spellsweil Spelling Checker &	
A.L.P. Systems MacProof V2.0		Proofreader V1.3	42.
(Requires MacPlus)	99.	Medical Dictionary	
Batteries Included		(35,000 Medical Terms)	58.
Thunder! (Interactive Spelling Checker)	32.		

Desktop Publishing

Aldus Corporation		Ready, Set, Go! 3.0	249.
PageMaker	419.	Ready, Set, Go! 4.0	289.
Boston Publishing Systems		Orange Micro, Inc. Ragtime V2.0	
The MacPublisher III	199.	(Integrated Page Processing)	229.
Letrasel Letra Hyphen	79.	Solutions, Inc.	
Letra Index	79.	Glue (Adds "Print to Disk" Capability)	41.

Accounting Packages

BPI		Migent In House Accountant	99.
BPI Entry Series-General Accounting	135.	Monogram Dollars & Sense	81.
Chang Labs		Business Sense (GL/AR/AP)	339.
New Enhanced Version III Modules!		Palantir General Ledger	
Rags to Riches GL, AR, or AP	125.	or Accounts Receivable	49.
Rags to Riches Three Pack-		Peachtree	
(GL/AR/AP)	299.	Back To Basics Three Pack	
Inventory Control	243.	(GL/AR/AP)	129.
Professional Billing	243.	Sierra On-Line	
Professional Three Pack-		MacOneWrite Three Pack	
GL/Professional Billing/Payables	349.	(GL/AR/CD)	59.
Digital, Etc.		Survivor Software	
Turbo Macaccountant V2.0	Special 259.	MacMoney (Financial Planner)	42.

Statistics Packages

BrainPower		Systat	
StatView 512 Plus	179.	Systat 3.1 (Specify Mac 512K,	
Cricket Software Statworks	77.	MacPlus, or Mac II)	459.

Graphics Software

Altsys Corp. FONTastic	27.	Hayden VideoWorks	59.
FONTastic Plus	49.	LaserWare, Inc.	
Fontographer 2.2	245.	LaserPaint	319.
Ann Arbor Softworks Full Paint	53.	LaserWorks	199.
Apple Computer MacPaint	99.	Miles Computing Mac The Knife	
Broderbund Print Shop	39.	Volume III, IV, V, or VI	27.
Toy Shop	32.	Mindscape ComicWorks	48.
Casadyware		GraphicWorks 1.1	64.
Fluent Fonts (Two-Disk Set)	29.	Silicon Beach Software	
Fluent Laser Fonts Vol. 1-15 (ea)	48.	SuperPaint	54.
Deneba Software Canvas	129.	Silicon Press	41.
Canvas DA	69.	Springboard Certificate Maker	35.
MacObject Library	20.	Certificate Maker Library #1	21.
Dubl-Click Software		Symmetry PictureBase V1.2	44.
World Class Fonts! Vol. 1 or Vol. 2	28.	T/Maker	
World Class Fonts! (Both Volumes)	49.	Click Art Letters or Personal Graphics	28.
WetPaint Vol. 1 or Vol. 2	28.	Click Art Publications or Effects	28.
WetPaint (Both Volumes)	49.	Click Art Letters II or	
Enzan-Hoshigumi (USA)		Click Art Holidays	28.
MacCalligraphy 2.0	115.	Click Art Business Image	28.
Japanese Clip Art Vol. 1 (Heaven)		Click Art Laser Fonts: Plymouth,	
or Vol. 2 (Earth)	59.	Bombay, or Seville (each)	46.

CAD Products

Apple Computer MacDraw	159.	Enabling Technologies	
Challenger Software		Easy 3D	69.
Mac 3D (Enhanced Version 2.0)	119.	Professional 3D	199.
Cricket Software		Innovative Data Design	
Cricket Draw	Special 169.	MacDraft (Updated Version 1.2)	159.

Educational/Creative Software

Addison Wesley Puppy Love	14.	Concertware+ 4.0	45.
Baudeville		Concertware+ MIDI 4.0	95.
Ted Bear Discovers...Rainy Day Games	20.	Hayden MusicWorks	29.
Guitar Wizard	20.	Score Improvement System for the SAT	59.
Bogus Productions Studio Session	59.	Micro: Maps	
Broderbund Sensei Geometry	64.	MacAtlas U.S.A. or MacAtlas World	49.
Davidson & Associates		Mindscape Perfect Score SAT	
Speed Reader II	39.	w/The Perfect College	46.
Math Blaster or Word Attack!	28.	Rubicon Publishing	
Electronic Arts		Dinner at Eight	32.
Deluxe Music Construction Set V2.0	63.	Silver Palate Collection	28.
First Byte/Electronic Arts		Dinner at Eight-Silver Palate Bundle	54.
Kid Talk, Speller Bee,		Simon & Schuster Typing Tutor III	35.
First Shapes, or Math Talk	32.	Paper Airplane Construction Set	24.
MathTalk Fractions, First Letters &		Spinnaker Typing Made Easy	32.
Words, or Smoothtalker	32.	Springboard	
Great Wave Software		Early Games for Young Children	28.
KidsTime or TimeMasters	28.	Easy as ABC	28.

Game Software

Accolade Hard Ball	24.	Microsoft	
Activision Shanghai or Hacker II	25.	Flight Simulator 1.0	32.
Hacker	16.	Miles Computing Inc.	
Portal	32.	Downhill Racer or	
Tass Times In Tonetown	22.	Harrier Strike Mission II	27.
Artworx Bridge 5.0	21.	Mindscape	
Avalon Hill Mac Pro Football	30.	Balance of Power or Crossword Magic	32.
Broderbund Ancient Art of War	27.	Deja Vu: A Nightmare Comes True	32.
Bullseye Software		King Of Chicago or Shadowgate	32.
Fokker TriPlane Flight Simulator	34.	Defender of The Crown,	
Ferrari Grand Prix	34.	Sinbad, or S.D.I.	32.
Electronic Arts Starfleet I	30.	The Uninvited	32.
ChessMaster 2000	37.	Practical Computer Applications	
Pinball Construction Set	27.	MacGolf 2.0 or	
Patton vs Rommel or One-On-One	27.	MacRacquetball	Special 35.
Seven Cities of Gold	27.	MacCourses	34.
SkyFox, Archon, or Scrabble	27.	Pson	
EPYX Winter Games		Pson Chess (3D & Multi-Lingual)	31.
or Sub Battle Simulator	24.	Sierra On-Line Space Quest	32.
Firebird Pawn	27.	Black Cauldron	25.
Hayden Software Sargon III	29.	King's Quest I, II, or III (each)	32.
Infinity Software, LTD.		Silicon Beach Software	
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World Cup Soccer	27.	Dark Castle	28.
Go	23.	World Builder	41.
Infocom		Simon & Schuster	
Ballyhoo, Bureaucracy, Hitchhiker's		Star Trek (The Kobayashi Adventure)	24.
Guide, Hollywood Hyjinx, Leather		Sir-Tech Mac Wizardry	35.
Goddesses of Phobos, Moon Mist,		Sphere, Inc. GATO	26.
Stationfall, The Lurking Horror,		Orbiter or Falcon	35.
Trinity, or Zork I (each)	25.	Sublogic JET	
Zork Trilogy	45.	JET Scenery Disk #7	
Intelligence		(South East Region)	18.
Alternate Reality/The City	29.	XOR Software NFL Challenge	69.

the user sees is basically a modified Macintosh Plus.

The SE delivers on Apple's promises. Aside from the keyboard, the visual differences between the SE and the Plus are strictly cosmetic. Chief among them is that the Mac is now bedecked in the official Apple Computer color. To those untrained in George Orwell's newspeak, the color is gray; others refer to it as "platinum." There is also a clumsy grill-like design, with holes for the disk drives on the front of the box.

Like its predecessors, the SE is mercifully easy to set up, and in five minutes I was ready to go. I filled up the internal 20MB hard drive with software and happily began to Macintosh.

Did the software run faster? It was tough to tell. Supposedly, the new internal SCSI port is speedier than the one for hard drives that connect to the back of the machine. Since I didn't use a stopwatch (let's face it, once you have to pull out a stopwatch to tell the difference, it's clear that the difference isn't earth-shattering), I'd have to conclude that the speed gain was between "a little" and "I think I saved a couple seconds on that one." Don't get me wrong—I'll take it. But if the Mac Plus is to

the unenhanced 512K Mac as day is to night, the SE is to the Plus as dusk is to early evening.

Almost all the software I tried ran; the exceptions were a few copy-protected games.

The Slot Machine

I cannot give a complete hands-on report of the virtues and vices of the slot, which is responsible for the SE (System Expansion) appellation. In the first few months of the SE's life, nothing was available for users to put in that wonderful slot.

At one point, I visited Apple and played with a prototype of the board that would provide file compatibility with other formats, including MS-DOS (IBM and compatibles) and PRO-DOS (Apple II family). With that \$150 card and a \$400 floppy disk drive attached, I was able to open a Lotus 1-2-3 file and, using an Apple utility called *Interfile*, convert it to *Excel*. I concocted a formula or two, then converted it back. I did the same with *AppleWorks* and *MacWrite*. It worked smoothly. Obviously this is of considerable value to those in offices that use different software formats—more useful, I'd guess, than buying a coprocessor card (at a cost approximating that of a

brand-new IBM clone) to perform the dubious stunt of actually running MS-DOS software on the Mac.

Finally I managed to get hold of a card for my own SE, and it was a good one—General Computer's HyperCharger 68020 board. This basically allowed me to convert the SE, which uses the same 68000 microprocessor as the Mac Plus, to a speed demon that uses the same powerful 68020 chip that the Macintosh II does. The improvement was not noticeable in everything I did, but it was dazzling with processor-intensive tasks. Things like converting *Word* 1.05 files to *Word* 3.0, moving around a full page of graphics in *MacPaint*, and laying out pages in *PageMaker*. I suspect if I were to undertake a calculation of the speed at which the universe expands, the card would be invaluable. Even if I didn't use all that power, it was consistently invigorating to know it was in my little Macintosh box.

Yes, I would have to say that the Macintosh SE accomplished the two basic tasks that Apple required. And I would gladly turn in my Mac Plus for an SE.

But are the improvements worth such a drastic change? Or a steep increase in price? I have my doubts.

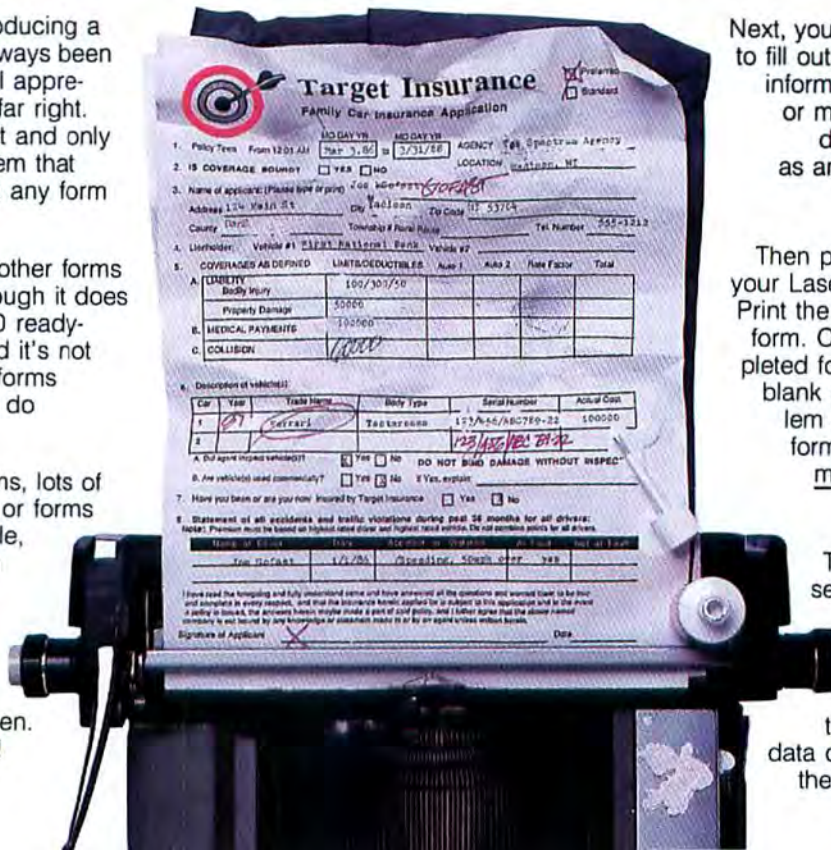
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APUP: The Dark Side of the SE

Instead of nit-picking (I don't like the fact that the keyboard cord connects to the back instead of the front, but do you really care?), I'll go right to my main objection. I do not believe that the main purpose of the SE is to satisfy user demands. It is a machine to satisfy the demands of Apple Computer and the vision of the marketplace it would like to serve. A new Apple principle has come into play, one I shall call APUP. This stands for Apple's Plan, User's Problem.

I cannot understand Apple's perception that Mac Plus users were storming the ramparts with demands of internal hard drives and a slot. Users were *ecstatic* with the Mac Plus. They could choose from dozens of hard disk drives. Most chose external drives—these are often preferable because information on an internal hard drive cannot be accessed when a computer fails. As for slots, everyone knew that Apple was planning the Open Mac, the ultimate answer to the slot question. What Mac Plus owners might want in a slot—whether 68020 cards, or connections to large screens—could already be provided by a

third-party product that connected circuitry to the existing Mac Plus motherboard. True, it required a dealer to install. *But so does the installation of a card into the Mac SE.* Despite the existence of a slot, the hardware is inaccessible to users—actually dangerous to get to—so the Mac SE is de facto a closed system like the Mac Plus. (A dealer charged \$40 to install the Hyper-Charger card in my SE; I suspect that this will be a minimum for an installation.) If you want to shuttle cards in and out, you'd better forget it.

My guess is that Apple felt that some of the stodgier folks who have buying power in the business community were holding out because the Mac didn't have a factory-installed hard drive and a slot to run communications to mainframes or to run MS-DOS software. It was for them, not for *us* (plain old users), that these changes were implemented.

Anyway, none of this explains why the SE comes in two versions—one with two floppy drives and the other with one floppy and a 20MB hard disk drive. The configuration that would allow users the most flexibility is one floppy drive, with the option of using third-party products to provide storage at lower cost and possibly higher

performance. Apple's Charles Oppenheimer explains that this was done because Apple was concerned that third-party manufacturers could not provide internal hard disk drives of the necessary quality. But what about those who want an external hard disk drive? They must pay for a second floppy drive they might never use.

Apple's Plan, User's Problem is even more apparent in the new keyboard. Incidentally, the keyboard is optional with the Mac SE—ever try to run a computer without one?—with users paying extra for either the Standard or the deluxe Extended version. The Standard, which most will opt for, is lower in profile than previous Mac keyboards, like the IBM keyboard, and at first touch it seems less sturdy. But for once IBM had it right: the low angle works better, at least for me, than did the previous Mac keyboard.

The Standard's layout, though, is a disaster. The space bar is cripplingly shortened; the Caps Lock key is banned to Lower Slobbovia; there is a big, fat, unidentified key on top; and on prime real estate, just left of the A key, stands a wide Control

(continues)

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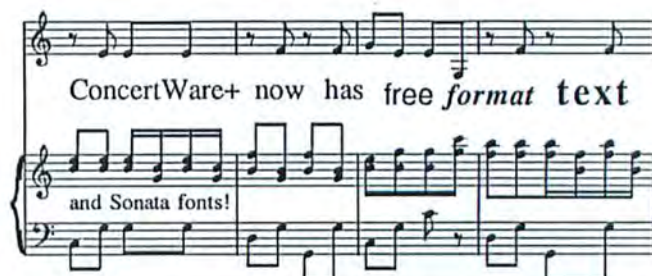
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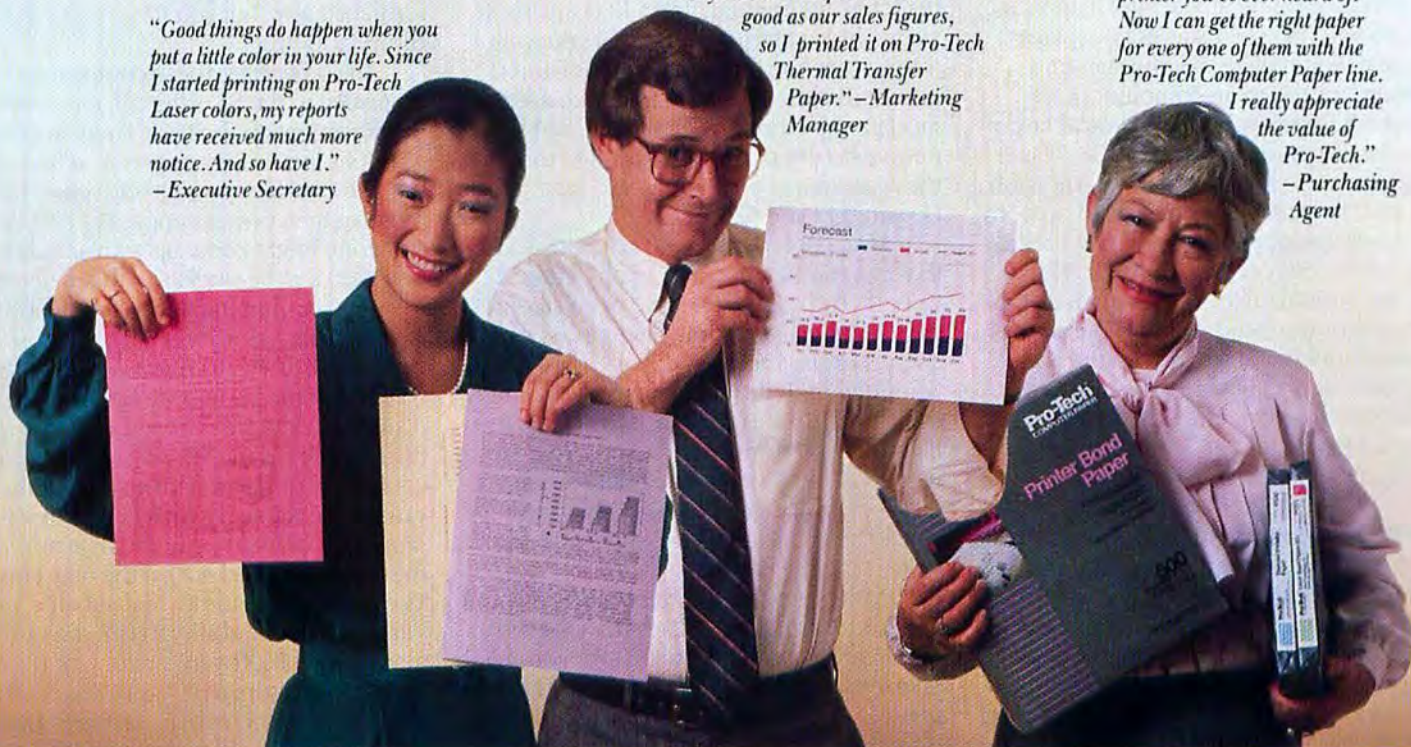
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key, unusable on most Macintosh applications so far. This seems to defy explanation, until you realize that the standard keyboard for the main computer of the Macintosh line now has an identical layout to the keyboard on the Apple IIGS. *Those* folks have a use for control keys. And with the new Desktop Bus system used on both the SE and the Apple IIGS, you can literally swap keyboards on the machines. This must be wonderful for Apple, but it doesn't do much for the hundreds of thousands of SE owners who will suffer with the Standard keyboard. (The more expensive Extended keyboard, on the other hand, is laid out quite logically.)

Apple's Plan, User's Problem.

The Woes of No 020

The most glaring example of APUP is what the Macintosh SE does *not* have: the 68020 chip. There has been much discussion as to why this chip will appear in the Macintosh II and not in the SE (for a good explanation, see "SE Close-Up," *MacWorld*, May 1987); it boils down mostly to price, software compatibility, and Apple's desire for product differentiation. If the SE used

that chip, we are told, it would cost almost as much as a Macintosh II—so if you want that power, buy that machine. Yet rumors persist that the SE was designed to accommodate the more powerful chip, and Apple people do not deny the possibility that future versions of the SE might indeed be powered by the 020.

Would it have been so horrible to use that chip in the current version of the SE? Initially, the cost might have been significantly higher—yet SE buyers must now spend several hundred dollars more for a computer with the same memory and the same processor as the Macintosh Plus. Unlike the two prominently stated "improvements" of the SE, which at the present moment can be obtained by other measures, the inclusion of this chip would provide a tangible cost-justification.

As it is, Apple will eventually come out with the Macintosh SE Exclamation Point, or whatever it calls the 68020 version, and SE users will be faced with a costly upgrade. Mac Plus users probably won't even have the option of undergoing that upgrade—which is why all first-time Mac buyers should go straight to the SE. So the main reason to pay extra for the SE is a defensive one: you won't get much more per-

formance now, but you'll be in line for future goodies.

In some ways, these complaints do not do justice to the SE. After all, it is indeed an improvement on the Plus. There are other wrinkles that are not apparent at first glance, but will provide some steady value—like a more rugged power supply. For all I know, someone might come up with a multifunction card for the single slot that will obviate the need of opening the box again, ever.

Still, the SE represents some sort of compromise; a chance was missed. I find it odd that some people are bitterly complaining that there is no upgrade path from the Mac Plus to the SE—what possible task could they perform with an SE that they cannot accomplish with a Plus? Nor will any significant software emerge that runs on the current SE and not on the Mac Plus. The real issue in future Macintosh compatibility will be the ability to run the next generation of software written for the Macintosh II. I'm sure that future SEs will be able to run much of that software—but not the current SE, which wins the 1987 Half a Loaf Is Better than None award. That lingering cockroach of a question, though, is "better for whom?" □



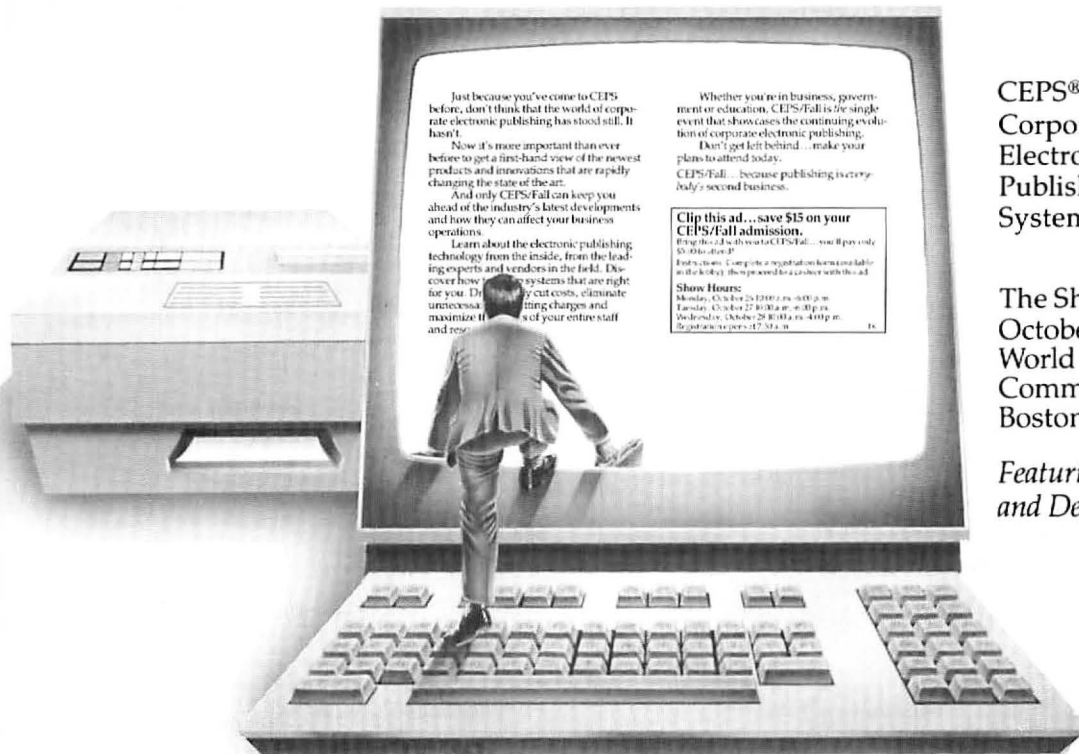
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*An interview with John Warnock,
president of Adobe Systems.*



John Warnock, president of Adobe Systems, has been at the leading edge of computer graphics since the beginning. He helped pioneer the field at the University of Utah in the mid-sixties. There Warnock developed the Warnock Algorithm, a breakthrough in solids modeling that made it possible for a computer to display a realistic simulation of 3-D objects. Later, he created geophysical databases for Computer Sciences in Canada. Warnock's work with Landsat image processing for that company led to NASA research working with his university mentor David Evans at Evans & Sutherland. Then, it was on to Xerox PARC, where he worked on the first laser-printing languages. Warnock and several associates from PARC went on to found Adobe and create PostScript, the page-description language that is at the heart of the LaserWriter.

The years you were at the University of Utah are known as its golden years. It was like the Manhattan Project of computer graphics. What was it like there?

We were doing things done nowhere else, always running down hallways to show the others what we had just come up with. It started in 1965, when David Evans, who was teaching at Berkeley, decided to go back to the University of Utah as the head of the computer science department. He brought with him a \$6 million grant from ARPA (Advanced Research Project Agency) to study computer graphics. Those studies, from 1966 to 1972, were responsible for most of the foundation research in computer graphics.

There were lots of unusual people on the faculty, each with different strengths: Bob Barton, designer of one of the early Burroughs mainframes with an architecture years ahead of its time; Tom Stockton, a signal processing specialist; Ivan Sutherland, incredibly bright, an incredible problem-solver. David Evans had this way of bringing out creativity. I'm not sure how he did it, but he steered you in fruitful directions and helped you avoid the dead ends.

After university you had a number of general programming jobs. How did you get back into computer graphics?

In 1974 Evans and Sutherland had a contract to build a ship simulator for the port of New York. The U.S. Maritime Administration wanted a computer to simulate the bridge of a ship so that pilots could see New York harbor—all the way up by Long Island, under the Verrazano Bridge, past Staten Island, and into the harbors area. This was to be some of the first simulator work. They wanted to project a 180-degree

view—the sun, shading, marker buoys, everything. It was about 100 square miles, had 1500 buildings, 1000 buoys, 6 types of ships, bridges. And this was to be projected in color with these old carbon arc lamps. There was no way in hell anyone could do it.

There was another problem—the hardware development was only beginning, so we had to design a database not knowing what hardware we would have to use. We had to have a computer language that described all of this stuff, and when we knew about the hardware we would use a compiler to convert it so that it could do the job. That was the birth of hardware-independent databases.

They had a three-year contract to complete the work. E&S came to me in the third year, and no work had been done yet. David Evans talked me and three other people into doing the software and the database. We actually delivered it, in one and a half years. It's still running out on Long Island.

After your work at E&S, you went on to Xerox PARC. What was that like?

It was great. We were building program environments—the CEDAR environment. My charter in the CEDAR project was to build the graphics subsystem. It was a radical departure from the work done at PARC up to that point. CEDAR graphics were the first really device-independent protocols. You could program on a black-and-white device and run the application on a color device by changing the device driver.

(continues)



Apple was going to kill the LaserWriter because there appeared to be little profit at \$7000.

At PARC you also developed InterPress, which could be called the first page-description language. How did that come about?

At PARC Martin Newell and I wrote JAM, a PostScript-like language, to experiment with graphics and imaging models for printers. At the same time, in 1981, a graphics group was formed in the computer science lab at PARC. Bill Paxton, Chuck Geschke, Doug Wyatt (on the CEDAR team), Frank Crow, Maureen Stone, Martin Newell, and I were to explore the intersection of graphics and electronic publishing.

The team of Chuck Geschke, Robert Sproull, Butler Lampson, Brian Reed, and I designed InterPress. We decided that the JAM language was the right model for printing protocols and that CEDAR was the correct graphics imaging model.

What happened to InterPress?

Chuck and I spent a year and a half trying to sell Xerox corporate on InterPress, and we succeeded. But then Xerox decided not to publish the specifications of the language, that it would be held completely confidential, indefinitely. The imaging model was dismembered, compromises were made, and the standard was diluted. It had to be retrofitted to the base of Xerox products in the field.

We were enormously frustrated. Our hope for an industry standard was doomed, and it wasn't clear that image processing on printers would ever make any real headway.

How did Adobe get started?

We continued at PARC through 1982, and then in late 1982 Chuck Geschke and I founded Adobe in Mountain View—in the same old building we had at E&S. At first we had the same business plan as Interleaf, Viewtech, and Xyvision—to build workstations to do publishing.

Adobe's goals are very different now. What happened?

We came to our senses. We saw that there were large companies spending time and money on laser printer research—with large budgets for research and development on graphics printing problems. We said, Gee, we know how to do that.

It seemed logical. Why should we do everything—build workstations—when others were doing that? We decided to build laser printer software and build off what others were doing.

When did PostScript appear?

In early 1983 we talked to Steve Jobs and formulated a product concept. In late 1983 we entered into a contract with Apple. The LaserWriter was developed in 1984, and in 1985 it was introduced.

The LaserWriter was a revolutionary product. What were the problems with its development?

Well, Apple was going to kill the LaserWriter in late 1984 because there appeared to be little or no profit margin at \$7000. It was saved by Steve, who loved the technology. You'll remember that at \$36 apiece for 256K RAM chips, the price for the printer appeared to be \$7000 to \$12,000, with little or no profit margin. Then the price of RAM started to decline, so there would be a little profit if it was sold at \$7000.

There were some people at Apple who didn't think it would sell. We said, Trust us, there are other laser printers selling for \$20,000 that don't have as much capability.

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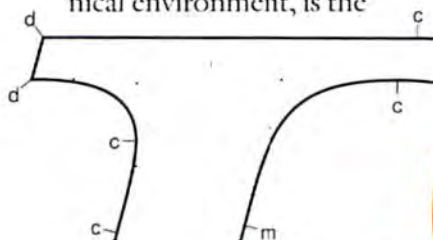
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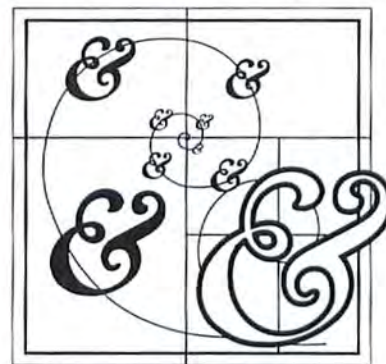


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When people say PostScript is slow, they're comparing it to a daisy wheel printer.

What is the future of PostScript?

The future of PostScript is color, facsimile, international printing and gray-scale printing, non-roman printing (such as kanji), and as a display language. The goal of the company is to bring graphic-art quality to computer printing, and to bring computer printing volume to graphic arts.

We look at PostScript in two parts: as a language and as an imaging model. In building an imaging model, we're interested in how graphical objects are defined, filled, and rotated, how lines are drawn, fonts treated—basically, how ink goes onto paper. Then we can take the imaging model and put it into a language—say C or LISP—and build a set of library functions.

PostScript, as a display system, would support programs with a set of subroutines for graphics cards. These routines would draw lines, fills, and other things the same way the printer handles them. Since PostScript is device-independent, there is no concern with the pixel standard of the display or whether it's color or black-and-white. The software will generate the display regardless of its characteristics.

Many questions have been raised about the performance of PostScript.

That's because there's nothing to compare it against. When people say it's slow, they're comparing it to a daisy wheel printer. You send a daisy wheel printer a job and it starts immediately, but PostScript doesn't. In truth, you have asked for an enormous number of calculations from the printer.

Take the example of a CAD/CAM drawing. A complicated drawing of a printed circuit may take 18 hours to plot on a Gerber photoplotter. Against that, PostScript looks very fast. If we lay out the circuit drawing with PostScript and send it to a Linotronic 300, it takes 3 hours to plot. The Linotronic costs \$50,000 and the Gerber photoplotter is \$150,000.

Lately people have been talking about a "personal LaserWriter," in which the CPU of the Macintosh acts as the PostScript processor. What are the possibilities for that, and what are the problems involved in having the computer do the calculations now done by the LaserWriter?

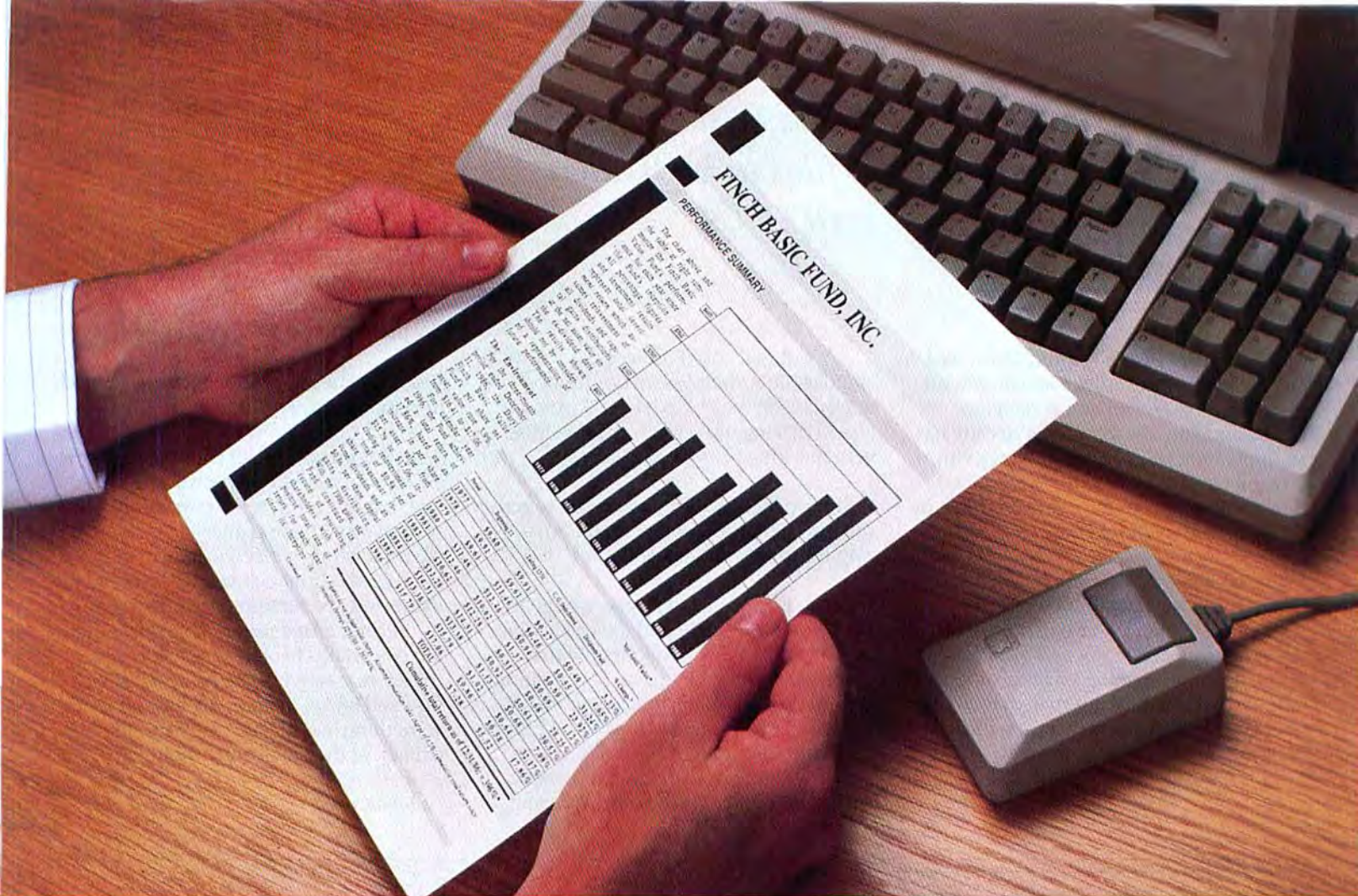
The processor has to build fonts, compose the page, and move the application out of the way so that there's room in RAM to build a bit map of the page. To do that on the Macintosh's CPU you'd have to swap the application out of memory to do printing, then swap it back in, slowing everything down. Also consider that the LaserWriter has a lot of special built-in tricks to do printing—it's not just another Mac in the printer engine. It has a different memory organization, and it has the ability to do some calculations at twice the speed of the Mac. It can build a bit map three times as fast as a Mac can.

Then think of the amount of data you'd have to transmit to the printer. You'd need 20 to 35 times more throughput than AppleTalk now has to drive a dumb printer. Even if you increase the bandwidth of AppleTalk, the computer would be tied up to control the network. For Apple it made sense to put PostScript and a CPU in the printer.

When will we be able to send pictures—half-tones—across AppleTalk?

I don't know. We'll need faster networks first. Even on Ethernet, big pictures of several megabytes take several minutes to transmit. Sending good gray scales across a network will require efficient compression algorithms.

(continues)



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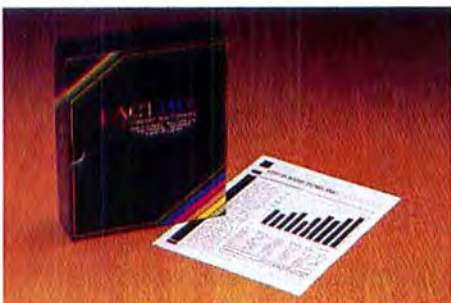
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Circle 575 on reader service card

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The Encapsulated PostScript File format allows files to be traded among different CPUs.

Can PostScript displace QuickDraw as a display language? You've said you intend to provide PostScript as a screen language, and Sun Microsystems already has an implementation under its News windowing environment. And I've noticed that Apple seems to have slowed down its development of QuickDraw.

I have no idea whether Apple will ever replace QuickDraw with PostScript, but other computer companies have expressed an interest in using PostScript as a display language. I can say that the imaging model in PostScript is much richer than that of QuickDraw, and I think that even the people at Apple would agree with that.

We already use PostScript as a display language in *Adobe Illustrator* [Adobe's graphics software]. We have a PostScript kernel driving the screen, and it works very quickly.

PostScript seems like a way to tie together the new generation of workstations—Apple and IBM. Is that possible?

Yes. The Encapsulated PostScript File format allows files to be traded among different CPUs. EPSF is a PostScript file that describes a complex image. Several graphics and desktop publishing programs already use EPSF—*Adobe Illustrator*, *Cricket Draw*, *ReadySetGo 3.0*, *Quark's XPress*, and several of the scanner companies. *PageMaker* and *Microsoft Word* read it.

IBM recently announced that its new laser printer will use PostScript. What does that mean for its new machines and for the OS/2 operating system?

IBM announced a PostScript driver card for only the old line of machines—the PC-DOS machines. IBM has not announced that its new machines will run PostScript, and I do not preannounce IBM's plans.

What are the especially exciting areas of development for Adobe?

Well, there's nonroman printing. We have an agreement with Morisawa, a Japanese font manufacturer, and we're talking with several printer companies in Japan. We have a contract with NEC Information Systems for the United States, and NEC may be interested in extending it to Japan.

Printing Japanese is a big deal. There are over 7000 characters per alphabet, therefore you need a printer with a hard disk and lots of memory to support that—something like the Agfa-Gevaert 400-dpi printer, or the Linotronic 100 and 300.

(continues)

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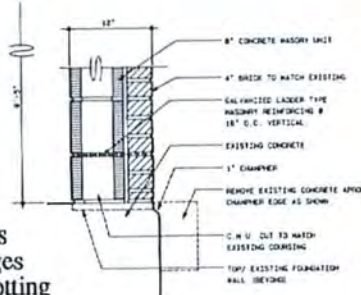


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Circle 664 on reader service card

This printer would be the equivalent of the LaserWriter in Japan?

Yes. A Japanese equivalent will be announced, probably in the second half of 1988.

What about gray-scale printing?

There are no gray-scale printers yet, and for good reason. You might have the world's best gray-scale printer, but you would still have to screen the image to produce a half-tone. Gray-scale printers would be useful only for one-time printing, not for making masters.

Will Adobe support color?

Yes, when we believe in a strategy, then we pursue it. We are showing our color capabilities to interested OEMs.

Different technologies for electronic color printing come and go, but they never really catch on—with good reason. Color printers that sit on the desktop do exist, but

if I want to include the output in a publication or a report, I have no way to reproduce the image. I can send it out for color separation and printing, but the cost and quality of that don't match up to what I can do with more traditional methods.

People do want to be able to produce color proofs. We're working on a 300-dpi thermal color printer, and we will be able to produce final color separations on Linotronic printers with the same set of data files. People in ad layout and brochure development could use this type of system to proof their color pages. The cost of a color proof will drop, from about \$150 (Chromalin costs) to about 10 to 50 cents per page.

What about facsimile for the Mac?

That's very important. There are over 10 million fax machines out there. Most facsimiles look bad because of sampling errors associated with the input device. Images are scanned in at 200 dpi, compressed, transmitted, and then output on a device that amplifies the earlier errors.

This is not a product announcement, but if you had a PostScript device that could originate documents, you could send the

document as a PostScript file to a remote fax machine. If the output machine—the fax printer on the other side—could interpret PostScript files, it could print the facsimile at any resolution from 200 to 1200 dpi.

You can do all that now with a modem, but the trick is to make the process transparent to the end user—add information to the Print dialog box that would allow a LaserWriter to write to a remote fax device. We've seen something like this already. Volvo published its car manuals in Sweden and sent the entire document to the United States as PostScript files via ordinary phone lines.

The volume of in-house typesetting is increasing, but is this just a repeat of history? When phototypesetters were introduced, lots of companies that had been having their publications done by graphics professionals thought they could start doing their typesetting in-house. Then, after they'd bought all the equipment, they decided to go back to professional typesetters.

(continues)

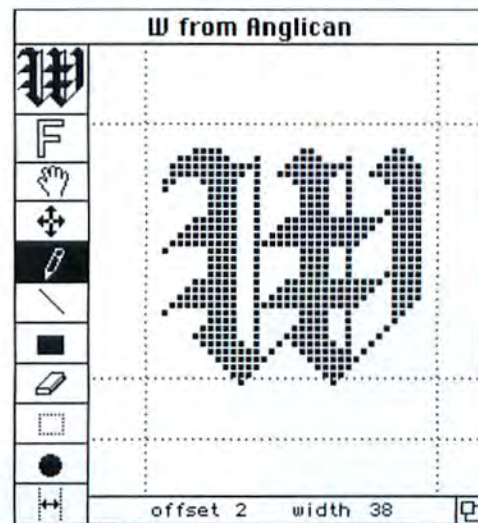
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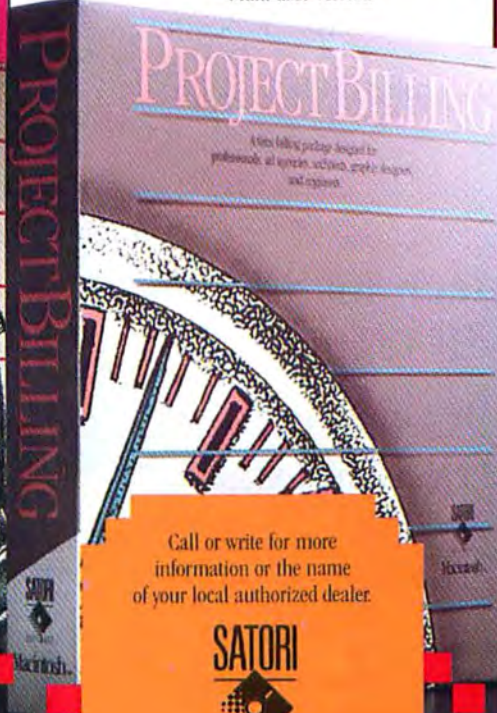
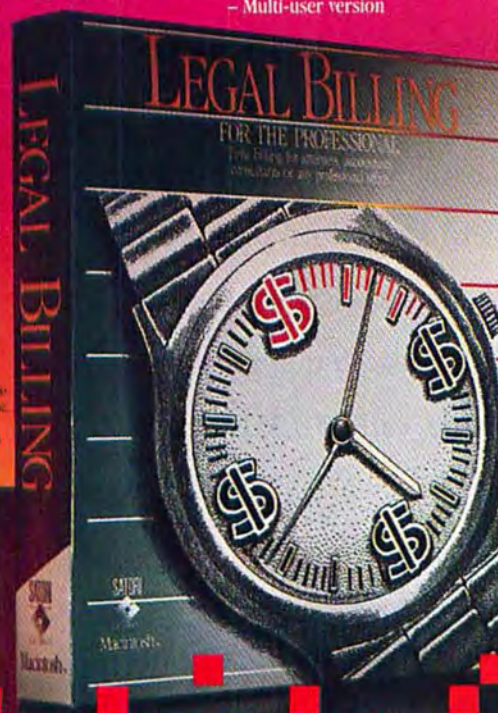
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- ▶ Mail merge with Microsoft Word
- ▶ Easy-to-use entry defaults
- ▶ Coding and date expiration fields
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- ▶ Hard disk compatible

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Title _____

Date _____

1. Industry (check one only)

Non-computer related businesses

- ☐ 1. Aerospace
- ☐ 2. Agriculture, mining, construction, oil
- ☐ 3. Business consulting (non-computer related)
- ☐ 4. College/university
- ☐ 5. Elementary/high school
- ☐ 6. Engineering/architecture
- ☐ 7. Finance, banking, accounting, insurance, real estate
- ☐ 8. Government
- ☐ 9. Health/medical services
- ☐ 10. Legal services
- ☐ 11. Manufacturing
- ☐ 12. Military
- ☐ 13. Other business services
- ☐ 14. Publishing/advertising/public relations
- ☐ 15. Research & development
- ☐ 16. Retail/wholesale
- ☐ 17. Transportation, communications, utilities
- ☐ 99. Other (please specify) _____

Computer-related businesses

- ☐ 18. Computer consultants
- ☐ 19. Computer retail
- ☐ 20. Distributor/wholesalers
- ☐ 21. Manufacturer (computers, software, peripherals)
- ☐ 22. Service bureau
- ☐ 23. VAR/systems house/integrator
- ☐ 99. Other (please specify) _____

2. Title (check only one)

- ☐ 1. Chairman/president/owner/partner
- ☐ 2. Vice president
- ☐ 3. Controller/treasurer/accountant
- ☐ 4. Director/supervisor/manager
- ☐ 5. Project manager/chief/group leader
- ☐ 6. Art director/writer/creative head/technical writer
- ☐ 7. Engineer/scientist
- ☐ 8. Administrator
- ☐ 9. Consultant/advisor
- ☐ 10. Microcomputer specialist/manager/analyst
- ☐ 11. Programmer
- ☐ 12. Educator
- ☐ 13. Professional (lawyer, doctor, etc.)
- ☐ 99. Other (please specify) _____

3. Department or function (check only one)

- ☐ 1. Accounting/finance
- ☐ 2. Administration/management/personnel
- ☐ 3. Consulting
- ☐ 4. Education/training
- ☐ 5. Engineering/R&D
- ☐ 6. Manufacturing/production
- ☐ 7. Microcomputer center/office automation
- ☐ 8. MIS/DP
- ☐ 9. Purchasing
- ☐ 10. Sales/marketing/distribution
- ☐ 99. Other (please specify) _____

4a. Does your company own or lease any mainframe computers at this location?

☐ Yes ☐ No

	Existing (quantity)	Plan to buy (quantity)
<input type="checkbox"/> 1. IBM	_____	_____
<input type="checkbox"/> 99. Other (specify)	_____	_____

4b. Does your company own or lease any minicomputers at this location?

☐ Yes ☐ No

	Existing (quantity)	Plan to buy (quantity)
<input type="checkbox"/> 1. IBM	_____	_____
<input type="checkbox"/> 2. DEC	_____	_____
<input type="checkbox"/> 3. Sun/Apollo	_____	_____
<input type="checkbox"/> 99. Other (specify)	_____	_____

5. Does your firm have or plan to buy any of the following types of personal computers or microcomputer systems at your location?

☐ Yes (indicate quantity below) ☐ No

Manufacturer	Currently own (quantity)	Plan to buy within 1-12mos	13-24mos
<input type="checkbox"/> 1. Macintosh 128/512	_____	_____	_____
<input type="checkbox"/> 2. Macintosh Plus	_____	_____	_____
<input type="checkbox"/> 3. Macintosh SE	_____	_____	_____
<input type="checkbox"/> 4. Macintosh II	_____	_____	_____
<input type="checkbox"/> 5. Apple IIe/IIc/IIgs	_____	_____	_____
<input type="checkbox"/> 6. IBM Compatible (Compaq, Tandy, etc.)	_____	_____	_____
<input type="checkbox"/> 7. IBM PC/XT/AT/RT	_____	_____	_____
<input type="checkbox"/> 8. IBM Personal System/2	_____	_____	_____
<input type="checkbox"/> 9. Sun/Apollo workstation	_____	_____	_____
<input type="checkbox"/> 99. Other scientific or engineering workstations (non-mini)	_____	_____	_____

6a. Please indicate your involvement with each of the following types of personal computers or microcomputer systems (check all that apply):

	Macintosh	Micros	Software	Peripherals	Networks &
<input type="checkbox"/> 1. Approve purchase	_____	_____	_____	_____	_____
<input type="checkbox"/> 2. Develop/manufacture	_____	_____	_____	_____	_____
<input type="checkbox"/> 3. Evaluate/select vendor	_____	_____	_____	_____	_____
<input type="checkbox"/> 4. Own (at least one)	_____	_____	_____	_____	_____
<input type="checkbox"/> 5. Own (two or more)	_____	_____	_____	_____	_____
<input type="checkbox"/> 6. Purchase or acquire	_____	_____	_____	_____	_____
<input type="checkbox"/> 7. Establish specifications	_____	_____	_____	_____	_____
<input type="checkbox"/> 8. Recommend to others	_____	_____	_____	_____	_____
<input type="checkbox"/> 9. Sell	_____	_____	_____	_____	_____
<input type="checkbox"/> 10. Train people to use/ or provide support	_____	_____	_____	_____	_____
<input type="checkbox"/> 11. Use	_____	_____	_____	_____	_____
<input type="checkbox"/> 12. No involvement	_____	_____	_____	_____	_____
<input type="checkbox"/> 99. Other (please describe by name and quantity)	_____	_____	_____	_____	_____

If you have no involvement with any of the above, skip to question 8.

6b. For approximately how many total personal computers or microcomputer systems do you have the above involvement? (check only one)

- ☐ A. 1-3 ☐ B. 4-9 ☐ C. 10-19 ☐ D. 20-49
☐ E. 50-99 ☐ F. 100-499 ☐ G. 500 +

7. For approximately how many Macintosh personal computers do you have involvement described in question 6 above? (check only one)

- ☐ A. 1-3 ☐ B. 4-9 ☐ C. 10-19 ☐ D. 20-49
☐ E. 50-99 ☐ F. 100-499 ☐ G. 500 +

(Over please, additional questions on reverse side)

8a. How many people work at your location? (check only one)

- ☐ A. 1-9 ☐ F. 1000-2499
☐ B. 10-24 ☐ G. 2500-4999
☐ C. 25-99 ☐ H. 5000-9999
☐ D. 100-499 ☐ I. 10,000 or more
☐ E. 500-999

8b. How many people are employed by your entire company? (check only one)

- ☐ A. 1-9 ☐ F. 1000-2499
☐ B. 10-24 ☐ G. 2500-4999
☐ C. 25-99 ☐ H. 5000-9999
☐ D. 100-499 ☐ I. 10,000 or more
☐ E. 500-999

9. What percentage of people who work at your location actually use a personal computer (check only one)

- ☐ A. 1-24% ☐ D. 75%-100%
☐ B. 25%-49% ☐ E. None
☐ C. 50%-74%

10. The personal computer purchased for this location would be: (check all that apply):

- ☐ 1. for internal use ☐ 2. for resale
☐ 99. other (please specify)

11. How are personal computers normally obtained for this location? (check all that apply)

- ☐ 1. direct from manufacturer
☐ 2. manufacturer's representative
☐ 3. distributor or wholesaler
☐ 4. retail computer store
☐ 5. mail order
☐ 6. VAR/systems house
☐ 7. in-house (company or university store)
☐ 99. other (please specify)

12. Personal computers or microcomputer systems at your location are or soon will be used for the following communications activities: (check all that apply)

- ☐ 1. Communicate with internal company mainframe or mini
☐ 2. Communicate with other micros via modem
☐ 3. Communicate with outside mainframe or mini through service bureau, database or time-sharing service
☐ 4. Local area network
☐ 5. Voice/data
☐ 6. None of the above
☐ 99. Other (please describe)

13. Are you involved in any of the areas shown below?

- ☐ Yes (check all that apply) ☐ No
☐ A. Recommend ☐ B. Influence ☐ C. Specify ☐ D. Buy
(check all that define your involvement)

Software

- ☐ 1. spreadsheets
☐ 2. word processors/outline processors
☐ 3. database management
☐ 4. accounting
☐ 5. statistics
☐ 6. communications/networking
☐ 7. graphics
☐ 8. presentation
☐ 9. project management
☐ 10. desktop publishing
☐ 11. CAD/CAM
☐ 12. programming language
☐ 13. back-up systems
☐ 14. utilities
☐ 15. other _____

Computers

- ☐ 16. personal computers
☐ 17. multiuser microcomputers
☐ 18. laptop microcomputers
☐ 19. portable microcomputers
☐ 20. engineering workstation
☐ 21. minicomputers
☐ 22. mainframe computers
☐ 23. others _____

Peripherals

- ☐ 23. dot matrix printers
☐ 24. letter quality printers
☐ 25. plotter
☐ 26. laser printer
☐ 27. local area network
☐ 28. file server
☐ 29. optical disk
☐ 30. monochrome monitor
☐ 31. color monitor (standard)
☐ 32. hi-res color monitor
☐ 33. add-on board
☐ 34. external hard disk
☐ 35. internal hard disk
☐ 36. back-up systems
☐ 37. modem
☐ 38. other _____

Outside services

- ☐ 39. on-line services
☐ 40. education/training
☐ 41. maintenance
☐ 42. custom application
☐ 43. service bureau
☐ 44. other _____

14. Over the course of one year, how would you quantify your level of involvement in total microcomputer systems products?

- ☐ A. Recommend ☐ B. Influence ☐ C. Specify ☐ D. Buy
(please check all that define your involvement)

- ☐ 1. less than \$10,000 ☐ 5. \$100,000-\$249,999
☐ 2. \$10,000-\$24,999 ☐ 6. \$250,000-\$499,999
☐ 3. \$25,000-\$49,999 ☐ 7. \$500,000 +
☐ 4. \$50,000-\$99,999 ☐ 8. None of the above
(check only one)

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"The definitive product for troubleshooting on the Macintosh™" (*Macworld*, April '87). It "stand[s] head and shoulders above any other product like it . . . I can't recommend 1st Aid Kit strongly enough" (*MACazine*, April '87).



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Verbatim

The tools are easier to use now. Using an application like *PageMaker* is not like entering typesetting codes. But it's like giving fine woodworking tools to both a craftsman and a carpenter. The final quality is only partially determined by the quality of the tools. There will always be a role for graphic arts professionals.

What's ahead for illustration on computers?

It will follow the same route word processing did: first there were basic word processing programs, and then features like global search were added. With illustrating programs like *Adobe Illustrator*, you'll be able to change designated colors, or line weights, or the type styles in the illustration's callouts.

In the past there was only bit-mapped clip art, which could be edited only in a crude way. You couldn't change line weight or use functions like scaling. This is where the paybacks come in desktop publishing. Comparing bit-mapped clip art and vector-based illustration is like comparing a typewriter and a word processor.

What is the next step for desktop publishing programs?

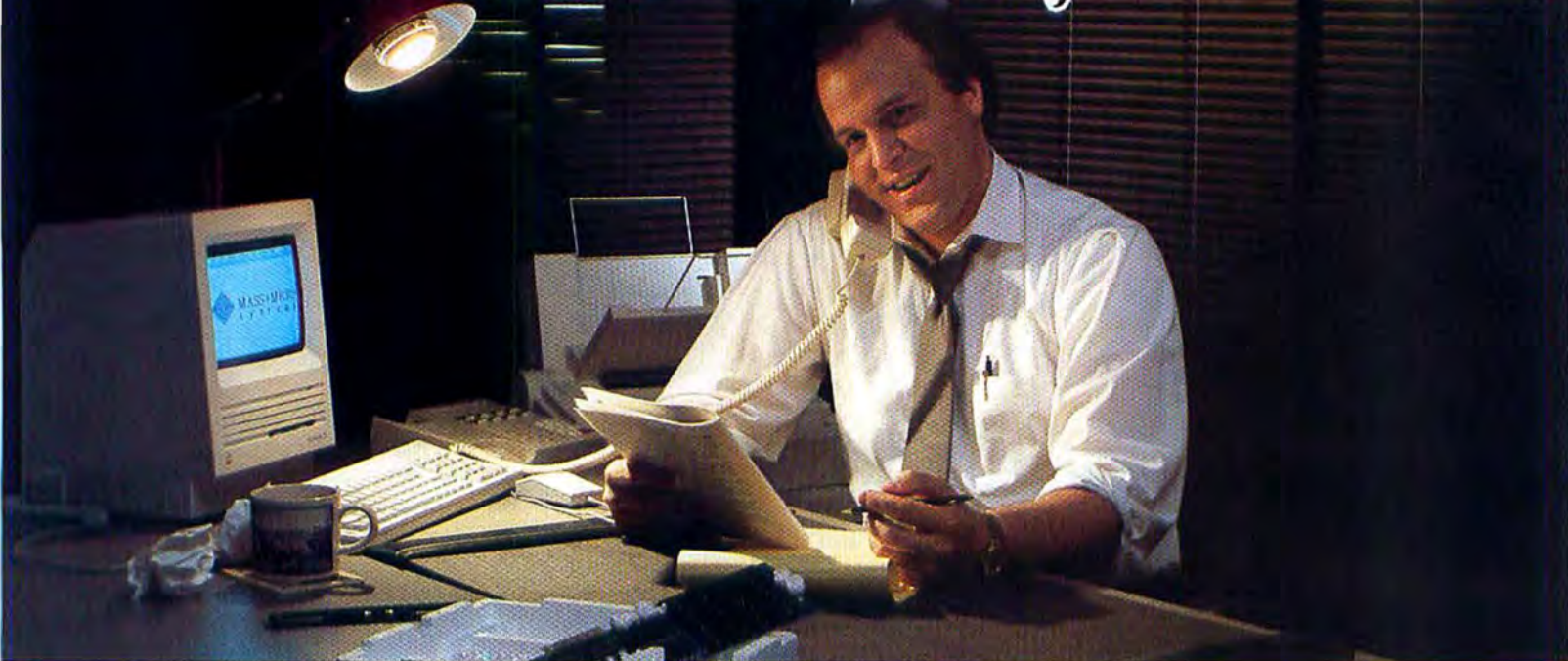
Right now the available products—*Ready-SetGo*, *PageMaker*—are focused on a one-time-use document; each page is laid out separately, and the information there can't be used again. Next, we'll begin to see information treated as a database—you'll be able to reformat it as you like and use it over and over again. The same will be true of graphics. Using vector-based graphics, you'll have a database of images you can manipulate according to your needs.

I believe that Steve Jobs was right, that desktop publishing will become so widespread that it will cease to be perceived as a niche. Desktop publishing will replace word processing, and then it won't be called desktop publishing anymore. □

Interviewed by Jerry Borrell

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So while MASS MICRO Systems is becoming a major part of the Macintosh evolution, others are just sleeping through it.

Circle 764 on reader service card



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Macworld News

by Daniel Farber

CYNTHIA MOORE



Godfrey DiGiorgi heads an unusual Macintosh user group in an unusual setting: NASA's Jet Propulsion Laboratory, where over 1000 Macs help explore the farthest reaches of our solar system.

Making Inroads at JPL



At NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California, the Macintosh has become an important tool for engineering teams that are planning a distant rendezvous with an icy comet, performing orbit analysis for the Voyager and Galileo missions, and improving the control and sensitivity of robot arms used to perform scientific functions in remote space.

JPL is among the top ten volume purchasers of Macintosh computers nationwide, and even has its own Macintosh user group. The Macs have been used primarily for preparing the scientific reports and presentations that are crucial for pushing design projects through to completion. Project teams will commonly present two or three review presentations each year, which often require 20 to 40 view graphs for overhead projection. Since each graph costs between \$100 and \$200 to prepare by traditional methods, a Macintosh

desktop system pays for itself within months, according to Godfrey DiGiorgi, president of JPL's user group.

When DiGiorgi got his machine in August 1985, JPL had only about 25 Macs. Now, he estimates the total at over a thousand. In the near future, he expects to see Macs become an integral part of JPL's scientific effort. As more and more Macintoshes enter JPL's labs and as its engineers discover the increased power, memory, and configuring flexibility of the Mac II—they keep finding new ways to exploit the Mac's capabilities.—Paul Shaffer

AP Broadcasts News Graphics to Macs



The Associated Press (AP) is upgrading its daily Macintosh-based news graphics distribution service by broadcasting *MacDraw* files via satellite directly to Macs in newspaper art departments across the country.

Currently AP—like the supplemental Knight-Ridder Graphics Network (KRGV) syndicated news graphics service—posts its *MacDraw* files several times a day on a mainframe-based, dial-up bulletin board retrieval system. Individual newspapers must now use a modem to download the graphics they want to publish.

With the new AP Graphics-Net broadcast system, newspapers will automatically receive graphics files on their Macs within seconds of transmission. If the receiving Mac is in use, a scrolling message indicates that the file is being stored in the background.

Using proprietary software developed by Solutions, Inc., of Montpelier, Vermont, the system links a modified AP receiver through the modem port of the Mac at 9600 baud. Solutions' *Glue* software is incorporated into the AP system so that receiving newspapers will not necessarily need the various Mac application tools that AP artists use in generating graphics. The challenge of creating the AP system, according to Solutions' president Tom Evslin, is in devising a one-way



satellite link, which won't allow the Mac to put a transmission on hold until the computer is no longer in use. File blocks are checked for errors, and good segments are automatically merged from the two transmissions that occur.

(continues)

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Circle 600 on reader service card

AP is a member cooperative of about 90 percent of this country's dailies, or almost 1400 papers. About one thousand of these subscribe to the AP photo network, which has traditionally carried hard-copy facsimile transmissions of news graphics. Macs are used by about 700 to 800 of those papers.

AP-member newspapers will be encouraged to contribute their own graphics to the network. The system is also likely to become a Mac graphics distribution utility for other news syndicates and business users.

AP GraphicsNet will vastly improve the resolution quality of graphics for newspapers receiving the actual Mac files instead of facsimile transmissions and will allow graphics to be locally edited. In the long term, an all-digital information transmission system could lead to the merging of words and images into complete page layouts that might even include national advertising—all sent to newspapers in finished form.

—Stuart Silverstone

Super Floppy Disks

Jasmine Technologies of San Francisco has announced a 10MB removable-cartridge disk drive for the Mac. The MegaDrive, based on technology developed jointly by Data Technologies Corporation and Kodak, offers the performance of a hard disk along with the advantages of removable media.

Because cartridges for the drive consist of a 5¼-inch floppy disk with a rigid hub, enclosed in a hard plastic jacket, they are more akin to the Mac's 3½-inch floppies than to the IBM PC's 5¼-inch floppies. The cartridges sell individually for \$39.95, or three for \$109.95.



The MegaDrive's 5¼-inch floppy disks offer portability at near-hard-disk speeds and capacities. Data on the 10MB floppies last ten times longer than on Bernoulli-technology cartridges.

The \$999 MegaDrive connects to the Mac's SCSI port and has an average access time of 65 milliseconds. According to Jasmine's Dennis Trager, the drive is far speedier than a floppy and is almost as fast as a SCSI fixed-media hard disk.

—David Usbijima

Games for Any Budget

The supply of entertaining public domain and shareware offerings continues to grow. Two of the recent additions are word games. *Phrase Craze Plus* 1.01 (by Bradley R. Pettit; \$10 shareware fee) is a multiplayer game modeled after a well-known television show. The objective is to identify a familiar phrase by filling in the letters one by one and, at the same time, to accumulate a pile of cash. The program comes with a well-stocked phrase file, and you can create your own files as well. With *CryptoSolve* (by John Martin and Clyde Person; \$10), you can solve any of the many cryptograms provided with the program, create cryptograms for others to solve, or

enter a cryptogram from the newspaper and have the program solve it for you.

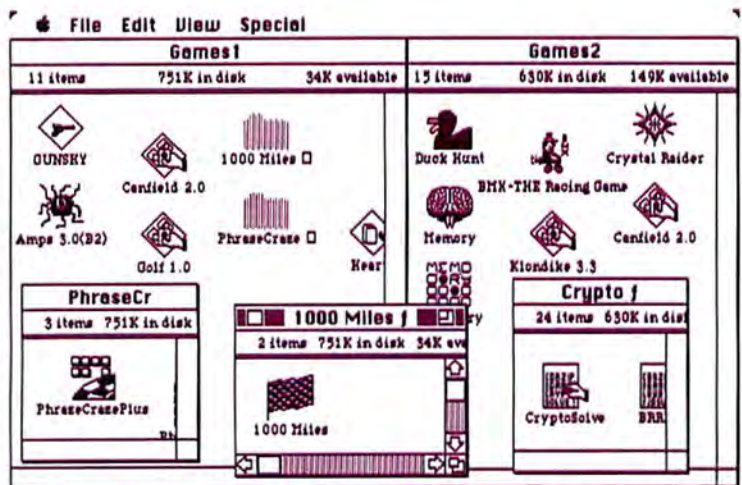
Cardplayers will enjoy *Hearts* 2.0 (J. Harold Spangler, Arnold Epstein; free). The Mac plays three hands to your one, and the program allows you to choose from a large number of game variations. *Golf* 1.0 (Michael A. Casteel, Dave Elward; \$10) is not an electronic version of golf but an unusual variation of solitaire. Two other popular solitaire programs by the same authors, *Klondike* 3.3 and *Canfield* 2.0 (\$10 each), have been upgraded to include

a casino scoring option, which puts a dollar value on your success. In addition, the cards for both games now appear in color on the Macintosh II.

Derivative games are not restricted to cards. *Gunshy* (E. C. Horvath; free) is much like the immensely popular *Shanghai*, except for the Macintosh-icon playing pieces and the ornamented playing board. *Amp* 3.0(B2) (Paul A. Perkins; free) uses the classic Macintosh public domain game *Daleks* as its model. Unlike *Daleks*, however, *Amp* uses a complex, always-changing maze as the playing field, and it's more challenging and unpredictable. With *Memory* 2.0 (Jean-Paul Paulin; \$10), which is based on the pair-matching game of Concentration, you can choose from a variety of picture sets and skill levels for your computer opponent. And *1000 Miles* 1.1 (Robert Harris; \$10) is a faithful (and addictive) reproduction of the Parker Brothers card game Mille Bornes.

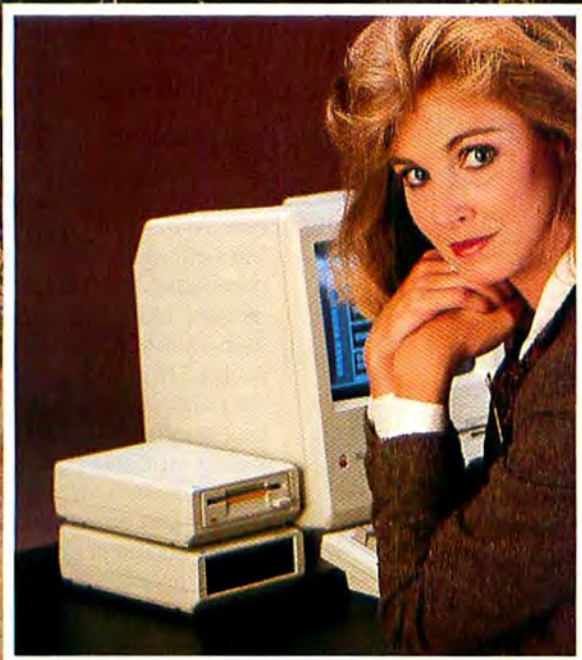
Action games include *Crystal Raider* (Patrick Buckland; \$10), a challenging mouse-controlled space game from England. *Iggy Iggyopolis* 1.1 (David Bayard; free), which requires extremely fast reflexes, is a cross between

(continues)



Creative programmers are still busy developing games that challenge and amuse the mind, and you can get many of them for free or for a minimal charge.

Power and Elegance

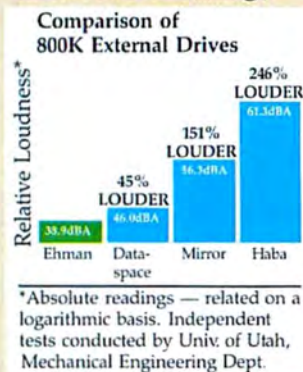


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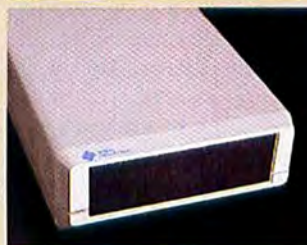
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Circle 602 on reader service card

the once-popular Pac-Man and Qix arcade games. In the surreal *BMX—The Racing Game* 1.0 (David Bayard; free), you negotiate an obstacle course through an editable geometric landscape. And *Duck Hunt* (Edgar Circenis; free) is just what it sounds like; select a bazooka and a flock of (soon-to-be) extinct birds for a relatively easy time of it, or go gunning for mallards with a shotgun in hurricane-force winds to test your mettle. —Robert C. Eckhardt



MPW Tools and Books


 MPW compilers from outside Apple are starting to appear. The first two are both Modula-2 compilers, *TML Modula-2* by TML Systems and *SemperSoft Modula-2* by Semper Software. Both compilers generate good code, fit well into the MPW environment, and come with more than adequate documentation, support tools, and excellent examples. The TML offering is priced at \$99.95, the Semper product at \$129.

TML Systems produced the first Macintosh-resident Pascal compiler for MDS as well as the first MPW Pascal compiler. This is Semper's first release in the Macintosh market.

People interested in MPW will also want to know about an excellent book by Joel West covering MPW 2.0 that's being released in August by Bantam (most of the text is also applicable to MPW 1.0). Priced at \$29.95, *Programming with the*

Programmer's Workshop provides something for anyone interested in MPW—from the just-curious to power users. —Dennis Cohen

Reality Strikes

 Once you scan in an image at 300 dots per inch, your editing options are limited. Although many 300-dpi scanners include software that enables you to alter scanned graphics, you are generally confined to editing a small magnified section of a drawing pixel-by-pixel. If you're the type who enjoys building a fully rigged schooner in a bottle or inscribing the Declaration of Independence on a grain of rice, you probably don't mind editing graphics this way. Otherwise, you no doubt long for a better way to enhance scanned high-resolution graphics.

Fortunately, help is on the way. A forthcoming program from Letraset, code-named The Realist, offers a multitude of tools for editing PostScript gray scales. The Realist's tools must be used to be believed; most bear an uncanny likeness to the

real-life tools they emulate. Perhaps the most impressive is the Water Droplet, which blurs sharp edges, causing grays to bleed together as in a watercolor painting. The finger-painting tool is equally realistic, smearing gray tones in the direction a finger icon is dragged (an option that even leaves a residual dab of "paint" on the finger to smudge anywhere on the page). The paint bucket fills areas with a single shade or a fountain of shades that blend from one gray to another. A brush paints in one of the palette's 64 grays; choose among a variety of preset tips or create a set of custom ones, including an airbrush. A charcoal stick darkens an area; the more you rub, the darker the area becomes.

The Realist lets you work on an image at its actual size or magnified by a factor of 2, 4, or 8. Not only can you alter an illustration with the program's drawing and painting tools, but you can also modify the entire image with a number of controls. The brightness and contrast sliders allow you to make minute adjustments in overall shading or to achieve special effects such as negatives, filters, and posterizations. Menu items let you crop, flip, rotate, or in-

vert a picture. You can also work on selected areas of an image, darkening or lightening a section or sharpening the edges.

Letraset claims that when released, The Realist will interface to several popular 300-dpi scanners, allowing users to scan images from within the program. Images can be saved in EPS or TIFF format, and should therefore be compatible with page-layout programs such as *PageMaker* and *Ready SetGo*. A few hours with a pre-release version provided a tantalizing glimpse of The Realist's potential. Keep an eye out for this one. —Erfert Nielson

FullWrite Professional

 The word processing scene is heating up as Ann Arbor Softworks prepares to release *FullWrite Professional*. The program is going head-to-head with *Microsoft Word* 3.0 and *WordPerfect's* Macintosh version, slated for release this fall. *FullWrite's* prerelease version included many features unavailable in competing programs, including substantial layout and graphics capabilities. But what makes *FullWrite* look like a real contender is the way the features are implemented. Its power and sophistication don't preclude ease of use.

Besides the usual features expected in a Macintosh word processor, *FullWrite* has auto-hyphenation, manual kerning, table-of-contents generation, indexing, footnoting, glossaries, and style sheets, as well as a spelling checker, a thesaurus, a bibliography, and an outliner. The program allows you to create multiple columns. You can also wrap text around

(continues)



The Realist provides tools for retouching scanned images. It can soften an edge or create striking effects like this inverted image.

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Like most professionals in today's multivendor environment, you have words stored on one system, spreadsheet and financial data on another and a need to combine information from both for presentation-quality documents on a third.

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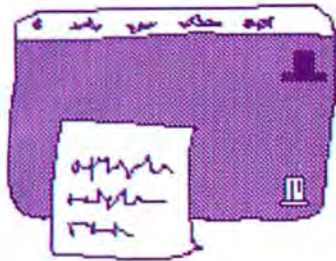
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graphics of any shape and control the white space between the two. You can specify placement of pictures and sidebars—text or graphics that are treated as separate documents within



the primary one—so that they stay with the main text. In addition, you can specify the placement of sidebars on even and odd pages as they flow onto different pages. You can also position a sidebar within surrounding material. *FullWrite* includes a *MacDraw*-like drawing module that provides for bezier curves and gray scaling, as well as screen-independent versions of bit maps for outputting to laser printers and typesetting machines.

One of *FullWrite*'s unique features is Posted Notes, an electronic equivalent of 3M's Post-it notes. The notes can be name-, date-, and time-stamped, allowing several people to attach comments to a document. The Browser offers a handy database function for checking various parts of a document, enabling you to browse through specific document elements. Click on an item in the Browser, and it takes you to the same spot in the actual document.

The locations of various notes are graphically marked in icon bars that run along the margin of a document. Displayed icons represent the notes attached to the document. The icons for a multi-column document appear along the left margin of each column. To keep track of changes made since a previous edit, you can display bars along the margin that show the docu-

ment's newly modified sections.

The program has many subtle touches. For example, the program automatically kerns italic text; and the cursor slants when you write in an italic font, making it easier to insert the cursor between characters. The program is smart enough to move footnotes from one page to the next if the references won't fit on the previous page. You can also index the first line of all paragraphs to create a kind of outline. A window tiling scheme gives you several alternatives for setting up windows on large screens.

If this preliminary version is any indication, *FullWrite* is definitely worth a look when it's released.

The Mac Joins the OSI World



Touch Communications of Scotts Valley, California, has announced network software for the Mac designed to let it connect transparently to DEC and IBM machines using an industry-standard communications protocol. The software from Touch, which implements the Open Systems Interconnect (OSI) protocols developed by the International Standards Organization, is the first commercial software to comply with both the Technical Office Protocol (TOP) and the Manufacturing Automation Protocol (MAP), standards expected to untangle communications between machines from different vendors.

The *Touch OSI* software for the Mac will allow Mac users connected via AppleTalk to transparently access information stored both on IBM PCs running DOS and on DEC VAXs running the VMS operating sys-

tem. Networked Macs connect to the PCs or VAXs via a Mac dubbed the Router, which is equipped with an external Ethernet bridge (an Ethernet card, in the case of the SE or Mac II) and the *Touch OSI* software. Macs that are not networked can connect directly to PC or VAX networks via Ethernet.

Using the *Touch* network software, Mac, PC, and VAX users can access information stored on other systems as if they were accessing the information locally. For example, Mac users could access PC and VAX files from a mounted volume on the desktop. PC files would appear as documents in folders, as would VAX files. PC and VAX users could access Mac files using the native DOS or VMS commands, specifying path names and subdirectories from a remote volume (E).

The *Touch OSI* software uses an interface similar to that of Centram Systems' *TOPS* software. However, *TOPS* requires non-Mac systems to understand the AppleTalk protocol, which has gained little acceptance

outside the Mac world. Because *Touch*'s software uses an industry-standard protocol (the OSI protocol suite), it allows the Mac to communicate with any machine that understands the OSI protocols.

Touch Communications, in which Apple now holds a minority investment, plans to release the Mac software by the end of the year. Both DOS and VMS software are available now. *Touch* also plans to make the OSI protocols available for UNIX and IBM mainframes.

—David Ushijima

Network Fun and Games



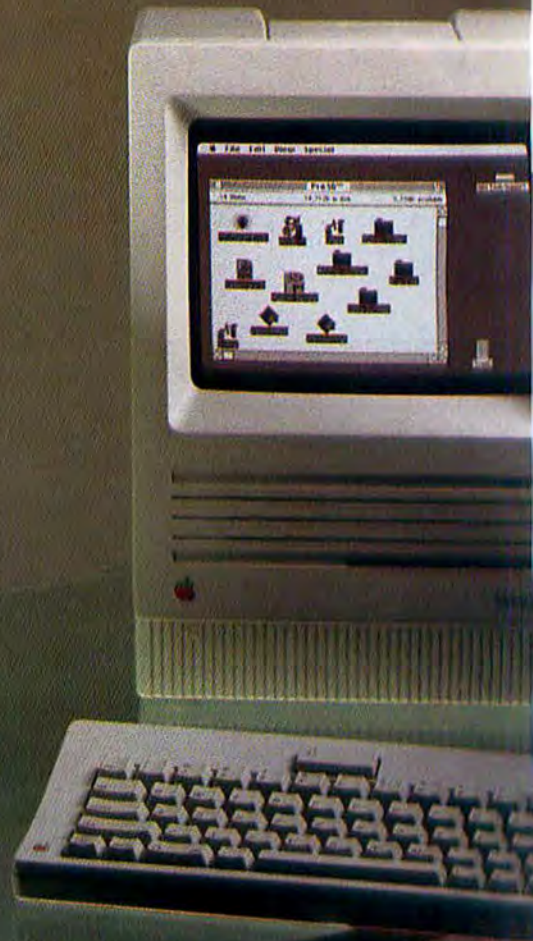
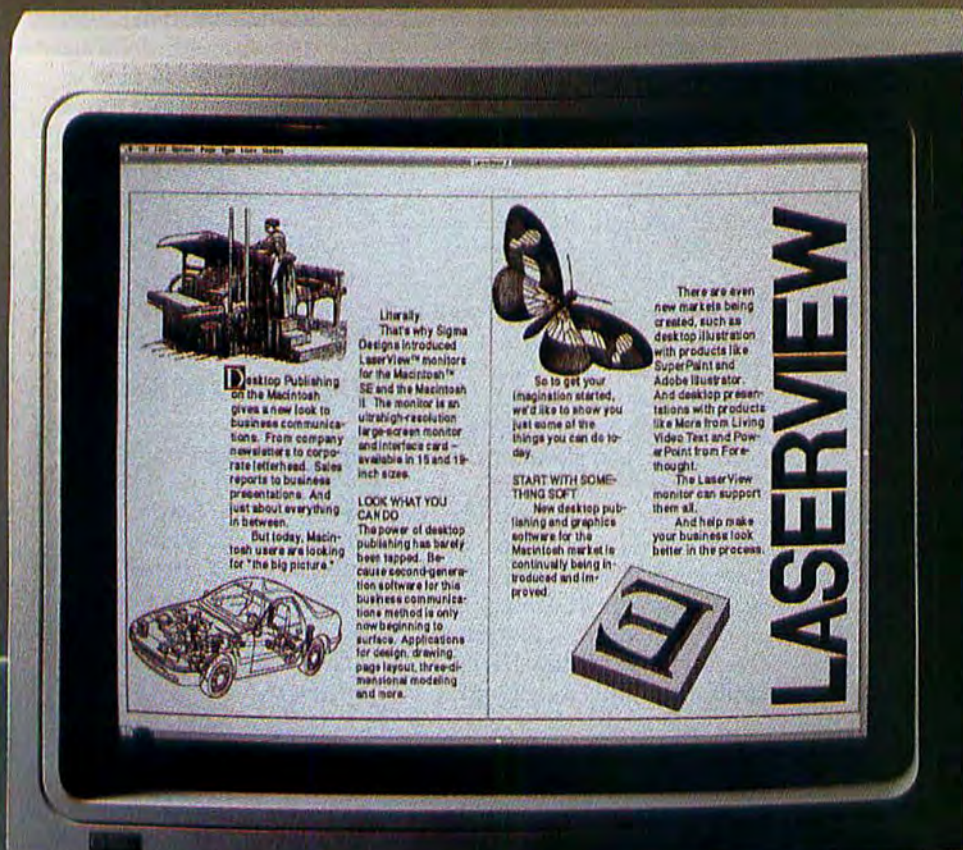
Although it's often hard to sell multiuser software, due to the complexities of installation and troubleshooting, there's one application that draws even low-tech Mac users to a net-

(continues)



Randy Carr has a role for Spock in his new "Star Trek"-like game, *NetTrek*, which can be played by several persons on a network.

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Circle 743 on reader service card

work: games. For instance, MacroMind's *Maze Wars* search-and-destroy game was a hit on the *Macworld* network. And at a recent confab in Dayton, user group officials stayed into the wee hours playing a prerelease version of Randy Carr's *Net-Trek*, a networked space-chase game that fans of TV's "Star Trek" are sure to find eerily familiar. (Carr, a software engineer for Apple, is still looking for a publisher for his game, which also has a single-user mode.)

Some publishers are wary of attempting to market entertainment software to the small group of people who have both networks and free time. Though MacroMind has sold more than 2000 copies of *Maze Wars* through little more than word of mouth, the firm has had a tough time convincing the distributor that the market is ready for such an innovative concept.

Kesmai Corporation has found a solution to the distribution problem: its multiuser aerial combat game for the Mac, *Air Warrior*, is played online by subscribers to the GENie information service. Subscribers download the game software, start it up on the Mac, and then enter the pregame orientation conference. There's no question that more dogfight competitors equals more excitement, since defying numerous human foes makes the game exponentially more unpredictable than does facing a single chip-bound opponent.

International Network Standards



When Bill Croft goes to his office at Stanford University each day, he may sit down to work at a Macintosh at his desk, a VAX across



After a solitary bicycle ride Bill Croft arrives at Stanford University, where he connects with colleges and universities all over the world. His connectivity is made possible by a key product he developed.

the street, a DEC System 20 across campus, a Cray across the country, or almost any kind of computer anywhere in the world. His Macintosh isn't any different from yours, but his work is part of what makes the Macintosh special for every user.

Bill developed *SUMacC*, the first cross-compiler for the Macintosh and the first alternative to *Lisa Pascal*. He needed more efficient communication between his Mac and the VAX for cross-compiling, so he next developed an AppleTalk/Ethernet gateway, which gave his Macintosh access to a lot more than the VAX across the street.

Through a gateway (now manufactured by Kinetics) and with Mac/IP software, an AppleTalk network can become part of the Stanford Ethernet, which connects hundreds of computers on campus. That network is in turn part of the ARPAnet that connects computers at many universities and research centers around the world. This has helped make the Mac an inte-

gral tool for international research.

Researchers can communicate easily, because all computers (from Crays to Macs) share one characteristic: they all speak IP/TCP, the U.S. Department of Defense Internet Protocols. IP/TCP is a network specification that has become an internationally used standard, and now programmers at half a dozen universities have written applications for the Macintosh that use IP/TCP.

EFS (external file system) from Stanford, Columbia, and the consulting firm of Bolt, Berenek, and Newman, allows the VAX across the street to become a file server for Macintoshes all over campus. Telnet, a virtual-terminal program, and FTP, a file-transfer program, the mainstays of ARPAnet users, have a long heritage. With them, users have access to computers and files on the entire ARPAnet.

Apple has assigned a MAC/IP coordinator and has held a

meeting of University Consortium members to facilitate further work in this area.

—Clay Andres

Power to the People



Steve Brecher, a programmer since 1965, is the one other programmers call on for help in cleaning up their code. He is fondly known on some telecommunication services as MAUG's Grammarian, since no one needs a spelling checker when he's nearby. Not only has Brecher worked as a consultant on at least two projects for Apple, but he wrote the software for the MicahDrive as well.

In addition to contributing programs such as *WayStation*, *Compact*, and *Multiple Regression* to the public domain, Brecher—through his company,

(continues)

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Steve Precher, a former philosophy major, is a contributing editor to MacTutor and has been programming exclusively for the Mac since 1984.

Software Supply—is releasing two commercial products of his own. The first is a Finder replacement called *PowerStation*, a software control center that enables you to organize frequently used applications, documents, and desk accessories to suit your work habits. It also lets you move between applications much more quickly than does the Finder.

You can easily configure *PowerStation* to open 472 specified applications, desk accessories, or documents; you can set one default document for each application. There are 16 pages of buttons that can be named and launched with a single mouse click. You're given a multitude of options, including a Go To function, upon quitting any application. Every aspect of the program adheres beautifully to the Mac interface. In fact, *PowerStation* is so versatile and easy to use, if it provided copy and delete functions as well, many of us would never view our desktops again.

Until now, Macintosh users were either limited to 15 desk accessories or forced to use convoluted means of accessing more. Brecher's other release, *Suitcase*, lets you easily access unlimited quantities of DAs,

fonts, and F-keys without installing them on the System. When you start up, *Suitcase* automatically puts many of them in their respective menus; it then allows you to call up additional ones from within applications. It even simplifies desk accessory selection by using a menu that responds to keyboard commands. *Suitcase* takes up less than 15K, is compatible with *Switcher*, and will work with a 512K Mac.

Evaluation copies of Brecher's programs are available through user groups and telecommunication services. When you purchase either of them (\$59.95 each), Brecher's *Pyro*—the prettiest and most configurable screen-saver around—is provided free of charge. —Linda Joan Kaplan

The European Difference



At the first European Macworld Expo, held in Rotterdam this April, a number of European companies exhibited products: Inventab of Sweden, a shareable RS-232C serial port for use with AppleTalk; MicroPlanning International of the United Kingdom, a very successful Microplanner project system; Pixel Software, also of the United Kingdom, a high-resolution color slide production system; CDS Electronics of the Netherlands, several front-end industrial device controllers and analog/digital converter add-on boards for the Mac SE and Mac II as well as for the TimeWand system from Videx. Abvent of France showed *Space Edit*, a 3-D CAD system; *Build 1-2-3*, a housing-oriented CAD system; *Simul*, a dynamic modeling program; and *WorkStation*, a 68020 accelerator add-on card for the Mac Plus.

Perhaps more important than the products themselves

was the vitality shown by the European Macintosh community—despite overwhelming odds. Due to the combined effects of customs duties, taxes, and generally lower personal income, the Macintosh is found primarily in business and professional environments in Europe. Business, cultural, and language differences have created another major barrier: market fragmentation. Still another factor limiting the Mac's acceptance there is Europe's rigid devotion to MS-DOS and IBM compatibility, which far exceeds anything we've encountered in North America. Perhaps this reflects the desire for a strong international standard in an otherwise highly fragmented multinational marketplace. Add to those factors the typical price of an MS-DOS clone—much lower than that of the Mac—and clearly the Mac faces a struggle for supremacy in the European market.

Also influencing the European Macintosh user community are *solution centers*, vertical-market-oriented dealerships that are even more popular in Europe than they are in North America. Apple itself has participated in the development of a number of Apple centers, specialized

dealers capable of providing high-level technical and market-specific support. Numerous third-party system/solution houses have also surfaced; they complete Macintosh hardware and software systems in engineering, graphic and musical arts, publishing, and accounting.



Although user group development has been slower in Europe than in North America, several user groups were represented at the conference, including Mac e.V., the Macintosh User Group UK, and MacClub Benelux. Unlike many smaller groups that are primarily group purchase discounters, they provide information, education, technical support, and a communication channel for their members.

Mac e.V., the German user group, has over 900 members

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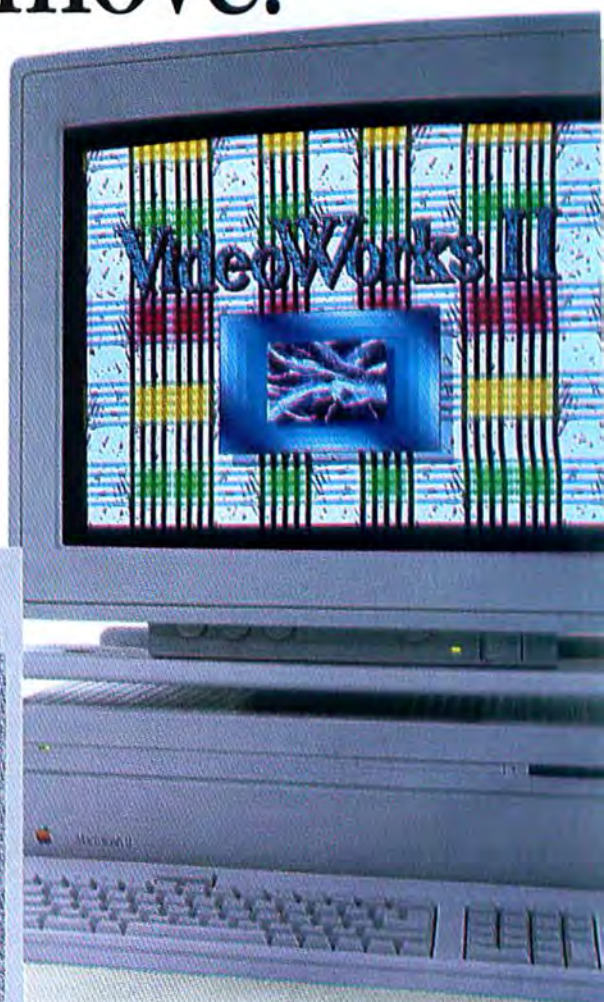
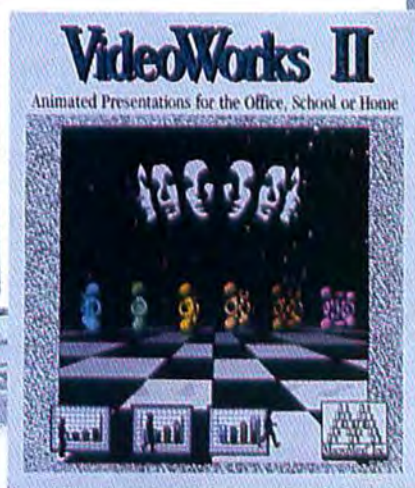


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and holds meetings in 18 cities. It publishes a bimonthly newsletter and distributes public domain software. Apple 2000—The National Apple Users Group of the UK comprises 26 local user groups. It publishes a bimonthly journal featuring articles on both the Apple II and the Macintosh. Apple 2000 actively supports user groups by providing both speakers and advice. In addition, it recently formed a User Group Council, similar to that of Apple USA, to gain a better understanding of user needs and desires.

MacClub Benelux has more than 1700 members in 71 countries, it has a full-time director and publishes monthly 800K-disk newsletters with editions in Dutch, French, and English that include feature articles, product news stories, user communications, and programming examples. Other services include a public domain software library, a postal lending library of Macintosh-oriented books, and a telephone hot line. Unlike many smaller groups, it has scrupulously avoided any commercial dealer alliances or discount agreements and actively discourages software piracy. What helps make this organization so unusual is its ability to conduct almost all its activities by mail or modem and to hold only one meeting a year. It's also considerably more expensive to join than most user groups. Nevertheless, the club is popular and well supported by Apple Benelux, which now distributes a MacClub postcard with its customer newsletters.

Although the anything-is-possible enthusiasm exuded at Rotterdam may already have faded, the future of Europe's Macintosh community looks bright. While the Mac is still a minority player in the European personal computer market, signs of growth are abundant. —Larry-Stuart Deutsch

Standardized Desktop Publishing



The National Bureau of Standards (NBS) is establishing the Electronic Publishing Laboratory to create page-description vernacular standards and to demonstrate the various PostScript output technologies available for desktop publishing. The laboratory will be housed in the NBS headquarters at the U.S. Department of Commerce in Gaithersburg, Maryland.

Standards developed at the laboratory are expected to have wide impact on the desktop publishing equipment industry, since they'll determine what federal government procurements will specify. NBS analysis of equipment performance is also expected to establish future benchmarks for "test-page" production time and costs.

The lab will be open for equipment demonstration and comparison by both federal agencies and corporate users; specifications will include rated duty cycle, type of engine, rate of speed, and type of papers used. The lab is also expected

to spin off workshops and conferences designed to generate ideas for future directions and applications.

—Stuart Silverstone

Sons of Apple



Not your typical Mac developer is Radius, maker of the Radius Full Page Display (FPD) and 68020 accelerator boards for the Plus and the SE. It derives its unusual character from its principals—all alumni of the original Macintosh development team. Radius president Mike Boich was the first Apple Evangelist and is coauthor of *MacTerminal*; Burrell Smith, the company's hardware wizard, designed the Macintosh LaserWriter digital boards; marketing and sales leader Alain Rossman was head of the Apple Evangelists; Matt Carter, head of operations, was the guiding force behind the creation of the Macintosh factory; and Andy Hertzfeld, the software guru of Radius, was the key developer of the Mac's System software.

Burrell Smith, believing that the Mac was capable of doing a lot of things that people didn't



Former members of the Mac development group (from left) Matt Carter, Alain Rossman, Burrell Smith, and Mike Boich teamed up to found Radius.

think it could, developed an expansion port and a large-screen design in his home workshop after the release of the Mac. In February 1986 Smith talked to Matt Carter about starting a company. Carter helped him draw up a business plan and get parts for building a prototype FPD. After learning of the plan, Mike Boich used the money from his recently sold house to get Radius off the ground in April. Rossman joined in May and Andy Hertzfeld was called in as a consultant to handle the software development. By September the FPD was shipping and Radius was on its way. Early in 1987, Radius signed a deal with Kleiner Perkins for an influx of venture capital to help the company grow and allow for more R and D.

With money in the bank and a few products under its belt, Radius has become a thriving company with more than 25 employees and new quarters in Sunnyvale. Its goal is still to develop products for the Mac that smoothly integrate hardware and software, and leverage off the engineering talents of Smith and Hertzfeld. Eventually Apple will get around to producing 68020 boards for the SE, while Radius and others will have taken the next leap forward before Apple catches up. □



Employees at the National Bureau of Standards are setting up a new laboratory that could have major impacts on the future of desktop publishing for both government and manufacturers.

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Magnum ... NCP

Natural Sound Effects 27.

Natural Sound Cable & Editor Disk 89.

McPic - Volume 1 or Volume 2 29.

The Slide Show Magician 1.3 (CP) 35.

Micro Analyst ... NCP

Mac Zap (recover crashed hard disks) . . . 36.

Microsoft

Flight Simulator (the Mac takes flight, CP) 32.

Basic Interpreter 3.0 (NCP) 64.

Chart 1.02 (42 chart styles, CP) 72.

Multiplan 1.1 (63 col. by 255 rows, CP) . . 105.

File 1.05 (flexible data manager, NCP) . . 111.

Basic Compiler 1.0 (NCP) 119.

Fortran 2.2 (compiler, NCP) 169.

Works 1.0 (integrated tool, NCP) 189.

Excel 1.04 (power spreadsheet, NCP) . . . 224.

Word 3.0 (word processor, NCP) 239.

Miles Computing ... NCP

Mac the Ripper (req. Paint program) 27.

Orchestra of Fonts Vol. 4 (30 different fonts) 27.

Mindscape ... CP

The Luscher Profile (personality profile) . . 24.

The Perfect Score: SAT 47.

ComicWorks (create your own comics) . . . 48.

GraphicWorks 1.1 (newsletters, NCP) . . . 48.

Monogram ... NCP

Dollars & Sense (home, small business) . . 81.

New Canaan MicroCode ... NCP

Mac Disk Catalog II (requires 512k) 31.

Soft Wear.

Out on a limb.

We don't want to offend anyone, but people who still use hard copy are seriously out of date. Just take a look at the artistic strokes of genius on our temporarily tattooed friend. Why, for the right price, you could present your next newsletter, spreadsheet, or epic poem in real living color.



Picture your logo rippling across someone's exotic exterior. Amaze your boss as the gentle undulations of breath do things to

your five-year plan that you never imagined possible. Why, even editing could be fun again!

Fleshtop publishing.

David Chalk and his partner Roy Zuckerman at Temptu Marketing in New York are designing tattoos on their Mac



which are turning traditional marketing literally inside out.

It all started when Roy saw what his father, one of the world's leading cosmetics chemists, had developed for the movie "Tattoo"—a safer and longer-lasting body paint than anything previously available. He and David were soon selling

the paint in kits along with design transfers which can be applied in seconds with good old rubbing alcohol.

They've done custom work for everyone from Miami Vice to Guinness Stout. And, for quick designs, the Mac is starting to come in handy (and footy, and everywhere in between). Temptu can now digitize very custom images for transfer to very custom parts.

According to our winners, temporary tattooing is "the contact sport of the 80's." So it's only natural that they've chosen the micro of the 80's to help with their design and marketing. Oh, Lydia, could you have had fun with this one. Eh, Groucho?

<input type="checkbox"/>	Contest Winner #9
Name:	David Chalk, Temptu Marketing
System:	Mac Plus
Applications:	Designs custom temporary tattoos; tracks clients and orders; produces mailing pieces and catalogs.

MacConnectionTM

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with your Mac.

Primera Software ... CP

Smash Hit Racquetball (*top-rated!*) \$15.

Pslon ... CP

Pslon Chess (3D and multi-lingual) 31.

Rainbird ... CP

Pawn (*fantasy adventure*) 27.

Sierra On-Line ... CP

King's Quest 30.

King's Quest II 30.

Space Quest 30.

Silicon Beach Software

Airborne! (*CP, the classic!*) 20.

Enchanted Scepters (*CP, over 200 scenes*) 21.

Dark Castle (*NCP, arcade action*) 28.

World Builder (*NCP, program creator*) 41.

Simon & Schuster ... CP

Star Trek—The Kobayashi Adventure 24.

Sir-Tech ... CP

Mac Wizardry (*high-rated fantasy*) 35.

SPHERE, INC. ... NCP

GATO (*submarine simulation*) 26.

Orbiter (*space shuttle simulation*) 27.

Tellstar II (*No. & So. hemispheres, req. 512k*) 32.

XOR ... NCP

NFL Challenge (*be the coach!*) 79.

HARDWARE

Manufacturer's minimum limited warranty period is listed after each company name. Some products in their line may have longer warranty periods.

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20 Megabyte SCSI Hard Drive 589.

Apricorn ... 1 year

ApriCord Mac (*for Mac 512k or Mac Plus*) 75.

AST Research ... 2 years

AST TurboScan (300 dpi scanner) 1479.

AST 2000 (20 MB, 20 MB tape) 1479.

AST 4000 (74 MB, 60 MB tape) 3895.

Curtis Manufacturing ... lifetime

Diamond (6 outlets) 29.

Emerald (6 outlets; 6 ft cord) 36.

Sapphire (3 outlets; EMI/RFI filtered) 47.

Ruby (6 outlets; EMI/RFI filtered; 6 ft cord) 55.

Dove Computer ... 90 days

Mac Snap Memory Upgrades call

Ergotron ... 1 year

Mouse Cleaner 360° 15.

MacTilt or MacTilt SE 74.

MacBuffer 512k 329.

MacBuffer 1024k 429.

Farallon Computing ... 1 year

PhoneNET PLUS (DB-9 or DIN-8) 39.

Hayes ... 2 years

Smartcom II (*communications software*) 88.

Smartmodem 1200 299.

Smartmodem 2400 449.

InterBridge (*connect Appletalk networks*) 599.

IOmega ... 1 year

Bernoulli Box (*dual 10 MB w/SCSI*) 1579.

Bernoulli Box (*dual 20 MB w/SCSI*) 1879.

Kensington ... 1 year

Appletalk Cable Clips or Connectors each 1.

Mouseway (*mouse tracking pad*) 8.

Mouse Pocket (*for your idle mouse*) 8.

Mac Plus/Mac SE System Saver Cover 9.

MacConnection Hardware Special

through September 30, 1987

KOALA

MacVision

The MacVision digitizer converts any video signal into a high quality image directly within your graphics software. Simply attach the unit between a video camera and your Mac to digitize three-dimensional objects, or capture images from your VCR. Completes a full screen scan in less than 30 seconds.

- Operates as a desk accessory
- Uses any RS170 standard video source
- Features MoreVision™ special effects software
- Special camera offer inside

MacVision (*for your Mac*) \$169.

Imagewriter II Dust Cover 9.

Mouse Cleaning Kit w/Mouse Pocket 17.

Disk Case (*holds 36 Mac disks*) 19.

Disk Drive Cleaning Kit 20.

Tilt/Swivel 22.

Universal Copy Stand 24.

Polarizing Filter (*Mac Plus or Mac SE*) 34.

Surge Suppressor 34.

Printer Muffler (80 column) 39.

Printer Muffler (132 column) 52.

Control Center 64.

System Saver Mac 64.

A-B Box (*for the Mac Plus*) 64.

Turbo Mouse 85.

Koala Technologies ... 90 days

MacVision see special

Kraft ... 1 year

3 Button QuickStick 39.

Migent ... 1 year

Pocket Modem (*ext. 300/1200 baud*) 169.

Mirror Technologies ... 1 year

Magnum 800 External Drive 209.

Magnum Tape 20 Backup 899.

Magnum Tape 40 Backup 1199.

MagNet 40/40 (40MB, 40MB tape) 2395.

MagNet 20x (*w/cable & backup utilities*) 779.

MagNet 30x (*w/cable & print spoolers*) 949.

MagNet 40x (*w/cable & print spoolers*) 1299.

MagNet 85x (*w/40 MB tape*) 3995.

Nutmeg Systems ... 1 year

Nutmeg 19" Monitor 1579.

Nuvotech ... 1 year

EasyNet (*AppleTalk network connector*) 29.

Personal Computer Peripherals ... 1 year

MacBottom Hard Drive 21MB (SCSI) 859.

MacBottom Hard Drive 45MB (SCSI) 1285.

SoftStyle ... 90 days

MacEnhancer (*for plotters to printers*) 179.

Summagraphics ... 90 days

MacTablet 12" x 12" 379.

Systems Control ... 2 years

MacGard (*surge protection*) 55.

Thunderware ... 90 days

ThunderScan 4.0 with PowerPort 199.

Western Automation ... 1 year

DASCH RAMdisk 2000k 429.

DISKS

Sony 3½" DS/DD Disks (*box of 10*) \$21.

MAXELL 3½" DS/DD Disks (*box of 10*) 21.

Fuji 3½" DS/DD Disks (*box of 10*) 21.

Verbatim 3½" DS/DD Disks (*box of 10*) 23.

3M 3½" DS/DD Disks (*box of 10*) 23.

INFORMATION SERVICES

Compuserve

Compuserve Information Service 24.

Dow Jones

Dow Jones News/Retrieval Membership Kit 24.

ACCESSORIES

Computer Coverup

Imagewriter II Cover 8.

Mac Plus & Keyboard (*two covers*) 10.

I/O Design

Imagewriter II (*Imagewriter II carry case*) 49.

Macinware Plus (*Mac Plus carry case*) 69.

Macinware SE (*Mac SE carry case*) 89.

Kalmar Designs

Teakwood Roll-top Case (*holds 45 disks*) 14.

Teakwood Roll-top Case (*holds 90 disks*) 21.

Teakwood Roll-top Case (*holds 135 disks*) 29.

Magnum

Mouse Mover (*let your mouse ride!*) 14.

Moustrak

Moustrak Pad (*standard 7" x 9"*) 8.

Moustrak Pad (*large 9" x 11"*) 9.

Sensible Softworks

High Quality "MacAttire" dust covers 7-17.

Smith & Bellows

Mahogany Disk Case (*holds 90 disks*) 28.

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Continental US: For printers and drives add 2% for UPS ground shipping (call for UPS Blue or UPS Next-Day-Air). For all other items, add \$2 per order to cover UPS shipping. We will automatically use UPS 2nd-Day-Air at no extra charge if you are more than 2 days from us by UPS ground. **Hawaii:** For printers and drives, actual UPS Blue charge will be added. For all other items, add \$2 per order. **Alaska and Outside Continental US:** Call 603/446-7711 for information.

hts in performance

Odesta ... NCP			
Double Helix (relational, custom menus) \$275.			
Multi-User Helix (requires 512k) 439.			
OWL International ... NCP			
Guide (hypertext, free-form info) 79.			
Guide Envelope System 109.			
Palantir ... CP			
MathFlash, WordPlay or MacType 26.			
inTalk (communication to emulation, NCP) 99.			
Passport Designs ... CP			
Passport MIDI Interface 95.			
Master Tracks Pro 259.			
PBI Software ... NCP			
HFS Locater (DA organizer for HFS) 26.			
HD Backup (supports MFS, HFS) 29.			
Personal Computer Peripherals ... NCP			
HFS Backup 32.			
ProVUE Development ... NCP			
OverVUE 2.0 (power-packed database) 149.			
Mail Manager or Pers. Finance Template 29.			
Rubicon Publishing ... CP			
Dinner At Eight-Silver Palate Bundle 52.			
Satori ... NCP			
BulkMailer (mailing lists) 74.			
BulkMailer Plus (up to 90,000 names) 225.			
Legal Billing (attorneys to accountants) 385.			
Legal Billing II (full trust accounting) 575.			
Project Billing (architects to engineers) 445.			
Silicon Beach Software ... NCP			
Silicon Press (printer utility, 512k) 41.			
SuperPaint (advanced graphics program) 54.			
Simon & Schuster ... NCP			
Mac Art Department (req. Paint program) 24.			
Paper Airplane Construction Kit 24.			
Typing Tutor III (learn to type!) 35.			
SoftStyle ... NCP			
Epstart (Epson printer driver) 27.			
Colormate (color printing utility) 48.			
Printworks (print faster & in color) 49.			
Laserstart (Hewlett-Packard Laserjet) 58.			
Softview ... NCP			
Macinuse (time-use manager) 29.			
Software Ventures ... NCP			
Microphone 1.1 (includes Glue™) 129.			
Solutions, Inc. ... NCP			
SmartScrap & The Clipper 41.			
Glue (creates "print to disk" capability) 41.			
Springboard ... CP			
Art a la Mac Vol. 1-People & Places (NCP) 23.			
Art a la Mac Vol. 2-Variety Pack (NCP) 23.			
Certificate Maker (CP) 35.			
State of the Art ... CP			
Electric Checkbook (print checks) 28.			
SuperMac Technology ... NCP			
SuperSpool 4.0 49.			
Diskfit (backup & restore utility) 49.			
SuperLaserSpool ... \$99.			
Multi-User SuperLaserSpool 259.			
Survivor Software ... NCP			
MacMoney (financial planner) 42.			
Symmetry ... NCP			
Acta 1.2 (outline/writing desk accessory) 38.			
PictureBase 1.2 (clip art manager, 512k) 44.			
Telos Software ... NCP			
Business Filevision (512k, external drive) 199.			
Think Educational ... CP			
MacEdge II or Mind Over Mac 28.			
THINK Technologies ... NCP			
Laserspeed (Laserwriter utility) 65.			
Lightspeed Pascal (includes debugger) 85.			
Lightspeed C (top-rated C Compiler) 125.			
InBox Starter Kit (CP) 235.			
InBox Personal Connection (Mac & PC) call			
T/Maker ... NCP			
ClickArt Personal Graphics, Effects,			
Publications, Letters Vol. 1 or 2, Holidays,			
Business Image ... each 28.			
Bombay, Plymouth, or Seville Laser font 46.			
Write Now (word processor) 102.			
TML Systems ... NCP			
TML Source Code Library 58.			
TML Database Toolkit 64.			
TML Pascal (compiler, req. 512k) 68.			
TrueBasic ... NCP			
True BASIC (fast, flexible, & portable) 59.			
Algebra I or II, Pre-calculus, Trigonometry,			
3D Graphics, Discrete Math, Probability,			
Chippendale utilities & Calculus ... each 35.			
TrueSTAT (statistics) 58.			
Runtime (create stand-alone applications) 59.			
Unicorn ... CP			
Animal Kingdom (ages 6-12) 27.			
Decimal Dungeon (math, ages 9 and up) 27.			
Fraction Action (arcade style math game) 27.			
Mac Robots (pre-school program) 27.			
Math Wizard (math games, ages 5-10) 27.			
Read-A-Rama (reading, ages 5-8) 32.			
William & Macias ... NCP			
myDiskLabeler (design & print labels) 24.			
myDiskLabeler w/Color (req. Imagewriter II) 33.			
myDiskLabeler w/Laserwriter option 38.			
216 Laser Labels 19.			
Working Software ... NCP			
Spellswell (spelling checker) 45.			
Spellswell Medical Dictionary 59.			
Championship Star League Baseball ... \$22.			
Shanghai (Mah Jongg strategy) 24.			
Addison-Wesley ... CP			
Puppy Love (your dog will love it!) 14.			
Artworx ... CP			
Bridge 5.0 (sharpen your skills) 20.			
Avalon Hill ... CP			
MacPro Football (req. 512k) 30.			
MacPro Football 85 Team or Season 16.			
Blue Chip ... CP			
Millionaire, Tycoon, Baron or Squire 35.			
Broderbund Software ... CP			
Lode Runner (over 150 levels) 24.			
Ancient Art of War (military strategy) 27.			
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Ferrari Grand Prix (Formula One racing) 34.			
Fokker TriPlane Flight Simulator 34.			
Electronic Arts ... CP			
Archon (arcade strategy, req. 512k) 27.			
Skyfox (3D graphics) 27.			
Seven Cities of Gold 27.			
One on One/Dr J vs Larry Bird (req. 512k) 27.			
Patton vs-Rommel (req. 512k) 27.			
Pinball Construction Set 27.			
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Epyx ... CP			
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Sub Battle Simulator 24.			
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Hayden Software ... CP			
Perplex (scrabble-type game) 24.			
Sargon III (9 levels of chess) 29.			
Infinity Software ... CP			
Grand Slam (tennis, req. 512k) 27.			
Infocom ... CP			
Hitchhiker's Guide to the Galaxy 18.			
Leather Goddesses, Trinity, Moonmist,			
Ballyhoo, Bureaucracy (standard) ... each 24.			
Zork Trilogy 45.			
Invisicubes Hint Booklets (please specify) 6.			
MacroMind ... NCP			
Maze Wars+ (play via modem or network) 32.			
Miles Computing ... CP			
Harrier Strike Mission (3D flight simulation) 27.			
Quintette (strategy of "Go") 27.			
Down Hill Racer 27.			
Mindscape ... CP			
Balance of Power (world politics) 30.			
King of Chicago (req. minimum 512E) 30.			
Bratuccus (great graphics, req. 512k) 30.			
Uninvited (mystery adventure) 30.			
Shadowgate (fantasy graphic adventure) 30.			
Deja Vu (murder mystery) 30.			
PBI Software ... CP			
Strategic Conquest (multi-user) 35.			

GAMES

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The QuickDraw Solution

by Lon Poole

Laser printers offer lower prices by abandoning PostScript—but does compatibility suffer?

Are you looking for an inexpensive laser printer? A new category of laser printers is appearing that promises faster printing at much lower prices. General Computer has announced one that prints at the same speed or faster, and with the same quality, as an Apple LaserWriter—for less than \$2500.

What's the difference? Printers like General Computer's Personal LaserPrinter don't use PostScript, Adobe's page-description language. The Personal LaserPrinter relies on the Mac's central processing unit (CPU) and memory to describe the page using the QuickDraw commands contained in the Mac's ROM, whereas the LaserWriter has two megabytes of memory and a 68000 microprocessor to translate PostScript commands into a printed image.

According to proponents of the new printing scheme, the Mac Plus has enough power to process 300-dots-per-inch (dpi) pages as fast as a LaserWriter Plus. A Mac II or an accelerated Mac Plus or Mac SE can process page images even faster. Furthermore, the QuickDraw graphics package that applications use to draw screen images is, with a few extensions, every bit as capable of describing most 300-dpi pages as PostScript.

But the QuickDraw scheme employed by General Computer has its disadvantages, too. Because the Personal LaserPrinter is just that—personal—it can't be easily attached to an AppleTalk network for others to share.

While General Computer's is the first laser printer that relies entirely on the Macintosh to process 300-dpi page images, at press time Apple was expected to announce a similar product also based on the QuickDraw imaging model.

From Screen to Page

A major precept of Macintosh philosophy requires printed images to match screen images as closely as possible. This precept is called What You See Is What You Get, or WYSIWYG (pronounced wizzywig). Almost all Macintosh application programs use the Mac's built-in graphics package, QuickDraw, to draw images on the screen. They also use QuickDraw to describe the image of a page for printing on an ImageWriter and to create a bit-mapped image (a dot pattern) of the page for that printer and the screen. Only a few games and special-purpose graphics applications bypass QuickDraw.

Most applications initially use QuickDraw to describe page images for a LaserWriter, too. The LaserWriter driver (the controlling software that runs on the Mac) translates the QuickDraw description to the LaserWriter's graphics language, PostScript. A few applications like *Cricket Draw* augment the LaserWriter driver's PostScript page description with their own PostScript commands for special effects. The processor inside the LaserWriter interprets the PostScript page description to create a 300-dpi bit-mapped image for the page.

In lieu of PostScript, General Computer's printer driver intercepts QuickDraw page descriptions and substitutes high-



SCOTT BALDWIN

quality fonts and special effects where appropriate. Together the Personal LaserPrinter driver and QuickDraw prepare a 300-dpi bit-mapped image for the page.

Neither PostScript nor QuickDraw is decidedly better for page description. Both have advantages and disadvantages. On the one hand, PostScript has superior font handling. It can directly create halftones from digitized photographs—limited by the printing device, of course. (A 300-dpi printer is capable of rendering an almost newspaper-quality photograph.) Also, PostScript is not tied to one machine. This means all PostScript printers are interchangeable, from the 300-dpi LaserWriter to the 2540-dpi Linotronic 300.

On the other hand, QuickDraw is faster than PostScript for most operations. For example, it is much faster at clipping objects to a nonrectangular boundary. (Clipping is the electronic version of a coloring book that won't let you draw outside the lines.) Most important, QuickDraw is free and it doesn't require costly additional computing power within the printer.

Most of the functions PostScript performs better or differently have now been defined as standard extensions to QuickDraw. They're known as picture comments, or *picComments*. The Personal LaserPrinter driver intercepts the most common *picComments* to create special effects such as rotated text. It also optimizes fonts like PostScript does.

Letter for Letter

The Personal LaserPrinter uses geometrically defined *outline fonts* that are very similar in appearance and concept to the LaserWriter's high-quality PostScript fonts. A single such font can be mathematically scaled up or down with no loss of quality, like circles and polygons in *MacDraw*. In contrast, *screen fonts* are defined by dot patterns, like circles and polygons in *MacPaint*. Each screen font size requires a separate bit-mapped definition. Figure 1 compares outline-font and screen-font definition.

Rotation at any angle, text along a curved path, and other special effects are easy to achieve with outline fonts. PostScript supports such effects now, although only a few Macintosh applications (like *Cricket Draw*) let you take advantage of them. At press time, General Computer hadn't decided which (if any) special effects it would support in the first release of the Personal LaserPrinter driver.

The Personal LaserPrinter has the same outline fonts as a standard LaserWriter and two of the additional fonts found on a LaserWriter Plus. However, instead of using the Adobe fonts the LaserWriters use, General Computer licenses its outline fonts from Bitstream, which distributes fonts for the IBM PC market. The Personal LaserPrinter comes with 6 font families: Times, Helvetica, Courier, Symbol, Zapf Calligraphic (like Palatino), and Swiss Narrow (like Helvetica Narrow). The font families contain separate definitions for various styles such as plain, bold, italic, and bold italic. Equivalent screen fonts are also included in several sizes. General Computer plans to offer another 20 or so outline-font families (about \$180 per family) when the printer is shipped.

Caching the Wave

The LaserWriter stores outline-font definitions in its memory—some in ROM and some in RAM. Personal LaserPrinter outline-font definitions are stored on disk. You control the availability of fonts by dragging icons in and out of the System Folder. You can keep as many fonts on hand as you like, without having to use space for fonts you aren't using. The Personal LaserPrinter

driver retrieves outline-font definitions from disk as needed and puts them in a reserved area of the Mac's memory called a font cache.

Although outline fonts are mathematically defined, when they're printed bit-mapped images must be built in the proper size and style for each character. The LaserWriter ROM contains prebuilt images for Times 12, Helvetica 12, and Courier 10. When the printer's not printing, it builds bit-mapped images for Times 10 and 14; Helvetica 10 and 14; Times bold 10, 12, and 14; and Helvetica bold 10, 12, and 14. It builds all other characters as needed. If it has room in its memory, it keeps images for characters it has built in its font cache.

Other PostScript devices, such as the Linotronic 300 typesetter, use a disk drive for font caching. The disk font cache is more permanent than the LaserWriter's RAM font cache. A disk font cache isn't necessarily erased after a document is printed, and it lives on even when the Linotronic is switched off.

Because General Computer's printer has no prebuilt characters in memory, the Personal LaserPrinter driver must build bit-mapped character images on the Mac as needed during page processing. Once built, they're kept in a font cache area of the Macintosh memory. If the font cache fills up, the driver removes the least used outline-font definitions and bit-mapped images to free up space. In the future, Personal LaserPrinter drivers will establish a font cache on disk, similar to the one just described for a Linotronic 300. The disk font cache will keep bit-mapped images for the characters used most often. If a needed character exists in the disk font cache, it can be retrieved directly from disk.

Blacker Blacks

The Personal LaserPrinter is physically capable of printing any image the LaserWriter or another similar laser printer can handle. Its best resolution is 300 dots per inch. The Personal LaserPrinter can also simulate 75 dots per inch, which is essentially the same as the Macintosh screen resolution. At that resolution it prints almost instantaneously.

The LaserWriter and all other laser printers that use the Canon printing engine are often criticized for poor-quality blacks that look dark gray. That's because the Canon engine uses a *write-black* technology, which means its laser beam exposes the

photosensitive drum where the toner will adhere (see "Laser Wars," *Macworld*, June 1987). The Ricoh printing engine in the Personal LaserPrinter uses a *write-white* technology that yields much darker blacks. Its laser beam exposes the areas of the drum that correspond to the white areas of the page.

Scaling for Accuracy

MacPaint documents and other bit-mapped images have always presented a problem for the LaserWriter, a problem the Personal LaserPrinter shares. Bit-mapped images are defined at 72 dpi for on-screen display and must be scaled for printing on a 300-dpi printer. For example, a 1-inch line is 300 dots long on either printer and 72 dots long on the screen. A single dot on the screen corresponds to $4\frac{1}{4}$ (or about 4.17) dots on the printer. Of course neither the LaserWriter nor the Personal LaserPrinter can print a fraction of a dot. To accurately scale a 72-dpi bit-mapped image, they must add one extra dot to every 24 dots at 300 dpi. This results in splotchy scaling of some images.

To avoid splotchiness, LaserWriter drivers before version 4.0 used a scaling factor of 4:1 for bit-mapped images. At that scaling factor, however, bit-mapped images are printed at about 96 percent of their displayed size (96 percent of 4.17 is 4). Outline-font text and geometrically defined objects can be scaled smoothly at any ratio, so LaserWriter drivers before version 4.0 used a scaling factor of 4.17:1. As a side effect, outline text and geometric objects printed slightly larger than bit-mapped images. Version 4.0 of the LaserWriter driver offers two cures for the discrepancy: it scales everything on the page either at 4:1, for a slightly smaller page image with smooth bit-mapped images, or at 4.17:1, for a correctly sized page image and rougher bit-mapped images.

General Computer's prototype printer driver used the same scaling factors as LaserWriter drivers before version 4.0. It printed outline fonts and geometric objects full size and bit-mapped images at 96 percent. It scaled screen fonts at 4:1 (96 percent) and added extra space as needed between words to maintain the displayed line length. At press time, General Computer had not decided whether to adopt the LaserWriter 4.0 conventions.

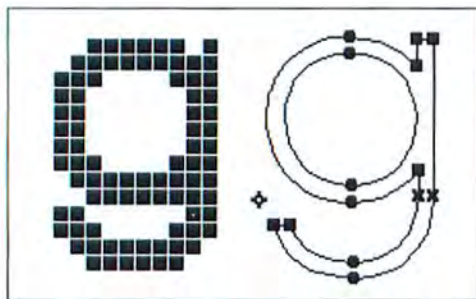


Figure 1
Bit-mapped fonts (left) are defined by dot patterns. Outline fonts (right) are defined geometrically with lines and curves. Outline fonts can be smoothly scaled and rotated.

You use the Chooser to choose a printer.

You choose Page Setup from the File menu and set page characteristics.

You choose Print from the File menu and select print job options.

Application uses Mac's built-in Print Manager software to generate QuickDraw description of each page in print job. (Some applications do one page per job.)

Personal LaserPrinter (PLP) driver saves QuickDraw description on disk.

Final Quality

PLP driver divides page into bands. Then, one band at a time:

PLP driver has QuickDraw prepare 300-dpi bit-mapped image of one band in Macintosh memory.

Repeat for all bands.

As needed, PLP driver copies outline fonts from disk to Mac.

PLP driver compresses single-band bit-mapped image and saves it on disk.

PLP driver reads all single-band images from disk and assembles compressed bit-mapped image for entire page in Macintosh memory.

PLP driver uncompresses bit-mapped image for entire page and simultaneously blasts it over SCSI bus, timed to match printer drum rotation.

Draft Quality

PLP driver has QuickDraw prepare 75-dpi bit-mapped image of page in Macintosh memory.

PLP driver blasts bit-mapped image for whole page over SCSI bus, timed to match drum rotation.

Inside printer, laser traces page bit map onto toner cartridge's rotating photosensitive drum.

If necessary, LaserWriter driver initializes LaserWriter by sending Laser Prep file, which adds commands and functions to the PostScript interpreter.

LaserWriter driver translates QuickDraw page description to PostScript.

As needed, LaserWriter driver copies screen fonts and downloadable PostScript outline fonts from disk to Mac and then sends them to LaserWriter.

LaserWriter driver sends PostScript translation to LaserWriter via AppleTalk network.

LaserWriter controller prepares 300-dpi bit-mapped image of page from PostScript translation.

The Price of QuickDraw Printing

Processing a 300-dpi page image takes lots of memory. You might think it imprudent of General Computer to ask a Mac Plus to try. The Personal LaserPrinter has one megabyte (1024K) of memory, half that of a standard LaserWriter. The Mac surrenders at least 128K to an application and donates another sizable chunk to system overhead. What's left is hardly the 960K required for a complete bit-mapped page image at 300 dpi. Furthermore, the Personal LaserPrinter driver and the font cache demand additional memory.

General Computer's programmers exercised their ingenuity and devised a method for reducing the amount of memory needed at any one time. The Personal LaserPrinter driver

doesn't attempt to prepare a bit-mapped image for a whole page at once. It divides the page into bands, the way the ImageWriter driver does when it prepares a high-quality page image. The driver adjusts the number of bands according to the amount of memory available.

For each band, General Computer's printer driver has QuickDraw prepare a complete bit-mapped image. Then it compresses the bit-mapped image and saves the compressed image on disk.

After the driver compresses and saves the bit-mapped images for all bands one by one, the portion of the driver that did the work is tossed out, freeing some memory. Then all the bands are read into memory

together. The resulting compressed bit-mapped image of the entire page typically occupies 200K to 300K of memory, though it may be as small as 50K or as large as 850K.

The maximum amount of memory is required when the compressed bit-mapped image of an entire page is in memory at once. So much memory is needed that it's probably not possible to print directly from an application when running under *Switcher*, using a RAM cache, or sharing the Mac's memory in any other way. To print on a Personal LaserPrinter, you must have at least 512K of memory available, and General Computer strongly recommends 1MB.

Like the LaserWriter, the Personal LaserPrinter can smooth bit-mapped images and screen-font text to eliminate some jaggedness attributable to their 72-dpi origins. The Personal LaserPrinter lets you choose to smooth either bit-mapped images, screen-font text, or both. The LaserWriter gives you a choice between smoothing both or not smoothing.

No Speed Loss

Because General Computer's evaluation unit was an early prototype, a stopwatch comparison to another printer would have little meaning. However, the Personal LaserPrinter seemed to exhibit about the same speed overall as other 300-dpi laser printers currently available for the Mac. Its main drawback is the Mac's unavailability for other tasks while a document is printing, since the printer uses the Mac's CPU and memory.

Speeding up a Personal LaserPrinter is easy. All you do is add more memory to your Mac. The more memory is available,

the faster the printing process. Adding an accelerator card to a Mac Plus or a Mac SE also speeds up printing. In both cases, you're enhancing the Mac, not the printer, so the enhancements will improve the Mac's performance in nonprinting tasks as well.

Installing the Personal LaserPrinter memory cartridge should not directly increase the printer's speed, since most of the printing time is taken up in image processing on the Mac. The memory cartridge helps Macs with limited free memory, such as a 512K Mac or a larger machine with a RAM cache, *Switcher*, and so on.

The Work Group Undone

Because the Personal LaserPrinter attaches to the Mac's SCSI port, it's a personal printer for use by one Mac only. Unlike the LaserWriter, it can't be directly connected to an AppleTalk local area network for use by several Macs in a work group. However, if you purchase an optional RS-232 serial port for the printer, you could connect the Personal LaserPrinter to the network

via a serial device server such as Abaton's Multi-Talk or Solana Electronic's C-Server. As of this writing, though, General Computer had not tested the printer with either device.

The printer is relatively easy to chain with existing SCSI devices. It has two 50-pin connectors and an external switch for setting the SCSI ID number, and it uses external termination. Attaching the Personal LaserPrinter to the SCSI bus means the printer must be on whenever the Mac is on. Although the Personal LaserPrinter prints silently, it does have a constantly blowing fan that's about as loud as a LaserWriter or a noisy hard disk.

And don't think you can hide the Personal LaserPrinter in another room the way you can a LaserWriter. The Personal LaserPrinter, like any SCSI device, can be no more than about 21 feet from the Mac. What's more, the standard SCSI connecting cable is only a few feet long, and extensions are bulky and expensive.

Serial-port cables can be much longer than SCSI cables, so the serial-port option lets you get the printer away from your desk. The serial-port option also lets you use a Personal LaserPrinter with a 512K Mac. Alternatively, you can add a SCSI port and more memory to a 512K for about the same price as the printer serial-port option. An upgraded Mac clearly provides more versatility.

Feeding Time

The Personal LaserPrinter is slightly smaller than a LaserWriter and about half as heavy. Weighing 36 pounds, it measures about 8 inches high, 16 inches wide (excluding the paper tray), and 16½ inches deep.

The standard paper tray holds 150 sheets, 50 percent more than the LaserWriter. It accommodates several sizes of paper, including letter, legal, A4, B5, A5, and half-letter. The paper tray incorporates a manual-feed guide that helps you feed those same paper sizes, plus envelopes. However, the manual-feed guide does not work well with small items such as individual 3-by-4-inch mailing labels (which the LaserWriter can handle). At press time General Computer had not decided whether to sell large accessory paper trays that hold 500 sheets under the printer. Similar accessory trays are available for other printers that use the same print engine, and they would probably work with the Personal LaserPrinter.

The Personal LaserPrinter normally stacks printed pages face down in a recessed area on top of its cabinet. This automatically places pages in normal ascending page-number order. By contrast, the LaserWriter places printed pages in reverse order, with the last page first. An auxiliary output path on the Personal LaserPrinter puts printed pages in reverse order, but it requires adding an accessory output tray to the printer on the side opposite the paper feed tray.

Compatibility

Printer compatibility has been a major bugaboo in the IBM PC world, one that the Macintosh community has avoided because almost all applications use Apple's Print Manager and PostScript for laser printing. While most applications use Apple's LaserWriter driver and Laser Prep file



for printing to a laser printer, one exception, *PageMaker*, supplies its own prep file, *AldusPrep*, to send additional PostScript routines to a PostScript-based printer. Now, the appearance of QuickDraw-based laser printers could introduce a new source of incompatibility. Different printers will require their own flavor of printer driver, and users will be forced to find out whether the applications they run behave correctly with a particular printer. It becomes the printer manufacturer's responsibility to ensure compatibility with applications.

Most applications need no modification to print on a Personal LaserPrinter. But some—such as *Cricket Draw*, *PageMaker*, and *Microsoft Word 3.0*—have unique QuickDraw extensions as well as PostScript-specific features. With those applications, you can create objects and effects that appear only when the document is printed on a PostScript device. *Adobe Illustrator* is even more device-specific, since it's meant to be a PostScript drawing program. General Computer hopes that future releases of the Personal LaserPrinter will be able to print all documents, but until then the QuickDraw printing scheme will continue to pose problems, since not all laser printers will work the same with all applications.

Apple is helping to promote device independence among applications and has recently begun discouraging developers from using device-specific (read PostScript-specific) printing schemes. Developers are working to free their applications from PostScript dependence by using *picComments* rather than embedded PostScript commands for special effects.

General Computer's QuickDraw-based laser driver differs from Apple's in the way the Personal LaserPrinter handles

nonprinting borders around the page. The Personal LaserPrinter, like the LaserWriter, cannot print right to the edges of a letter-size sheet of paper. The maximum printable area is about 87½ square inches, regardless of paper size; the nonprinting border dimensions change to make up the difference. LaserWriter driver versions 4.0 and higher let you choose a larger printable area, but if you do that you reduce the space for fonts. General Computer does not plan to include this option in the first release of the Personal LaserPrinter driver.

Printing Comes Full Circle

The first Mac printer, the ImageWriter, had no page-processing capabilities, relying instead on system software in the Mac to do that. Today's Macs have the power to do the same for 300-dpi laser printers. On a Mac Plus or a Mac SE, the Printing Manager and QuickDraw parts of the Mac's software Toolbox, together with clever printer driver software, can easily match or exceed a LaserWriter's speed and print quality.

The Personal LaserPrinter is the first product to be announced in this new printer category. It can't easily be shared by Macs on an AppleTalk network, and because of the slightly different letter spacing, it may not be the best choice as a proofing device for higher-resolution PostScript typesetters. But it certainly makes LaserWriter-quality printing more affordable for single Macs. People who have the money for a LaserWriter may instead choose a Personal LaserPrinter and spend the difference on souping up their Macs. □

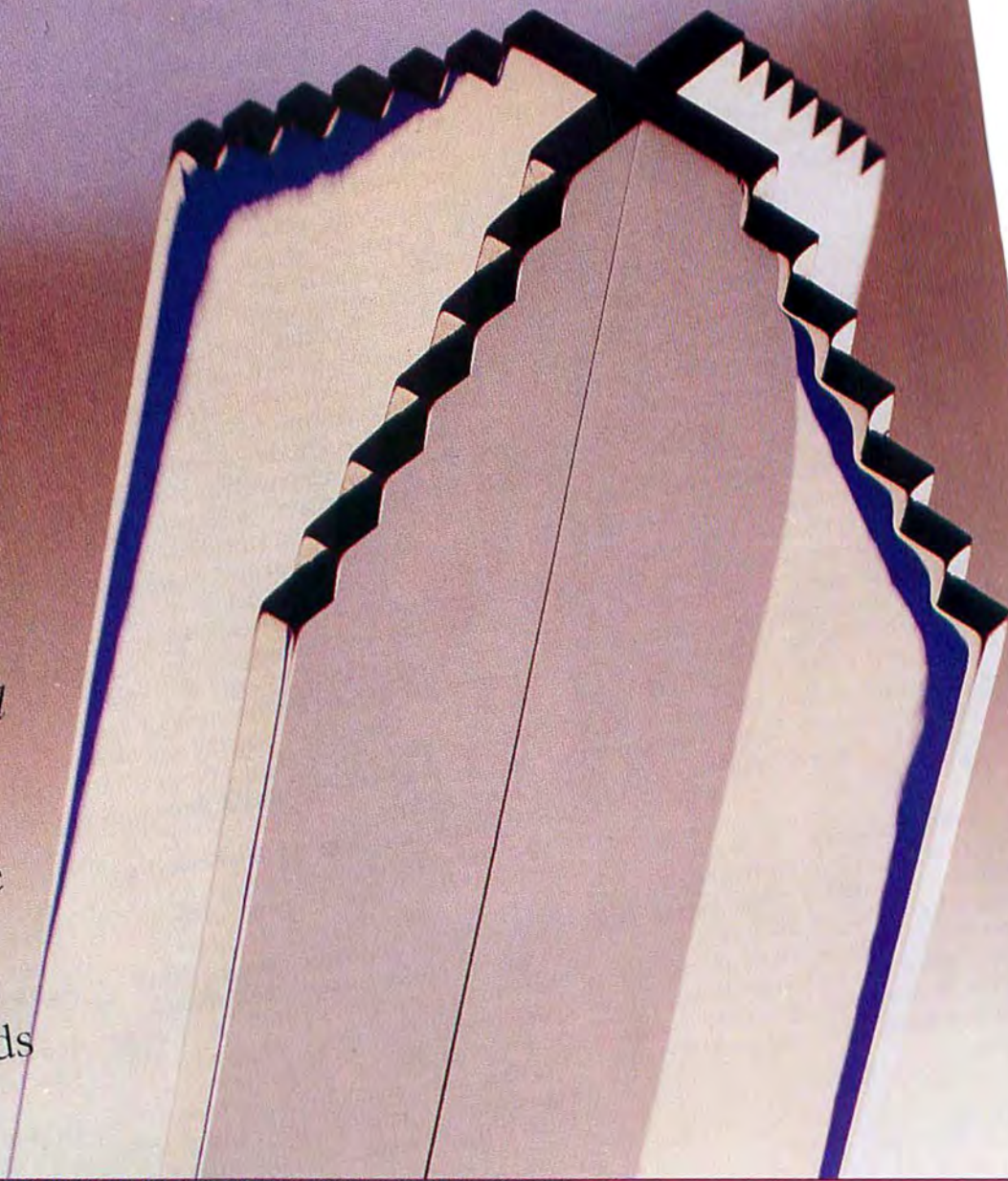
See *Where to Buy* for product details.

Chain Letters

Unlike the LaserWriter, the Personal LaserPrinter is chained to the Mac through the two SCSI connectors at the top. An option lets you connect the printer via the serial port (below). Neither method lets you connect the printer directly to AppleTalk.

World Class Macintosh

The results are in. In the February issue we asked readers to vote for their favorite Macintosh products in 39 categories. Although Mac owners generally need no prodding when it comes to voicing their opinions, *Macworld* offered three prizes as an incentive to respond. The three winners were chosen at random from the thousands



of responses we received. The grand-prize winner receives a World Class Macintosh system, consisting of a Macintosh Plus, a LaserWriter, and each of the top-voted hardware and software products. The runner-up receives a Macintosh Plus and a copy of each winning software package, and the third-prize winner receives a Macintosh Plus.

The Prizewinners

The grand-prize winner is Scott W. Allen of Woodland Hills, California. Mr. Allen works at an architectural firm in the Los Angeles area, where he uses his Mac to lay out and publish brochures, as well as to keep a database of client information. Mr. Allen also teaches several architecture classes at a community college, using the Mac to produce handouts, to print lab manuals, and to keep track of students' grades. Instead of sending materials to a copy shop to be laser printed, Mr. Allen will now be able to print them with the LaserWriter included with his World Class system.

The second-prize winner is John P. Turner, Jr., an English professor at Humboldt State University in Arcata, California. Mr. Turner uses his Mac to edit and lay out a user group newsletter, to compile bibliographies, and to connect to a local bulletin-board service. While serving as a graduate student adviser, he networked a number of Macs to the university's mainframe, allowing students to log on and contribute to a serial novel.

Our third-prize winner, Suzanne Brooks of Arlington, Virginia, works for a nonprofit organization that provides technical resources for a variety of projects aimed at fostering self-sufficiency in developing countries. Ms. Brooks uses the firm's Mac to write and lay out a newsletter and other publications, including technical manuals. She intends to use her new Mac Plus at home for personal and work-related projects.

The Winning Products

The following table shows the results of our World Class survey. In addition to the winning product in each category, products that received a significant percentage of the votes are listed. The "Others" entry shows the combined percentage for the remaining products; a large number here indicates a large number of contenders in a category. To show the degree of reader interest in particular types of products, we've listed the percentage of survey respondents who voted for products in each category.

Although reader selections should not be construed as endorsement by *Macworld*, they are an important indication of our readers' preferences. The survey results provide valuable information about what hardware and software products *Macworld's* readers use, allowing us to tailor our product coverage to meet readers' needs.

There were few surprises in the survey results. Predictably, industry giants Apple and Microsoft had many of the categories sewn up; Apple placed first or second in 10 of the 39 categories, while Microsoft won or placed in 9 of them. There is hope for the little guy, however: Scott Watson's *Red Ryder* communications program, a veteran of the shareware circuit, placed first in the General Communications category and second in Micro-to-Mainframe Communications.

Another up-and-coming program is Living Video-text's *More*, which captured significant numbers of votes in several areas. *More* was in the running in the Project Management and Business Presentation categories; it placed second in both Personal Management and Most Promising Software Newcomer; and it was voted the leading Outline Processor as well. This range of responses is not only a tribute to *More*, but also shows the versatility of Mac programs in general. When you scan the table, you'll notice several products that make an appearance in more than one category.

If vote percentages are any indication of how our readers are using their Macs, then word processors are the most popular application, followed closely by spreadsheets, graphics, and games. Desktop publishing seems to be going strong as well, with 40 percent of the contestants voting in that category. (Two of our contest winners use *PageMaker* to produce newsletters and other publications.) The desktop publishing boom may also account for the popularity of the Radius Full Page Display, a large screen that placed first in two hardware categories: Display (Monitor) and Most Promising Newcomer.

We'd like to thank our readers for taking the time to respond. It is, after all, the product users who ultimately decide which products will be successful; we hope to continue the World Class contest next year, giving you another chance to voice your opinions.

Hardware

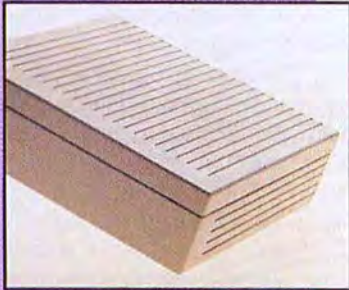
Display (Monitor)



% of Votes Product, Manufacturer

75	Radius Full Page Display, Radius
15	The Big Picture, <i>E-Machines</i>
3	MegaScreen, <i>MicroGraphic Images</i>
7	Others
100	Total
(26% of respondents voted in this category)	

Hard Disk



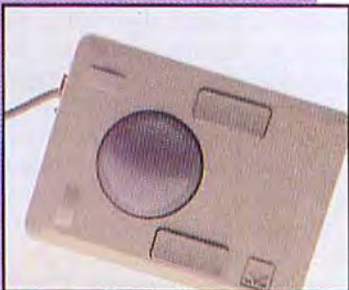
18	Hard Disk 20, Apple Computer
9	DataFrame XP-20, <i>SuperMac Technology</i>
7	Hard Disk-20SC, <i>Apple Computer</i>
7	HyperDrive 20, <i>General Computer</i>
6	HyperDrive FX-20, <i>General Computer</i>
6	DataFrame 20, <i>SuperMac Technology</i>
41	Others
100	Total
(44% of respondents voted in this category)	

Alternate Mass Storage



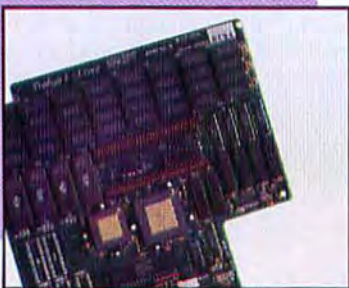
24	Apple 800K External Drive, Apple Computer
15	Bernoulli Box 20 + 20, <i>Iomega Corp.</i>
6	Apple 400K External Drive, <i>Apple Computer</i>
55	Others
100	Total
(16% of respondents voted in this category)	

Input Device



30	Turbo Mouse, Kensington Microware
16	Apple Mouse, <i>Apple Computer</i>
9	Softstrip, <i>Cauzin Systems</i>
9	MacTablet, <i>Summagraphics</i>
6	Numeric Turbo, <i>Cambridge Automation</i>
5	A+ Mouse, <i>Mouse Systems Corp.</i>
25	Others
100	Total
(17% of respondents voted in this category)	

Macintosh CPU Upgrade



44	Prodigy 4, Levco
3	TurboMax, <i>MacMemory</i>
2	HyperDrive 2000, <i>General Computer</i>
51	Others
(15% of respondents voted in this category)	

Hardware

Printer-Dot Matrix



% of Votes Product, Manufacturer

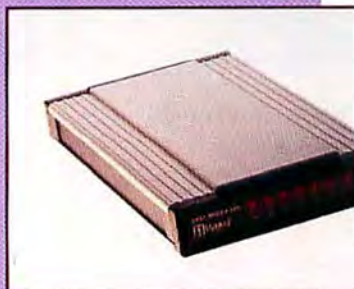
77	ImageWriter II, Apple Computer
17	ImageWriter, Apple Computer
6	Others
100	Total
(51% of respondents voted in this category)	

Digitizer/Scanner



65	ThunderScan, Thunderware
13	Abaton Scan 300, Abaton Technology Corp.
6	MacVision, F.T. Industries
3	AST TurboScan, AST Research
3	PC Scan Plus, Dest
10	Others
100	Total
(28% of respondents voted in this category)	

Modem



20	Smartmodem 2400, Hayes Microcomputer Products
19	Smartmodem 1200, Hayes Microcomputer Products
14	Apple Personal Modem, Apple Computer
8	Courier 2400, USRobotics
7	Apple Modem 1200, Apple Computer
32	Others
100	Total
(29% of respondents voted in this category)	

Printer-Laser



96	LaserWriter/LaserWriter Plus, Apple Computer
4	Others
100	Total
(38% of respondents voted in this category)	

Plotter



36	HP 7475A, Hewlett-Packard
13	HP ColorPro, Hewlett-Packard
51	Others
100	Total
(5% of respondents voted in this category)	

Hardware

Network Server



% of Votes Product, Manufacturer

- 26 **TOPS, Centram**
- 11 3Server, 3Com
- 63 Others
- 100 Total

(9% of respondents voted in this category)

Most Promising Newcomer

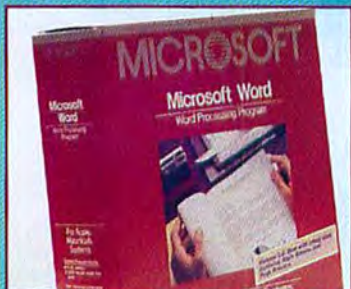


- 27 **Radius Full Page Display, Radius**
- 6 Dynamac, Dynamac Computer Products
- 6 Softstrip, Cauzin Systems
- 6 The Big Picture, E-Machines
- 55 Others
- 100 Total

(19% of respondents voted in this category)

Software

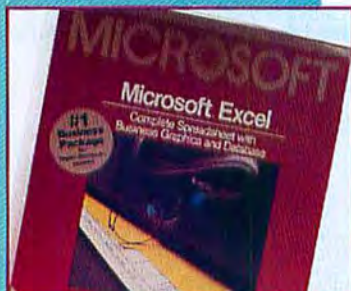
Word Processor



- 64 **Microsoft Word, Microsoft Corp.**
- 23 MacWrite, Apple Computer
- 8 WriteNow for Macintosh, T/Maker
- 5 Others
- 100 Total

(76% of respondents voted in this category)

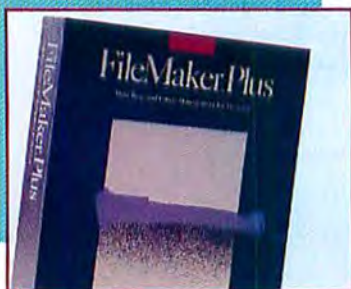
Spreadsheet



- 78 **Microsoft Excel, Microsoft Corp.**
- 13 Microsoft Multiplan, Microsoft Corp.
- 9 Others
- 100 Total

(61% of respondents voted in this category)

Database Management

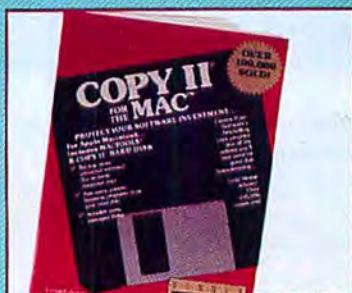


- 16 **FileMaker/FileMaker Plus, Forethought**
- 16 **Helix/Double Helix/Multiuser Helix, Odesta Corp.**
- 15 Reflex for the Mac, Borland International
- 14 Omnis 3, Blyth Software
- 12 Microsoft File, Microsoft Corp.
- 10 OverVue, ProVue Development
- 17 Others
- 100 Total

(48% of respondents voted in this category)

Software

Utilities—Disk and File



% of Votes Product, Manufacturer

51	Copy II Mac, Central Point Software
12	Fedit Plus, MacMaster Systems
37	Others
100	Total

(33% of respondents voted in this category)

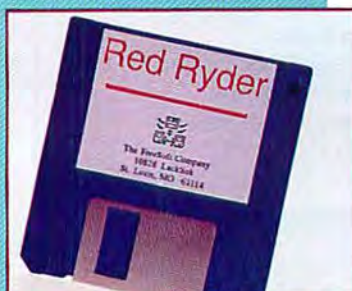
Utilities—Programming



18	ResEdit, Apple Computer
7	Tempo, Affinity Microsystems
7	Fedit Plus, MacMaster Systems
7	QUED, Paragon Concepts
6	TMON, ICOM Simulations
5	MacNosy, Jasik Designs
50	Others
100	Total

(11% of respondents voted in this category)

Communications—General



41	Red Ryder, FreeSoft
16	Smartcom II, Hayes Microcomputer Products
14	MicroPhone, Software Ventures
13	MacTerminal, Apple Computer
16	Others
100	Total

(33% of respondents voted in this category)

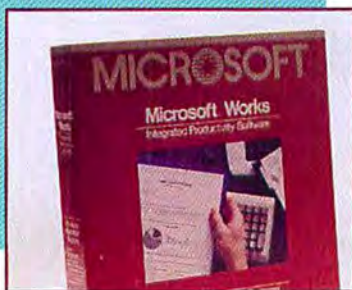
Programming Language



25	Microsoft BASIC, Microsoft Corp.
15	Lightspeed Pascal, Think Technologies
13	TML Pascal, TML Systems
11	Turbo Pascal, Borland International
11	LightspeedC, Think Technologies
25	Others
100	Total

(32% of respondents voted in this category)

Integrated Products



50	Microsoft Works, Microsoft Corp.
28	Microsoft Excel, Microsoft Corp.
16	Jazz, Lotus Development Corp.
6	Others
100	Total

(30% of respondents voted in this category)

Software

Desktop Publishing

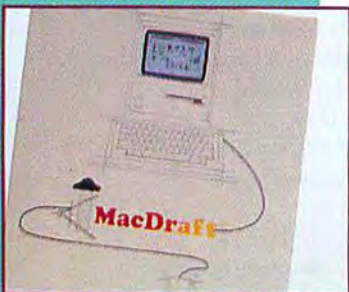


% of Votes Product, Manufacturer

- 56 **PageMaker, Aldus Corp.**
- 37 ReadySetGo, Manhattan Graphics/Letraset
- 7 Others
- 100 Total

(40% of respondents voted in this category)

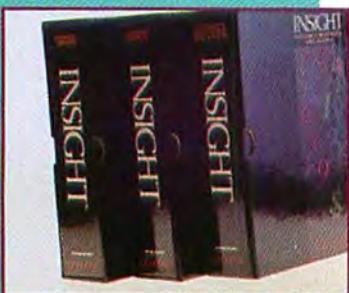
Graphics—CAD



- 47 **MacDraft, Innovative Data Design**
- 10 MacDraw, Apple Computer
- 8 MiniCad, Diehl Graphsoft
- 7 Mac3D, Challenger Software Corp.
- 6 MacCAD, CompServeCo
- 22 Others
- 100 Total

(17% of respondents voted in this category)

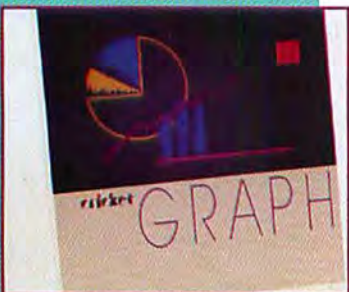
Accounting



- 27 **Insight, Layered, Inc.**
- 17 Rags to Riches, Chang Labs
- 16 Dollars and Sense, Monogram
- 7 Back to Basics, Peachtree Software
- 33 Others
- 100 Total

(40% of respondents voted in this category)

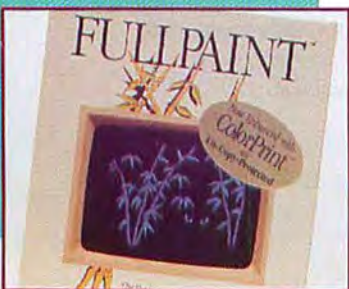
Graphics—Business Presentation



- 37 **Cricket Graph, Cricket Software**
- 16 Microsoft Chart, Microsoft Corp.
- 14 Microsoft Excel, Microsoft Corp.
- 9 MacDraw, Apple Computer
- 8 More, Living Videotext
- 16 Others
- 100 Total

(31% of respondents voted in this category)

Graphics—Paint/Draw/Animation

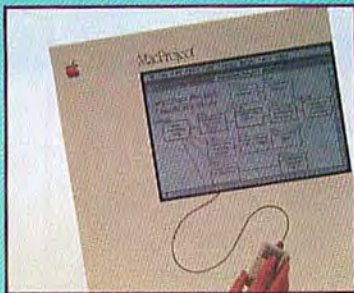


- 29 **FullPaint, Ann Arbor Softworks**
- 27 SuperPaint, Silicon Beach Software
- 16 MacDraw, Apple Computer
- 11 MacPaint, Apple Computer
- 5 Cricket Draw, Cricket Software
- 12 Others
- 100 Total

(56% of respondents voted in this category)

Software

Project Management



% of Votes Product, Manufacturer

- 61 **MacProject, Apple Computer**
- 19 Micro Planner Plus, *Micro Planning Software*
- 9 More, *Living Videotext*
- 11 Others
- 100 Total

(17% of respondents voted in this category)

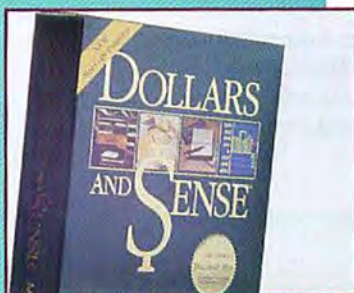
Outline Processing



- 73 **More, Living Videotext**
- 9 Acta, *Symmetry Software*
- 9 ThinkTank/ThinkTank 512, *Living Videotext*
- 9 Others
- 100 Total

(27% of respondents voted in this category)

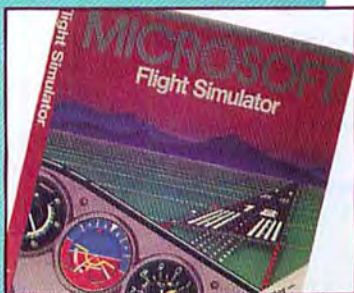
Personal Management



- 32 **Dollars and Sense, Monogram**
- 11 More, *Living Videotext*
- 8 SideKick, *Borland International*
- 7 Home Accountant, *Haba/Arrays, Inc.*
- 7 MacMoney, *Survivor Software*
- 35 Others
- 100 Total

(12% of respondents voted in this category)

Games



- 20 **Microsoft Flight Simulator, Microsoft Corp.**
- 11 Dark Castle, *Silicon Beach Software*
- 7 Déjà Vu, *Mindscape*
- 6 MacGolf, *Practical Computer Applications*
- 5 Uninvited, *Mindscape*
- 5 Wizardry, *Sir-Tech Software*
- 4 Airborne, *Silicon Beach Software*
- 4 Sargon III, *Hayden Software*
- 4 Shanghai, *Activision*
- 4 The Ancient Art of War, *Brøderbund Software*
- 4 Gato, *Spectrum HoloByte*
- 26 Others
- 100 Total

(53% of respondents voted in this category)

Software

Tax Planning/ Preparation



% of Votes Product, Manufacturer

- 74 **MacInTax, SoftView**
 - 8 Microsoft Excel, *Microsoft Corp.*
 - 5 Forecast, *Monogram*
 - 13 Others
 - 100 Total
- (13% of respondents voted in this category)

Statistics/Math



- 36 **StatView 512+, BrainPower**
 - 18 StatWorks, *Cricket Software*
 - 8 Systat, *Systat*
 - 7 PowerMath, *Industrial Computations*
 - 6 MacSpin, *D² Software*
 - 25 Others
 - 100 Total
- (12% of respondents voted in this category)

Spelling Checker



- 37 **MacLightning, Target Software**
 - 23 Spellswell, *Working Software*
 - 15 Thunder, *Batteries Included/Electronic Arts*
 - 9 MacSpell+, *Creighton Development*
 - 16 Others
 - 100 Total
- (35% of respondents voted in this category)

Music



- 25 **ConcertWare+, Great Wave Software**
 - 21 Deluxe Music Construction Set, *Electronic Arts*
 - 20 Studio Session, *Impulse, Inc.*
 - 9 MusicWorks, *Hayden Software*
 - 7 ConcertWare+ MIDI, *Great Wave Software*
 - 5 Professional Composer, *Mark of the Unicorn*
 - 4 Performer, *Mark of the Unicorn*
 - 9 Others
 - 100 Total
- (18% of respondents voted in this category)

Desk Accessory



- 17 **SideKick, Borland International**
 - 8 Battery Pak, *Batteries Included/Electronic Arts*
 - 8 Smart Alarms, *Imagine Software*
 - 6 MockPackage, *CE Software*
 - 6 TopDesk, *Cortland Computer*
 - 5 Tempo, *Affinity Microsystems*
 - 5 Acta, *Symmetry Software*
 - 45 Others
 - 100 Total
- (34% of respondents voted in this category)

Software

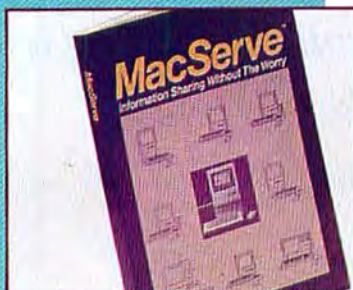
Micro-to- Mainframe Communications



% of Votes Product, Manufacturer

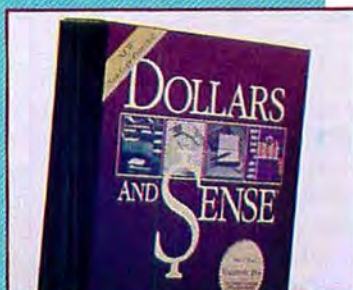
20	MacTerminal, Apple Computer
19	Red Ryder, <i>FreeSoft</i>
9	VersaTerm, <i>Peripherals, Computers, & Supplies, Inc.</i>
52	Others
100	Total
(8% of respondents voted in this category)	

File Server



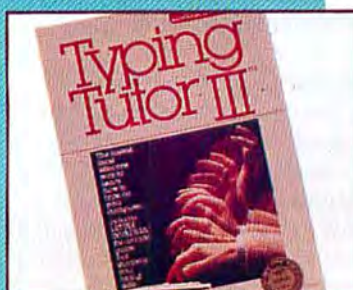
46	MacServe, Infosphere
24	TOPS, <i>Centram</i>
30	Others
100	Total
(10% of respondents voted in this category)	

Financial/ Investment



33	Dollars and Sense, Monogram
13	Market Pro, <i>Pro Plus Software</i>
10	MacMoney, <i>Survivor Software</i>
9	Profit Stalker II, <i>Button.down Software</i>
8	Market Manager Plus, <i>Dow Jones</i>
8	Microsoft Excel, <i>Microsoft Corp.</i>
19	Others
100	Total
(8% of respondents voted in this category)	

Education/ Training



20	Typing Tutor III, Simon and Schuster Computer Software
15	KidsTime, <i>Great Wave Software</i>
9	ChipWits, <i>BrainPower</i>
5	Geometry, <i>Broderbund Software</i>
4	MacType, <i>Palantir Software</i>
47	Others
100	Total
(12% of respondents voted in this category)	

Most Promising Newcomer



7	SuperPaint, Silicon Beach Software
5	More, <i>Living Videotext</i>
5	Cricket Draw, <i>Cricket Software</i>
5	WriteNow for Macintosh, <i>TiMaker</i>
5	Guide, <i>OWL Software</i>
5	Trapeze, <i>Data Tailor</i>
68	Others
100	Total
(30% of respondents voted in this category)	

The Desktop Publishing Shopper

The key to publishing productivity is finding a program that meets your needs

by Jim Heid

If a psychologist used the phrase *desktop publishing* in a word association test, the likely response would be "newsletters." Microcomputer page-layout programs are so strongly associated with pint-size periodicals that it's often hard to imagine them being used for anything else.

But they are. A survey of the desktop publishing field reveals a diverse set of applications ranging from brochures and business plans to newsletters and technical publications. Corresponding to these applications is an accordingly diverse set of requirements. For example, a program that's suitable for publishing a book may not be appropriate for producing an advertisement. If you're preparing to publish, you should first assess the demands of the job and learn which collection of product features best satisfies those demands. Learning how to identify your requirements will go a long way toward helping you select the best desktop publishing software for the work at hand.

This overview of common desktop publishing applications (and the features they require) is designed to help you decide what type of software is most appropriate for your needs. Under each group of applications you'll find descriptions of the various programs that best accomplish the necessary tasks. However, nothing can take the place of an in-depth product review. Before making a purchasing decision, you should read individual reviews and carefully evaluate each product on its own merits.

Some of the products mentioned here are designed specifically for desktop publishing; others are word processors or drawing programs whose text-formatting capabilities allow them to infiltrate the desktop publishing camp. It's important to remember that there are few sharp boundaries delineating publishing applications and program categories. A program's absence from one category doesn't necessarily mean it can't tackle that application, only that other programs are better suited for it.

Periodicals

Applications: *newsletters, magazines*. Products: *PageMaker, ReadySetGo, Scoop, XPress*. Newsletters don't own the desktop publishing field, but they may have a controlling interest. All the leading publishing programs cater to the kind of periodical publishing that businesses, special interest groups, and entrepreneurs have embraced with a vengeance. And because newsletter publishing requires a well-rounded mix of capabilities, a program that's suited to newsletters can also handle many other publishing tasks, such as reports, short books, and manuals.

Like most publications, newsletters usually have a consistent design from page to page and from issue to issue, and require certain text and graphic elements,



such as issue dates and rules, to repeat on each page. *PageMaker* pioneered *master pages*—special work pages for holding elements that appear on every page. You can create separate master pages for left- and right-hand pages and hide the master elements on pages that have a unique design. *ReadySetGo* 3.1, *XPress*, and *Scoop* offer similar master-page features. (At press time, *Scoop* was still a prerelease product. *Scoop*'s manufacturer, Target Software, claims the program will be available by the end of summer.)

Newsletter publishing almost always means multi-column pages; a program that lets you easily create and adjust them is a must. *PageMaker*'s Column Guides command lets you create up to 20 equally spaced columns on a page. To create columns of unequal width, drag the column guides after *PageMaker* creates them. *ReadySetGo* lets you choose from 8 pre-

set design grids containing from 1 to 8 columns, or create a custom grid with any number of columns and rows (rows are horizontal dividing lines). *Scoop* provides similar custom grid features and adds a Place Columns command that creates columns within a selected area, letting you mix and match column layouts on the same page. Unequal-width columns with *ReadySetGo*, *Scoop*, and *XPress* require more work than with *PageMaker*; however, because you can't drag the guides the program creates.

The columns in periodicals are usually narrow, and narrow columns impose an aspirin bottle's worth of text-handling headaches. If the columns have a ragged right margin, the degree of ragging—each line's relationship to the right margin and to the lines above and below it—influences the overall appearance of the

text. Ragged columns whose right edges vary wildly, with some lines falling far short of the full measure, can detract from the page and waste space. In justified columns, words too long to fit on a line force the program to add grand canyons of space between words and letters to justify the line.

Both headaches can be remedied by an automatic hyphenation facility. *Dictionary-based* hyphenation such as *PageMaker's* is the most accurate but tends to be slower than the *algorithmic* (rule-based) hyphenation offered by *XPress*, *Scoop*, and *ReadySetGo*. Those three also provide *exception dictionaries* to which you can add error-prone words like *program*. Another feature that helps bridge the word gaps in justified text is the ability to control the maximum amount of space added between words and letters.

The articles in periodicals usually span more than one column and often continue on subsequent pages. *Text reflow*—the ability to break lines and reshuffle the text in a lengthy story as it's edited—is a godsend to anyone who's peeled and pasted strips of type after a last-minute edit. With *ReadySetGo*, *Scoop*, and *XPress*, creating a linked story means first creating *text blocks* in each location where the story will appear, then linking the blocks by clicking the mouse pointer within

each. *PageMaker* makes it a bit easier by automatically creating text boxes and the link between them as you place a lengthy document.

Periodicals usually contain illustrations, so graphics support is a must. All four programs discussed here can place *MacPaint*- and *PICT*-format images. *Page-*

The better equipped your electronic layout table is, the sooner you can call it a day.

Maker and *ReadySetGo's* TIFF support is useful for placing scanned photographs, as is *Scoop's* ability to place graphics created with Abaton's C-Scan 300 scanner. All support the EPS format, allowing them to place graphics created with Adobe's *Illustrator* and Cricket's *Cricket Draw*.

A variation on the graphics theme involves enhancing your pages with rules or shapes such as boxes and circles, a requirement all four programs meet with drawing tools and the ability to draw rules of various weights and styles. The four also let you create shaded rules and shapes. *Scoop* is the shadiest of the bunch, offering shades from 0 percent (white) to 100 percent (black) in 1 percent increments.

Newsletter production is a layout-intensive task, and the better equipped your electronic layout table is, the sooner you can go home. Features that streamline interactive page layout include on-screen measuring rulers, various viewing scales for viewing pages in different degrees of magnification, a page palette or Go To Page command for quickly jumping to a certain page, and "snap-to" column guides and grid lines, which allow fast, precise positioning by exerting a pull on elements dragged near them.

The Forms Generation

Applications: *business forms*. Products: *PageMaker*, *ReadySetGo*, *Scoop*, *XPress*, *Cricket Draw*, *MacDraw*, *GraphicWorks*, *Ragtime*, many database managers.

Another layout-intensive publishing application is the production of forms—those rule-riddled pages that hold everything from credit histories to personnel information to insurance claims. The primary requirement for forms production is a program that can mix text with rules and boxes, and that streamlines the layout process with on-screen rulers, snap-to grids and

Figure 1
Laura Larumar of MAX design studio in San Francisco used *ReadySetGo 3.0* to produce this dealer newsletter for Apple. An artist created the drawings in *SuperPaint*; the color separations were cut by hand.



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TOTAL PARTS

SUBTOTAL

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guides, and the other layout tools mentioned earlier. The newsletter production programs just discussed meet those needs handily. *XPress* and *ReadySetGo* are especially adept at forms creation. To create a series of parallel rules, for example, you draw one rule, choose *XPress*'s Step and Repeat command, and specify the spacing between rules and the number of times the rule should repeat. Click OK, and *XPress* replicates the rule in a flash. *ReadySetGo*'s Duplicate Object command lets you perform the same operation. *Scoop* also provides a Duplicate command to quickly copy a selected shape.

Drawing programs like *MacDraw* and *Cricket Draw* also make good forms-production tools. And if your forms will be holding data that would benefit from computerized storage, consider one of the many database managers that provide form-design features. *FileMaker Plus*, *Microsoft File*, *dBase Mac*, *Business Fivision*, *Reflex*, and *Helix* all provide interactive layout capabilities that let you create attractive forms.

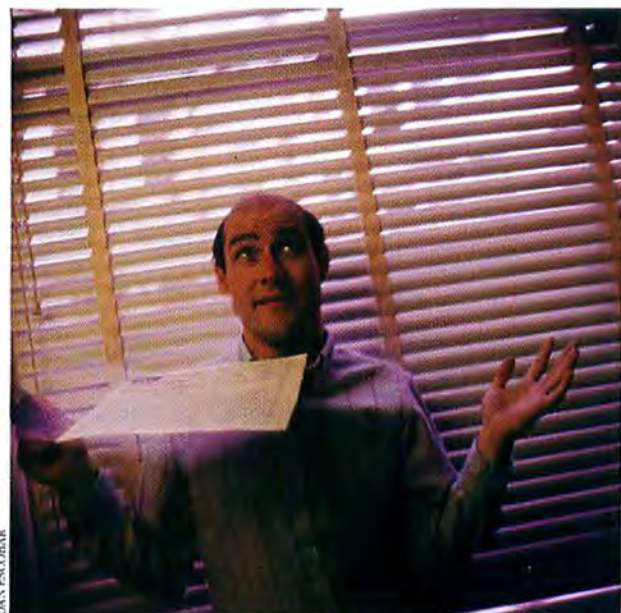
Flashy Jobs

Applications: menus, advertisements, brochures, package design, magazine spreads. Products: *XPress*, *Scoop*, *PageMaker*, *ReadySetGo*.

The first generation of desktop publishing programs couldn't measure up to the standards set by

Figure 2

The Mac's ability to act as an efficient front end for a typesetter has enabled people like writer, publisher, and printer Jim Morton to develop a profitable sideline in forms design. Because the form shown above includes both horizontal and vertical titles, Morton designed it in Cricket Draw. His usual forms program is PageMaker, which he also used to lay out his latest book, *Pop Void*, a collection of offbeat essays on topics from Kraft Macaroni and Cheese Dinner to Nancy Sinatra.



professional designers and type houses. Their click-and-drag, interactive styles were ideal for laying out graphically complex publications, but they lacked the features necessary for producing top-notch typography and *runarounds*—text whose margins vary to flow around the nooks and crannies of an irregularly shaped graphic. Today, several programs provide excellent typographic control, and three—*XPress*, *ReadySetGo*, and *Scoop*—can automatically create runarounds with an ease that would make many typographers' jaws drop.

Producing high-quality type requires control over interletter and interword spacing. Automatic *pair kerning* features, found in *PageMaker*, *XPress*, and *Scoop*, use the *kerning tables* that are built into most PostScript fonts to improve the appearance of letter pairs such as *To* and *Yo*. Manual kerning commands, available in the aforementioned programs as well as in *ReadySetGo*, let you specify the amount of space between letters. *PageMaker* and *XPress* accept kerning values in fractional increments of an em space, while *ReadySetGo* and *Scoop* require values in points. Because the width of an em depends on the text's font and size, the manual kerning facilities in *PageMaker* and *XPress* are more precise and better suited to fine-tuning text in 16-point and smaller fonts.

Another common typographic trick involves removing or adding space between each character in a line or block of type. Known as *tracking control*, this technique lets you tighten the letter-spacing in a headline to achieve a common effect typographers often

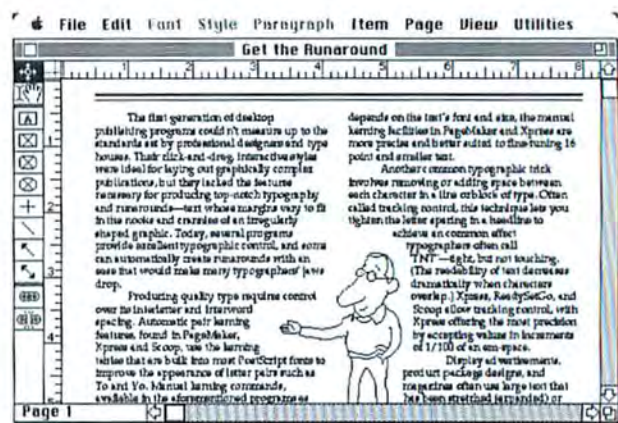


Figure 4

In addition to requiring top-drawer type, flashy jobs often contain runarounds, which can be costly to have typeset. Interactive publishing programs like Quark's *XPress* (shown here), Letraset's *ReadySetGo* 3.1, and Target Software's *Scoop* let you produce runarounds with a few mouse clicks.

call *TNT*—tight but not touching. (The readability of text decreases dramatically when characters overlap.) *XPress*, *ReadySetGo*, and *Scoop* allow tracking control, with *XPress* offering the most precision by accepting values in increments of $1/100$ em space.

Display advertisements, product package designs, and magazines often use large text that has been stretched (expanded) or compressed (condensed) for an added visual effect. With *XPress* and *Scoop*, you can alter the width of text directly by simply selecting the text, choosing a command, and selecting a scaling value. *PageMaker* lacks scaling commands, but you can achieve the same effect by typing a headline in *MacDraw*, copying it to the Clipboard, then pasting it into the publication and resizing it as you would a picture. One drawback of this workaround is that you can't edit the text or change its style.

A Spot of Color

Applications: publications that will be printed with spot color. **Products:** *XPress*, *Scoop*, *Cricket Draw*.

Color adds a great deal to a publication, if you have the budget for it. *XPress* and *Scoop* are the first Mac publishing programs that allow you to use *spot color*—single colors used for elements such as rules and headlines.

With *XPress*, adding spot color is a matter of selecting some text or a graphic element, choosing the *Modify* command, and selecting from a palette of eight colors. To separate the colors for printing, you choose the *Print* command and click the *Make Separations* check box, and for each color *XPress* prints a separate copy of the page, with registration marks that a printer will use to align the colors.



Figure 3

Flashy indeed. Designer Ann Cochran used Adobe Illustrator to create the display type and art for this layout, and then assembled the tabloid-size page in PageMaker. Adobe's new Separator DA was used to produce four film negatives for the color.

Scoop's approach to color is more complex. A *Scoop* document comprises eight overlapping *planes*, one each for black, cyan, magenta, yellow, white, red, green, and blue. All text and graphics you place are ini-

XPress and Scoop are the first Mac publishing programs that enable you to use spot color.

tially on the black plane, but you can move any object to any other plane by selecting the object and using *Scoop's* Change Plane command. The advantage of this approach is that you can selectively "turn off" any or all planes, allowing you to see only those objects for a given color. Like *XPress*, *Scoop* can separate the colors at printing time.

The Business End of Publishing

Applications: *executive summaries, profit and loss statements, departmental reports, business plans*. Products: *Ragtime*.

Managers responsible for producing business plans and weekly or monthly reports often need publishing programs that let them include figures from a spreadsheet. While any interactive publishing program can meet that need through the Mac's Clipboard, a harried manager may not have time to grapple with Cut and Paste commands.

One possible solution is *Ragtime*, which combines spreadsheet features with an easy-to-use desktop publishing foundation (see *Reviews, Macworld*, February 1987). *Ragtime* lets you create a spreadsheet "frame" anywhere within a publication. Its spreadsheet features would never be mistaken for those of *Microsoft Excel*, but they are complete enough for many business tasks. Publishing features such as kerning, on-screen rulers, automatic hyphenation, and the ability to read formatted word processing documents are missing from its desktop publishing toolbox, but considering the program's business slant, these omissions probably aren't drawbacks. A manager who doesn't have time to cut and paste isn't likely to be snuggling a lowercase *o* under a capital *T*.

The Joy of Text

Applications: *books, manuals, lengthy reports, technical publications*. Products: *Word 3.0, MacTeX, Textures, Just Text*.

For some people, desktop publishing means being able to produce books and manuals at a fraction

of the cost of conventional typesetting and production. Such lengthy jobs can be handled by a general-purpose interactive publishing program like *Page-Maker*, but only up to a point. Projects requiring hundreds of pages, tables of contents, indexes, footnotes, and formulas call for a program with industrial-strength text handling talents—even if those talents come at the expense of simplicity.

One such program is *Microsoft Word 3.0*. It's billed as a word processor, but *Word 3.0* has enough text-formatting features to pass muster for some book publishing tasks. A single *Word 3.0* document can be up to a half-million characters in length, although only a high-stakes gambler would trust roughly 600 single-spaced pages to one document. However, an index in *Word 3.0* is limited to 1500 entries. Also, with the initial *Word 3.0* release many people reported problems handling long documents—problems Microsoft claims to have fixed in its 3.01 version, but at press time users had not begun to test the newer version.

A safer approach is to divide a publication into separate but linked documents. Linking documents allows *Word* to maintain continuous page numbering and to generate a table of contents and an index. You create the latter elements by typing codes such as *.i*, where you want each index and table-of-contents entry, then formatting the codes in *Word's* hidden font style. You can also create a complex formula—the bane of a typesetter's existence—by typing single-letter codes that indicate such components as arrays and square roots.



At U.S. West Direct in Seattle, Gary Jaycox is setting up a system that enables salespeople selling Yellow Pages ads for the regional phone company to produce their own color mock-ups. Sales staffers create the ads in CricketDraw and Illustrator, and then use XPress's spot-color function to make separations for red and black elements. A Canon copier combines the laser-printed separations to produce 300-dpi, two-color proofs.

Common Ground

Regardless of the kinds of publications you produce, you'll want to examine how the publishing programs you evaluate handle the basics. Because every desktop publishing task involves working with text, text-manipulation features form the core of a desktop publishing program. Some, most notably *PageMaker*, take a minimalist approach to text editing. The manufacturers of these programs recommend that you use a separate word processor to create text, and that you use their programs' lightweight editing features for correcting typos, creating captions and headlines, and making minor revisions.

But more publishing programs are adding word-slinging features. *XPress* and *ReadySetGo* 3.0 offer search-and-replace commands; *ReadySetGo* provides the ability to search and replace both text and formatting attributes. Both these programs, as well as *Scoop*, also

offer spelling checkers. *ReadySetGo* 3.0 has a glossary that holds common words and phrases for quick recall. Such features are useful, but they're far from vital. For one thing, the people who lay out the pages aren't always the same ones who write the text, and writers tend to have favorite word processors that fit them like an old pair of slippers.

A more basic reason is that desktop publishing programs don't make good word processors—which is why most publishing programs can read and retain the formatting of documents created with popular word processors. The layout-table metaphor and the approach to handling a single article as a series of linked blocks or frames impose restrictions and extra steps that distract from the writing process.

Text-processing features may not be vital, but text-formatting features are. All publishing programs allow multicolumn

pages of various sizes and orientations and can automatically reflow text throughout an article after editing changes. Other formatting options include tabs for aligning columns of numbers in tables, commands for adjusting the spacing between words and letters in justified type, and commands for controlling *leading*, the horizontal spacing between lines.

But few publications live by text alone. Most desktop publishing programs allow you to paste graphics from the Mac's Clipboard and, better still, to directly place *MacPaint* and PICT-format graphics. *PageMaker*, *Scoop*, and *XPress* can also place graphics stored in encapsulated PostScript format (EPS) that many illustration and drawing programs support, and in the tagged image file format (TIFF) that many scanners use. (For basics on graphics file formats, see "Getting Started with Graphics," *Macworld*, July 1987.)

Word 3.0 lacks the what-you-see-is-what-you-get (WYSIWYG) layout features of an interactive publishing program. Columns don't appear alongside each other on screen, for example, and headers, footers, and footnotes don't appear in their final position. Fortunately, however, the Page Preview command lets you see how the final product will look and make adjustments in margins and in header and footer positions.

Word 3.0 is an adequate book-publishing tool, but it lacks the fine typographic control necessary for producing high-quality books. It can't, for example, kern text or justify margins by altering interletter as well as interword spacing. Two products in the book-publishing league that provide this control are *MacTeX* and *Textures*; the latter was still in development at press time. Both programs are versions of the TeX (pro-

nounced *tech*) typesetting language developed by Stanford University professor Donald Knuth for the production of his equation-laden *Art of Computer Programming* book series.

These TeX-based products, and Knowledge Engineering's *Just Text*, are *command-driven* publishing programs. Instead of providing WYSIWYG displays and enabling you to position elements by clicking and dragging, they rely on typed formatting commands to specify margins, type styles and sizes, word-spacing values, and all the other measurements necessary to produce a page.

Using command-driven programs is similar to using a conventional phototypesetting machine. Both require a large investment in learning time, but they reward the investor with capabilities that WYSIWYG programs only dream of. *MacTeX*, for example, can produce text in sizes from 1 point to 2048 points, ver-

sus most WYSIWYG programs' 4- to 127-point range. And both *MacTeX* and *Textures* provide preview windows that show what your commands produce. *MacTeX* also makes talking in codes less intimidating because of its ability to translate formatted *Word* and *MacWrite* documents.

Using command-driven programs is similar to using conventional photo-typesetting machines.

TeX-based products also let you create formatting macros—entire series of TeX commands that you can refer to by a single name. If you define macros that govern a publication's appearance, you can make wholesale formatting changes in a flash by editing the appropriate commands in the macro, rather than editing hundreds of individual commands throughout the publication. Entire libraries of canned TeX macros are available for producing books and other lengthy documents. Canadian graphic arts giant McCutcheon Graphics has released *Page One*, a series of 50 *MacTeX* templates for book publishing.

With layout-table-style programs, the temptation is great to make last-minute edits on the pasted-up text rather than in the original files, which would leave



Figure 5

For some applications, the best publishing program may actually be a database manager. Here, *Forethought's* FileMaker Plus displays a page from a catalog that doubles as an inventory database. Most Macintosh data managers support graphics, can mix fonts, and have excellent forms-drawing tools, making them good candidates for catalog and form production.

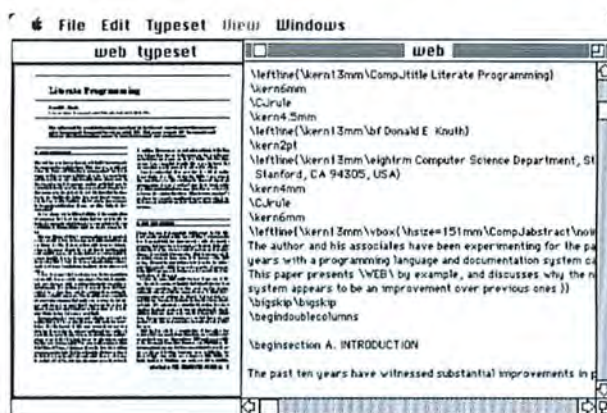


Figure 6

Although code-oriented programs like Addison-Wesley's *Textures* add an imposing learning curve to the publishing process, they're the best choice for producing lengthy documents that require tables of contents, indexes, arithmetic equations, and frequent revisions. Here, *Textures* shows a preview of the page produced by the code in the right window.

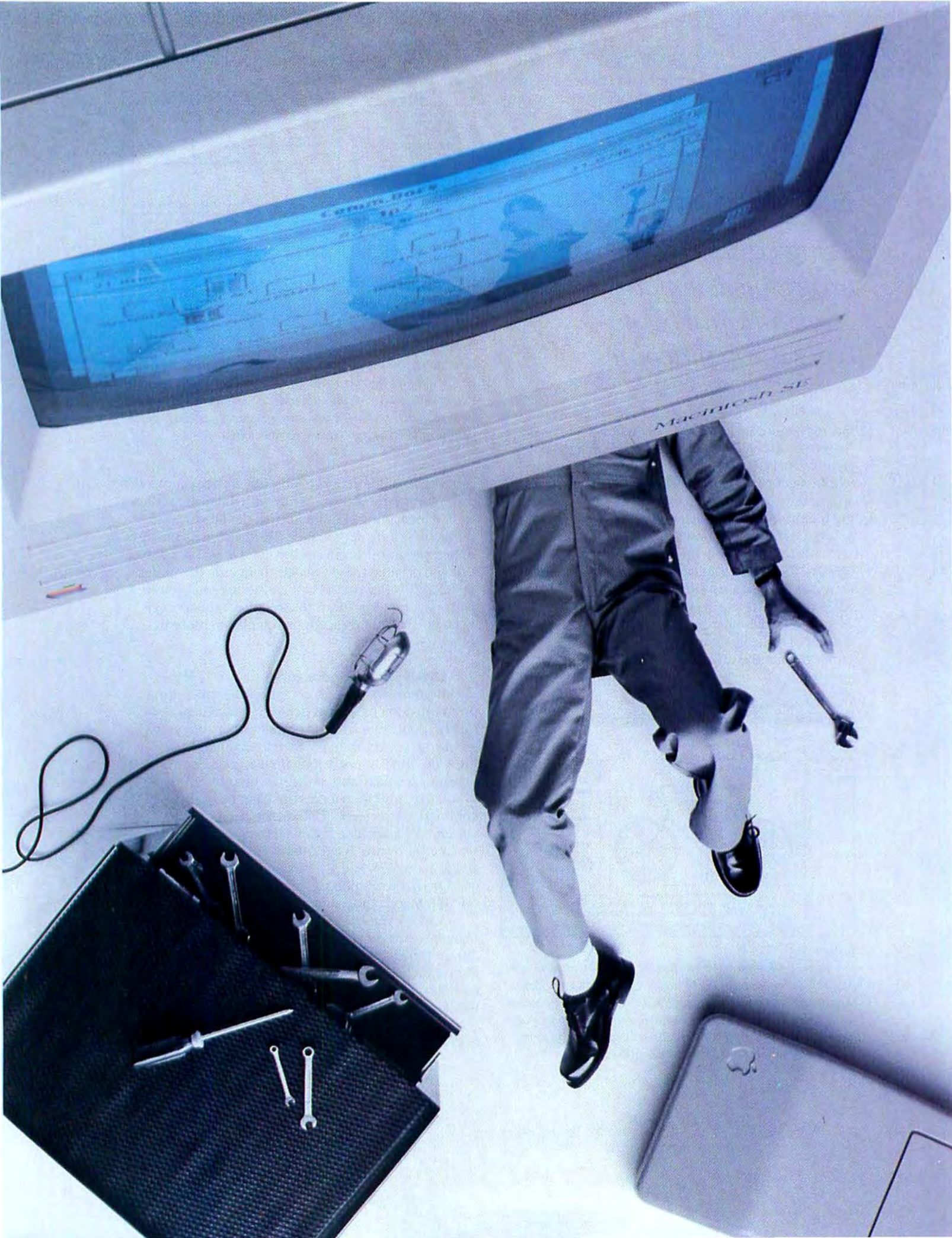
you with two different versions. But with a command-driven program, you work only with the original files, adding formatting commands that define or revise the publication's appearance. Therefore, a command-driven program eliminates the need to go back and revise the original files to match changes in the pasted-up text. This is an important consideration if you're working on publications that require frequent revisions or that contain sections you plan to reuse in other issues.

Other Deciding Factors

Because it's difficult to typecast a type-casting program, don't base your decision on features alone. Narrow your search to the products that appear to meet your needs, then try each to evaluate its operating style. You'll spend a long time at your electronic layout table; make sure it feels comfortable. Assess how each program handles the basic tasks that are common to every application (see "Common Ground"). Determine how well the product will run on your hardware. *PageMaker* and *XPress* tend to be sluggish on 512K Macs, for example, and both Aldus and Quark recommend a Mac Plus. *Scoop* doesn't run on 512K Macs, but requires at least a 512K Enhanced.

And ask questions. What kind of support does the manufacturer provide? How thorough is the documentation? Is the product shackled by copy protection? (Of the products discussed here, only *XPress* is.) By being an informed and critical shopper, you'll find the right tool for turning your words into type. □

See *Where to Buy* for product details.



Beefing Up the SE

Think that because you have a Mac SE, you have to settle for less performance? Think again. Accelerator cards for the Mac SE make even the Mac II look a bit slow.

by Prasad Kaipa and Bruce Webster

Face it: you wanted a Macintosh II, but you bought a Mac SE. You didn't have the money to get a Mac II at the time, and you just weren't willing to wait. Or money wasn't the issue, but time was: you didn't want to sit around until the Mac II finally shipped. Whatever the reason, it's a Mac SE, not a Mac II, that's sitting on your desk, and you're getting tired of reading the glowing reports of the Mac II's great performance. If only you could squeeze a 68020/68881 combination into your system.

Cheer up, pilgrim: you can. In fact, you can actually get *better* performance. True, it won't come cheap, but it will come cheaper than a Mac II. Besides, have you ever tried to fit a Mac II into one of those carrying cases?

Levco Corporation (Levco) and General Computer Company (GCC) have been going head-to-head for some time now in the Macintosh market, playing a constant game of one-upmanship to see who can soup up the Mac the most. The newest battleground is the Mac SE: both Levco and GCC have introduced 68020/68881 coprocessor boards. And they aren't the only ones. Peak Systems and Radius Corporation also recognize a good opportunity when they see one and are plunging into the battle.

Levco Prodigy SE

Levco has long been known for its legendary (both in power and cost) Prodigy 4 upgrade, a 68020/68881 4-megabyte RAM, 20MB hard-disk package that turned an ordinary Mac into a true high-performance monster more than a year before Apple offered the Mac II. So it comes as no surprise that Levco has been quick to introduce a similar product for the Mac SE.

The Levco Prodigy SE does its best to turn your SE into a Mac II. No modifications are needed: the upgrade plugs into the expansion port on your Mac SE motherboard. Of course, getting it there can be a challenge. Even though Levco includes a detailed installation manual, you're probably best off leaving the actual work to your dealer, especially as the price you pay for the upgrade includes installation.

The heart of the Prodigy SE is a Motorola 68020 processor running at 16 megahertz (MHz) and using a 32-bit-wide data path. By contrast, the Mac SE comes with an 8-MHz 68000 processor that uses a data path 16 bits wide. The combination of doubled clock speed and widened data path gives you an immediate fourfold increase in speed. Additional speed can come from

the 68020's instruction cache and the power of certain 68020 instructions.

If it's number-crunching speed you're looking for, consider the optional Motorola 68881 math coprocessor chip. This special chip performs floating-point operations much faster than the 68020 does—over 100 times faster for certain applications. Apple was smart enough to make this equipment standard on the Mac II; you should strongly consider getting it if you're getting a coprocessor board.

The Prodigy SE also comes with 1MB of RAM, doubling the Mac SE's memory. That memory can—in theory, mind you—be expanded to 32MB. A more realistic limit, based on 1MB chips, is 8MB, and even that exceeds the Mac SE's normal limits for user memory. It may also exceed your pocketbook, since 1MB chips are still pricey. You have to use Levco's memory expansion units, but since they're cheaper than Apple's, that's not necessarily bad. Note that all memory added to the board uses the 32-bit-wide data path, which leads to higher performance.

The Mac SE is only set up to use 4MB of RAM; what if you decide to expand beyond that? You'll need to get the Motorola 68851 Paged Memory Management Unit (PMMU), a chip that makes the SE think it only has 4MB at any one time. The Mac II has a socket for this same chip; you need

the PMMU to run A/UX, Apple's version of UNIX, on the Mac II. Will you be able to run A/UX on a Prodigy SE with a 68851? Stick around and find out.

What if you want a large-screen display for your Mac SE? The engineers at Levco anticipated that: the Prodigy SE has a 125-pin expansion port that is (according to Levco) a superset of the expansion port on the Mac SE motherboard. We were unable to test anything using this port; however, Levco says that at least one large-screen display—Micrographic Images' MegaScreen II—works just fine.

Software support is fourfold. First, on boot-up the Prodigy SE automatically copies the contents of the SE ROM (about 160K) into its high-speed RAM. This greatly improves performance, since all ROM routines can be accessed and executed at the 16-MHz clock speed.

Second, once you place a special Init file into the System Folder, you can control certain aspects of the Prodigy SE from the Control Panel. For example, you can turn the 68020 cache on or off, route SANE (Standard Apple Numerics Environment) calls to the 68881, or allow *MacWrite* 4.5 to run on the system. See "Speed Traps" for more details.

Third, Levco says that the Prodigy SE supports a recoverable, bootable RAM disk. This RAM disk is unaffected by sys-

tem crashes or resets; only a power loss (turning off the machine, for example) can modify the disk's contents. Likewise, if the system does reboot, it checks the RAM disk first to see if you have the System files for booting there. Unfortunately, we did not receive the software for this RAM disk with the Prodigy SE we received, so we cannot attest to how well this feature actually functions. In addition, the version of the software that we did receive did not recognize the interrupt switch properly, but it should work just fine by the time you read this.

Fourth, you can turn the souped-up SE back into a normal machine. By pressing the interrupt and reset switches on the side of the Mac SE in a certain order, the system reboots as a plain-vanilla 8-MHz 68000-based Mac SE. This allows you to run any applications (like games or programs that violate 68020 conventions) on your system.

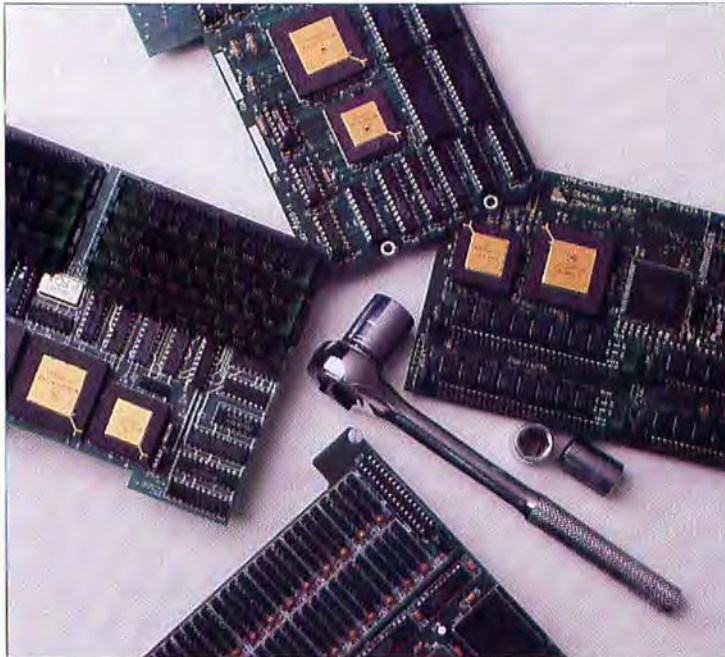
The Prodigy SE is not cheap: \$1495 for the basic board (68020 with 1MB of RAM). The 68881 chip costs another \$295; add \$500 if you opt for 2MB of RAM instead of just 1. The 4MB version lists for \$2795. The price for the 68851 was not available at press time. Levco has been shipping the Prodigy SE since the end of March.

GCC HyperCharger 020

General Computer Company is well known for having introduced the first (and for a long time, the only) internal hard disk for the Macintosh. When that market started to get a little crowded, GCC introduced the HyperDrive 2000, a 12-MHz 68000/68881 1.5MB RAM, 20MB hard-disk combination that, while not nearly as fast as the Prodigy 4, was substantially cheaper. However, GCC's newest product, the HyperCharger 020, is comparable to Levco's Prodigy SE in price and is as fast or faster in performance.

The HyperCharger 020 for the Mac SE represents GCC's first foray into the 68020 upgrade market. Like the Prodigy SE, the HyperCharger 020 plugs into the SE's expansion port. And like the Prodigy, the HyperCharger comes with a 16-MHz 68020 processor (with a data path 32 bits wide), 1MB of RAM, and a socket for a 68881 coprocessor. While the HyperCharger comes standard with a 12-MHz 68881, you can order an optional 16-MHz 68881. If you choose the latter, the resulting performance improvements are almost identical to those of the Prodigy SE. In fact, the floating-point operations tend to be faster.

Four on the Floor
Peak Systems' Orion, Radius's Accelerator, General Computer's HyperCharger 020, and Levco's Prodigy SE. Of the four boards, only the Accelerator doesn't provide on-board RAM. The HyperCharger is the only board that accepts standard Mac SE SIMMs.



Speed Traps

Accelerator boards are real time-savers: they increase performance, sometimes dramatically, and they make your system nicer to use. Are there any drawbacks? Unfortunately, yes. Just as there are incompatibilities between the Macintosh II and some Mac software, there are incompatibilities between some software and the Mac SE accelerator boards. The difference is that you can often work around those incompatibilities with the SE boards.

Cache Crash

The biggest potential pitfall has to do with the 68020's instruction cache. The cache is a small amount of memory on the chip itself, enough to hold 64 instructions. As the 68020 loads instructions from RAM, it copies them into this cache. When the 68020 goes to fetch the next instruction, it checks first to see if that instruction is in the cache; if so, it loads it from there instead of from RAM. This procedure improves performance, since it takes less time to fetch an instruction from the cache than to get it from RAM. And if you have a tight loop that fits entirely in the cache, the speed-up can be significant.

Unfortunately some programs—particularly those that are copy protected—use a technique known as self-modifying code. Briefly put, this involves a set of instructions that change themselves as they execute. A different but related technique may be used in the code produced by some compilers. Certain low-level routines, such as the routine for disk I/O, are not called directly by the compiled code. Instead, the code (when

executed) generates a set of instructions elsewhere in memory, then calls those instructions to perform the function.

The problem with both types of programs is that, under certain conditions, the instructions in the cache do not match those in memory. The result is erratic behavior, failure to pass the copy-protection test, or even a system crash. The obvious answer is to turn off the 68020 cache; unfortunately it is not so simple. If the 68020 cache is not on, AppleTalk does not work reliably. Both Levco and GCC allow you to turn the 68020 cache on and off via the Control Panel; the Mac II does not. This means that you can run programs on these souped-up SEs that you can't run on the Mac II.

Cruise Control

A second problem has to do with code compatibility. Some programmers have used certain instruction shortcuts on the 68000 that do not work properly on the 68020. These programs will not work with an accelerator board unless the board provides a 68000 mode (the Prodigy SE and the Radius do this).

MacWrite 4.5, for example, will not run on a 68020-based system. Because *MacWrite* is so widely used, both Levco and GCC put a special option in the Control Panel that compensates for the problems of *MacWrite* 4.5. The drawback is that with the option on, the entire system slows down. At press time Apple was working on *MacWrite* 4.6, which will run on the Mac II or a souped-up SE.

Vid Skids

Yet another problem has to do with video memory. Despite Apple's years of warnings, there are programs out there—especially games—that make assumptions about the location and size of video memory, or about the existence of a second video buffer. Most of these programs simply will not run on the Macintosh II, and many have problems with the accelerator cards. For example, Levco uses the second video buffer, and some games (like *Dark Castle* from Silicon Beach) attempt to access the second video buffer, which causes the system to crash. Silicon Beach is trying to modify its programs to run properly on the Prodigy SE, but new Apple specifications make it very hard. In any case, it's wise to test new programs on an upgraded system before you buy. If you want to be sure that certain programs will run on your machine, check with your dealer before you buy an upgrade. A dealer can verify which accelerator card will run which software.

Speed Limits

Finally, there's the problem of speed itself. Some programs make assumptions as to how fast the code itself is executing; having that code run four times faster than expected can cause problems. The four areas in which problems most often occur are: AppleTalk, the SCSI port, hard disk drivers, and sound. If you have hardware or software that involves any of these areas, you should test it out on an accelerated system before investing in one of these boards.

Unlike the Prodigy SE, the HyperCharger accepts standard Apple SIMMs for memory expansion (up to 4MB). Since there is a 4MB limit on the RAM, there's no socket (or need) for a 68851 PMMU chip. There is an expansion port, and the board supports E-Machines' large screen; however, the expansion port is GCC's own 64-pin-plus-12-pin design (see "Difference in Acceleration" for more comments on expansion ports).

The HyperCharger we received did not load the ROM into its fast RAM at first. The result was a general performance penalty of about 30 percent; in other words,

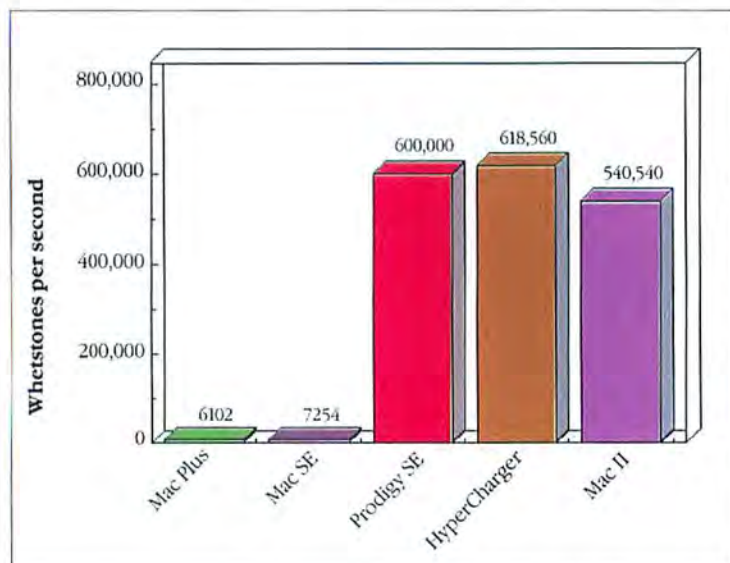
the HyperCharger ran at about 70 percent of the Prodigy's speed. However, GCC shipped us an early version of an application that does load the ROM into the fast RAM. Using this application, the HyperCharger's performance was dead-even with the Prodigy's in just about every benchmark and was faster in several. GCC has indicated that a version of this application will be available to HyperCharger owners.

The HyperCharger also has a Control Panel option, which is installed by putting an Init file into your System Folder. This option has the same basic functions as the

Prodigy's: turning the 68020 cache on or off; selecting SANE/68881 support; and turning on or off the patch that allows MacWrite 4.5 to run. When selecting SANE/68881 support, you can choose between Apple SANE and GCC SANE, depending on whether you are interested in greater accuracy (Apple) or higher speed (GCC).

The HyperCharger's price is very competitive with the Prodigy SE's: \$1499 for the basic system (68020, 1MB RAM); with a 12-MHz 68881 it sells for \$1699. The faster 16-MHz version costs \$1899. GCC has been shipping the HyperCharger since early May.

Figure 1
The Whetstone benchmark, a common measure of compiler efficiency and floating-point performance, shows that both the Prodigy SE and the HyperCharger were faster than the Mac II at calculating double-precision floating-point values.



Accelerators Compared

	Radius	HyperCharger	Orion	Prodigy SE	Macintosh II
CPU with 20MB hard disk	\$3569	\$3569	\$3569	\$3569	\$6015
Keyboard	\$ 129	\$ 129	\$ 129	\$ 129	\$ 129
Accelerator card	\$ 995	\$1499	\$1995	\$1495	—
16-MHz 68881	\$ 395	\$ 400	\$ 295	\$ 350	—
Total cost	\$5088	\$5597	\$5988	\$5543	\$6144

Peak Systems' Orion Board

Peak Systems introduced several hard disks and tape backup units for the Macintosh in 1986. Now, Peak Systems is getting into the upgrade act with its Orion board for the SE, and Peak plans to support the Mac Plus and the 512KE with similar accelerator boards. We didn't get to play with a finished Orion board; instead, an engineer showed up in town with a wire-wrap version that sat outside of the Mac SE.

From what we were told, the basic system will be the same as those for the other upgrades: a 16-MHz 68020, 32-bit-wide data path, and a 1MB RAM socket for an optional 68881. And like the Prodigy SE, the Orion will allow RAM expansion up to 32MB and will have a socket for the 68851. Peak Systems is actually removing the Apple ROM and placing it on the Orion board, thus saving some RAM space. In theory, this should result in better performance because the Orion's 68020 can execute ROM routines much faster when they're on the Peak board than when the ROMs are on the motherboard. The initial benchmarks we ran with the wire-wrap version did not reflect that increase in speed, but performance comparisons are not justified until the board is complete.

The price for the basic Orion board will be \$1995; the 68881 option is an additional \$295. Peak Systems started shipping the Orion board the first of June.

Radius's Accelerator

Radius announced an accelerator board in March, when Apple introduced the Mac SE. We were unable to obtain one for testing, but in a phone conversation with Alain Rossman, vice president of Radius, we gleaned some information about the product.

Like the other boards, the Accelerator will have a 16-MHz 68020 and a socket for a 68881 coprocessor. Like the Prodigy SE, the 68020 can be disabled and run in 68000 mode. Unlike the other boards we've discussed, the Radius product will offer no on-board RAM expansion possibilities. With 1MB chips, you can expand the motherboard memory on an SE to 4MB, but the data path is still 16 bits wide. According to Rossman, that's not as serious a limitation as it might seem, because of the on-board cache.

The 68020 has its own cache, which holds up to 64 instructions (see "Speed Traps" for a more detailed explanation). The Accelerator has a 32K cache made up of fast static RAM with no wait states. The Accelerator's cache holds both data and instructions—unlike the 68020's cache, which only contains instructions—and is a write-through cache, avoiding some of the common problems with accelerator boards. Also, the 68020 uses its full 32-bit bus for accessing the cache.

Radius claims that the 32K cache results in high performance. In fact, according to Radius, many writes to the video screen end up going through the cache. This means that the processor writes a full 32 bits to the cache; the hardware on the board itself then copies the data from the cache to the video RAM.

The Accelerator also has firmware that can intercept all SANE calls and automatically transfer them directly to the 68881 (or the 68882 when it is available).

The Accelerator has an expansion bus called the Magic Bus. It's a full 96-pin connector that doesn't use a cable. Not surprisingly, the Radius Full Page Display plugs in and works just fine. Radius plans to make the pin-out public so that other manufacturers can adapt their hardware to it.

Most significant, perhaps, is the price: \$995 for the basic board, \$395 for the 68881 chip. This allows you to get a souped-up Mac SE for the lowest possible investment. Radius says that they will start shipping the Accelerator by the first of July, so it should be out by the time you read this.

Off to the Races

We ran a series of benchmarks to measure the relative performance of the different systems. The difficulty, of course, was in coming up with some universal

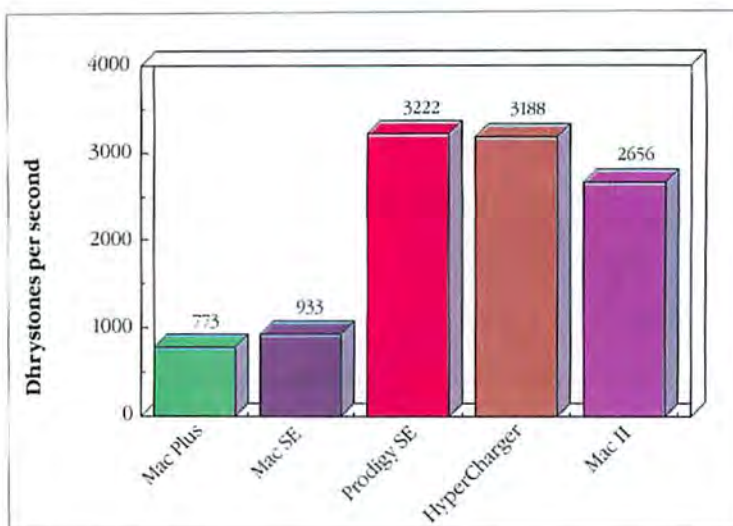


Figure 2

The Dhrystone benchmark, a test consisting of a balanced mix of CPU instructions, also shows that the Prodigy SE and HyperCharger outperform the Mac II.

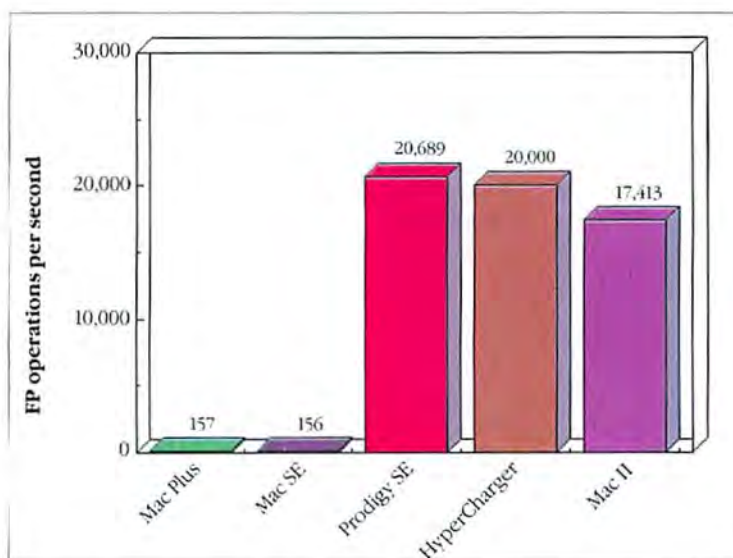


Figure 3

The FP operations benchmark pits the accelerators against the Mac II on a series of addition, subtraction, multiplication, division, sine, and tangent calculations. Both accelerator cards edged out the Mac II.

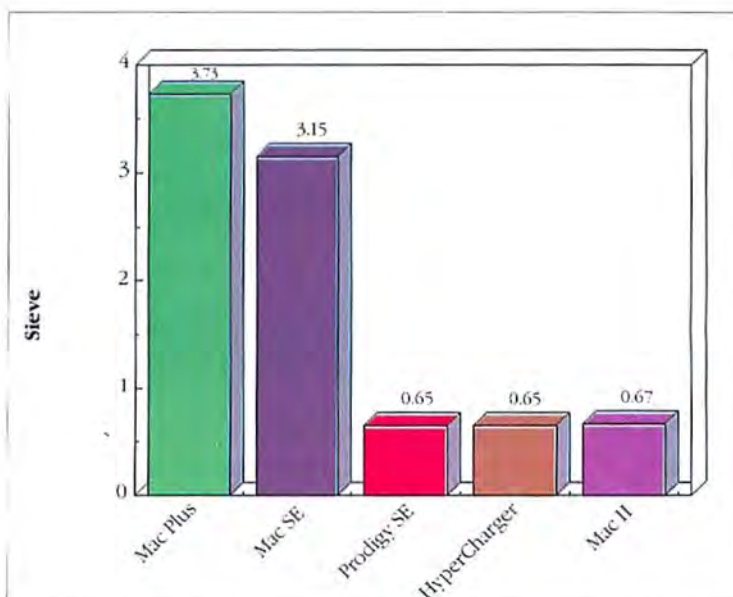


Figure 4

The Sieve of Eratosthenes, a widely quoted benchmark, runs so fast on 68020-based machines that the resulting differences are too small to be meaningful.

Difference in Acceleration

One area in which accelerator cards differ is the implementation of the numeric calculation routines called the Standard Apple Numerics Environment, or SANE. Levco routes all SANE calls through its own SANE software to the 68881 chip. The Levco SANE package (like the GCC SANE package) routes more floating-point calculations to the numeric chip than the Apple SANE package does; this gives you maximum performance.

But if you are interested in maximum precision, Apple's SANE software is recommended, because it overrides the 68881 coprocessor for calculations when the 68881 is not accurate enough. Additionally, in cases where exact Macintosh II compatibility is necessary and in very high-precision calculations, an option to use the Apple SANE package is very handy. From the information available at this moment, only the GCC HyperCharger 020 supports Apple SANE as an option.

A second important difference between accelerator cards relates to RAM compatibility. Even though the 68020 on the accelerator card has a data path 32 bits wide, the 68020 can only access the RAM on the SE motherboard via a 16-bit data path, slowing down overall operations. Because of this, Levco, GCC, and Peak all recommend setting a 1MB cache via the Control Panel, so that the moth-

erboard RAM is used for the cache and all application programs are loaded into fast (32-bit path) RAM on the accelerator board.

However, if Apple comes out with SE machines that have 2MB or 4MB of RAM on the motherboard, you'll want to remove those SIMMs and install them on the accelerator board. The HyperCharger 020 and the Orion use Apple SIMM on the accelerator board, so you can easily do this. The Prodigy, on the other hand, uses ZIP RAM, which only interchanges with other ZIP RAM from Levco. In that case you could set the cache to 2MB or 4MB to increase performance; however, very few programs would be able to take advantage of a cache that large.

Radius takes another approach to using the motherboard memory. The Accelerator's high-speed 32K cache memory can use whatever memory is available on the motherboard. Depending on the percent of instructions running from the cache, the Accelerator's performance could compare favorably to that of other boards. However, the Accelerator was not available for testing as we wrote this article.

A third difference is in the way the cards allow for additional expansion. The Mac SE provides only one slot, a 96-pin connector that the accelerator board plugs into. What if you want to connect another peripheral, like a large-screen

monitor? All the cards discussed in this article do have one type of expansion slot or another.

Peak and Radius pass the SE's original 96 signals to an expansion connector, so you plug other SE boards into these cards. Levco provides an adapter for its 125-pin connector, which makes the SE's standard 96-pin connector available. Taking another route, GCC passes out its own expansion connection, which contains 64 signals from the 68000 plus 12 signals from the 68020. GCC is aggressively soliciting third-party developers to support this connector.

As we have not tested any of these connectors, we cannot comment on the feasibility of installing additional cards either inside or outside the Mac SE. However, this does bring up the issue of expansion-connector standards. Until the manufacturers agree on one connector standard, you won't be able to add the same expansion boards to all the accelerator cards.

Three of the four accelerator-card manufacturers have announced large-screen displays that work with their boards: the MegaScreen II from Micro-Graphic Images works with Levco's Prodigy SE, the Big Picture from E-Machines works with GCC's HyperCharger 020, and the Radius Full Page Display works with Radius's Accelerator.

benchmarks and running them on all systems. The accelerator cards were run with the 68020 cache turned on, the SANE-to-68881 mapping on, the *MacWrite* patch off, and the 1MB disk cache (Apple's standard cache in Control Panel) on, to avoid locating the program in "slow" memory.

For the Mac Plus and SE comparison, the benchmarks were written in *Consulair Mac C* version 4.53, which produced standard 68000 code and SANE calls.

For the accelerator cards and the Mac II we used a special version of *Consulair C*, version 5.04, which produces 68020 code and direct calls to the 68881 chip (instead of to SANE).

Even with regular SANE calls, the accelerator boards equipped with 68881 chips were over ten times faster than the regular Mac SE for benchmarks with intensive floating-point use (Whetstone and FP). The HyperCharger was as fast as, or faster than, the Prodigy SE in most benchmarks. With the direct calls to the 68881, the floating-point benchmarks take another dramatic leap: both the Prodigy SE and the HyperCharger now run from 80 to 130 times faster. Again, the HyperCharger has a general edge over the Prodigy SE; both clearly outpace the prototype Orion and even the Macintosh II. That last bit of news shouldn't be a complete surprise; though the Mac II also runs at 16 MHz, it requires two wait states for the 68851 address translation (as opposed to one wait state for the accelerator boards), so you would expect it to run most benchmarks more slowly.

To compare graphics speed we ran the same program, written in *Turbo Pascal*, on all five machines. In addition, we ran that program on the HyperCharger with the ROM-copying application turned off. You can see what a tremendous difference it makes to load the ROM into the fast RAM; without doing that, graphics performance is not much better than with a regular Macintosh SE.

Applications

We also ran a long list of application benchmarks on the Prodigy SE and the HyperCharger. The results once again showed the Prodigy SE and the HyperCharger very close to each other. This time it was the Prodigy SE that had the slight edge in most benchmarks, although the differences in speed were typically less than 5 percent.

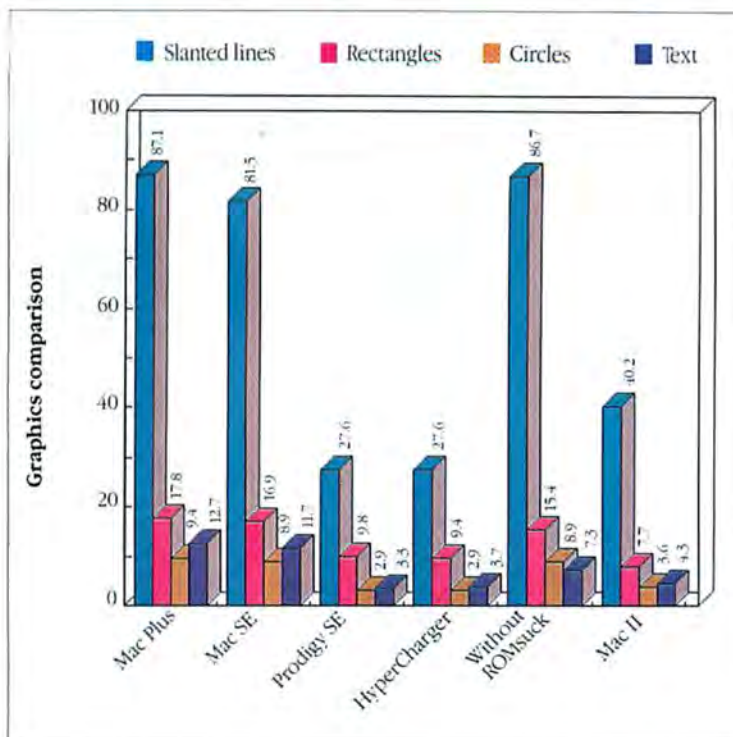


Figure 5

The graphics benchmark written in Turbo Pascal measures the time it takes to draw objects on the screen. Tasks include drawing 8000 slanted lines, 2000 rectangles, 200 circles, and 38,000 text characters.

No major incompatibility surfaced during the applications testing; however, the boards won't run all existing Mac software. And, of course, the increase in performance was wonderful. The ability to turn off the 68020 cache and the special patches that handle *MacWrite* give these systems greater Macintosh software compatibility than the Mac II. The hardest thing about using these machines was going back afterwards to a regular Mac SE (or a Mac Plus).

At the Finish Line

The only two boards that we can really compare are the Levco Prodigy SE and the GCC HyperCharger, since those were the only two we could evaluate to any extent. Performance was a toss-up: slightly faster on the HyperCharger for some benchmarks, slightly faster on the Prodigy SE for others. But in almost every case, the outcome was too close for the difference to be significant. Levco has been at this a little longer, and it shows in the additional features and options. The Levco and GCC accelerators cost about the same.

One possible issue for consideration: service. Levco will service their own products, whereas GCC refers all service to your local dealer. Levco offers a 90-day warranty that covers all parts and labor; af-

ter that, the standard charge is on the order of \$40 per hour. In any case, you need to pay shipping. GCC offers a one-year warranty on the HyperCharger, and you can buy extended service through HyperCare from GCC.

Price, as always, is a consideration; if it weren't, you'd probably be buying a Mac II instead of reading this article. For comparison, we'll assume the following system: a 16-MHz 68020 with a 68881 coprocessor, 2MB of RAM, one 800K drive, a 20MB hard disk, a monochrome display, and the (new) Macintosh keyboard connected to the Apple Desktop Bus. "Accelerators Compared" shows how these systems stack up. The bottom line: unless portability and desk space are pressing issues, you're better off buying a Macintosh II than buying a Mac SE and one of these cards. The Mac II gives you a large screen, color, and much greater future expansion. If, on the other hand, you already own a Mac SE, or travel with your Mac, then buying one of these boards is (obviously) far cheaper than going out and buying a Mac II. But regardless of which route you take, be forewarned: once you've used a supercharged Mac, it's hard to go back to the Mac of old. □

Mastering Mail Merge

by Charles Seitter

Learn about software and techniques that can help you handle mailing lists

Sooner or later, from economic necessity or merely the perverse desire to clog up a few mailboxes, you'll want to mail out documents to the many names on your mailing list. So that you don't have to type the same letter or report over and over again, embellishing here and there for the personal touch, you'll want to *merge* the document with the mailing list. A merge simply puts the right information from the list into the document at selected places, giving you a whole set of customized documents automatically.

Even experienced users of word processors can find form letters and mailing labels confusing. It's possible, with a little inattention, to have your printer spewing hundreds of incorrectly formatted letters in a mad Sorcerer's Apprentice-style catastrophe.

But don't worry—it's nothing you can't master in a half hour. The basic steps of mail merge are easy to follow if you use a simple example as your guide. And many software companies are eager to help you; they offer specialized programs with easier and more powerful mail merge functions than word processors have.

What follows is a roundup of mail merge software. I'll tell you what to look for in a mail merge program, and compare the capabilities of some representative programs that I've selected for their convenience and flexibility. Since most mailing-list management software is geared toward working with *Microsoft Word*, I'll also illustrate the use of the Print Merge option in *Word 3.0's* File menu (see "Getting Out the Word"). The merge function in *Word* really works best at an intermediate level of use—if you only use it a few times a year, you'll be stuck doing some scrambling in the manual, whereas if you merge a variety of documents every day, it falls a little short on convenience and power.

What to Look For

There's a ready market for two types of mail merge products: very easy office software that makes merging nearly automatic, and high-end software designed for large database use or professional offices. Here's a checklist to help you find software to make merging simple and efficient:

■ **Word Compatibility** A good heavy-duty mailing-list manager can create data files that work with documents in *Word*. This feature can be crucial if you want to share list data or tasks with other offices.

■ **List Import** You probably already have a mailing list around the office. Make sure the product you choose can use your list. Mailing list professionals figure that it costs 20 to 30 cents to enter a name and address in a standard list—that means that for lists of 500 to 1000 names, entry costs can

outweigh the cost of the software. Microsoft products easily convert name lists developed in Lotus's *1-2-3* on the IBM PC.

■ **List Handling** Some merge applications call for lists that are stable for a year or more, while other applications have "hot" lists that are edited every week. Consider whether you want to manage and link lots of separate short lists, or whether simple addition or deletion of one item at a time is all you'll need.

■ **Cost Control** Some software, such as *Bulk Mailer* from Satori, can search lists for duplicates: J. Miller and John Miller with the same address. *Bulk Mailer* will also sort list entries to take advantage of lower postal rates for presorted mail. Any competent database (like Forethought's *File-Maker Plus*, for instance) will do these sorts, but in *Bulk Mailer* they're built in.

■ **Ease of Learning** If you know your way around Mac software, you won't have much trouble with a database-plus-word-processor combination for mailing list work. But if you're a first-time computer user in a professional sales office, a program like Software Complement's *Client/Mac*, with ready-made screens for every probable use, will likely be a happier solution.

■ **Hardware** In the future, of course, we'll all have removable 200-meg hard disks that cost 12 cents and fit in a matchbox. In the meantime, there are plenty of organizations with small budgets whose last big upgrade was the 400K external drive. The packages reviewed here differ greatly in hardware appetite—check the summary table to make sure the program you want will fit your hardware or warrant an extra investment.

Executive Office

If you have read "Getting Out the Word" and still aren't sure which line is the header in a data document, then look into *Executive Office* from DataPak Software. Each aspect of this program, which covers word processing, database management, and spreadsheet calculation, has limitations compared to the ultimate power product in each category. But *Executive Office* has a special strength of its own: all operations mimic what you would do if you were working with paper files. The program's metaphor, in which you shuffle little folders around an office from file cabinet to copier to stockroom, is enough to make an *Excel*-macro maven snort in disgust, but it has lots of charm in practice and surprising flexibility. A folder for a given name can contain calculations, forms, data tables, and drawings, and all these are very easily merged into an associated letter. Figure 1 offers a view of the mail merge function's starting screen in *Executive Office*. This program won't let you fail. And, there is also a simple provision for mailing labels: you pick the label you want from the "stockroom" and tell the program where to find the names.

Microsoft Works

Microsoft Works takes a more mainstream approach, integrating the standard word processing, database, and spreadsheet functions, but providing more hand-holding than Microsoft's power programs for those tasks. To prepare a merge document you simply type in the text, stop at the point where you want a merge field, and select Prepare to Merge from the Edit menu. *Works* then prompts you for the field by listing the available *Works* data-



bases (you will have entered your name list in a database) and associated lists of fields. If you insist, you can export database files to *Word* as data documents for merging with *Word* letters.

To inspect your work, choose Show Field Data from the Edit menu and you will see the first record merged into the appropriate places in the text. This is the simplest

Getting Out the Word

The best way to understand how mail merge works is to look at a simple merge operation done with the ubiquitous *Word* 3.0. On one side you have your document, with some spaces tagged to receive information. On the other side, you have the information in a list. For a successful merge you simply show *Word* where to find what by specifying both the list you will use and the items within the list.

Let's look at "Between Letter and List" to see the mail merge

in operation. First, notice that the list (or *Data Document* in *Word* jargon) has a special first line called the *header*. The header names the categories of information on each line in the list. The *field names*, name (tab) state (tab) product, match up with the information on the first "real" line, Bob (tab) Wisconsin (tab) cheese.

Next, notice that the first line of the letter (*DATA my list*) names the list you want it to use. The letter also contains tags (*name*, and so forth) that match the field names in the header of "my list." The tags are placeholders that indicate the type of information the program should look up and the information's position in the document.

Thus, when you call for Print Merge on the document "my letter," *Word* knows that "my list" has the information to merge because of the first line, *DATA my list*. It will look through that file for each set of fields (name, state, product in our example), generating one document at a time.

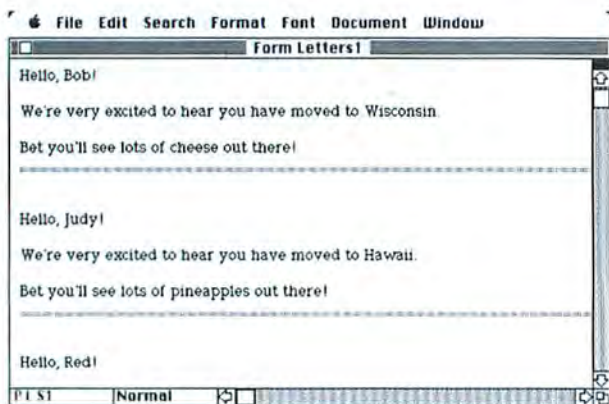
You can preview the results of the merge operation by selecting Print Merge from the File menu and then choosing New Document in the Print Merge dialog box. New Document stacks all your merged letters in a window called Form Letters so that you can review them and make little personalizing changes if you like (see "Between Letter and List"). The double line near the bottom of each letter stands for a page break—all you need to do is select Print in the File menu and you will have a stack of properly separated letters.

If you have another file full of names, called "my file," for instance, you could generate form letters with that file simply by using *DATA my file* as the first line of the document. So there are only three key elements to keep in mind when you perform a merge: the letter containing field name tags, the Data Document containing all the fields, and the DATA line (the first line in the form letter) connecting the two.

The example in the figure still leaves us with two questions. How do you write the letter? And how do you set up the data document? Let's consider these questions and a few other points step by step.

■ **Size of List** First, decide whether you have more time invested in your letter or in your mailing list. If you have a 1000-name list in a particular format, you should learn to be happy with the fields in that list. If you have a 30-page business plan and are making up your mailing list from scratch, you might as well pick any fields you like and then make up a list to match.

■ **Document Preparation** The easiest way to create a fool-proof letter for merging is to create a first draft with real names in place (Mr. David Goliath, for example) and then replace the fields one at a time. That is, search for Mr. and replace it with *title*, search for David and replace it with *first*. With this method you won't inadvertently end up with double blanks or other punctuation slips in the address. Please note also that « and » are the special



Between Letter and List

Keep your eye on the DATA statement in the letter. It's the line that tells Word what file contains the list that will be merged with the letter.

characters Option-\ and Shift-Option-\, not the little arrows over the comma and period on your keyboard. This tiny point is a frequent cause of frustration for newcomers to merging.

■ **A List in Word** If you haven't prepared a mailing list in some form of database, you need to make a document like "my list." Using *Word*, you can start typing in a first line of field names (the header), making sure that you separate the fields with tabs (turn on the Show ¶ option in the Edit menu so you can see the little arrows in place). Then type in each line of data, again separating the fields with tabs, and ending each line with a Return (make sure there's a paragraph mark at the end of each line). When you're done, give the document a suitably evocative name so you know it's a data file.

■ **Lists from File** If you have a database of names in *Microsoft File* that you want to merge, simply save it as text (with a different name to remind you that it will be used in a merge). Open it in *Word*, once more with Show ¶ on, and check the fields available for merging in the header.

■ **Lists from Excel** If you have a list in *Excel*, just save it as text, again giving it a special name. When you open it in *Word*, however, you may find that the first line is just a data line—*File* requires that you set up fields before entering data, but *Excel* doesn't. In this case, you must take a look at the information in the first line and insert a first line that defines the field names. It's slightly easier to make up a header line in *Excel* itself than in *Word*, so

you may want to reopen the original *Excel* file and insert a new first row.

■ **Remember the Header** Most database programs will save files with text, showing tab-separated fields when the saved text file is opened in *Word*. As in *Excel*, you may want to set up the header line in the program itself for convenience, but it's no great problem to tack on a header in *Word*.

■ **Preview** When you select New Document from the Print Merge dialog box, you get to preview the merged letters. This, however, creates a new document—if you have a 1000-name mailing list for a 5-page letter, you have just created a 5000-page document. You should thus probably consider merging just a few letters under New Document for inspection (there's a From: To: choice). If you're working with a limited amount of memory and a long document, and you can only preview the first merged record, it still helps to make sure that all details are correct before you chew through half a forest in paper. *Word* is unforgiving about merge formats, and typos can cause major snags.

■ **Fine Points** Although a discussion of all *Word*'s ingenious possibilities on this theme is beyond the scope of this article, you should know that it's possible to write little pieces of "program" into a letter to let *Word* make decisions during a merge. For example, you can

insert IF...THEN statements in a letter so it prints one message for names A through L and another for names M through Z. Typically, you would use IF statements when you have a highly developed data file that contains fields specially set up for sorting and tagging names (see the *Word* reference manual for details).

■ **Mailing Labels** Labels are treated in *Word* just as any other merge document—in fact, the label document is typically no more than the address part of your form letter. All you have to do to print perfect three-across labels on a standard 8½-by-11 label sheet is tinker with the output format. Choose Show Ruler from the Format menu and move the left indent to the right a bit so that the labels don't print right to the edge. Under Page Setup (in the File Menu) set 1 inch as the height, set a top margin of 0.1 inch, and set all other margins at 0 inch. From the Format menu, choose Section, set 3 for Columns Number, and select New Column for Section Start. This is a little more cumbersome than the label-making routines in specialized mailing list programs, but it will work without much fuss. Again, try printing just a few until you're happy with their appearance.

That's it. Now you're armed with a little bit of dangerous knowledge—dangerous to anyone with a mailing address, anyway. But at least you can get that mailing out without rewriting the same basic letter over and over. That's a fate that should be reserved for after-school blackboards.

merge scheme that retains easy upward compatibility with other Microsoft products. Mailing label production proceeds, as in *Word*, through the Page Setup choice under File, but only allows one-across labels (*Works* may do windows, but it won't do columns). To remedy this limitation, Heizer Software offers a special *Works* mailing label template that accommodates any label layout you are likely to need.

Bulk Mailer

Some programs, such as *Works*, concentrate on document production and do mailing labels as a sideline. But mailing lists and labels are *Bulk Mailer*'s bread and butter. If you really want hassle-free labels for long lists, Satori's *Bulk Mailer* is the program for you. The first screen you see is a customizable mailing label and a set of command buttons for scrolling through your list. Lists can be linked, merged, and sorted by any field, including CAR-RT and various forms of zip code separation for postal money-saving. *Bulk Mailer* lets you review a mailing list for duplicates at user-specified levels of matching, holding suspected duplicates in a file for your inspection (see Figure 2). This product is clearly not intended for your personal Christmas card list, but in heavy office use it would pay for itself in days.

Bulk Mailer is not a word processor, so it uses a simple command (Send to Disk) to generate a file that can be used as a data document in *Word*. The document produced by *Save* contains *Bulk Mailer*'s field titles as the header line, so you will need to check that these are the field names you are using in your *Word* text.

FileMaker Plus

FileMaker Plus, from Forethought, is a professional database with a new series of templates that automates most of the functions in list development and form-letter mailing. The Mail List Management template lets you call up names from a *FileMaker Plus* database and print labels according to many preset formats, specified right down to their Avery stock numbers. A related template, designed specifically for organization membership lists, manages extra data fields (work and home phones, payments, and other references) and includes a Postcard template for billing dues.

FileMaker Plus provides facilities for generating a form letter. In this case it really is a form rather than a plain text document, using a blank form layout with provisions for inserting fields anywhere on a page. Mailing list files can also be exported to *Word*, producing the familiar tab-separated fields with a first-line header as a

data document. There are advantages to using a full-featured database for merge work—the facilities for sorting, rearranging fields, and picking out subset lists are well-designed—but *FileMaker Plus* also excels at producing structured documents, not just text files, for merging.

Client/Mac

Client/Mac, a program from Software Complement, is a special mailing list manager geared to sales and consulting operations. Its standard mailing list record provides entry spaces for tracking follow-up on sales leads. It also has a multiuser format that can coordinate follow-up records for a group of salespeople, and it will keep track of time spent on projects for particular clients, too. Because some business correspondence requires no more than a standard form, *Client/Mac*'s Letters menu provides a set of ten user-defined form letters for use with client lists. *Client/Mac* also exports client lists to *Word* as data documents for merging. The program generates one-across mailing labels with a single command and prints Rolodex cards, UPS forms, and shipping labels just as easily.

Software Complement has designed a system that neatly anticipates a great many business needs. It runs under *Omnis 3*, so you need either *Omnis 3* or its run-time system. One problem with *Client/Mac* is that it searches and processes files more slowly than, say, the database section of *Works*. A hard disk drive ameliorates the speed problem somewhat, but the program is still comparatively slow. For small-to-medium client databases that require detailed attention (as opposed to a once-a-year, 10,000-name membership drive), *Client/Mac* has the right stuff.

Market Master

For a little more money, you get a little more program. *Market Master*, a Helix-based program from Breakthrough Productions, is a full-fledged activity manager arranged around a sophisticated mailing list organizer (see Figure 3). Like *Client/Mac* it is easy to use, but it is specifically oriented toward sales.

Market Master's sales support is truly comprehensive—one trembles at the thought of this program in the wrong hands. It provides automatic tracking and updating of leads, a stackable, searchable phone notepad for sales calls, date-driven

Figure 1

One of the folders in Executive Office's scale-model business universe contains mail merge instructions and a sample form letter.

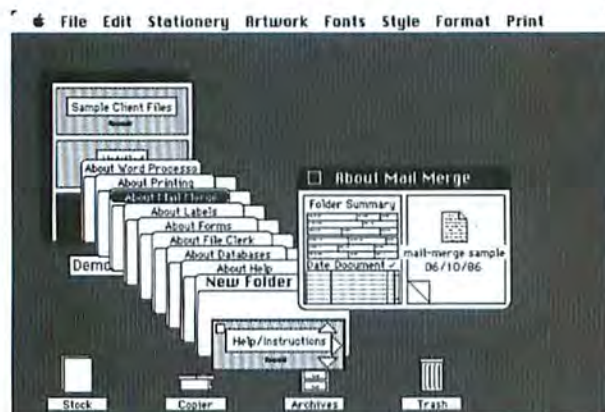
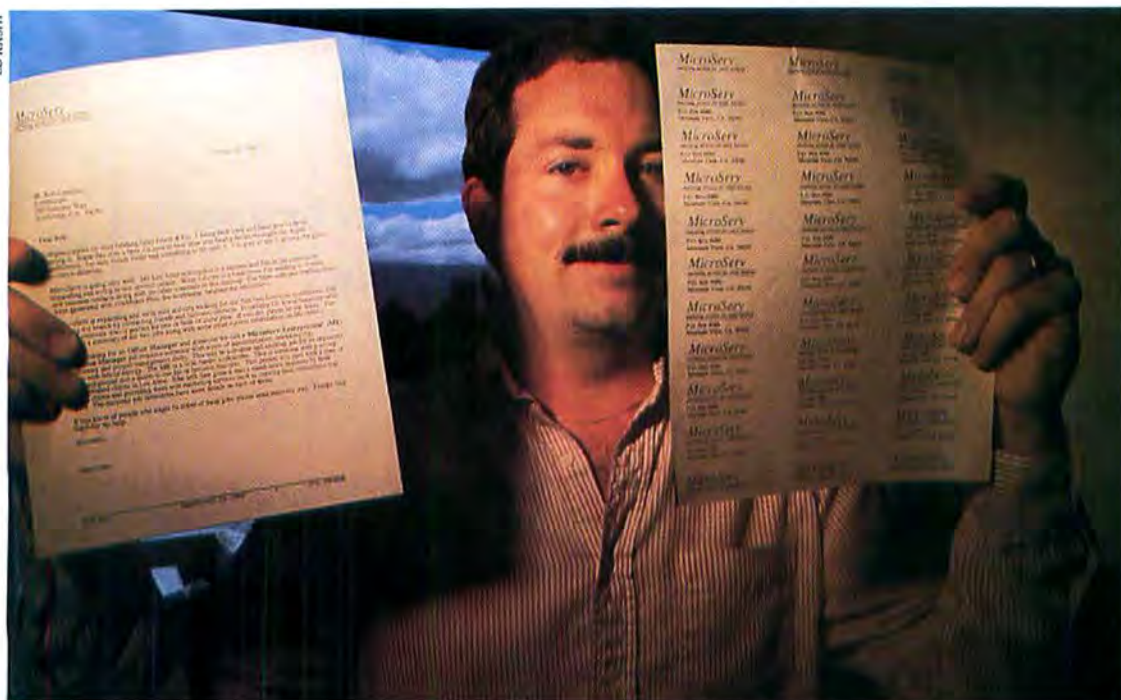


Figure 2

Bulk Mailer provides convenient facilities for serious mailing list management—note the space for user-defined search codes (lower left) as well as zip and CAR-RT.



As president of MicroServe, Matt Cobb runs a marketing services business that provides newsletters, flyers, brochures, and other published materials. MicroServe handles direct mail promotions for clients and maintains mailing lists with FileMaker Plus and Microsoft Word.

reminder notes for future calls, sets of form letters customizable within a huge matrix of output shapes and sizes, and facilities for sorting and printing lists of customers and clients by any criterion. If you can't improve your sales with this program, consider taking up carpentry.

Like *Client/Mac*, *Market Master* is slow on searches of large lists of names, but for medium-size lists (50 to 300 names) its performance is quite acceptable.

Excellent Exchange

Heizer Software has an effective set of products—cataloged under the title *Excellent Exchange*—for people with large name-list files in *Excel*. The mail-merge

template system lets simple form letters access *Excel* files directly. (Yes, you could export the *Excel* files as data documents to *Word*, but you may not have *Word* or may not want to learn it.) The mailing label template allows you to define and print mailing labels of any size (up to 256 across, if you have a 60-foot-wide printer) using your *Excel* name lists.

Heizer's templates offer several advantages to *Excel* users with moderate mailing list chores. First, they're cheap—at \$15 each for the merge and label template sets, there isn't much risk involved. Second, *Excel*'s links to the IBM PC world are better than those of the other merge products described here. You can translate a name list

from 1-2-3 into *Excel* rapidly and automatically, without worrying about header lines or tabs, and you can ship an error-free form letter directly from *Excel*. Third, *Excel* lets you sort subsets on any combination of fields before merging (and adding a new field simply means inserting a new column), so you can generate specialized lists from your original set of names. The merging function is not as fast as a plain merge in *Word* from a data document, but for occasional use or for work that involves fancy sorting, the templates offer a quick and clean solution to everyday form-letter problems.

The Last Word

At the center of the Macintosh form-letter universe is *Microsoft Word 3.0*, to which all documents flow. But many programs, even the ones that ultimately pass text files to *Word* for merging, provide special facilities to smooth the preparation of custom documents that are based on mailing lists of varying levels of complexity. And with the streams of mailing labels that can be generated from the programs described here, neither snow, nor rain, nor heat, nor gloom of night can stay your Mac from the swift completion of its postal rounds. □

See *Where to Buy* for product details.

File Edit Set View • Setup Reports Routine 16:18

1. Enter Names

Nancy Dunn

Name	First	Last
	Boris	Taurus
Company	Books and Hooks	
Address	555 78th Street	
City	New York	State NY Zip 10023
Phones:	Work: 212/333-9876, Ext 234	Home: 879-5468
Dear...	Boris	Source SD Union
Remarks	Nice place to hang out and read	
Start at Step	1	Sex M
Date of Birth	3/3/33	54 Years Old
Client Number	5	
Entry Date	2/24/86	

Figure 3

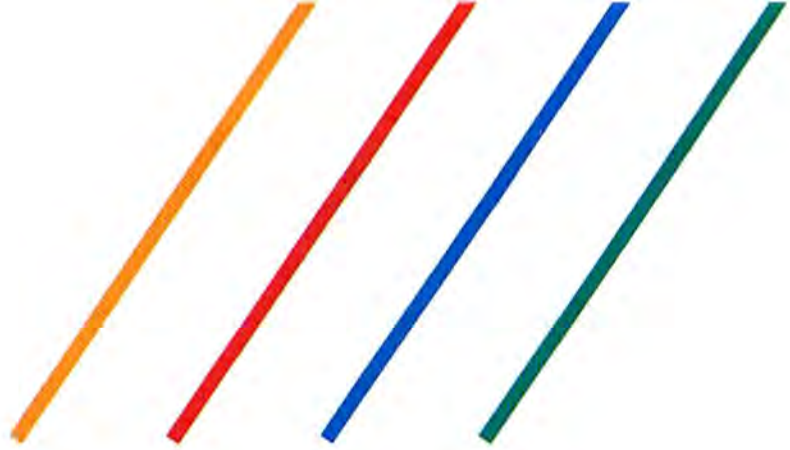
Information in Market Master's client records can be merged into form letters, sorted into daily activity files, and used to make follow-up files. Breakthrough Productions has composed an exceptionally zany set of demo files—the example shown here is the only tame one.

Desktop Design

Lightspeed's Color Page Layout System brings graphic designers out of the Dark Ages

by Erfert Nielson





Graphic designers at all but the biggest studios, agencies, or publications currently design color materials in black and white. Cutting, pasting, and resizing photocopies or photostats, they lay out pages, posters, or ads and then choose colors for the various elements from a book of standard shades. These designers don't see how their creations will actually look until they see the four-color film proof or the finished product. At that point, changes—if deadlines allow them—cost money and hold up the production process.

Now a page-design system that runs on the Mac II enables designers to create and revise layouts in 256 on-screen colors. The Color Page Layout System (CPLS) from Boston-based Lightspeed is a turnkey system that comprises the hardware and software necessary to transfer hard-copy artwork to the Mac's screen and manipulate the elements of a design. The standard system, which sells for around \$30,000, consists of a Mac II with 2 megabytes of RAM and a 40MB internal hard disk, Lightspeed's page-design software, Apple's 640- by 480-pixel by 8-bit frame buffer card, an Apple 13-inch color monitor, and a 300-dots-per-inch Howtek color scanner. If a designer wishes to print proofs, a color thermal printer can be added to the system for an additional \$10,000. Future versions of the system will also work with film recorders.

Needless to say, this price range makes professional design studios, rather than individuals, the target market for CPLS. The system can be used for advertisements, package design, brochures, charts, and other applications using color graphics.

Design Elements In, Layout Out

Entering and editing artwork on CPLS is simple. The graphic designer uses the color scanner to transfer a piece of artwork—a photo or illustration—to the CPLS program, where it's stored in a file for later use. The designer then opens a new file, in the form of a blank page, and pastes, crops, and positions the graphic elements. Headlines or other elements of display type can be entered from the keyboard; like graphics, text can be resized and moved about the page. If the project includes body copy, CPLS fills selected areas with dummy type. The designer can experiment with the typeface, size, style, and even color.

The Color Page Layout System doesn't fit into current Mac application software categories. It's not a color paint program; while you can create and fill regular and irregular shapes, you can't edit scanned pictures pixel-by-pixel or draw original artwork. Neither is CPLS a desktop publishing system. Mac owners are accustomed to laying out pages of text and illustrations on the Mac and printing a camera-ready hard copy on the LaserWriter or a Linotronic typesetter. While CPLS can produce what's known in the design field as a *comprehensive*, or *comp* (a close approximation of a finished design), in most cases the final design will have to be produced by traditional printing methods. (An image scanned at the Howtek's 300-dpi resolution might be suitable for a newspaper, but would not be appropriate for a higher-quality job.)

Although the Color Page Layout System focuses on design rather than production, it can send layout information to a prepress system to facilitate the production of the final four-color film. This layout information includes specifications for page size, the size and placement of graphics, the shape and color of graphic elements produced on the Lightspeed system, and display type. (Even in the minicomputer world, design systems don't produce production-quality output. The systems that can work with the very-high-resolution files required for producing four-color film are called *prepress* systems, or production systems. These workstations are electronic stripping facilities where high-resolution text and graphics—accessed from disk or input with a high-quality scanner—are assembled into electronic pages. The layout file produced by CPLS does not contain as much information as files produced by high-end systems, but it can make the electronic stripping process easier.)

Apart from a limited interface to a prepress system, what are the advantages of the Color Page Layout System? Perhaps the most important benefit of CPLS is its ability to closely approximate the look of a finished design, freeing the graphic designer from relying on crude sketches to convey an idea to a client. In addition, the system lets designers easily manipulate the elements of a design. Text and graphics can be ar-



Of Color and Money

Thirty thousand dollars may sound like a lot to Macintosh owners, but it's a basement bargain in the world of color design. Minicomputer-based color design systems like the Scitex Vista III, the Crossfield ProEdit Visualizer, or Lightspeed's own Sun-based Design System 20 range in price from \$100,000 to more than \$350,000. Like the Color Page Layout System, these workstations usually include a scanner for inputting color graphics, a computer with a graphics frame buffer, and a high-resolution monitor. A variety of optional devices, such as thermal printers or film recorders, provide less-than-publication-quality output.

But while the Lightspeed system is a breakthrough PC product in some ways, it's not going to turn high-end systems into dinosaurs just yet. In general, high-end systems offer more features, more peripheral options, and a tighter tie-in to production systems. For example, because they work with millions of on-screen colors (compared to CPLS's 256) and operate at resolutions up to 1024 lines per inch, high-end design systems can offer more advanced color painting features, including photo retouching capabilities.

It's likely that in a few years Mac II design systems will perform up to the level of current minicomputer systems. But, as Tyler Peppel of Lightspeed notes, that still doesn't mean the Mac II will eliminate the minis' usefulness: "By the time the Mac can do what our Sun system does now," Peppel predicts, "the mini will be even farther up the road to true pre-press capabilities."

ranged—and rearranged—on the screen, with each altered design saved as a separate file. The designer can crop, resize, or reposition graphics on a displayed page, instead of having to peel up, rephotocopy, and rearrange pieces of paper stuck down with wax or glue. The designer can instantly change the size and style of text as well, saving time-consuming trips to a typesetting service. Finally, CPLS enables designers to experiment with color in a way that's impossible with traditional layout methods. The designer can change the color of text, the background color, or the color of graphic elements such as rules or bars. If the client wants a 72-point magenta headline rather than a 48-point indigo one, the change can be immediately incorporated and evaluated.

Hands-On Experience

Macworld looked at a preliminary version of the Color Page Layout System (the name "Color Page Layout System" is also preliminary and may change by the time the final product is released). Although the software was several months from completion, it functioned well enough for us to give the system a test run. Our system consisted of a Mac II, a SuperMac 19-inch color monitor with a resolution of 1024 by 768 pixels, a 300-dpi Howtek Scanmaster color scanner, and a 200-dpi Seiko D-Scan color thermal printer.

Macworld senior design associate Leslie Barton put CPLS through its paces, creating the three opening-spread layouts shown in Figure 1. She was able to use the system after about two hours of training—a tribute to the software's ease of use, especially since no documentation was available. The CPLS application has a user interface that will be familiar to those who have used other Mac graphics programs, such as *MacPaint* or *MacDraw*.

A typical page-design session went something like this. Barton entered two pictures (in this case photos) with the Howtek scanner. Since she didn't need the images in their entirety, she made several croppings, named each, and saved them in a folder called Images. She could then copy her selections to the Clipboard and paste them onto a page. She used the selection arrow to size the photos and position them on the page. On-screen rulers and an adjustable snap-to grid helped align various pieces of the design.

Next, Barton typed a headline with the display type tool. She set text size by simply drawing a box of the appropriate height; to fine-tune her selection, she typed specifications into a dialog box. (The version of CPLS we previewed had only bit-mapped fonts, but a Lightspeed representative informed us that the final version will use outline fonts from Bitstream; like LaserWriter fonts, Bitstream fonts can be proportionally resized.)

Barton then chose a column width for the article's body copy and filled the columns with dummy text. She used the display type tool to create a large drop cap for the beginning of the article. Next, she wanted the color of the drop cap to match one of the colors in

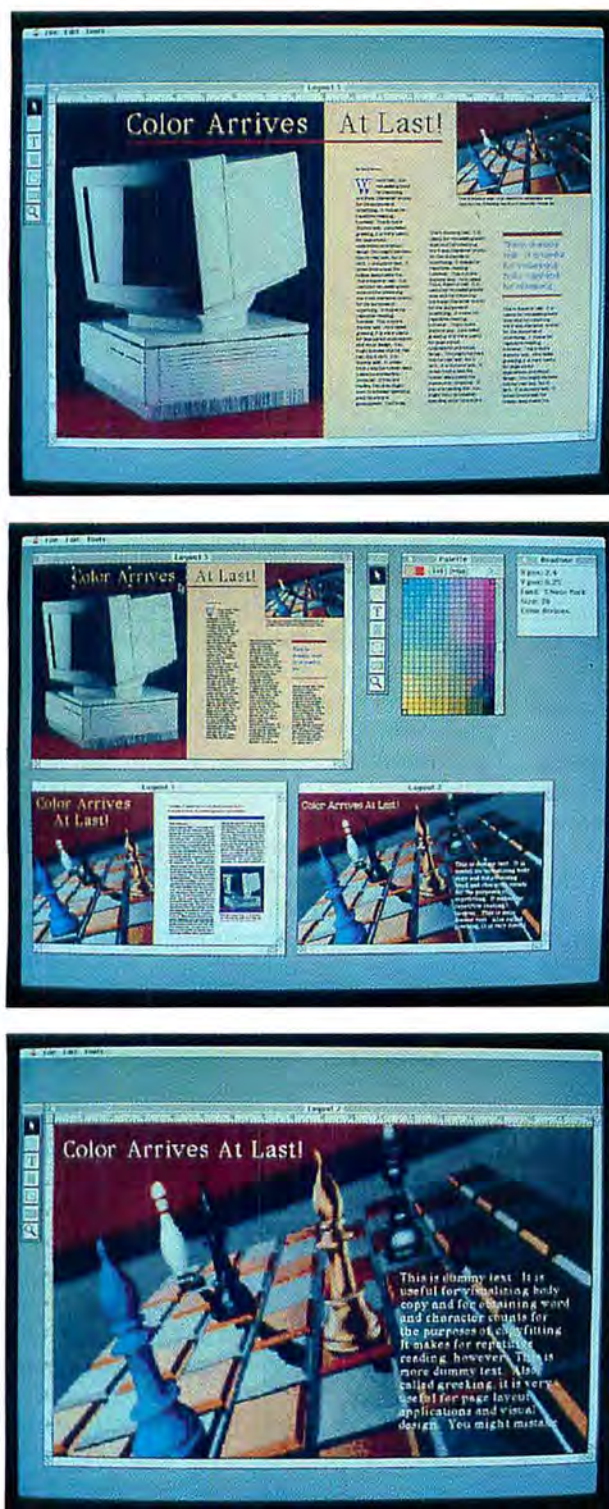


Figure 1

With the Color Page Layout System, alternative layouts can be compared on screen, complete with photos, illustrations, and text. The system allows you to open several windows simultaneously to view layouts side by side. (Note: If the chess-pieces artwork looks jagged to you, it's because it was scanned from a computer-generated graphic; scanned images normally have crisp, well-defined edges.)

the photograph. No problem: CPLS allowed her to set the letter's color by simply selecting the letter and then clicking on a portion of the scanned image. This color-matching technique can be applied to graphic elements or background page color as well as to text. In addition to picking up a color from an illustration, designers can either choose from a preset palette of 256 colors or mix their own palettes.

Speed and Flexibility

Our designer spent several hours experimenting with various page layouts, type specifications, and color combinations. She ended up with three proposed layouts, which she printed out with the Seiko thermal printer, ready to be critiqued by a client or supervisor. CPLS also lets designers compare the merits of different layout options on the screen; several pages or spreads can be opened at once for direct comparisons.

On the whole, Barton was favorably impressed with the system, though she doesn't think it would necessarily be worth the investment for the purpose of article design, her main job at *Macworld*: "I didn't feel the sizing and other layout abilities saved me that much time," she said. "The great thing about the system is the speed with which you can try out different color combinations. I think it's best suited to applications where color is a major consideration—as with posters or covers."

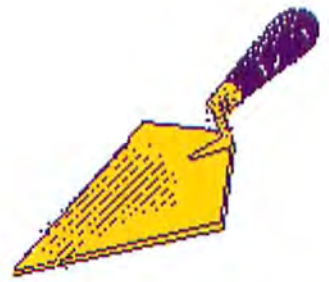
A potential problem surfaced when Barton printed her results on the thermal printer. The printed colors didn't closely match the colors displayed on the screen. Lightspeed says the color correspondence will be better when the software is completed, but there will always be some discrepancy between the colors on the screen and those on thermal-printer output.

Many designers won't need to rely on printed proofs, however. Lightspeed's Rapport remote-viewing system allows designers to send color page layouts by modem from one computer to another. (Rapport currently operates with an IBM PC or compatible, but Lightspeed plans to offer it on the Mac-based system as well.) Rapport not only sends files from one location to another, but also allows the person on the receiving end to scrawl notes on the design with a light pen and return the annotated image to the designer for revisions. If a design studio and a client are in different cities, Rapport can shave days off the approval cycle. A standard Rapport system, which includes a PC AT compatible, a 40MB hard disk, a modem, a high-resolution graphics card, a 19-inch color monitor, a digitizing tablet and stylus, and communications and graphics software, runs about \$30,000.

Lightspeed's Color Page Layout System is a promising product for professional graphic designers. While \$30,000 may seem expensive, keep in mind that CPLS, especially when combined with the Rapport communications system, can save designers a good deal of time, effort, and money in the long run. For many graphic design studios, the ability to work directly in color will be well worth the price. □

See *Where to Buy* for product details.

Reviews



The Original Gets Better

PageMaker 2.0

Desktop publishing program. **Pros:** Faster printing than version 1.2; dictionary-based hyphenation; improved importing and new exporting features; support for EPS and TIFF files; hypertext help system. **Cons:** Cannot wrap text around graphics; cannot place long documents with one command; does not group multiple items. **List price:** \$75 for 2.0 update; \$495 for complete package. **Requires:** Mac Plus, Mac II, or Mac SE plus a hard disk. **Copy protection:** None.



Although *ReadySetGo* and *XPress* still maintain a measure of superiority over *PageMaker* in certain areas, Aldus's version 2.0 is a completely rewritten update that includes dozens of new features. Foremost among the improvements are the new typographic functions (kerning, hyphenation, extensive character and paragraph formatting) and the new importing and exporting capabilities.

Typographic Features

PageMaker 2.0 allows both automatic and manual kerning (the process of adjusting the space between characters). The automatic function kerns given pairs as you place or type text. However, it is available only for PostScript fonts that have been designed with specific character kern-pairs. For other pairs (and for fonts which do not provide kern-pairs), you can manually adjust the spacing between any two characters in increments $\frac{1}{24}$ the characters' point size. In addition, a 110,000-word dictionary automatically hyphenates as you type, edit, or place text.

A number of new paragraph format options have been added that bear a strong resemblance to their counterparts in *Microsoft Word*: left indent, right indent, first-line indent, and space before and after each paragraph.

Tabs have also been somewhat improved, with the addition of various leader options. However, the tab-ruler window is still difficult to deal with, since the ruler is

not aligned with the text block. Also, since the text does not reformat until you click OK, it may take several attempts to format it correctly.

PageMaker 2.0 is missing both a Show Paragraphs command, which would display paragraph and tab characters within the text, and the ability to transfer formats between paragraphs. On the other hand, the new version can now mark a selection of text one word or one paragraph at a time and select all or part of a story, no matter how many text blocks it spans.

You can manipulate text blocks much more easily in version 2.0. You can resize an existing one by clicking on and drag-

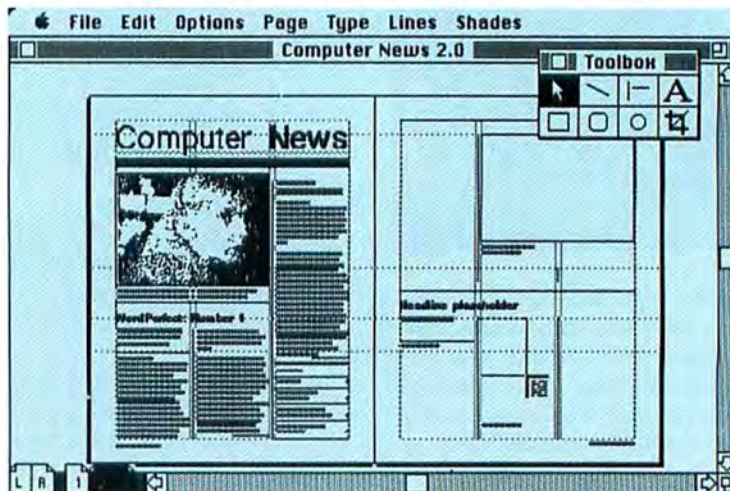
ging one of its corner handles. You can also size a placed or newly typed text block by simply holding down the mouse button and dragging to indicate the desired size while placing, or before beginning to type.

PageMaker's text-importing function has been dramatically improved. The program can now read formatted documents from *Microsoft Word* 3.0 and T/Maker's *WriteNow*, as well as from PC-based programs and formats such as *WordPerfect*, *WordStar*, *XyWrite III*, and *DCA*.

Another new feature in *PageMaker* 2.0 is the ability to export stories back into word processing documents. This is useful when you have edited a story in *PageMaker*, rather than making the change in the original document and then repeating the placing process. The exported document can be stored as text-only or as a *Microsoft Word* 3.0 file.

Graphics

Several new graphic formats are now supported by *PageMaker*, including EPS (Encapsulated PostScript), which is used to place graphics created with sophisticated drawing programs like Adobe's *Illustrator*.



Facing Pages and Drag-Placing

With *PageMaker* 2.0 you can edit your publication while displaying facing pages. Here you also see a story on the second page being drag-placed—that is, its images are defined as it is placed by dragging the loaded text icon.



Although *Cricket Draw* can produce EPS files too, *PageMaker* 2.0 will not accept them. (It will, however, allow you to place *Cricket Draw* files saved in the PICT format.) Version 2.0 also supports TIFF (Tagged-Image File Format), used for transferring scanned images with accurately reproduced shades of gray.

Printing and Performance

Printing is much faster with version 2.0. Documents with several downloadable fonts and a few paint-type graphics could sometimes take up to a half hour to print on a LaserWriter with version 1.2. With 2.0, the same complex documents are printed in less than five minutes.

PageMaker now lets you choose between Aldus's printer driver and Apple's. While the Aldus driver provides numerous advantages, such as faster printing and support of several special *PageMaker* features, it also has some shortcomings. For exam-

ple, the documentation mentions that smoothed polygons—and PICT graphics in general—may not print well with the Aldus driver, and suggests that you use the Apple driver if you have problems.

PageMaker 2.0 can place crop marks around each page, making it easy to trim the paper to the proper size for duplication. You can also collate multiple copies of a document, as well as print pages in reverse order so that they'll be in the correct sequence on the output tray. Finally, you can print page proofs that contain text and *PageMaker* graphics, such as rules and boxes. (Instead of placed graphics you see a box with a big X where each graphic would be.)

PageMaker 2.0 generally performs better than version 1.2. For instance, the new version saves documents much faster. Also, the program no longer needs to re-

fresh the publication window after you call up some of the dialog boxes—the window reappears instantly. (When the window does need to be redrawn, however—such as when you call up a desk accessory window—it's not much faster than the older version.)

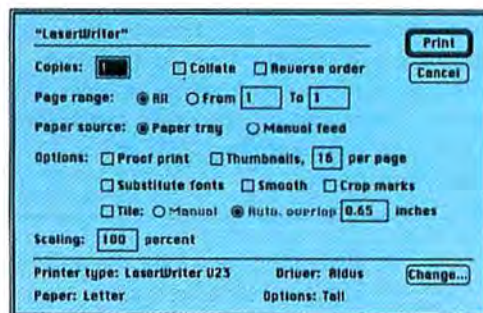
The maximum size of a publication has been expanded to 128 pages, up from a 16-page limit in version 1.2. And another new feature allows you to rotate through layers when selecting items by simply holding down the Command key as you click the mouse button.

So What's Missing?

Despite *PageMaker*'s useful additions and enhancements, other products still are more capable in several areas.

One shortcoming is that *PageMaker* does not automatically wrap text around a graphic image, as do *XPress* and *ReadySetGo*. Also, it would be useful to have a simple way of specifying a large initial capital letter for a paragraph, as there is in *Ventura Publisher* on the PC.

Both *XPress* and *ReadySetGo* 3.0 can automatically flow an entire story with one click of the mouse button. To place a long story in *PageMaker*, you must click the bot-



Print Dialog Box

A new *Print* dialog box provides additional options, such as *Reverse orders*, *Proof print*, *Crop marks*, and the ability to switch to the *Apple* printer driver.



PostScript Options Dialog Box

An optional Print dialog box provides additional features for PostScript printers. You can use the Print PostScript Disk command to create a PostScript file for later printing. Or you can save a page of your publication in EPS format for placement in other publications or programs.

tom of each text block, advance to the next page, and reflow the text for each page of the document. This can be a serious hindrance if you're producing lengthy documents. Another sorely missed feature is the ability to group multiple items so that they can be repositioned in one piece.

Yet given these limitations, *PageMaker* 2.0 is still an impressive update. The \$75 charge for the upgrade is reasonable, considering its comprehensiveness. Even with the competition at its heels, Aldus should be able to maintain a significant presence in the marketplace with *PageMaker* 2.0. —Eric Alderman

See *Where to Buy* for product details.

Easy E-Mail

OfficeTalk 4.0

Electronic mail and Linotronic output service. **Pros:** Easy to send and receive messages and documents; includes library of clip art and tips from Aldus and Microsoft; offers optional private libraries. **Cons:** Has far fewer subscribers than MCI Mail; has few general-interest areas; is relatively expensive. **List price:** \$50 per address. **Requires:** 512K. **Copy protection:** None.



In telecommunications, the winds of change could barely blow out a candle. The Mac's graphic point-and-click operating style extends to drafting and accounting, but communications remains a bastion of typed commands and control codes.

Telecommunicators glimpsed the future when Apple unveiled its icon- and

mouse-based *AppleLink* communications network—a private link to dealers, developers, and user groups (see "The Telecom Link," *Macworld*, May 1986). For the rest of us, however, composing and sending electronic mail still means pressing Return at the end of each line and grappling with file-transfer protocols. To browse a CompuServe data library, you must type commands like cat/des/age:7/key:Mac.

Now there's *OfficeTalk*, an electronic-mail network similar to *AppleLink*. *OfficeTalk* is a reseller for GEISCO (General Electric Information Service Company), a company whose mainframe computers form the foundation of the *AppleLink* network. *OfficeTalk* uses GEISCO's computers with software identical to *AppleLink* to provide its customers with electronic mail, Linotronic typesetting services, and private bulletin boards that appear as icons on the *OfficeTalk* desktop (see "OfficeTalk's Desktop"). Because software is available for MS-DOS customers, *OfficeTalk* lets offices with Macs and IBM PCs exchange files.

To subscribe to *OfficeTalk*, you pay a \$50 start-up fee, which buys an address, a password, *OfficeTalk* software for the Mac or the IBM PC, and 30 minutes of connect time. After that, you pay 80 cents per minute between 8 a.m. and 8 p.m. (Eastern Standard Time) on weekdays, and 40 cents per minute 8 p.m. to 8 a.m., weekends, and holidays.

Although these rates make *OfficeTalk* twice as expensive as CompuServe, by-the-minute cost comparisons may not be appropriate. The *OfficeTalk* software has a built-in text editor that lets you write outgoing letters offline, and the network's mouse-based operating style eliminates

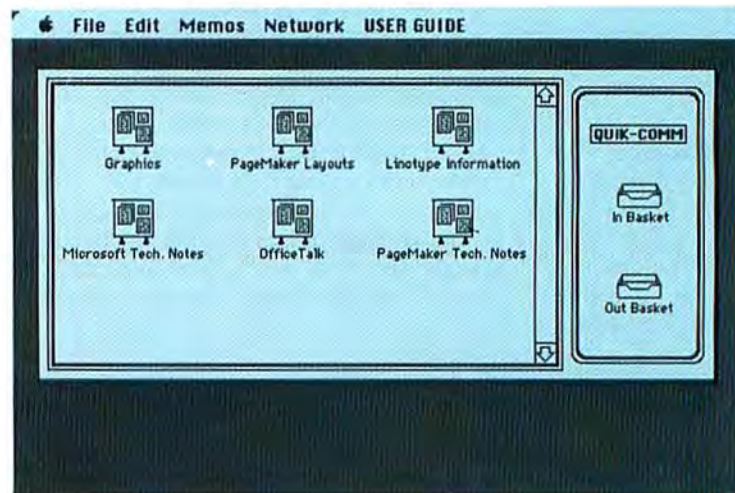
threading through menus and typing lengthy commands. Combine these features with the time you save by not having to learn a conventional service's E-mail commands, and *OfficeTalk*'s rates may look competitive.

Simple Sign-on

Unlike most information services, *OfficeTalk* lets you simply type your password and click a Connect button to sign on. The *OfficeTalk* software signs in and displays the network's desktop. Using *OfficeTalk*'s menu commands, you can exchange memos written with *OfficeTalk*'s text editor, formatted documents (such as *MacPaint* or *PageMaker* files), or applications. Receiving mail is a matter of double-clicking the In Box, then double-clicking each item to open it.

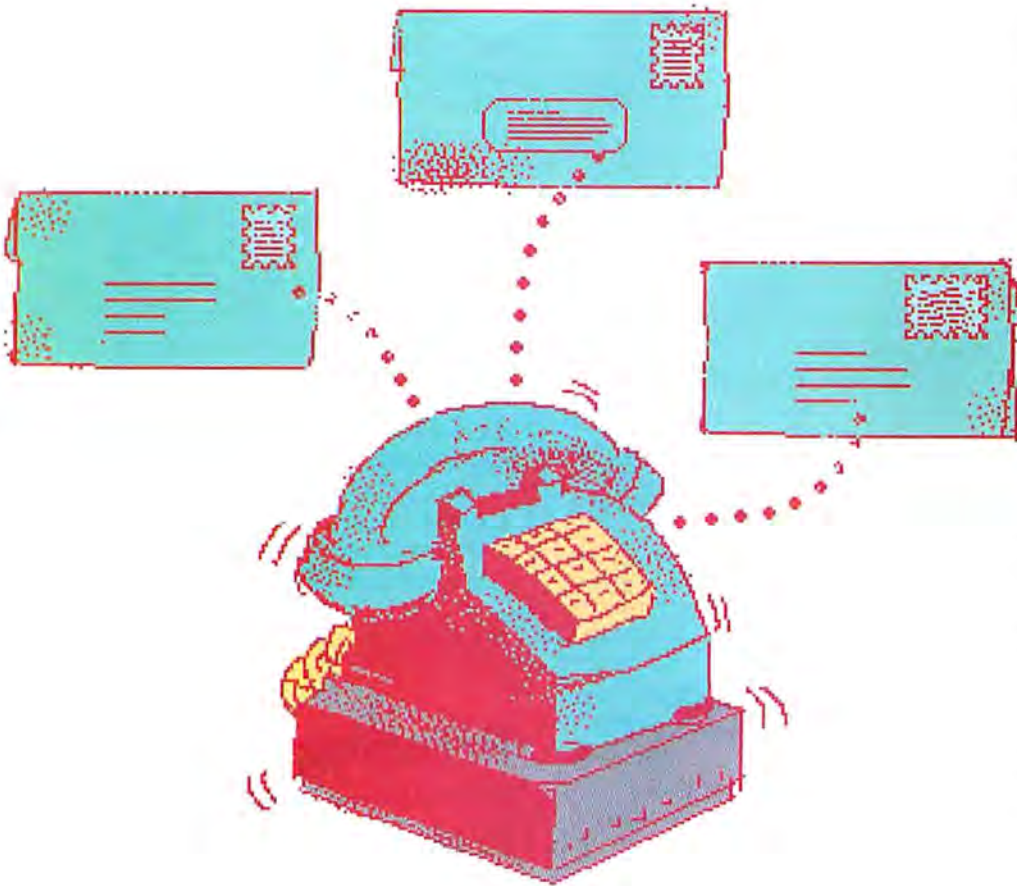
OfficeTalk's typesetting service is only an address away. Send a document to the address LINOTRON, and *OfficeTalk* personnel will download it (for 50 cents per minute) and print it on a laser printer, a Linotronic, or both, depending on instructions you supply in a Comments text box that's sent along with the file. The file itself can be a document or an image file created with Solution's *Glue*, which eliminates the formatting problems that can occur when a document created on one system is printed on another (see *Reviews*, *Macworld*, December 1986).

OfficeTalk's Linotronic rates are competitive with those of most PostScript typesetting services. An 8½ by 11-inch page containing mostly text costs \$7; an 8½-by-14-inch page is \$9; and an 11-by-17-inch page is \$12. With a graphically complex page that takes more than 15 minutes to



OfficeTalk's Desktop

OfficeTalk's data libraries and any private libraries your company may have appear as icons (left). Double-clicking one displays a window listing its contents, which you can download or read by double-clicking on an item's name. The In Box and Out Box hold incoming and outgoing mail.



typeset, you'll pay \$2 for every additional 10 minutes. LaserWriter proofs are \$2 per page. You can charge your type to VISA or MasterCard and receive it by mail, UPS, or overnight courier. *OfficeTalk* also offers a logo-conversion service that will transform your firm's logo into a PostScript font so that you can reproduce it in virtually any size.

OfficeTalk isn't a general-purpose information service like CompuServe or The Source. You'll find no up-to-the-minute news and stock quotes, and no electronic shelves bulging with shareware utilities and desk accessories. Instead, there's some clip art you can download (for \$2 per graphic), some technical support notes on *Microsoft Word* 1.05 and *PageMaker* 1.2, some canned *PageMaker* layouts you can use as starting points for your own publications, and some tips on using the Lino-tronic service. CompuServe's data libraries are as overwhelming as the Library of Congress, but you can cover *OfficeTalk*'s in an hour.

OfficeTalk can also set up private libraries, whose icons don't appear on the desktop unless you're registered as a member of a given organization. One distributing firm uses a private library to get price updates and sales figures to and from its field sales personnel. Pricing for a private library varies, depending on the number of subscribers an organization can offer, but on a monthly basis you can expect to pay about \$125 per megabyte of data. That sounds steep, but it can be far cheaper than using express couriers or trying to set up your own computer bulletin board. And *OfficeTalk*'s Mac-like nature will appeal to businesses that shy away from text-oriented E-mail services.

Is Anybody Out There?

Your only difficulty with *OfficeTalk* may be finding someone to communicate with. At this writing, *OfficeTalk* had a scant 100 subscribers, versus CompuServe's 300,000. Clearly, if you want to reach out and touch as many modem-equipped Macs as possible, *OfficeTalk* isn't for you.

If you do need to communicate with a large subscriber base, you might consider instead *Desktop Express*, a communica-

tions program that acts as a graphic front end to MCI Mail and Dow Jones News/Retrieval. Instead of requiring typed commands to navigate those services, *Desktop Express* creates a desktop with an In Box, an Out Box, an Address Book, and icons for creating memos. You use *Desktop Express* to write and address correspondence, then it dials and controls MCI Mail behind the scenes by sending the commands you'd normally type.

If you already use MCI Mail and don't require *OfficeTalk*'s typesetting service, *Desktop Express* is the better choice. But consider *OfficeTalk* if your company is contemplating E-mail and hasn't yet committed to one service, or if you could use its Lino-tronic output or private library services. With its spartan data libraries and relatively costly connect charges, *OfficeTalk* isn't trying to replace CompuServe, GENIE, or The Source. But it is a welcome alternative to those services' arcane commands, and a harbinger of a future in which communicating online will be as easy as pointing and clicking. —Jim Heid

See *Where to Buy* for product details.

Statistically True

Systat 3.1

Complete statistical-analysis program.

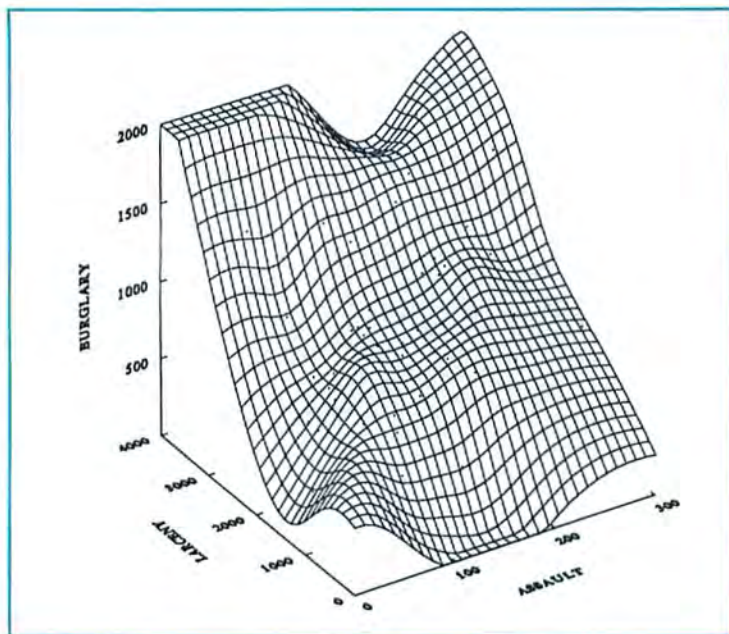
Pros: Fast, full-featured professional statistics system; superior output graphics. **Cons:** Main-frame heritage shows in not-quite-Mac interface. **List price:** \$595. **Requires:** 512K; can use single 400K drive but more disk space required for easy operation. **Copy protection:** None.



In the world of professional statistics, the heavyweight programs for scientific minicomputers are BMDP, SAS, SPSS, and Systat. With the introduction of *Systat* 3.1 for the Mac, the Macintosh now delivers all the types of analysis found in a university computing environment. In fact, according to Leland Wilkinson of Systat, a Mac with a 68881 coprocessor will outrun a mid-range VAX or a Compaq 386 on all Systat benchmarks—which means that no computer selling for under \$5000 can compete with the Mac as a serious statistics engine.

Picture Perfect

LaserWriter output gives true 300-dpi resolution, rather than simply plotting graphs at laser-printed screen-shot resolution. Besides dramatic 3-D plots, Systat includes the usual two-dimensional plotting facilities (histogram, bar, box, and stem) and unique plotting modes like fizzygrams.



The five disks provided with Systat 3.1 contain modules for standard descriptive statistics (STATS), data editing (DATA), cross-tabulation (TABLES), nonparametric statistics (NPAR), correlation matrices (CORR), multivariate linear regression (MGLH), factor analysis (FACTOR), cluster analysis (CLUSTER), time series analysis (SERIES), nonlinear modeling (NONLIN), and graphing (GRAPH). Each module contains the expected standard features, except maximum-likelihood factor analysis. Systat does run on a 400K drive in a 512K Mac, but count on lots of disk swapping. On a 1MB system the graphics module can support additional features such as 3-D plotting.

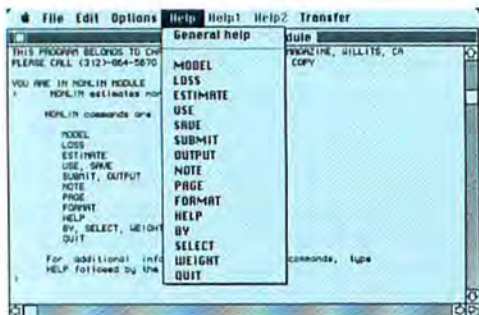
Mixed Signals

Systat's interface is a hybrid—it uses menus for handling file operations, inter-module transfer, and the Help directory

(see "Nonlinear Help"), but retains a command interpreter core. So unlike StatView 512+, in which all actions are executed through menu choices, Systat uses a BASIC-like language to string together files of commands.

The interface allows great data-processing flexibility. The IF-THEN-ELSE construction, for example, lets you automate a search through a set of data files, examining their statistical descriptions to find a set that matches a particular condition. The program that directs this search can itself be stored as a file for later use or modification. Systat also facilitates complex analysis by recording all your commands during a work session.

It may not have a true Mac interface, but Systat is obliged to accommodate many thousands of Systat users already trained to exploit the power of complex command programs on time-shared minicomputers. Systat on a coprocessor-equipped Mac can compute a 50-by-50 correlation matrix from the FACTOR module in 10 seconds; a standard 40-variable regression analysis takes 20 seconds (these tests used a Levco Prodigy board, but Mac II and SE coprocessor figures should be comparable). These numbers are comparable to the performance of SPSS on a VAX 11/780. Systat also guarantees the highest numerical accuracy of any micro-based statistics program, and includes a test file called NASTY.DAT so that you can check this for yourself.

**Nonlinear Help**

Systat uses command lines for most functions, but it provides a pull-down menu to explain the commands and offer examples of their use.

Two last points deserve special mention. A major concern of working statisticians is the transfer of large existing data files into a new program. Systat provides an excellent file-import routine, which can read ASCII files with all sorts of delimiters (blanks, commas, tabs). Systat 3.1 also provides 300-dpi LaserWriter output from the graphics module (see "Picture Perfect"). This is the highest output resolution from any widely available statistics package.

Systat is a fast, accurate, relentlessly thorough program for professional statistical analysis—complete with a genuinely humorous manual that provides a complete, easy-to-follow description of program operation. Systat's interface and price will discourage casual users, but for scientific and commercial use the Systat-Mac combination is the top choice.—Charles Seiter

See *Where to Buy* for product details.

Printing Potential

Printworks for the Mac 3.1**Integrated printer-driver utility.**

Pros: Substantially enhances ImageWriter printing capabilities and opens the Mac to many other dot matrix printers; has excellent spooling, page preview, and color options; works with the SE.

Cons: Some difficulties with proportional fonts in tabbed output or mixed text/graphics; potential problem with spooler memory set too high; does not yet work with AppleTalk; needs two to three desk accessory slots. **List price:** \$75.

Requires: 512K. **Copy protection:** None.



Even though LaserWriter output is not available to most of us, this does not mean that quality is out of reach. *Printworks for the Mac*, from Softstyle, Inc., is a set of transparent printer drivers and associated desk accessories that together raise dot matrix printing to a new art. In addition to a built-in spooler, the program offers Page Preview, three kinds of color printing (on an ImageWriter II), full integration of text and graphics (bit-mapped or object-oriented), and support of many non-Apple dot matrix printers.

Printers, Text, and Graphics

Printworks offers third-party printer drivers for various Brother, Epson, Hewlett-Packard, IBM, NEC, Star Micronics, Texas

Instruments, and Toshiba printers. For example, *Printworks* can send a combined text and graphics document to a Quietwriter 3, producing quality output rivaling that of a laser printer. Or a Brother Twinriter can—in one pass—alternate between its daisy wheel and its dot matrix head, on the same line. Although not all third-party printer drivers are included with the package, as many as you need can be requested free of charge on the registration card.

Printworks' Print dialog box (which automatically replaces the standard Print dialog box in almost all applications) contains five text settings: No Text, Digitized (exact graphic printout of the screen—used to print specific fonts), Draft (with significant improvement in word spacing), Standard (using built-in printer fonts and optimized word spacing), and NLQ (using near-letter-quality fonts). The ImageWriter II has only one NLQ font, but with printers containing plug-in cartridges or several built-in fonts, a special Font Adjustment desk accessory allows choosing of fonts. Some alignment problems occur when you use proportional fonts in columnar data (spreadsheets and databases) or with graphics, but you can solve them by using Digitized mode or by changing to non-proportional fonts.

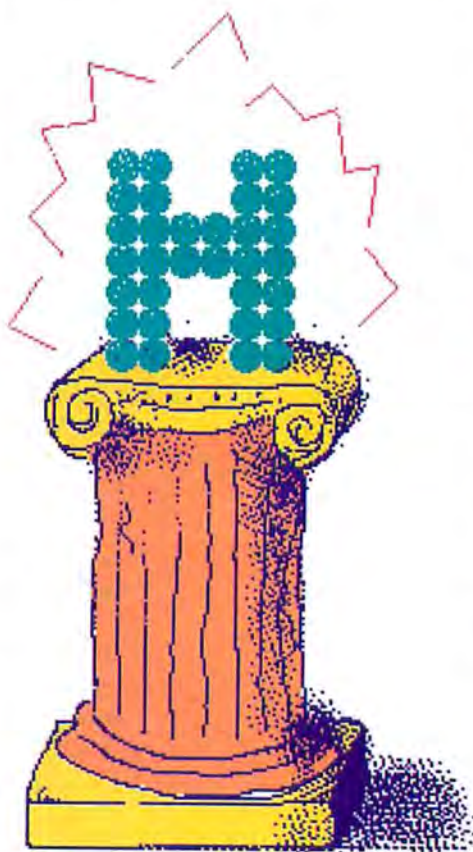
Printworks is also a very useful tool for working with graphics. Selections range from No Graphics (to skip any bit-mapped graphics), to Standard, High (multiple strikes), or Extra High (more strikes). You can also select Digitized to include object-oriented graphics like those from such programs as *MacDraw*, *SuperPaint*, and *ComicWorks*; or No Objects. However, some of these graphic or text options may not apply to all printers.

Page Preview, Spooling, and Color

One *Printworks* option allows you to preview a reduced image of an entire page before it prints, then print it or skip to the next page. You can use this option to test whether a graphic image is bit-mapped or object-oriented. To print draft documents more quickly, you can also print without graphics and use Page Preview to verify that graphics are not included. Page Preview shows you how much of the current page has been spooled into memory, which gives precise control if you want to end printing at a particular place on the

page. Setting the spooler memory too high, though, can prevent the Mac from booting the next time you use it. Although the problem is fixable, it is still annoying.

Color options (for the ImageWriter II only) are controlled by the Color Adjustment DA and include Single, Map, and Program options. In Single mode, any document can be printed in any of six colors other than black. Map works with object-oriented graphics and can be set to substitute various fill, line, and hatch patterns with specific colors. You can use this feature to produce color charts and graphics



from otherwise noncolor programs like *MacDraw*, *Excel*, and *Works*. An object graphic, like a chart from *Excel*, will still print in color when pasted into another document. The Program option works with applications, like *SuperPaint*, that set colors directly.

The excellent *Printworks* manual is thorough and clear, and deserves praise for providing valuable insight on the nature of dot matrix printing.

Printworks for the Mac takes dot matrix printing where it has never gone before, with increased spooler speed,

enhanced print quality, and third-party compatibility. It is a definite must for any Mac user with a dot matrix printer. Once you get used to *Printworks*, you'll probably wonder how you managed so long without its performance benefits.

—Rusel DeMaria

See *Where to Buy* for product details.

MacEverything

LaserPaint 1.1

Integrated graphics, text, and page-layout program. **Pros:** Combines text, bit-mapped graphics, and PostScript graphics in a single program; customizable. **Cons:** User interface is awkward; some traditional Mac functions (Undo, paste to Scrapbook) not supported. **List price:** \$495. **Requires:** Mac Plus; external drive recommended. **Copy protection:** Key disk.



LaserWare's *LaserPaint* could well be called *LaserPaint/Draw/Write*, since it integrates all these functions in a single program. This ambitious application combines bit-mapped graphics, object-oriented graphics, text, and PostScript effects. The finished product is printed on the LaserWriter (or another PostScript-compatible printer). *LaserPaint* can be used to create illustrations or to produce newsletters, ads, pamphlets, or other publications that combine text and graphics. It is not a page-layout program along the lines of *PageMaker*—it's a graphics program with page-layout capabilities. The program also provides a module that automates the color-separation process for four-color printing.

It Draws, It Paints...

LaserPaint is divided into five separate modes, each of which displays its own panel of icons. Click a button marked *D* to enter drawing mode, *P* for painting, *L* for laser printing, and so on.

The drawing panel's functions are like those of *MacDraw* or *Cricket Draw*. In this portion of the program you create lines, Bezier curves, arcs, ovals, and rectangles (see "Drawing Panel"). Lines and curves can be combined to produce complex

polygons, which can be filled with shades of gray, preset bit-mapped patterns, or patterns you create. A unique "thumbwheel" control lets you adjust your line width from a hairline to more than an inch.

Also unique to *LaserPaint* is a joystick icon that moves the drawing window anywhere on the program's drawing surface—eight 8½-by 11-inch pages. I prefer the joystick to standard scroll bars because it permits diagonal movement as well as vertical and horizontal scrolling. Other features that set the program apart include a tool that draws a spiral, a mask tool, and different styles of caps and joins to enhance lines and corners.

LaserPaint's painting mode employs the same principles as *MacPaint*-style graphics programs, but several of the tools differ from their *MacPaint* counterparts. The pen draws black lines in a variety of widths; the marker paints in any pattern with a number of adjustable "tips"; and the fill tool acts like *MacPaint*'s paint bucket, filling an object with a pattern. *LaserPaint*'s paintbrush and airbrush are impressively realistic; in fact, I found the paintbrush *too* realistic—it runs out of paint when a brushstroke is concluded, and leaves wispy marks like those made by individual brush hairs.

In addition to drawing with *LaserPaint*'s painting tools, you can import bit-mapped graphics from other applications, including TIFF (Tagged-Image File Format) files created with high-resolution scanners. Images can be edited in FatBits at 72, 300, or even 600 dots per inch (however, 600-dpi editing consumes a good deal of memory—and time).

Except for the excellent airbrush, which even includes a spatter cap, I found

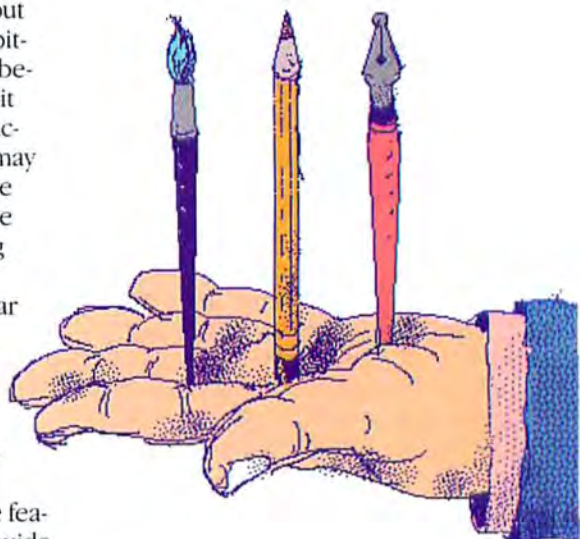
LaserPaint's painting tools adequate, but not up to the standards of many other bit-map graphics programs. For example, before painting, you must first define a "bit box"—an area in which to paint; users accustomed to *MacPaint*-like programs may find this annoying. Many of the tools are slow on the uptake; there is a noticeable lag between the time you start drawing and the time a line appears. Also, the brush, marker, and pen produce angular lines rather than circles when quickly moved in a circular pattern.

...It Writes

Press the W button to enter *LaserPaint*'s writing mode. Here you'll find some of the program's most impressive features. Although *LaserPaint* doesn't provide a full-fledged word processor, the writing mode offers enough style options to pass for a respectable page-layout program.

Text can be typed in a *LaserPaint* "text box" or imported from another application. You can change the font style and size, the font itself, and the line justification. *LaserPaint* enables you to arrange blocks of text anywhere on a page or to place them in a variety of preset or custom column formats. You can modify leading and kerning, although *LaserPaint*'s kerning merely adjusts the space between either the words in a line or the letters in an individual word. (Character spacing within a word can be achieved with the Extend or Condense commands, but this feature is not clearly explained in the manual.)

LaserPaint offers several flashy PostScript text effects. For example, you can draw a line, curve, spiral, or irregular path in the drawing mode and attach a line of text to the path. Even more exciting is the



program's ability to wrap text around a shape or place it inside one. Unfortunately, this procedure works well only with simple shapes.

Qualms

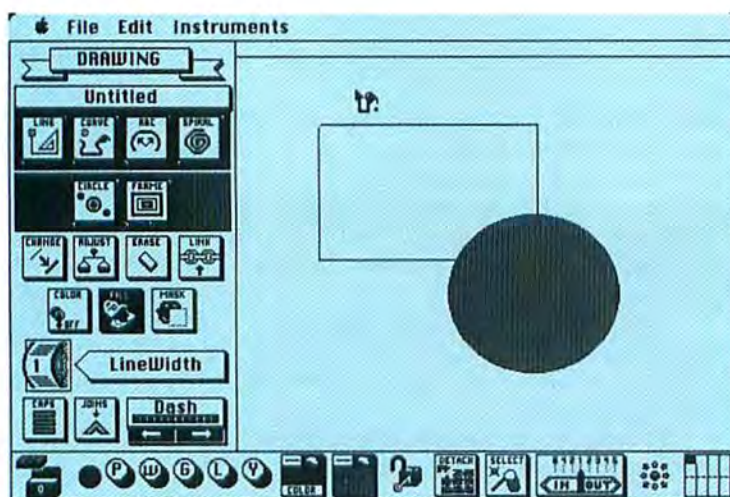
While I'm astounded that one program can do so much, I'm distressed by *LaserPaint*'s user interface; primarily, I don't like jumping from one tool panel to another to complete a drawing. Furthermore, the modes don't always function smoothly together. When you work in *LaserPaint*'s painting mode, for example, the bit box obscures text or drawings beneath it as you paint.

The interface could use some aesthetic improvement as well—learning a lesson from the clean lines of *MacPaint* or *Crick-et Draw*. With its myriad buttons, gauges, dials, and occasionally odd icons (a snake, a butterfly net), *LaserPaint* is harder to learn than programs that replicate interfaces established by earlier programs.

Fortunately, if you don't like *LaserPaint*'s icons, you're free to create your own. Not only can you edit individual icons, but you can arrange them in a custom panel accessed with a button. While it takes some effort, the ability to customize the program is one of *LaserPaint*'s best features. *LaserPaint* has problems more serious than a slightly offbeat interface, however; several fundamental functions will be missed by those accustomed to the typical Mac interface. For instance, text and graphics can be pasted from the Scrapbook, but *LaserPaint* will not paste objects to the Scrapbook (the Clipboard is supported, though). In addition, the Undo function appears in the Edit menu, but the

Drawing Panel

LaserPaint's drawing panel lets you combine lines, curves, and shapes with text or graphics from the program's other panels.



program's designers were unable to implement it. Finally, *LaserPaint*'s 180-page manual fails to explain adequately many of the program's features. (Help screens alleviate the problem somewhat, but a good manual is essential with a program this complex.)

On the positive side, *LaserPaint* offers an amazing number of features on a single disk. Rather than invest in a page-layout program, a painting program, an object-oriented drawing program, and a PostScript effects program, you might prefer the integrated approach. But keep in mind that *LaserPaint*'s modes don't necessarily offer all of the functionality of their single-application counterparts. *LaserPaint* is a step in the right direction—toward integrating graphics and page layout—but the program is seriously hampered by its poor documentation and overly complicated user interface. For now, I'll take ease of use over a multitude of features; bigger is not always better. —*Erfert Nielson*

See *Where to Buy* for product details.

Dark in the Heart of Texas

OmniLaser 2108

PostScript laser printer. **Pros:** Runs faster and prints darker than LaserWriters; high-end durability; emulates Hewlett-Packard printers and plotters; accepts font cartridges. **Cons:** Small type prints muddy; status display illegible at a distance. **List price:** \$5995. **Requires:** 512K, AppleTalk or compatible connector, and cable.



Texas Instruments' OmniLaser 2108 is a recent arrival in an increasingly crowded corral of PostScript laser printers (see "Laser Wars," *Macworld*, June 1987). But the 2108 is a horse of a different color. It's one of the few LaserWriter-class (under \$6000) printers built around a heavy-duty Ricoh print mechanism rated at 10,000 pages per month. The Canon engines in Apple's LaserWriters and QMS's PS-800 series are rated at 3000 pages per month; you're asking for mechanical problems if you exceed that figure. And the Ricoh engine produces extremely dense black images, without the scan lines that appear in the output of Canon-based printers.

These and other differences make the 2108 more than an also-ran in the field of PostScript printers.

Saddling Up

The 2108 has roughly the same Texas-sized footprint of a Canon-based printer. To set up the 77-pound printer, you must install a toner cartridge and the disposable transfer belt that applies toner to the paper. Installing the photosensitive belt requires fast action; you can shorten its life span by touching its surface or exposing it to room light for more than five minutes. But the job is no harder than loading film into a camera. Working carefully, I did it in about two minutes.

Lasers at a Glance

Specifications

RAM (in megabytes) 2
ROM (in megabytes) 0.5
PostScript version in unit tested 45
Built-in fonts 13
Free memory available at start-up (in bytes) 315,196
Size of font cache (in kilobytes) 286
Number of paper cassettes 1
Maximum paper size (in inches) 8½ by 14
Capacity of paper cassette (in sheets) 250
Print engine manufacturer Ricoh
Engine duty cycle (in pages per month) 15,000
Writes white or black white
Interfaces¹ A, R, P
Emulation Modes Diablo 630, HP LaserJet Plus, HPGL plotter, Texas Instruments 855

List price \$5995

Performance (in minutes:seconds)²

Initialize and print simple document 03:37
Print simple document after initialization 02:12
Initialize and print complex document 06:58
Print complex document after initialization 05:51

¹A stands for AppleTalk; R, RS-232C; and P, Centronics Parallel.

²Simple document: single-spaced 10-page *Microsoft Word* document in 12-pt. Courier with Bold and Italic, no graphics; complex

The 2108's \$79 toner kit contains enough powder for roughly 6000 pages. (Compare this to a Canon-based printer, which needs a new \$95 drum-and-toner cartridge every 3000 copies.) And its \$179 belt lasts for 20,000, lowering the 2108's cost per page and dulling its appetite for maintenance.

A Master Mocker

The 2108 has impressive impersonation skills. Besides being completely compatible with LaserWriters, it can mimic a Texas Instruments 855 dot matrix printer, a Diablo 630 daisy wheel printer, a Hewlett-Packard LaserJet Plus, or a Hewlett-Packard 7475 plotter. None of these modes can match PostScript's text- and graphics-handling capabilities, but they do make the 2108 an excellent choice for offices using IBM PC programs that don't support PostScript.

You select the printer's emulation mode and interface by using several front-panel push buttons. Above the switches, a calculator-like liquid crystal display (LCD)

OmniLaser 210	LaserWriter Plus
2	1.5
0.5	1
45	38
13	35
315,196	174,040
286	160
1	1
8½ by 14	8½ by 14
250	100
Ricoh	Canon
15,000	3000
white	black
A, R, P	A, R
Diablo 630, HP LaserJet Plus, HPGL plotter, Texas Instruments 855	Diablo 630
\$5995	\$5799

document: single-spaced 10-page *Word* document in 24-pt. Times Roman Bold, 12-pt. Helvetica and Italic (1 line), 12-pt. Garamond with Italic (downloadable fonts), and 7 small bit-mapped images.

shows the current mode and displays a menu for choosing among the printer's serial port, the AppleTalk port, and the Centronics parallel port (which is the standard printer interface on IBM PCs). When the printer is processing a job, the display

shows the same status messages that appear on the Mac's screen. In all, the LCD makes an impressive message center—when you can see it. The display isn't lighted and is nearly impossible to read unless you're right on top of it. Its status messages may convey more information than the blinking light on most PostScript printers, but they won't do you much good if you're trying to make them out from across the room.

A Bold Performer

The 2108 performed admirably for me, printing a document containing numerous fonts and bit-mapped graphics roughly three times faster than Apple's LaserWriters (see "Lasers at a Glance"). The printer never approached its engine's eight-page-per-minute rating, but I have yet to see a PostScript printer that does. The 2108 was just short of overtaking the fastest LaserWriter-class printer available, QMS's PS-800 Plus. The 2108 doesn't have as much free memory for downloadable fonts as the PS-800 Plus, but it still offers nearly twice that available in the LaserWriter Plus.

Unlike the Canon engines in LaserWriters and in the QMS PS-800 series, the OmniLaser's Ricoh print mechanism is a *write-ubite* engine; instead of exposing areas of the photosensitive belt that will appear black on the page, it exposes areas that will appear white. The result is an image with extremely dark, bold blacks. Graphics containing large black areas look superb, but text, especially 10-point and smaller sizes, appears muddy, with the enclosed areas of letters such as the lowercase *e* partially filled in.

The 2108 outclasses Canon-based printers in other ways. It boasts a half-megabyte more memory than a LaserWri-

ter Plus. Its paper cassette holds 250 sheets versus the LaserWriter's 100. It has two front-panel slots for accepting plug-in font cartridges, and its paper transport delivers pages in the proper front-to-back order.

You should consider the OmniLaser 2108 if you expect to print more than 3000 pages per month, and if you can exploit its versatile emulation features and its Centronics parallel interface. But do examine its output first to judge whether it's too dark for the types of documents you print. Speed, ruggedness, and versatility are excellent traits to look for in a laser printer, but the real proof is in the printout. —*Jim Heid*

See *Where to Buy* for product details.

Film Scoring Simplified

Cue: The Film Music System 1.0

Film-scoring program. **Pros:** Quickly collates and converts film and video timing cues; finds tempos for key-bit points; cue sheets provide detailed timing and descriptive information; prints custom score paper, master cue sheets, and performing-rights cue lists. **Cons:** Does not support all professional film and video timing formats; offset feature is buggy and convoluted; price is prohibitive for the amateur or semi-professional film composer/editor. **List price:** \$499. **Requires:** 512K. **Copy protection:** Key disk.

Clicktracks 2.0

Film-scoring program. **Pros:** Inexpensively converts click information to musical tempos; compiles a list of key-bit points and scans bit list to find best tempo; supports nearly all film and video formats. **Cons:** Very limited in the number of cues it can analyze and collate; slow and buggy; bit list can contain only minimal descriptive cue information. **List price:** \$85. **Requires:** 512K. **Copy protection:** None.



Mating music to film involves meticulous calculations and tedious paperwork. Two programs, *Cue: The Film Music System* by Op-code Systems and *Clicktracks 2.0* from Scores Unlimited, make the process less frustrating for the film composer by generating cue sheets and converting film tempos to musical tempos.

A Question of Time

Cue not only handles all the computations involved in translating and matching the film editor's timing references to sections in the musical score, but also accurately converts the timing references to the different formats of film and video. Timing formats are assigned in the Set Format dialog box—allowing cue times to be input in feet/frames for film, SMPTE time-code numbers for video, or in hours, minutes, and seconds if stopwatch timings are used.

While useful, the time display selections do not represent all the professional film and video formats currently in use. The SMPTE time display measures only 30 frames per second, and the film time display measures only 35mm feet/frames. The absence of such common professional timing formats as NTSC color drop frame (29.97 frames per second), European video standard (25 frames per second), 16mm film, Super 16mm film, and 70mm film is puzzling for a program aimed at the professional user, and it definitely limits its flexibility.



Collating Timing Information

With *Cue*, each cue is formatted according to production title, cue number, and offset information; cue timing can be shown in absolute or elapsed time in the Cue Sheet, while the Input window always shows absolute time values.

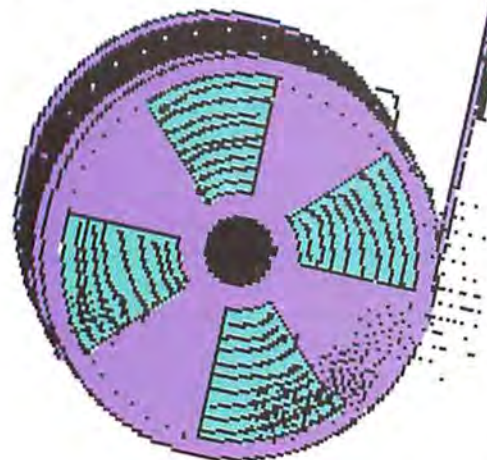
Cue simplifies the task of collating all timing information in a script. Once you select the film or video format, you enter cue information in the Input window and the program displays the results in the Cue Sheet window in three columns. The first column shows the timing reference (when the cue starts), the second lets you describe the associated action in the film or video, and the third references the musical beat for the cue (see "Collating Timing Information").



TI's OmniLaser 2108

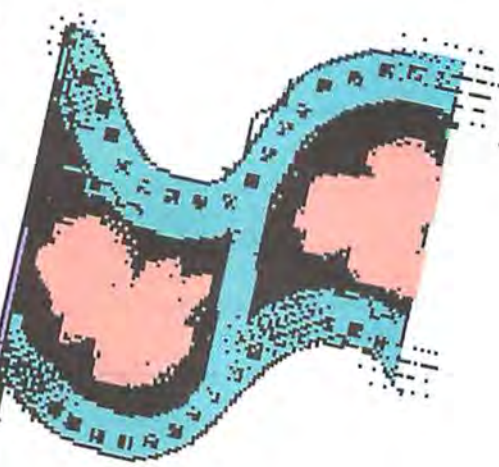
On the Beat

The next major step for the composer is to find a musical tempo in which important points in the film fall on the beat, so that those points can be accented effectively by the score. A Key Hit box checked in the Input window lets the composer quickly locate important moments in the film score on the cue sheet. Then, while in the Search Tempo mode, *Cue* looks for



the best tempo that will strike all key-hit points. It resolves the key hits to the nearest quarter note, eighth note, or triplet within a predefined range of tempos. The program compiles a list of all key-hit point tempos found, thus allowing the composer to decide which tempo most closely matches the one originally desired. *Cue* lands the key hits on the beats of the tempo you choose.

The Set Offset menu selection lets you globally alter an entire cue sheet after it has been created. If the director removes four frames from a scene, the Set Offset feature allows you to remove those four frames from all timings in the cue sheet. This important feature is also the most convoluted function of *Cue*. Instead of saving time, it can actually create more work (for example, by not automatically transferring offset information from the Running Time dialog box to the Set Offset). There are other problems with this feature as well: some operations are inconsistent, while others can even cause system bombs.



However, *Cue* has better-implemented features that do save time. The Master Cue List and Performing Rights Cue Sheet functions compile all saved cue sheets in a production (see "Side Benefits"). All information originally entered into the Cue Information window is listed numerically by reel and cue number. The Master Cue List serves as a bible for composers and editors on all cues within a show, while the Performing Rights Cue Sheet is important for copyright and royalties information. *Cue* will even take timing, tempo, and meter information from any selected cue sheet and generate custom score paper that shows all timing and descriptive information for each measure above the staff. (This is especially impressive when printed out on a laser printer that has the Sonata font by Adobe.)

Another handy feature is the stopwatch in the Input window for manually timing cues. Once the stopwatch is selected, hitting any key starts and also stops the timing; the time elapsed is shown in whatever format was previously selected. This feature lets you obtain an accurate timing if you do not have access to a moviola or a videotape with visible SMPTE numbers.

Finally, *Cue* has several unique features that give the film composer alternative ways to approach the scoring of a film. Play Clicks will send the click track of a selected cue sheet out of the Mac speaker or external speaker jack. This click track can be recorded directly to tape, or, if the composer feels limited by the click track, *Cue*'s

Free Timing window will generate an animated graphic that shows when key hits occur. These options are a boon when troubleshooting a difficult cue that cannot be resolved by the traditional method of conducting the orchestra while following a click track. These features nearly justify *Cue*'s \$495 price.

A Less Costly Alternative

Those who need a less expensive click-to-music tempo converter might turn to *Clicktracks 2.0* by Scores Unlimited. *Clicktracks 2.0* is a collection of three programs written in *Microsoft BASIC*: Clicktracks, Hitlist, and Scan. The Clicktracks module is really just a computerized version of the infamous Big Click Book, an authoritative reference text that shows where each film frame falls in relation to the beats of a given tempo. The Hitlist and Scan modules are similar to *Cue*'s Cue Sheet and Search Tempo features. The compiled Hitlist can be scanned for the best possible tempo, and later printed out (see "Click-to-Music Tempo Converter").

Clicktracks 2.0, however, is limited both in the amount and in the types of data it can manipulate. Many features are sluggish but are still usable on most projects. Furthermore, unlike *Cue*, *Clicktracks 2.0* supports nearly all film and video formats and has a crude but functional offset feature. For the novice film composer, it's a good value for the money.

Set Cue Information			
Production Title:	Part in Parcel		Cue #: 9
Cue Title:	Ash-Tone Confrontation		
Other:	A Ragone Camera Production, © 1986		
Composers:	%:	Publishers:	Affil.:
Erik Holsinger	100	Musical Imagery	BSCAP
	0		
	0		
	0		
Orchestrator: E. Holsinger			
<input checked="" type="checkbox"/> Written <input type="checkbox"/> Orchestrated <input type="checkbox"/> Copied			
Usage: <input checked="" type="radio"/> Bkgnd <input type="radio"/> On Cam <input checked="" type="radio"/> Inst <input type="radio"/> Voc			
<input type="button" value="OK"/> <input type="button" value="Cancel"/>			

Side Benefits

A wide variety of useful information is stored in each cue; this is used later for *Cue*'s Master Cue Sheet and Performing Rights Cue List, both of which are necessary documentation.

File Edit Do Firms Format Resolution									
BLACK WHOLE: Clicktracks 2.0: Part in Parcel Cue#9									
TEMPO 152.41 BPM (SPD=0.4531250 SEC) 10 - 7 CLICK									
* VIDEO30* DROPPFRAME									
* PAGE 1 *									
YOUR LIST	DESCRIP	CLOSEST HIT	RT	OFFSET	LOC				
1: 0: 0: 0	do to You?	1/ 0	1	0	0: 0: 00				
1: 0: 2: 7	Tone runs	5/22	6	0	0: 2: 27				
1: 0: 7: 20	Cornered!	17/22	18	0	0: 7: 20				
1: 0: 16: 22	"I think ..."	37/23	38	0	0: 16: 22				
1: 0: 20: 20	"NO! Really ..."	46/16	47	0	0: 20: 20				
1: 0: 23: 1	Ash follows	51/21	52	0	0: 23: 11				
1: 0: 47: 12	"Ms. Tone"	105/17	106	0	0: 47: 50				
1: 1: 2: 27	The offer	139/19	140	0	1: 2: 98				
1: 1: 25: 4	"Please, I ..."	188/22	189	0	1: 25: 19				
1: 1: 30: 15	The stop	200/19	201	0	1: 30: 62				
1: 1: 42: 0	Ash's Threat	226/ 4	226	0	1: 41: 95				

Click-to-Music Tempo Converter

In the Hitlist section of Clicktracks 2.0, bit points show sequential order, frame information, and bit resolution at the selected tempo. Here a well-timed bit is plus or minus two frames.

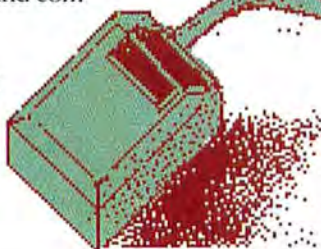
Which One's for You?

Cue has a variety of useful tools for the modern film and video composer. The program simplifies even the most complex timing calculations and collates all music cues in a variety of incredibly useful ways. Moreover, the Stop Watch feature within the Input window, and the Click and Free Timing windows, provide a means to combine artistic intuition with spreadsheet accuracy. Although the current version still lacks many timing formats, a prerelease copy of the new version not only addressed the previous version's bugs, but added significant features to an already full-featured program. However, *Cue*'s \$495 price is hard to justify for those who have not yet scored a professional film or video production.

Meanwhile, *Clicktracks* 2.0 effectively converts film and video timing information in all formats to a musical tempo, compiles a hit list, and looks for the best tempo that accurately corresponds to each hit—all for a fraction of the cost of *Cue*. But *Clicktracks* is limited in the number and variety of cues it can handle. The Mac interface is not nearly as intuitive and complex as *Cue*'s; multiple tempos and meters cannot be specified; and parts of the program, such as the resolution of hit tempo and scan functions, are sluggish if not buggy.

All in all, both programs are welcome tools for the professional film composer/editor, and both further validate the Mac's position as the best computer investment for the professional musician and composer. —Erik Holsinger

See *Where to Buy* for product details.



Reading by Computer

Portal 1.0

Computer novel. *Pros:* First-rate science fiction narrative. *Cons:* Would be faster in a RAM disk or on hard disk, but only works from floppy drive; reservations about reading novels on a CRT. **List price:** \$49.95. **Requires:** 512K. **Copy protection:** Key disk.



Portal is the first interactive program to call itself a computer novel. Written by Rob Swigart and published by Activision, *Portal* is a compelling, complex, and often plausible science fiction story.

The story takes place in 2016, apparently a pretty bad year for humans on planet Earth. Returning from an outer space mission, you find no one. Not a soul. Not even the proverbial "last surviving man (woman)." In fact, you're him (her). You do find that Worldnet, the massive multi-dimensional computer system that spans the globe and reaches into the nearby space colonies, is functioning, though not very well. Still, enough of the global net-

work is operating for you to piece together the story of the disappearance of humanity. You pursue the truth by using the available nodes of the computer.

While you're scanning the few accessible bits of data left in History, Central Processing, and Med10 (3 of the 12 "data space" nodes in the Worldnet system; see "Story Fragments"), your research is interrupted by Homer, the raconteur node—a complex algorithmic crystalline AI computer that takes the massive input from Worldnet and turns it into cohesive narrative. Homer wakes up (so to speak) distraught that there is no one left to hear his tales; he's encouraged by your presence, though, and asks you to help him remember what has happened. Gradually, with Homer's help, you unravel the complex story of Peter Devore, Regent Sable, the Mentor, and others who played pivotal roles in the events preceding humankind's demise.

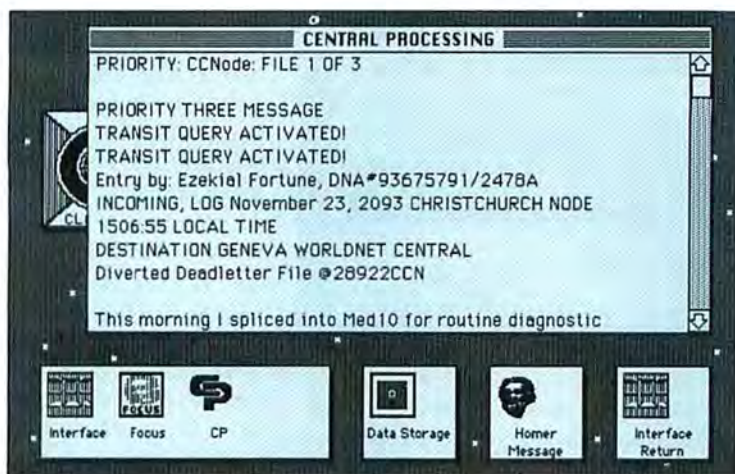
Homer delivers the story in short episodes with supporting information from History and the other nodes (SciTech, PsiLink, Military, Edmod, Life Support, Geography, Wasatch, and Psychological). You can read some parts of the novel out of sequence, either by accident or by intention, but most of the story is only presented after previous parts have been read, so your role is controlled. A flowchart of the entire novel is available from Activision. It takes nothing away from the story, and it helps you orient yourself within the narrative.

You interact with *Portal* (except when you sign in) by using the mouse, so you can simply relax, sit back, and read. Pleasant sound effects occasionally punctuate the story but aren't critical, and you can turn the sound off. Prepare to do a lot of reading; it took me almost three full days to complete the story. The program is, in fact, a full-length novel on three disks. Fortunately you can save your place at any time and come back to it later.

As software, *Portal* is well conceived and enjoyable. As literature, it is a first-rate novel with wit, warmth, mystery, and adventure. My only reservation about *Portal* is that I might have been more comfortable reading this story in a conventional book. Long stretches watching the screen tired my eyes more than reading a book does. On the other hand, I experienced a sense

Story Fragments

You choose the data space you want to examine from the interface. Some data spaces become accessible as the story unfolds; others will malfunction and become unavailable.



of freedom and participation playing *Portal* on the computer that I would have missed with a novel. *Portal* may well be a first step toward a new genre of computer entertainment. As Swigart puts it, "*Portal* may be the 'Great Train Robbery' of computer novels."—*Rusel DeMaria*

See *Where to Buy* for product details.

For FORTH Programmers

Mach 2 2.1

FORTH programming language. Pros:

Complete development system; includes assembler, editor, debugger, numerous utilities; multitasking; fast compilation and execution; compact, well-written manual. Cons: Departs from FORTH 83 standard; not suggested for novice programmers. List price: Version 2.11

\$99.95. Requires: 512K. Copy protection: None.



A professional software developer looks for several things in a development system—compilation and execution speeds, a code library, and a selection of programming utilities such as editors, disassemblers, and debuggers. The FORTH programming language *Mach 2*, from Palo Alto Shipping, provides these tools and several extra features as well. And at \$99.95, it is readily accessible even

to casual programmers who want to tinker with the Mac's hidden power.

Vital Statistics

Mach 2 is based on *FORTH 83* but is not restricted by the 16-bit address limitations of that standard. And unlike the indirect threading of words found in standard FORTH, *Mach 2* words are direct subroutine calls, so programs run at near-assembly speeds. Also, *Mach 2* can accept regular Macintosh text files for source code instead of the "screens" normally associated with FORTH.

Mach 2 includes several features necessary for creating large, complex programs. Among these features are multitasking capability, dynamically loaded overlays, separate dictionary headers, and local variables.

For multitasking, *Mach 2* employs the *round robin* system often used in game programs or printer spoolers. Each task runs until it gives up control to the next task in the queue.

Dynamic overlays are useful for creating a very large program or a program consisting of numerous individual sections. When planning a program, developers break it into segments, or independent sections of code. A program segment is called into memory only when needed. Otherwise, the segment is removed, and its memory space is released. The *Mach 2* utilities, including the editor and assembler, are all written as segments.

Separate headers also reduce the amount of memory needed by a completed application. All of the information used by the FORTH compiler during program development is held in an area of memory separate from the actual program subroutines. When you give the *TURNKEY* command, only the subroutines are saved; the compiler information is dropped. (Incidentally, application programs created by using the *TURNKEY* command may be distributed license-free.)

The use of local variables makes *Mach 2* programs easier to follow and much easier to write. They are implemented as a stack-frame environment, partially addressing some of the complaints about FORTH's rather naked parameter stack and its unwieldy collection of stack-manipulation words.

Utilities, Libraries, Manual

As a complete development environment, *Mach 2* includes a program editor and an assembler, a disassembler and debugger for checking the execution of programs, and a library of functions to access the various Macintosh utilities. The program editor was not available when this article was written, so a simple Macintosh text editor was used instead.

Mach 2's tools are all accessible from within the programming environment. The assembler is not the Reverse Polish assembler usually associated with FORTH, but uses the familiar syntax of standard 68000 assemblers. And because it is subroutine threaded, *Mach 2* allows you to embed FORTH words within machine code. They are simply assembled as subroutine calls.

The code library includes functions to call the Macintosh Toolbox, gives programmers access to the SANE floating-point and transcendental functions, provides a vocabulary of I/O words, and offers the *Macintalk* speech utility. Provision is also made for defining Macintosh resources and events.

The manual, which is generally well written and illustrated with many examples, is divided into two sections. The main section covers various aspects of programming on the Macintosh. It assumes the reader is already familiar with using FORTH to program on the Mac and therefore may be difficult for an inexperienced

programmer to follow. However, Palo Alto Shipping provides technical phone support as well as "RoundTable" on the GENie on-line network. The reference section is particularly well organized, both for quick help and for in-depth information on the internal structure of the language.

Wrap-up

Mach 2 is a solid product at a reasonable price, and it includes many of the features and utilities required by professional programmers. Its many enhancements are of great value, though the *FORTH 83* standard was often compromised to include them. Overall, I feel that any faults in this product are more than adequately balanced by its strengths.—Ken Takara

See *Where to Buy* for product details.

Two Electronic Editors

Doug Clapp's Word Tools 1.0

Style and punctuation checker. **Pros:** Fast; style checker catches common pitfalls. **Cons:** Inadequate manual; cannot read Word 3.0 files. **List price:** \$79.95 (\$119.95 with Speed Spell). **Requires:** 512K. **Copy protection:** None.

Tools for Writers 1.1

Writing improvement program. **Pros:** Allows extensive revision at any time; excellent manual. **Cons:** Slow; sometimes awkward to use; reads only text files. **List price:** \$17 plus \$8 for shipping and handling. **Requires:** 128K. **Copy protection:** None.

While nearly every writer can benefit from a personal editor, few can afford such a luxury. You can call on either of the programs described here, however, as an electronic editor for help and advice at any time.

Word Tools

Doug Clapp's Word Tools by Aegis Development checks punctuation and style, marks your longest sentences and paragraphs so that you can revise them later, and analyzes your writing using a variety of standard tests.



Style Conscious

Word Tools' style checker displays errors, clichés, and similarly suspect words and phrases; it then suggests changes and allows you to fix each one on the spot.

It's a lot like using a spelling checker. First you select a document, then click on any one of the icons representing the program's three major routines: Count, Style, and Punctuation. *Word Tools* opens *MacWrite* and *Word 1.0* files directly; other word processor files must be in text-only form.

Word Tools' most obviously useful features are its style, punctuation, and "extremes" checkers. The style checker compares your prose to an editable, 900-entry "suspect-style" file. After a document has been checked, the Improving Document window displays each stylistically suspect word or phrase (such as "rather," "fairly," "at the present time") in context. Underneath is a suggested improvement, an explanatory comment, and buttons for taking some action (for example, make the suggested change, insert one of your own, mark the passage for later revision). As mechanical and impersonal as this may sound, the style checker is surprisingly helpful in catching clichés, hack phrases, and the like.

The punctuation checker works like the style checker, locating such difficult-to-find errors as extra or missing spaces and misplaced commas. The extremes checker allows you to mark overly long sentences and paragraphs for later editing.

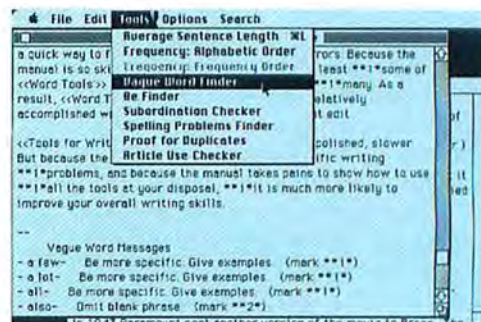
Three kinds of reports are provided by the Results window: Counts, Averages, and Extremes. Counts shows the total characters, words, sentences, and paragraphs in your document. Averages tells you the length of the average word, sentence, and paragraph; Extremes does the same for the longest ones. The Rankings window dis-

plays several indexes—including the Interest Level and the (school) Grade Level—that are supposed to determine your document's readability and its appropriate audience. The Word List window displays a word-frequency list, which tells you how many times each word has appeared in your document. Unfortunately, you're not likely to find these reports and indexes very helpful, since the *Word Tools* manual fails to explain how to use the information they contain. For example, the word-frequency list doesn't indicate which words should be used sparingly, while the Interest Level index offers no ideas about how to make your document more engrossing. But even if you discover how to change your index results, how accurately can they evaluate your writing style? Readability and interest levels are determined by too many factors to be easily reduced to a simplistic word- or sentence-length formula.

Despite its polished look, *Word Tools* also has some irritating foibles. It handles input errors poorly and sometimes refuses to complete a requested count or check. And some of the entries in the suspect lists are suspect themselves, while the style checker sometimes lists word fragments like the "very" in "everyone."

Tools for Writers

Tools for Writers, by Kinko's Academic Courseware Exchange, was written with students and teachers in mind. It lacks the polished look of *Word Tools* and does not always run as smoothly as it should. On the other hand, it contains some of *Word Tools'* most useful functions and a few others besides. Unlike *Word Tools*, however, *Tools for Writers* is organized around specific writing problems. While this format tends to make the analysis of a single document rather laborious, it is an excellent way to improve general writing skills.



Eliminating Vagueness

Tools for Writers' Vague Word Finder marks ineffective words or phrases and suggests changes at the end of the document.

Although *Tools for Writers* works only with text files, you can revise or create documents within the program. As does *Word Tools*, the program computes the number of words, sentences, and paragraphs, and it calculates average sentence and paragraph length. *Tools for Writers* also compiles word-frequency lists. Unlike the documentation for *Word Tools*, however, the *Tools for Writers* manual extensively discusses potential uses for the counts, averages, and lists.

The rest of *Tools for Writers* addresses specific writing problems. The Vague Word Finder marks a variety of vague or ineffective words and phrases ("some," "totally," "for the reason that") and adds referenced comments at the end of the document. The Be Finder marks all forms of the verb "to be" and reports the percentage of sentences that contain such weak constructions. The Subordination Checker marks all the subordinators and coordinators in your document and tells you if too many were used. And the Article Use Checker analyzes article usage, marking them and reporting those you overuse.

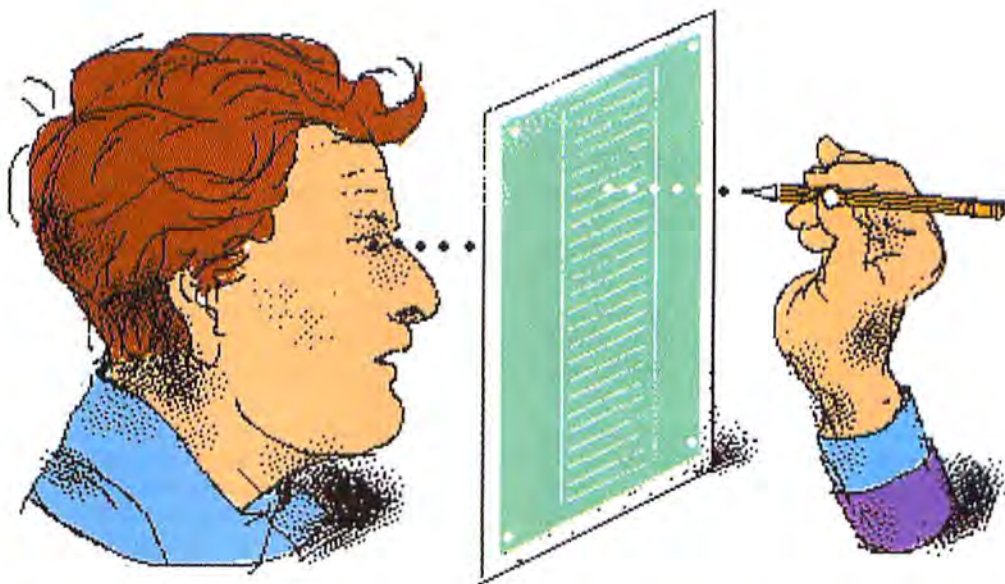
After *Tools for Writers* has marked a document, the user must go back, search for the marks (with the program's Find command), and decide whether the marked passages can be improved. Here *Tools for Writers* excels, for the exercises in the manual show how to use each part of the program effectively, how to judge correct and incorrect usage, and how to improve your writing overall.

A Helping Hand

Although neither program can match a human editor, each one has something to offer writers. *Word Tools* is fast, easy to operate, and most helpful as a quick way to fix common style and punctuation errors. Because its manual is so skimpy, however, the usefulness of at least some features will remain a mystery to many. As a result, *Word Tools* is probably best suited for work that needs only a light edit.

Tools for Writers is more schoolmarmish, less polished, slower. But because the program is carefully aimed at specific writing problems, and because the manual takes pains to show how to use all the tools at your disposal, it is much more likely to improve your overall writing skills. —Robert Eckhardt

See *Where to Buy* for product details.



Shareware DA Text Utilities

Grep-Wc 1.1

Desk-accessory text utility. **Pros:** Reads documents from within an application; can save text files; documentation; search features. **Cons:** Does not allow editing, can only read MacWrite or text files. **List price:** Free. **Requires:** 128K. **Copy protection:** None.

miniWriter 1.34

Desk-accessory text utility. **Pros:** Better control of screen and print format in text files; well documented. **Cons:** Large for a DA; defaults are sometimes inconvenient. **List price:** Version 1.36 \$12. **Requires:** 128K. **Copy protection:** None.

Smart Quotes 1.1

Desk accessory curved-quote converter. **Pros:** Simple; works with many applications. **Cons:** Not compatible with MS-DOS PCs. **List price:** \$10. **Requires:** 512K. **Copy protection:** None.



Want to enhance your word processing or work with text files? Three desk accessories, widely available on electronic bulletin boards, promise to help. One lets you read text and MacWrite files from within other applications or MacWrite itself, in effect opening a read-only window. Another lets you write, edit, read, and print text-only files. The third automatically changes plain vertical quotes entered from the keyboard to the more attractive style used by typesetters

("), without hitting the Option key. One is free; the other two are inexpensive shareware.

Grep-Wc

Hiding under the cryptic name of *Grep-Wc* is a handy DA that reads and counts words in text and MacWrite files. You can use it to read on-disk documents from any application that supports DAs. It can open a second window in MacWrite, too. Although *Grep-Wc* won't let you edit the document, it will save it as a text file, which you can then open with a text-file DA and copy via the Clipboard into MacWrite. That may not be elegant, but it's adequate if your cut-and-paste needs are modest, or if you only need to read another document. The word-count feature is also a handy supplement to MacWrite.

The acronym *Grep* (Globally search for Regular Expressions and Print) means the ability to show on the screen every line in a document containing a string of characters—even to look for those characters at only certain places in each line. However, for most people the real value of *Grep-Wc* is its ability to read MacWrite and text files from within applications.

Grep-Wc is limited to reading only those files, ignoring MacWrite formatting information and pictures. It uses no scroll bars but starts at the beginning and runs the document sequentially through its screen window. (Be sure you get version 1.1, since version 1.0 bombs on MacWrite 2.2 documents.) You might ask more from

a commercial product, but *Grep-Wc* is extremely useful, reasonably small at 12K—and free.

miniWriter

Text files are handy for notes, file transfers between programs or computers, and many other purposes, but they are awkward to use with word processors like *MacWrite*. *miniWriter* is a new shareware DA that lets you write, read, edit, and print text files as large as 30K, a limit imposed by the DA format. (*Grep-Wc* only lets you read them.)

Written by David Dunham, creator of the DiskInfo DA, *miniWriter* has more features and flexibility than its major shareware competitor, the venerable *MockWrite* DA. For example, *miniWriter* comes with a special ImageWriter font, to show how output will look on an ImageWriter I or II. It adds extra characters to the ImageWriter internal fonts and lets you pick display font and size. For printing, you can select from standard ImageWriter fonts and specify bold or underline style; *miniWriter* also works with the LaserWriter. A handy Get Info command gives a near-instantaneous word count. What's more, *miniWriter* costs only \$12, compared with the \$35 list price for the full *MockPackage*.

The bad news is that with the ImageWriter font, *miniWriter* adds 32K to your system file, compared with only 11K for *MockWrite*. That makes it hard to squeeze into a RAM disk in a 512K Mac or onto 400K disks. *miniWriter* also suffers from a "feature" that many users may consider a bug. It has a default setting that automatically

converts ordinary quotes to "smart quotes," which look nice on paper but translate into garbage symbols when you send text files to other computers.

Smart Quotes

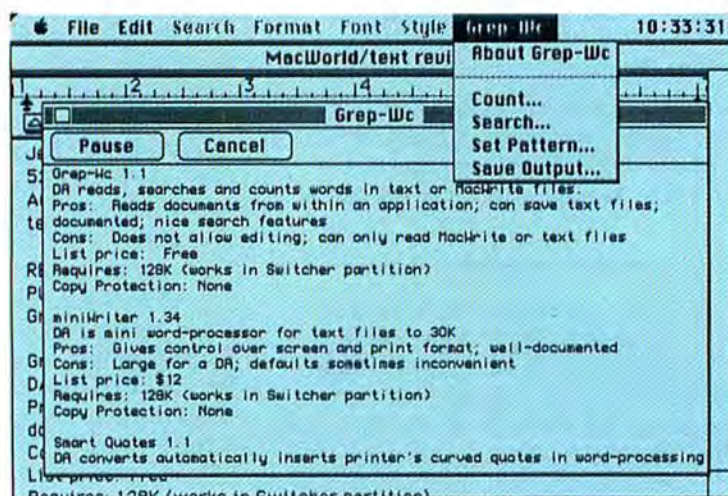
Finally, if you like curved quotes in finished documents, you'll want *Smart Quotes*—a DA written by the editor of a small Boston-area literary magazine. Press the quotes key, and you'll get curved apostrophes and double printer's quotes (alternating open and closed quotes) without having to use the Option key. It's simple and indestructible, and it works with most applications, including *MacWrite*, *Word 3.0*, *WriteNow*, and *MindWrite*. However, it does not affect DAs such as *miniWriter*.

All three DAs come with on-disk documents. They run with Systems 2.0, 3.2, and 4.1, on the 512K Mac, the Plus, and the SE, as well as in 128K Switcher partitions. *Grep-Wc* should be in the library of every Mac user, even those who don't own *MacWrite*. So should a text-processing DA, though the choice between *miniWriter* and *MockWrite* depends on your needs and system configuration. *Smart Quotes* is more a specialty item, though it can add a touch of class to printed output. *Smart Quotes* and *miniWriter* are good examples of why it pays to shop the shareware market, while *Grep-Wc* is an outstanding example of the public domain tradition of users freely sharing programs they've developed for their own use.—Jeff Hecht

See *Where to Buy* for product details.

Second Window

Grep-Wc lets you read one *MacWrite* document while editing another in *MacWrite* or in some other application. You can even read the last saved version of the document you're editing. The Pause/Resume button lets you stop text scrolling while you read.



Using the LaserWriter with the PC

TOPSPrint 1.08

PC-to-LaserWriter networking software.

Pros: Easy installation; good documentation; no limit on number of fonts and attributes in a document. **Cons:** Can't handle proportional spacing; must be reconfigured to switch between PostScript and ASCII/Dialog printing; bit-mapped graphics only. **List price:** TOPSPrint \$189; TOPS network \$389. **Requires:** 512K PC (IBM or compatible); TOPS for the PC (board and network software). **Copy protection:** Serial number detection.

PSPrint 1.01

PC-to-LaserWriter networking software.

Pros: Menu-based options; options for paper size and orientation. **Cons:** Can't handle proportional spacing; limit of four font and attribute combinations per document for PostScript translation; confusing documentation; poor error handling; no graphics capabilities. **List price:** PPSprint \$150; PC MacBridge board \$250. **Requires:** 256K PC (IBM or compatible); Tangent PC MacBridge AppleTalk board. **Copy protection:** None.

LaserScript 2.16

PC-to-LaserWriter networking software.

Pros: Custom routines for WordStar, MultiMate, and 1-2-3 spreadsheets and graphs; PostScript routines. **Cons:** Can't handle proportional spacing in spreadsheets and reports. **List price:** LaserScript version 3.0 \$150; PC MacBridge board \$250; PC MacBridge Plus (board, PPSprint, LaserScript, several other utilities) \$650. **Requires:** 256K PC (IBM or compatible); Tangent PC MacBridge AppleTalk board. **Copy protection:** None.



The LaserWriter, Apple's laser printer, has a built-in capacity for use with almost any PC running MS-DOS. Plug in the proper serial cable (the one used to hook a PC to an HP LaserJet works fine), invoke a few special commands, and you can easily print from most MS-DOS programs to the LaserWriter. But this quick-and-dirty direct-connect approach creates problems: you're almost always limited to one typeface (Courier), and you'll have to throw a switch on the

printer that cuts off any users connected to the LaserWriter by AppleTalk—a move that will make you less than universally popular among your coworkers.

Three commercial products—Tangent Technologies' *PSPrint*, its deluxe add-on *LaserScript*, and Centram's *TOPSPrint*—address the issues of adding fonts and attributes to your PC documents, translating them to PostScript, and sending them over AppleTalk to the LaserWriter. *PSPrint* and *TOPSPrint* try to do all this as transparently as possible by working from inside your normal PC application programs, while *LaserScript* offers extra features but is less transparent. Each offers different options, and none quite achieves the ultimate goal of a seamless connection.

Get Set to Net

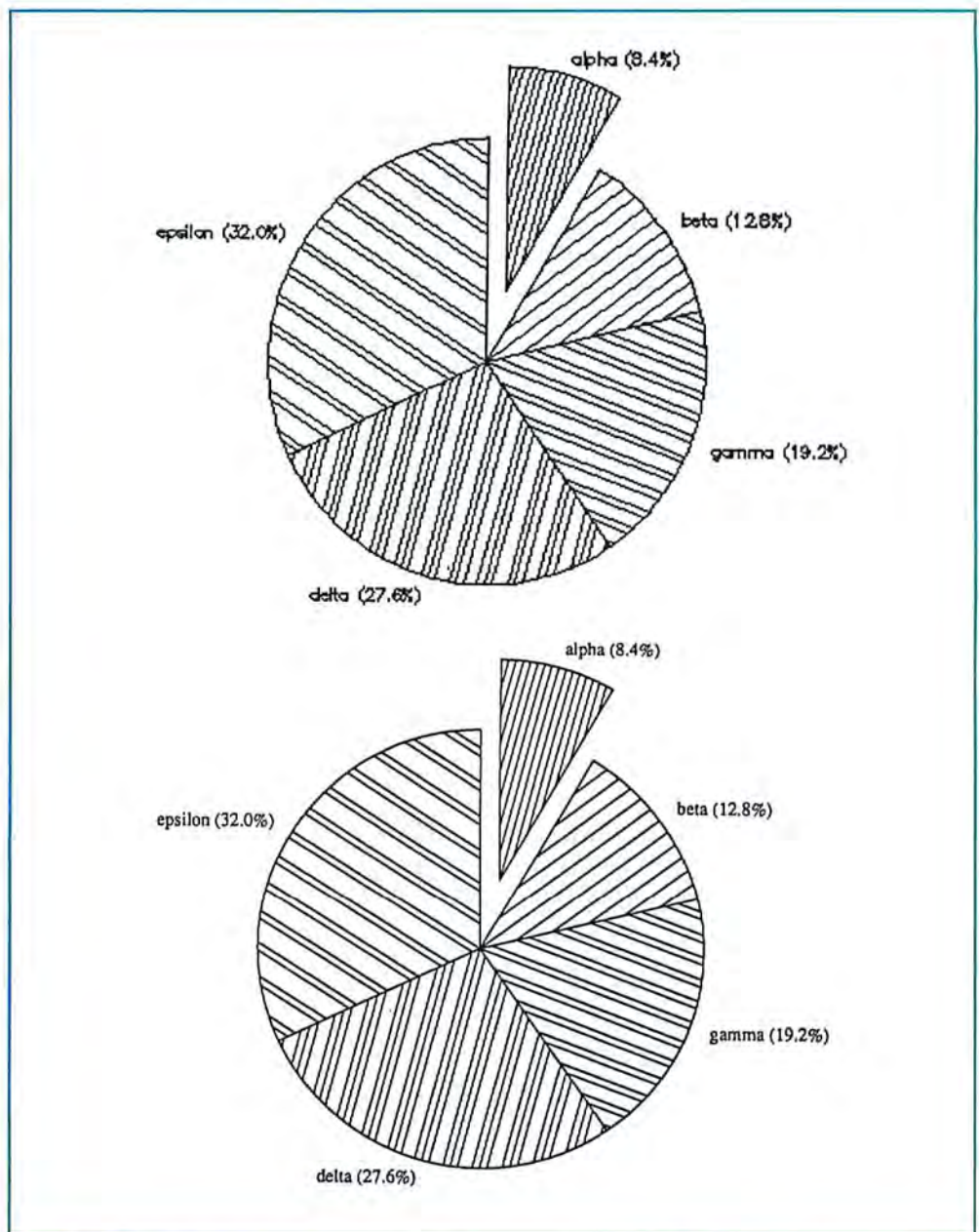
To use any of these products, you'll need the appropriate AppleTalk circuit board (a Tangent PC MacBridge or a TOPS network card) installed in your MS-DOS machine. Tangent offers the least expensive solution, bundling *PSPrint* with PC MacBridge for \$350, while Centram charges \$389 for its board and network software, then another \$189 for *TOPSPrint*. Once the board's in, you'll need to go through a brief installation procedure that includes modifying your config.sys and autoexec.bat files. *TOPSPrint* handles this in a particularly nice way, automatically adding its commands to the critical files.

You're up and running now if your application comes with its own PostScript driver (*Microsoft Word*, *Windows*, *WordPerfect*, Lotus's *Manuscript*, and a few others do). But be aware that a little fine-tuning may still be necessary: both programs, for example, require you to edit a line or two in *Word*'s LaserWriter driver before you can successfully print.

If the application you're using on the PC does not have its own PostScript driver, you'll need your print program to help you with font selection and size, page orientation, and PostScript translation. Here's where the programs really diverge, with *LaserScript* offering the most sophisticated options and *PSPrint* and *TOPSPrint* offering ease of use.

TOPSPrint

TOPSPrint lets you embed short codes in a document to specify your choice of fonts and attributes. If you then set up your software for printing to an Epson dot matrix printer, *TOPSPrint* translates the Epson instructions into a



Graphic Output

With *TOPSPrint*, converting Epson output to PostScript gives a jagged bit-mapped result similar to Epson's dot matrix output (top). Converting the

same graph to an object graphic with *LaserScript* gives smooth, clear output (bottom).

PostScript file to drive the LaserWriter. It's easy, it's networked, and it lets you access the laser's fonts and features...in theory.

In practice, you'll get mixed results, depending on the type of document and the fonts you select. If you use Courier, your documents will look as good as that font can look. The Epson-to-PostScript translation utility, however, can't handle proportional spacing well. This means that

spreadsheets or database reports printed in fonts like Times or Helvetica come out with snaking columns: where each row in the second column begins depends entirely on the length of the same row's first-column entry. While problems in text documents will be less noticeable, any tabbed or columnar information will exhibit this problem.

Graphics are even worse. In Lotus's 1-2-3, for example, *TOPSPrint* takes the Epson bit-mapped PICT file output and reproduces it in blotchy laser dots. Lotus's

font choices for graph labels—block, roman, italic, script, and so forth—are not changed to Laser fonts, but left as bit-mapped graphics, resulting in almost unreadable text.

It's disappointing that such a well-implemented program falls short in such essentials as font variety and graphics output. *TOPSPrint* has a good interface, a model installation procedure, and a clear, easy-to-read manual. But when all is said and done, it succeeds in just two areas: it networks output from programs with their own LaserWriter drivers, and it facilitates Courier/Diablo emulation output from inside any other program.

PSPrint and LaserScript

Like *TOPSPrint*, *PSPrint* also takes normal printer output and creates a PostScript file for the LaserWriter. Rather than embedded codes, it makes use of a front-end menu to access the LaserWriter's features. This is a matter of personal preference: *TOPSPrint*'s codes offer more flexibility in font and attribute choices and let you work entirely within your application, while the *PSPrint* menus are less cryptic and offer several additional formatting choices, but may require you to leave your application program to select new settings.

Two of *PSPrint*'s menu settings are especially noteworthy. One makes it easier to alternate between printing from applications with their own PostScript drivers and those that need *PSPrint*'s own PostScript translation, without any extra steps. (*TOPSPrint* requires a bothersome trip through its configuration program each time you switch, for example, between printing a Word document and printing a 1-2-3 spreadsheet.)

The second useful feature addresses the difficulty of specifying fonts within most PC applications. *PSPrint* uses the limited-attribute choices built into almost all applications—normal, bold, italic, and bold italic—to trigger font changes on the LaserWriter. Using the menu, you build a table of equivalents that *PSPrint* uses in printing your document. You could, for instance, make the body of your text Times by setting normal to Times, then add Helvetica headlines by setting italic to Helvetica in the *PSPrint* menu and using your regular PC application commands for italic on all headlines. This is easier than embedded codes but limits you to four choices.

Unfortunately, *PSPrint* exhibits many of the same limitations as *TOPSPrint*. When you're working with anything other than straight text, in any font other than Courier, columns don't line up properly, and tabs are erratic. And there's no way to output graphics at all.

LaserScript

Tangent's solution to this is to sell you (for an additional \$150) a more enhanced product called *LaserScript*. Used in conjunction with *PSPrint* and the Tangent board, *LaserScript* has several extra bells and whistles not found in the regular *PSPrint* package: it converts formatted WordStar and MultiMate files to PostScript for laser output, it lets you print 1-2-3 graphs in sharp laser lines and fonts, and it even outdoes 1-2-3 itself by giving you a way to easily print graphs and spreadsheets on the same page. It also lets you add PostScript commands to some of your documents for even better customized results.

With all these great features, though, even *LaserScript* can't master the problem of accurately printing columnar spreadsheets and database reports in any font but Courier. And what's more, all this power is inaccessible from within your PC applications. You must save your work first, then run the *LaserScript* program itself to send your output to the LaserWriter.

Connectivity Compared

There's no clear-cut winner. After all, it's never going to be completely painless to print to a proportionally spaced printer with high resolution from a machine using a monospaced monitor with low resolution; at best, compromises will be necessary. The fewest compromises are encountered in programs that have their own PostScript drivers; even proportional fonts work fine in these programs. For programs without this capability, *TOPSPrint* is best at approximating the normal print-from-within-an-application ease; *PSPrint* has the lowest price and several useful formatting features; and *LaserScript* has special options for WordStar, MultiMate, and 1-2-3 users.

For the widest range of features and options, you'll probably want to buy both of Tangent's products. Be prepared for some confusion, though, since *PSPrint* and

LaserScript are not designed to work together smoothly, and the documentation—consisting of two manuals and various addenda and notes, with no indexes—is confusing and rife with grammatical errors and typos. Tangent's products aren't bug-free either; *PSPrint* can occasionally lock up the PC or drop you out to DOS.

The market should respond quickly to the large number of PC users printing on LaserWriters by combining the features of *PSPrint* and *LaserScript* with the well-documented ease of *TOPSPrint*.

—Cynthia Harriman

See *Where to Buy* for product details.

A Pair of Deuces

Plus-20

Hard disk. **Pros:** Extra software utilities; push-button SCSI selector; SCSI address in Get Info; quiet. **Cons:** Poor performance; not very compact. **Requires:** Mac Plus or 512KE with add-on SCSI port (available from Peak). **List price:** \$1095.

Magic20

Hard disk. **Pros:** Quiet. **Cons:** Poor performance; not very compact; six-month warranty. **Requires:** Mac Plus or 512KE with add-on SCSI port. **List price:** \$545.



The Plus-20 from Peak Systems and the Magic20 from Magic Products are two 20MB hard disks that differ only in software and in minor design features. The 20MB SCSI disk market is now crowded with offerings, making product selection even more confusing for the end user. One clear selection criteria, however, is performance, and these two prod-



Peak Systems Plus-20



Magic Products Magic20

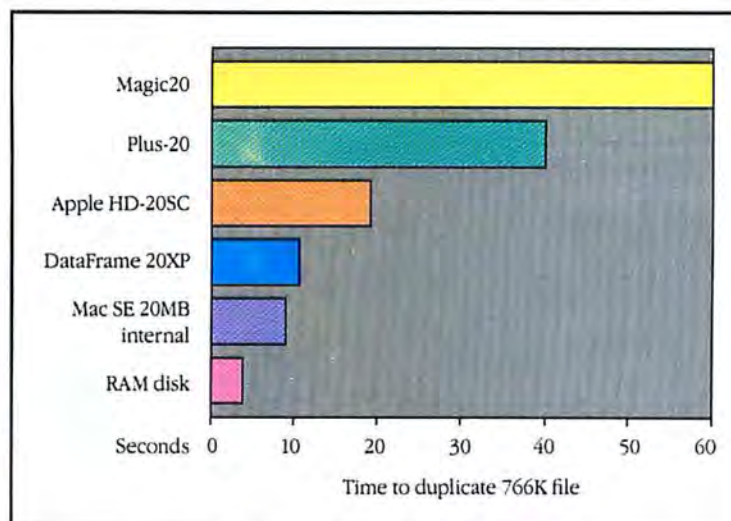
ucts suffer from performance problems that make their competitors more attractive buys.

Hardware

The Plus-20 and Magic20 are almost the same size—about 75 percent larger than a Rodime, DataFrame, or MacBottom disk, and 3 inches deeper than the Macintosh that sits on them. Each has a light on the front that shows when the disk is being accessed, 50-pin SCSI connectors, and a fan in the back. The Plus-20 is more attractively packaged: it has a power switch that lights up when it's turned on, as well as a push button for selecting the SCSI address—a far better approach than the Magic's internal jumpers. The Magic20 is set to an address of 0 by default, which will cause problems with a Macintosh SE that has an internal hard disk (I didn't test either drive with an SE). Both drives operate fairly quietly. The Plus-20 has a one-year warranty, while Magic's lasts only six months.

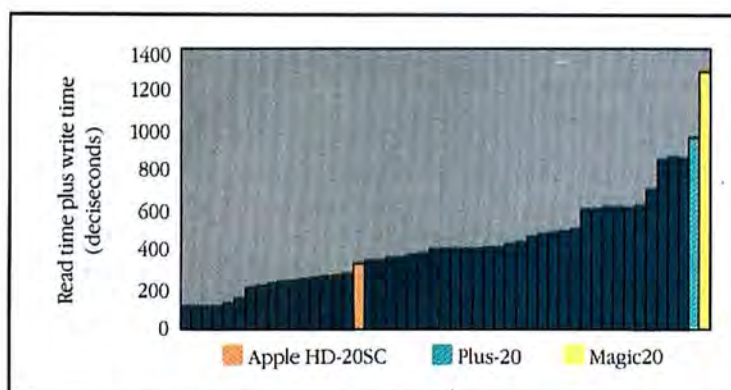
Software

The software packaged with the drives distinguishes these two SCSI disks from each other. The Plus-20 comes bundled with some unusual utility programs: Peak Express, from ALSoft, for optimizing the disk (*defragmentation*), and a set of programs from MicroAnalyst for recovering lost files, patching copy-protected programs, and other such tasks. The package does not include a backup program or a security program. The formatting application has no provision for updating the driver on the hard disk without reformatting it and destroying data. Peak Systems does provide options for testing the disk for errors and for parking the drive heads in preparation



On the Mark

The amount of time necessary to duplicate a 766K file in the Finder. The RAM disk represents the theoretical limit of disk speed.



Down to Basics

A comparison of raw disk performance (Disk-Timer II read time plus DiskTimer II write time) for 49 Macintosh SCSI hard disks. The Peak and Magic drives were significantly slower than the rest.

for travel. One especially nice touch with the Plus-20 is that you can see the drive's SCSI address when you select Get Info in the Finder.

The Magic20 comes with a good backup program, Dantz Software's MegaCopy, and provides a way of updating the driver on the hard disk without destroying any data. However, there is no way to park the heads and no utility for testing the disk for errors. The only other application supplied is a public domain program by Billy Steinberg called *Password*. This provides some simple password checking at start-up, but is easily bypassed by a Mac expert.

Performance

The one serious problem I found with the two drives was their performance. I ran a series of tests, including Steve Brecher's *DiskTimer II* test of raw performance and a test that timed the operation of duplicating a large (766K) file in the Finder. In both cases, the Plus-20 and the Magic20 took much longer than comparable 20MB hard disks, like the Apple

HD-20SC. They looked even worse when compared to faster hard disks, such as the DataFrame 20XP and Apple's Macintosh SE internal drive (see "On the Mark" and "Down to Basics").

The Peak-20 and the Magic20 work as advertised, but they are not up to the level of their competition in the 20MB SCSI disk market. Utilities like disk optimizers, file-recovery programs, and backup programs can be purchased separately for a small additional outlay, but performance is not easily improved. I cannot recommend either of these disks when there are many others (the DataFrame, the MacBottom, and the Jasmine, for example) with much better performance and good utility software in the same price range. —Ric Ford

See *Where to Buy* for product details.

More Castle Hassles

ShadowGate 1.0

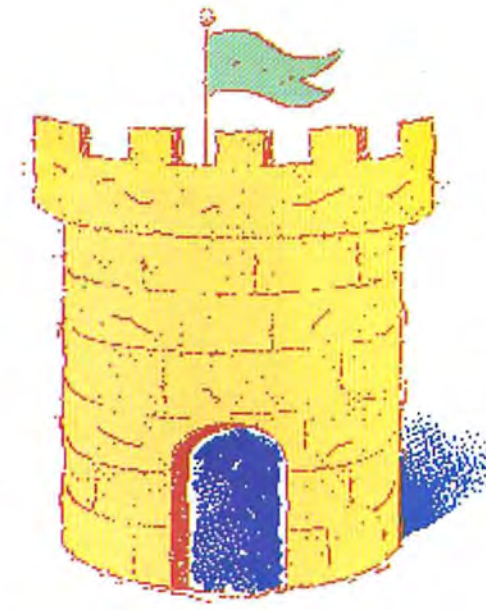
Graphics and text fantasy game. **Pros:** Simple interface; increasing challenges; top-quality sound effects and graphics. **Cons:** Script lacks flair and originality; games must be saved to third disk. **List price:** \$49.95. **Requires:** 512K. **Copy protection:** Key disk.



ShadowGate is a fantasy adventure game set in the chambers and hidden recesses of a castle possessed by evil. Who, after all, would bother exploring a castle possessed by goodness? So much is jammed into these two disks that nearly everyone should find this game appealing, but players new to treacherous computer castles will enjoy *ShadowGate* best. The plot is tried and true. Rooms and tombs are visited, objects are examined, knowledge accumulates. It becomes clear that the Warlock Lord (he of the recurring evil laugh) can only be defeated by the Staff of Ages. If you've been this way before, you know the Staff couldn't possibly be in one piece. You've got to find the pieces, put the thing together, and finally, you get your showdown with the W.L. This is the natural order of things.

Effective Effects, Nothing Bizarre

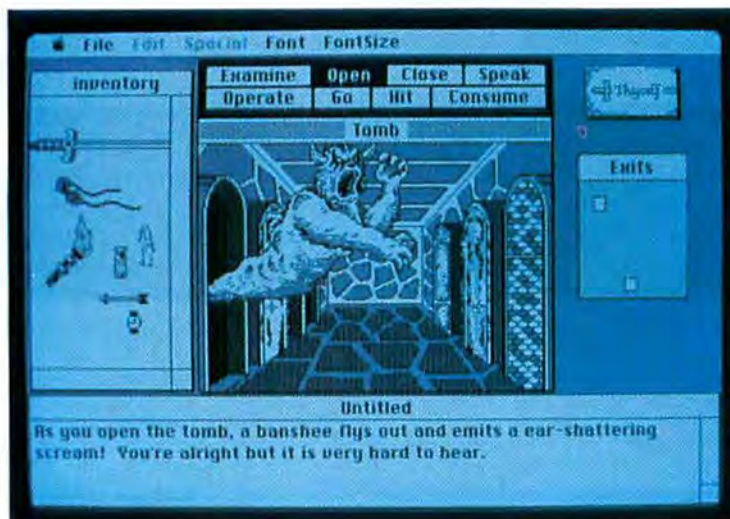
Although its graphics are top quality, I kept wishing the game would generate a few more chills with something totally new



and bizarre. Admittedly, computer games aren't actually supposed to upset anyone, but good ones can be like network television—technically well produced but somewhat restrained. The most amusing treats in *ShadowGate* are for the ears. Various animations are enhanced by digitized real-sound effects that are better than the rudimentary sound effects of most games; among them the ringingly realistic shattering of glass, old W.L.'s peals of evil laughter, sliding walls, magic effects, and a deadly drop through a trapdoor. Animation occurs briefly at essential and revealing moments—none of it, however, as elaborate and protracted as the animated musical presentation of the game's creators in "About ShadowGate." It's too bad that the sense of humor displayed there wasn't carried over to the game itself.

Sight and Sound

ShadowGate's graphics are expertly crafted but tend to lack originality. However, the accompanying sounds are far better than those of most adventure games.



Keep the Torch Burning

The mouse interface requires no typing; *ShadowGate* plays easily and instinctively. The most basic challenge quickly becomes obvious: you must keep a torch burning at all times in a dark castle, and the torches you find as you go vary in quality. The manual guides the player through the opening turns, and the first portion of the game is relatively easy, but its complexity increases. (Hint: Don't underestimate the long-term effects of the Wraith's Curse.) Although advanced players may find the challenges of the game routine, *ShadowGate* has two disks' worth of scope and is ultimately less of a pushover than the first hour or so may suggest to an experienced castle crawler. A hint book, available by mail order for \$5, will probably do a good business.

If you've passed over something too quickly or have resumed a game and want to review the moves ending the last session, you'll appreciate the ability to scroll back the Text window approximately 20 lines (about the last ten actions), another helpful feature not present in all games.

Because the *ShadowGate* disks are completely loaded, they have no room for game storage. Prudent players store their games frequently, which means constant disk swapping. It's an inconvenience on a 512K Mac even with an external disk drive, much more so if you're attempting to play with only one drive. *ShadowGate* is also available for the SE and the Mac II, but as of this writing, a sound glitch exists in the Mac II version.

Routine Superiority

ShadowGate is technically, visually, and aurally superior to most of its competition, but this reviewer still found something lacking. *ShadowGate* does not take itself seriously enough to create a mood of mystery that reaches beyond the gaming; it also lacks the tongue-in-cheekiness found in, for example, *Leather Goddesses of Phobos*. The excellence of the graphics and digitized sound ultimately do not compensate an experienced computer castle adventurer for the generally routine script. Newcomers are far more likely to derive genuine excitement from the game, although the essential quality of the production may still provide some enjoyment for experienced fans of the genre.—Keith McCandless □

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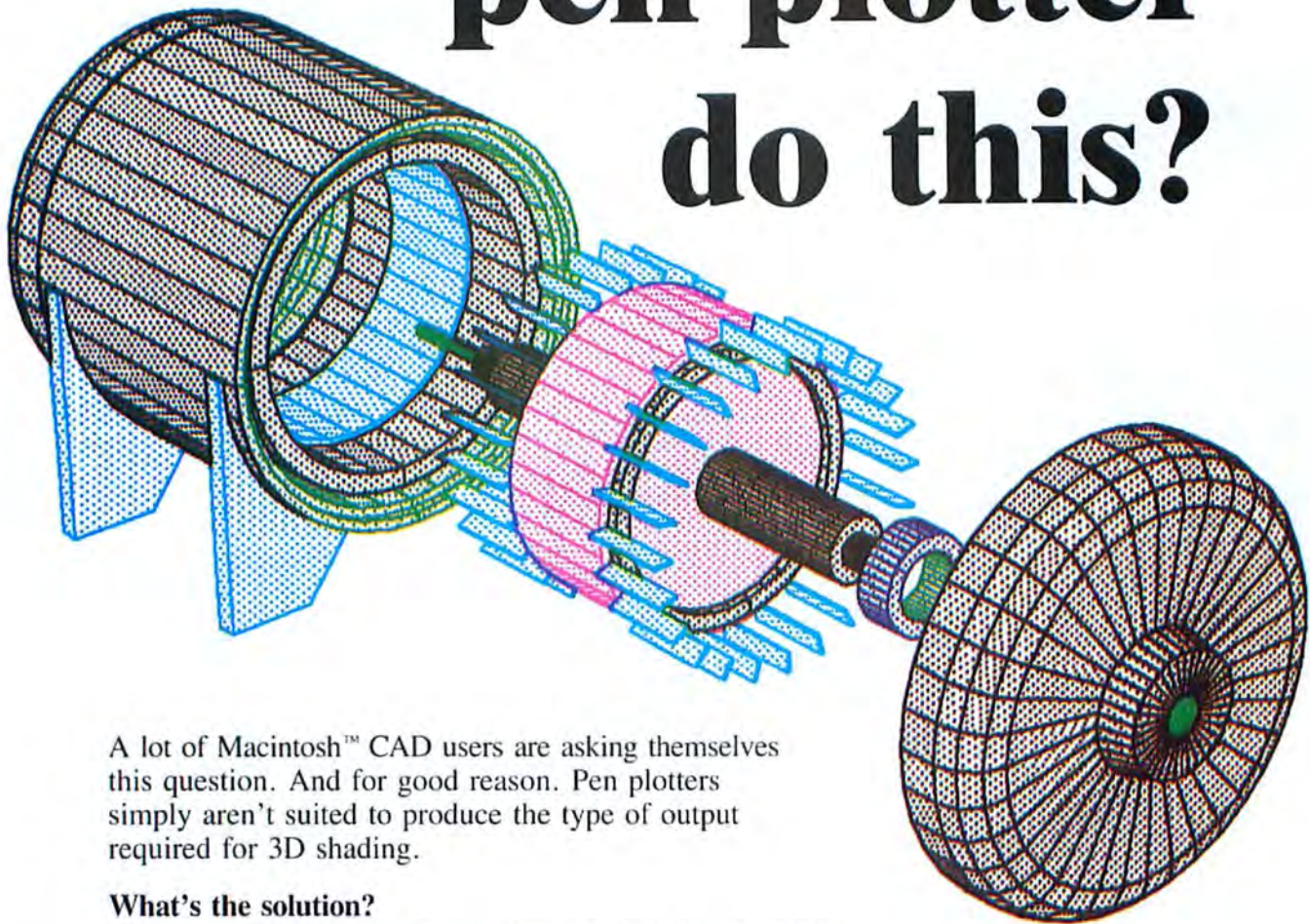


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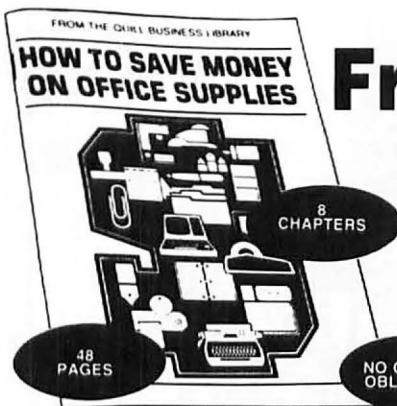
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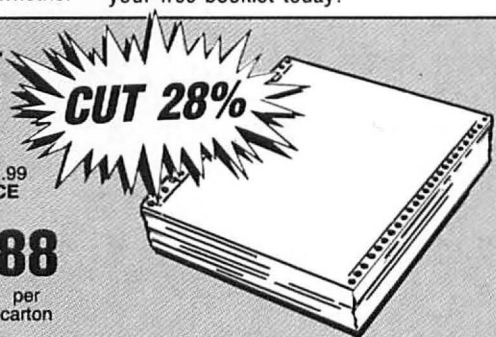
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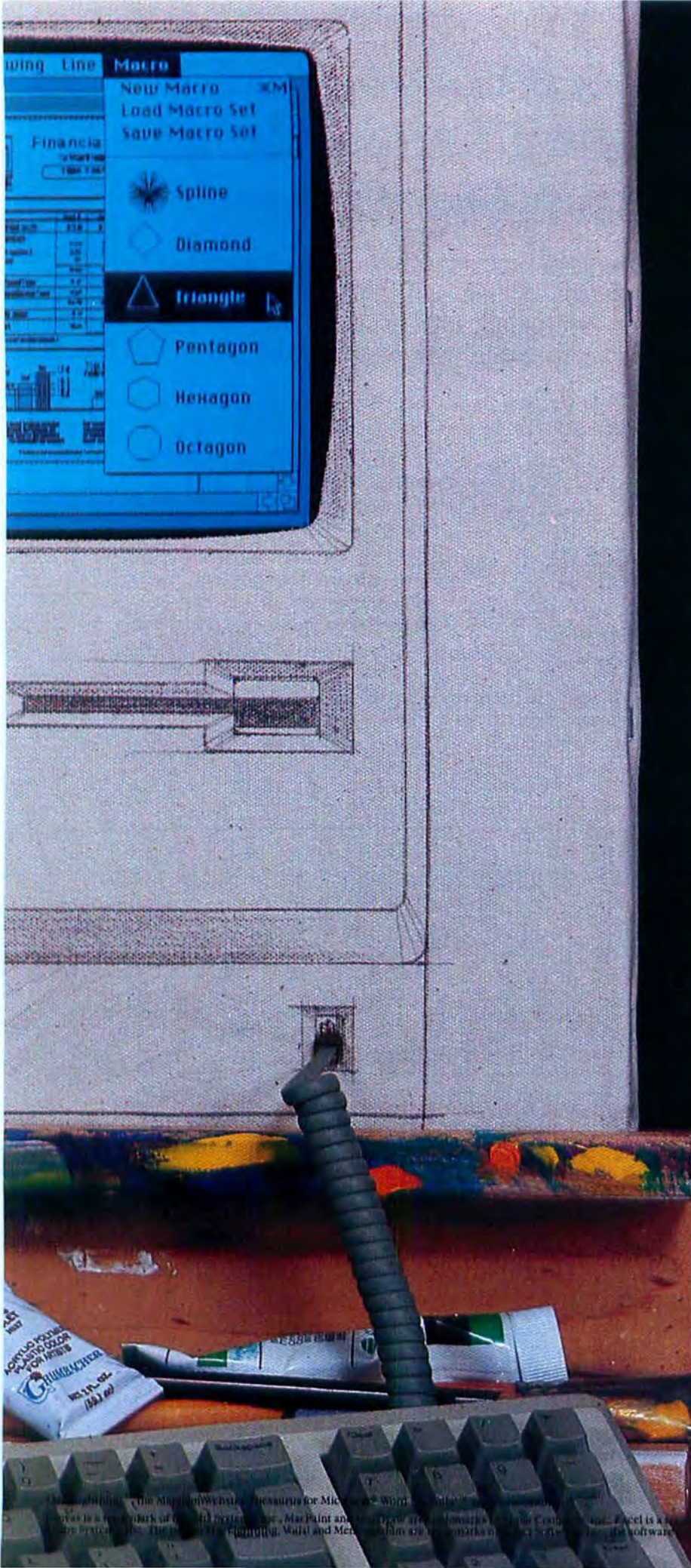
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New Products

*Information on the Mac's latest software,
hardware, and accessories*

Edited by Eileen Drapiza

New Products includes Macintosh products that have been formally announced but not yet evaluated by *Macworld's* editors. All prices are suggested retail prices. Please call vendors directly for information on availability.

SOFTWARE

Business Simulator A game in which you become the CEO of an electronics company and guide it through start-up, growth, independence, new-product, and new-market phases. 512K minimum memory. \$69.95. Reality Technologies, 215/387-6055.

Clients & Profits Complete agency-management system featuring estimating, job scheduling, job costing, and invoicing. 1MB minimum memory. \$1895; Payroll module \$495, General Ledger module \$395, Multi-user Clients & Profits \$2995. Working Computer, 619/483-1453.

Crystal Paint Graphics program for creating crystalline patterns. Includes the abilities to replay previously drawn images and to redraw strokes with different patterns. 512K minimum memory. \$49.95. Great Wave Software, 408/438-1990.

Double Feature Collection of utility programs for E-Machines' The Big Picture monitor, including 2X magnification and simultaneous use of Macintosh and The Big Picture monitors. 512KE minimum memory. Free from E-Machines dealers.

DS Backup Hard disk utility that enables you to back up and restore an entire hard disk, selected directories and files, or files that have been changed since the last back-

up session. Also prints out a report of files copied. 512K minimum memory. \$79.95. Design Software, Inc., 312/231-4540.

Go A strategy board game designed to let users play matches against the computer, as well as against other players via modem. Competes at an 18Q level. 512K minimum memory. \$39.95. Infinity Software, Ltd., 415/420-1551.

Hebrew CalendarMaker Generates Hebrew dates, weekly Torah portions, and Jewish holidays for any month of any year. Includes 15 pictures to be used in monthly calendar displays and a set of 24 Judaic icons for use on individual dates. 512K minimum memory; requires *CalendarMaker* from CE Software. \$19.95, bundled with *CalendarMaker* \$39.95. Davka Corp., 312/944-4070.

In-House Accountant Accounting software for consultants, sales representatives, small-business owners, and individuals with sophisticated personal finances. Features include full search and edit capabilities, selective text styling, 18 different financial formulas for business calculations, and context-sensitive help windows. Outputs activity reports, checks, invoices, aging reports, customer statements, pie charts, and bar graphs. 512K minimum memory. \$149. Migent, Inc., 702/832-3700.

Linkware Mac Connection Works with host-based *Linkware* software to provide direct access to mainframe and minicomputer files. Allows Macintosh users to connect to IBM, DEC, HP, and UNIX host computers. 512K minimum memory. \$300; information server pricing varies with host system type and configuration. Linkware Corp., 617/894-9330.

The Lurking Horror An interactive horror story in which you become a student at the George Underwood Edwards Institute of Technology. 128K minimum memory. \$39.95. Infocom, 617/492-6000.

MacAPL An APL interpreter designed solely for Macintosh architecture. Features include picture variables that allow image processing, shared variables that allow communication between computers via AppleTalk network, multiuser shared file access with record locking, and access to ROM toolbox routines and machine code. 512K minimum memory. \$125, demo disk \$10. Leptonic Systems Co., 914/682-0377.

MacSS Statistical and forecasting package featuring a full range of basic statistics, nonparametric statistics, graphics, multiple regression with analysis of residuals, ANOVA/ANCOVA/MANOVA, discriminant analysis, and contrast analysis. Complete spreadsheet-style database management. 512K minimum memory. \$245. StatSoft, 918/583-4149.

NSChart and NSPDL Language Translators Design and documentation aid for software engineers. NSChart automatically produces Nassi-Shneiderman (NS) flow diagrams from a program design language (a PDL). Checks PDL syntax and text format. Provides a graphic symbol for each of the standard structured programming concepts and enforces the single-entry, single-exit basic structured design principle. 512K minimum memory. \$450. Siltronix, 800/637-4888.

(continues)

OverVUE. Best Database of the Year.



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

Said MacUser (Jan. 1986), in selecting OverVUE for its **Editors Choice Award**: "OverVUE 2.0 is a deceiving program in that the more you use it, the more you realize what it can do."

Power, speed and logical menus make this a dream database."

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

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

Infoworld (July 8, 1985): "...it is Macintosh software done right."

Icon Review (Fall 1985): "OverVUE 2.0 is our favorite database workhorse... it simply offers the best balance of power and ease-of-use available on the market today."

Nibble Mac (Oct. 1985): "OverVUE is not only easy to set up, it's the easiest for data entry. Its tools for entering repetitive data minimizes typing time."

Online Today (electronic version — Nov. 1985): "OverVUE 2.0 is a heavy-duty data management tool... It does all the things a good relational database manager should."

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New Products

123Laser Plots Lotus 1-2-3 and Symphony graphs on an Apple LaserWriter or other PostScript output device. \$99.95 per network. Carl A. Carlson, 415/322-4609.

Personal Writer Pen and tablet digitizer with software that learns your handwriting and enables you to input text without using the keyboard. 1MB minimum memory. Base \$700-\$800. Anatex, Inc., 213/556-1628.

Rainy Day Games A three-in-one card-game package. Includes Concentration, Old Maid, and Go Fish. 512K minimum memory. \$34.95. Baudville, 616/957-3036.

Stationfall Interactive fiction in which you are enlisted as a Lieutenant First Class on the paperwork task force of the Stellar Patrol and are put on assignment with Floyd the robot. 128K minimum memory. \$39.95. Infocom, 617/492-6000.

Time Scrolls Entertainment database application that lets you print detailed information based on news events occurring since January 1, 1901. 512K minimum memory. \$29.95. Accurate Computer Search, 619/726-7136.

World Cup Soccer Sports simulation game that lets users control the playing characteristics of their team to compete against other teams. Features include digitized sound and more than 400 frames of full 3-D animation. 512K minimum memory. \$49.95. Infinity Software, Ltd., 415/420-1551.

HARDWARE

Flip 40 Meg A 40MB internal disk drive that weighs 1.2 lb and provides an average seek time of 28 milliseconds. Utilizes a Whitney-type head suspension with four heads and two disks. VLSI technology allows compact packaging and leaves room for Network Specialties screens and accelerator board. Network Specialties, 415/467-8411.

Jump Board 020 An accelerator board with a 68020 microprocessor and an optional 68881 math coprocessor. Adds 2MB or 4MB of RAM and runs at either 12 or 16 MHz. \$999. Network Specialties, 415/467-8411.

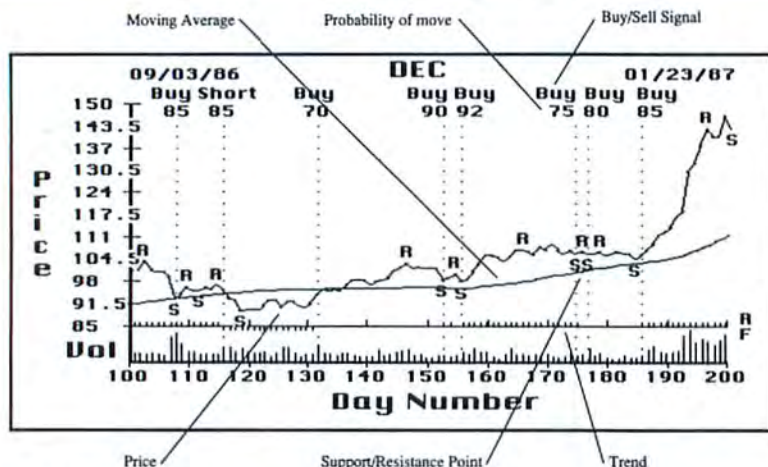
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of 40MB, 65MB, 100MB, and 230MB for the Mac Plus, Mac SE, and Mac II. Include interface cable, drivers, utility software, installation, and user manuals. EM40 \$1895, EM65 \$2295, EM100 \$2695, EM230 \$3995. Priam Systems Division, 408/434-9300.

MacPacq A portable data acquisition and control system that lets the Mac function as a digital oscilloscope, a chart recorder, and a waveform generator. MacPacq software provides a detailed graphic presentation of recorded and real-time data. Applications include physiological and environmental recording, process control and monitoring, and stimulus and acquisition problems. 512K minimum memory. \$995. BioPac Systems, 805/968-8880.

Mac+PC An Intel 8086 add-on board that allows the Mac to run MS-DOS programs. Includes utilities for transferring data and files to and from the PC. Custom firmware allows DOS and Mac applications, folders, directories, and files to coexist on the same hard disk. Optional accessories include an IBM-compatible printer port, an RS-232C communications port, and an external IBM 3 1/2-in. drive adapter. 512K minimum memory. \$995. PerfectTEK, 408/263-7757.

Ministreamer A nine-track, 1/2-in. reel-to-reel tape drive with an internal SCSI controller and Mac SCSI tape utility for transporting data between Macs and mainframes. \$3995. Qualstar, 818/882-5822.

MS-300C 300-dpi intelligent image and text scanner. Choose from 8 halftone screen patterns (grain settings) and 15 brightness and contrast settings. Scan both halftones and line art in a single pass. Scale images down to 25 percent of original size. \$1595; includes *VersaScan Plus* graphics software. Microtek Labs, Inc., 213/321-2121.

PenMac A non-magnetizing pen and tablet digitizer based on radio telemetry. PenMac software enables automatic magnification, translation, rotation, reduction, enlargements, reverses, and inversions. Provides resolution up to 1000 points per inch. Eight sizes available. Price varies depending upon model, \$345 to \$1095. Softweaver, 408/425-8700.

PowerPort and Power Accessory PowerPort connects to the disk drive port of either the Mac Plus or the Mac SE and provides

(continues)

This is why IBM, NCR, HP, Compaq and Apple chose 3M data cartridge tape backup.

The preceding page illustrates why the leading PC makers needed a reliable backup system for their computers.

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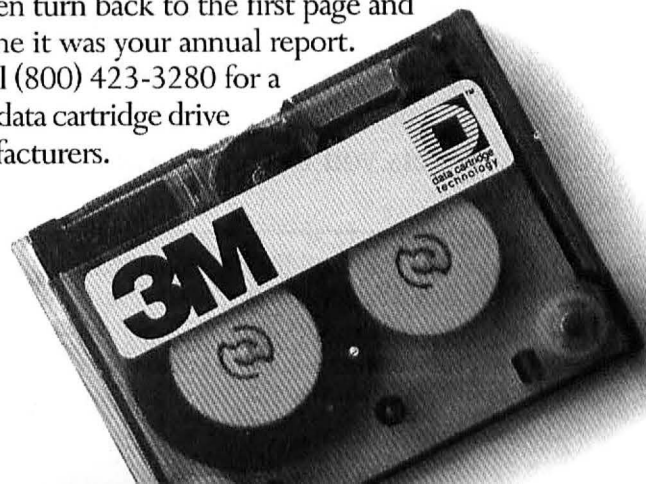
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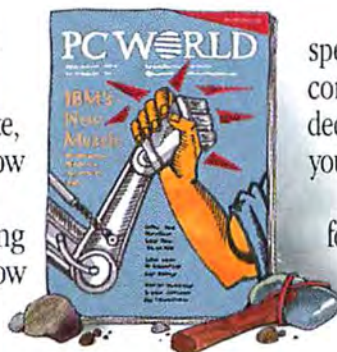
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New Products

connectors for a disk drive and another peripheral. Power Accessory is a similar device for the Mac II. PowerPort \$29, Power Accessory \$49. Thunderware, Inc., 415/254-6581.

Rely Drive Series High-capacity drives with access times of 20 to 30 milliseconds. Fan cooled, shock mounted, with self-parking heads. Rely 65MB \$1995, 110MB \$2595, 240MB \$4995. Rely Technologies, 617/661-7359.

Scripten A laser printer that offers collated output and prints 10 pages per minute with print resolution of 300 dpi. Operates both in PostScript mode and as an emulation of the HP LaserJet Plus printer. Available in 2MB or 3MB configurations. 512K minimum memory. 2MB model \$4795, 3MB model \$5295. Qume Corp., 800/223-2479.

Stretch Screen, Baby Stretch, Reach Overhead Stretch Screen is a 19-in. monitor with resolution of 1024 by 932 pixels and 80 dpi. Clip-on video board allows for user installation. Compatible with Macs from 128K to

the SE. Baby Stretch is a 15-in. full-page display with resolution of 720 by 900 pixels and 90 dpi. Reach Overhead is a 640- by 400-pixel display screen used with an overhead projector; connects directly to any Mac and permits interactive display of Mac documents and programs. Stretch Screen \$1849, Baby Stretch \$1699, Reach Overhead \$1799. Network Specialties, 415/467-8411.

TrueForm System Scanner and software system for filling out forms. The Image Scanner transmits a form's image to the Mac screen, then allows you to fill it out or train the computer to do it. Prints the entire form complete with data, or prints data on preprinted forms. 1MB minimum memory. \$1995. Spectrum Digital Systems, 608/244-4300.

ACCESSORIES

Command Center Plus Multipurpose switching system that gives push-button control of up to five devices, such as computers, monitors, printers, and modems. Also protects communications equipment against damage due to electrical and phone

line surges, electromagnetic and radio frequency interference, and static electricity. \$139.95. Curtis Manufacturing Co., Inc., 613/924-3821.

FloppiClen Upgrade Kit For FloppiClen owners who have upgraded from single-sided to double-sided disk drives. Consists of one 3 1/2-in. cartridge and five 3 1/2-in. cleaning disks. \$10. Tech-sa-port, 412/661-2629.

ImageMaker Shaded Backgrounder Snap-in filters create shading on ImageMaker slides. Presentation Technologies, Inc., 408/749-1959. □

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, Macworld, 501 Second St., San Francisco, CA 94107. We reserve the right to edit press releases.

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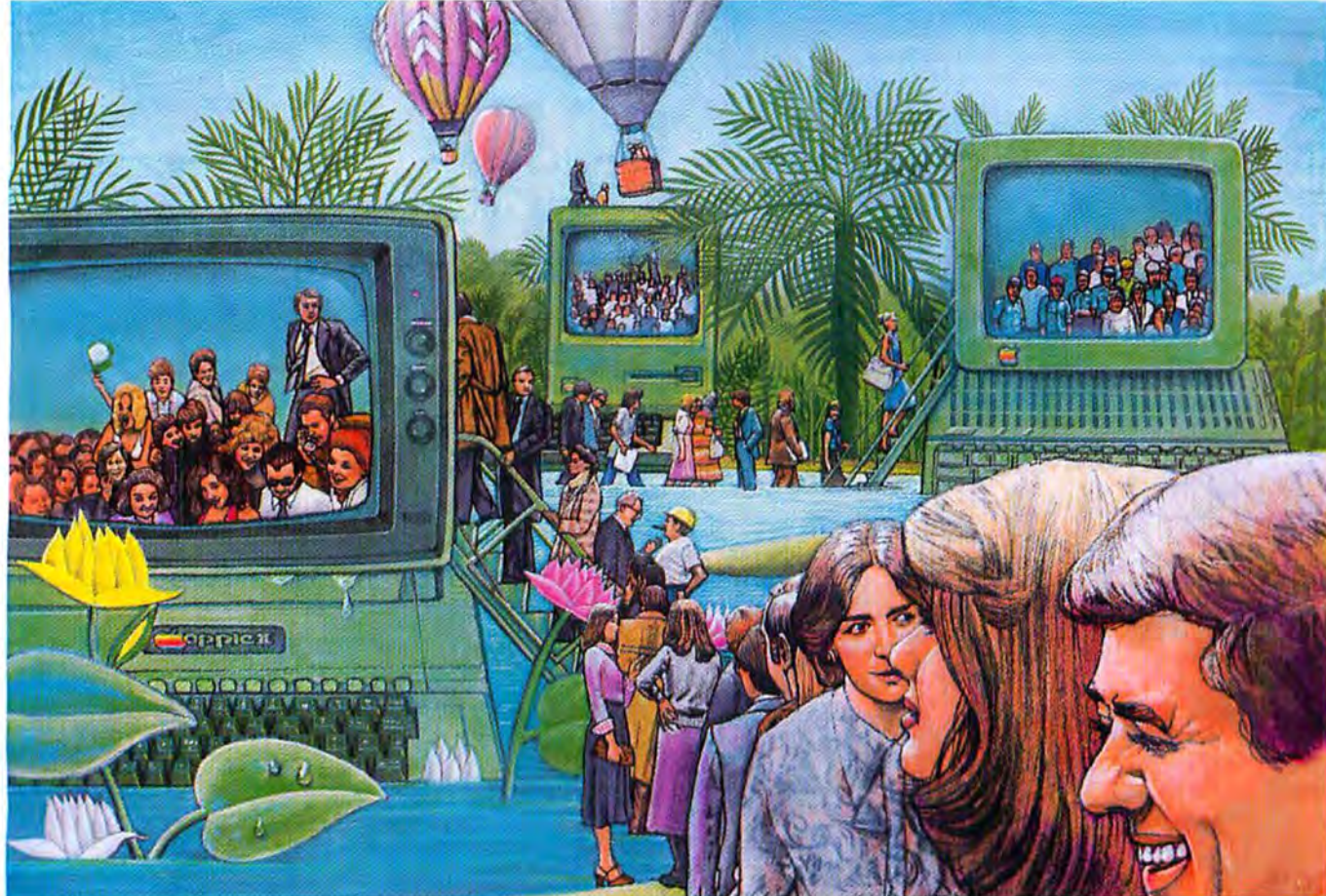


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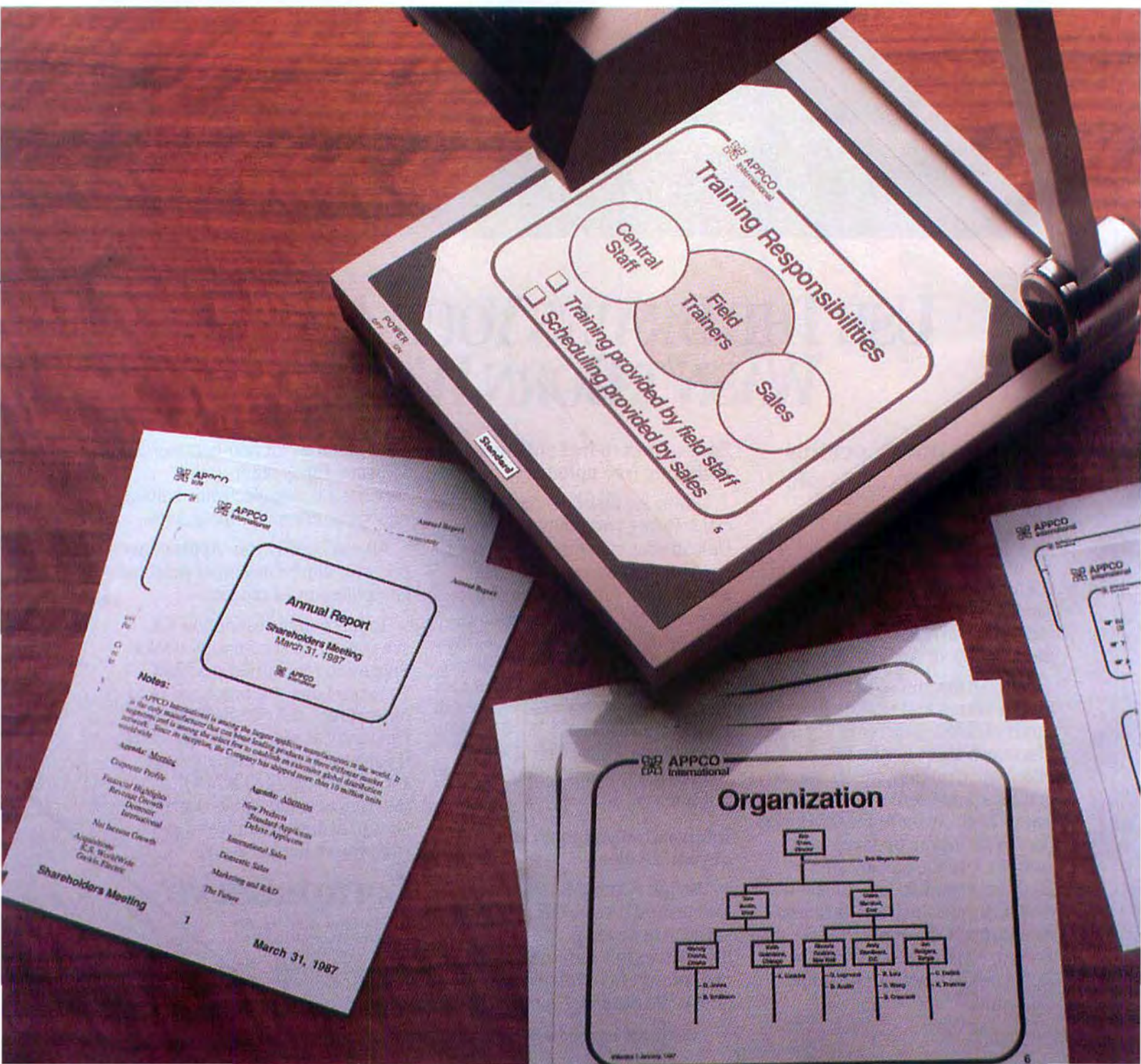
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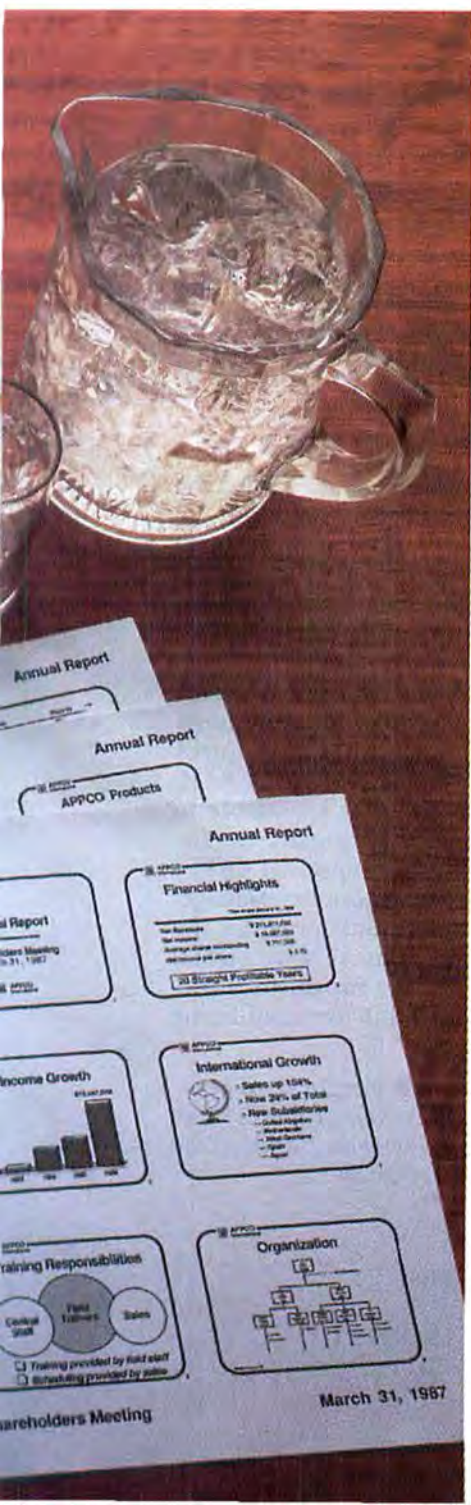
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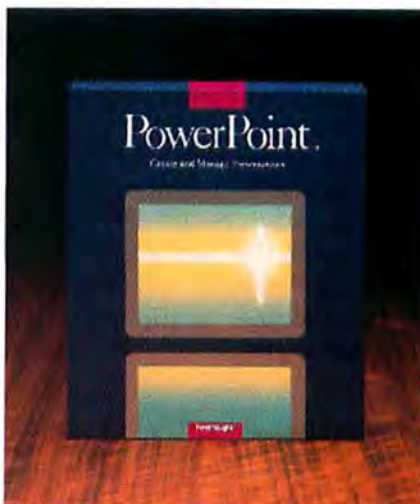
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Quick Tips

Answers to your questions

by Lon Poole

First, an update on the international scene. Apple has always recommended against using a U.S.-model ImageWriter II or LaserWriter with 50-Hz electrical power, which is common throughout the world outside North America. I echoed that advice in the March 1987 *Quick Tips*. Reader Richard O'Regan reports that he and others in Switzerland have been using those printers for months with 50-Hz power without trouble. Pam Miracle, Apple spokesperson, says Apple engineers have now tested the ImageWriter II enough to OK its use with 50-Hz power. You still need a 220-volt to 110-volt grounded isolation transformer (available from electronics supply stores).

The Apple engineers are not ready to bless the U.S. LaserWriter for 50-Hz use. Its fuser/heater element is frequency-dependent and may overheat after long sessions on 50-Hz power. A thermal sensor and a backup thermal sensor inside the LaserWriter detect overheating and shut the printer down if it gets too hot. You can probably get away with light-duty use of a U.S. LaserWriter outside North America, especially if you don't leave it on continuously. But for long-term, heavy-duty use overseas, you should sell your domestic model and get a 220-volt 50-Hz LaserWriter.

Better BASIC Rounding

April's *Quick Tips* presented a BASIC function for rounding a numeric value to a specified number of decimal places. Several readers have suggested the following simpler function definition:

```
DEF FNROUND(value,places)=  
CINT(value*10^places)/10^places
```

This formula, like the original, works for most values, but not for some negative values. For example, it rounds -6.45 to one decimal place as -6.4. Bernd Stücker, of Morsbach, West Germany, suggests this

function definition when values to be rounded may be negative:

```
DEF FNROUND(value,places)=  
SGN(value)*INT(ABS(value)*  
10^places+0.5)/10^places
```

Degrees, Minutes, and Seconds in BASIC

I am writing a surveying program using *Microsoft BASIC*. Surveying instruments measure angles in degrees, minutes, and seconds. I need to convert these measurements to decimal numbers. Is there a known formula for this?

Ron Bonham
Lost City, West Virginia

The following formula converts degrees, minutes, and seconds to a decimal number:

```
angle = degrees + minutes/60 + seconds/3600
```

To convert back, use these formulas:

```
degrees = INT(angle)  
minutes = INT((angle-degrees)*60)  
seconds = INT((angle-degrees-  
minutes/60)*3600)
```

PostScript in Word 3.0

Now that a *Microsoft Word* 3.0 document can include PostScript programs, I have begun rummaging through old issues of *Macworld* and Adobe's *Colophon* newsletter for sample PostScript programs. I found a text rotation program in the February 1985 issue of *Macworld*, but cannot get it to work in a *Word* 3.0 document.

Craig R. Hanna
Sun Valley, California

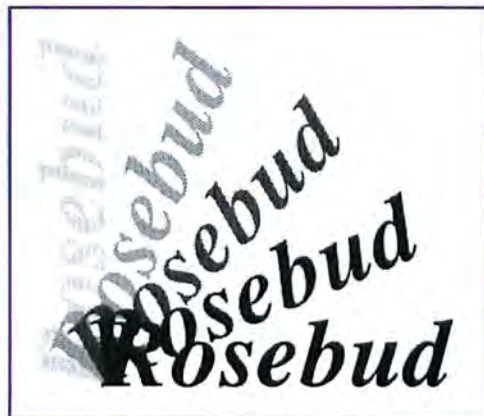
The PostScript program you mentioned requires a few changes before it will work in *Word* 3.0. The program can also be simplified. See "PostScript in

Word" for the revised program listing and "PostScript Text Rotation" for the output the program prints.

The first line of the program defines a macro—*inches*—that converts inches to points. The next two lines set the initial text rotation at 90 degrees (vertical) and the gray level at 0.9 (10 percent gray).

Next the program defines another macro, *rotationloop*. The macro uses a *gsave* operator to save the current graphics state. In the new graphics state, a *moveto* operator places the pen at the lower-left corner of the drawing area, *rotate* and *setgray* operators set the current rotation angle and gray level, and a *show* operator draws the word *Rosebud*. Then *sub*

(continues)

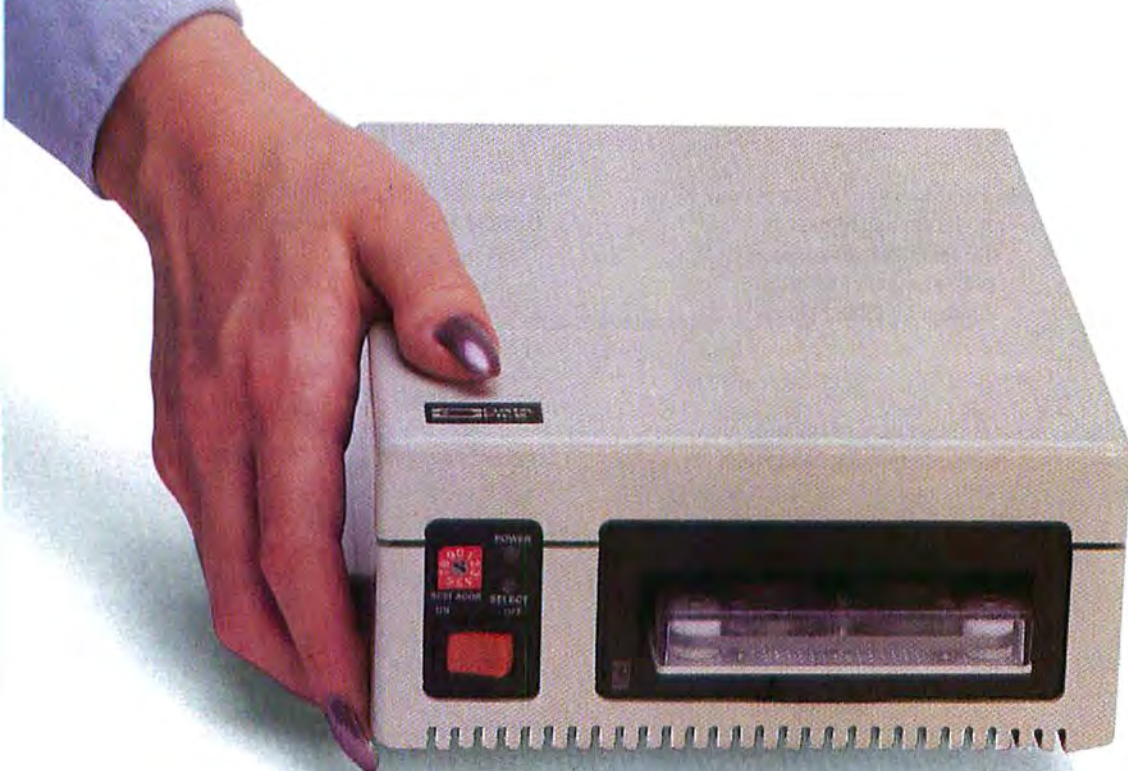


PostScript Text Rotation

PostScript makes it easy to experiment with special effects like text rotation. The text in this rotating sequence is 82.5-point Times Bold Italic. The gray level starts at 10 percent and darkens 15 percent for each line. The rotation angle ranges from 90 degrees to 0 degrees in 22.5-degree increments.

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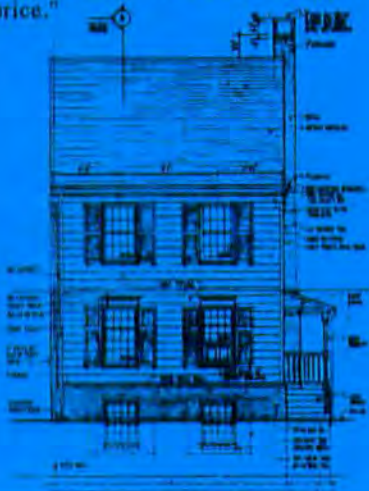
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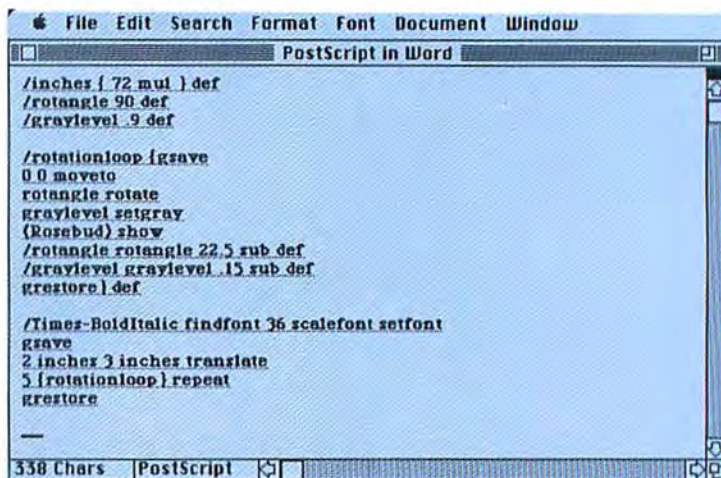
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How To/Quick Tips

PostScript in Word

You can include PostScript programs in Microsoft Word 3.0 documents. They appear on screen as 10-point Normal bold hidden text. This example rotates text as shown in "PostScript Text Rotation."



operators decrease the rotation angle 22.5 degrees and darken the gray level 15 percent. The macro ends by restoring the graphics state to its previous condition with a *grestore* operator.

With definitions and initializations done, the program sets the font to Times Roman Bold Italic, 82.5 points, using the *findfont*, *scalefont*, and *setfont* operators. Then a *gsave* operator saves the current graphics state. In the new graphics state, a *translate* operator moves the lower-left corner of the drawing area 2 inches to the right and 3 inches above the absolute lower-left corner of the page. Finally, a *repeat* operator repeats the *rotationloop* macro five times and a *grestore* operator restores the graphics state to its previous condition.

When you type the PostScript program, you can freely intersperse blank lines and blank spaces for better readability. But do not use Tabs or the program won't work.

After typing the program, you must format it in Word's standard PostScript style. Simply select the entire program, press ⌘-Shift-S, type the word *PostScript*, and press Return. Be sure you format the whole program, including blank lines. You can put graphics or non-PostScript text before or after the program, but not in it.

Fanny Mac Jitters

Recently I purchased a Fanny Mac from Beck-Tech. Although it does keep my Mac considerably cooler, it also has the annoying side effect of causing my screen to jitter. Can you suggest how I can correct this?

Miguel A. Castañeda
APO New York, New York

According to Beck-Tech, the symptoms you describe are rare. Some fan motors have a magnetic field strong enough to interfere with the picture tube's magnetic field, resulting in screen jitters. The Fanny Mac has a one-year warranty, and Beck-Tech will fix or replace any unit that causes problems during the warranty period.

If your Fanny Mac is out of warranty, you can fix the problem by placing a piece of mu (pronounced *mew*) metal, which is an adhesive-backed, flexible aluminum-nickel alloy, inside the Fanny Mac case. You can get mu metal from some electronics parts stores. Contact Beck-Tech for assistance (41 Tunnel Road, Berkeley, CA 94705, 415/548-4054).

Unwanted LaserWriter Help

Each time we turn on the LaserWriter, it prints a status sheet, and each time we choose Manual Feed for the LaserWriter, it prints a sheet of manual feed instructions. We no longer need these instructions. Is there any way to prevent this waste of paper and toner?

Land Design
Salt Lake City, Utah

You have old versions of the LaserWriter and Laser Prep files in your System Folder. The manual feed instructions were removed more than a year ago. You should be able to get the latest LaserWriter, Laser Prep, System, Finder, and other System files from your Apple dealer. Or

(continues)

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How To/Quick Tips

contact your local user group (call 800/538-9696 ext. 500 for the name of a user group near you).

In the June 1987 *Quick Tips*, you'll find instructions for suppressing the status page that appears when you switch on the LaserWriter.

Q Disk-Drive Head Parking

There is much confusion about hard-disk head parking. Every manufacturer seems to have a different opinion about how it should be handled. The original documentation for my SuperMac DataFrame advised me that the Shut Down command would park the heads on an unused sector of the disk. Recently, I received SuperMac's SuperParker program, which SuperMac now advises using before moving the drive. What is head parking? Does the Shut Down command park the heads or not?

I recently bought a Macintosh SE with an internal hard disk. Its documentation says nothing about head parking, advising only that canvas cases made for older Macintoshes are probably not sufficient protection for moving my machine. Is the Mac now so business-oriented that it should not leave the office? What about the seat of my car, with the safety belt buckled? Should I affix a Computer on Board sign in the rear window of my car?

Serge Froment
Ville St-Laurent, Quebec
Canada

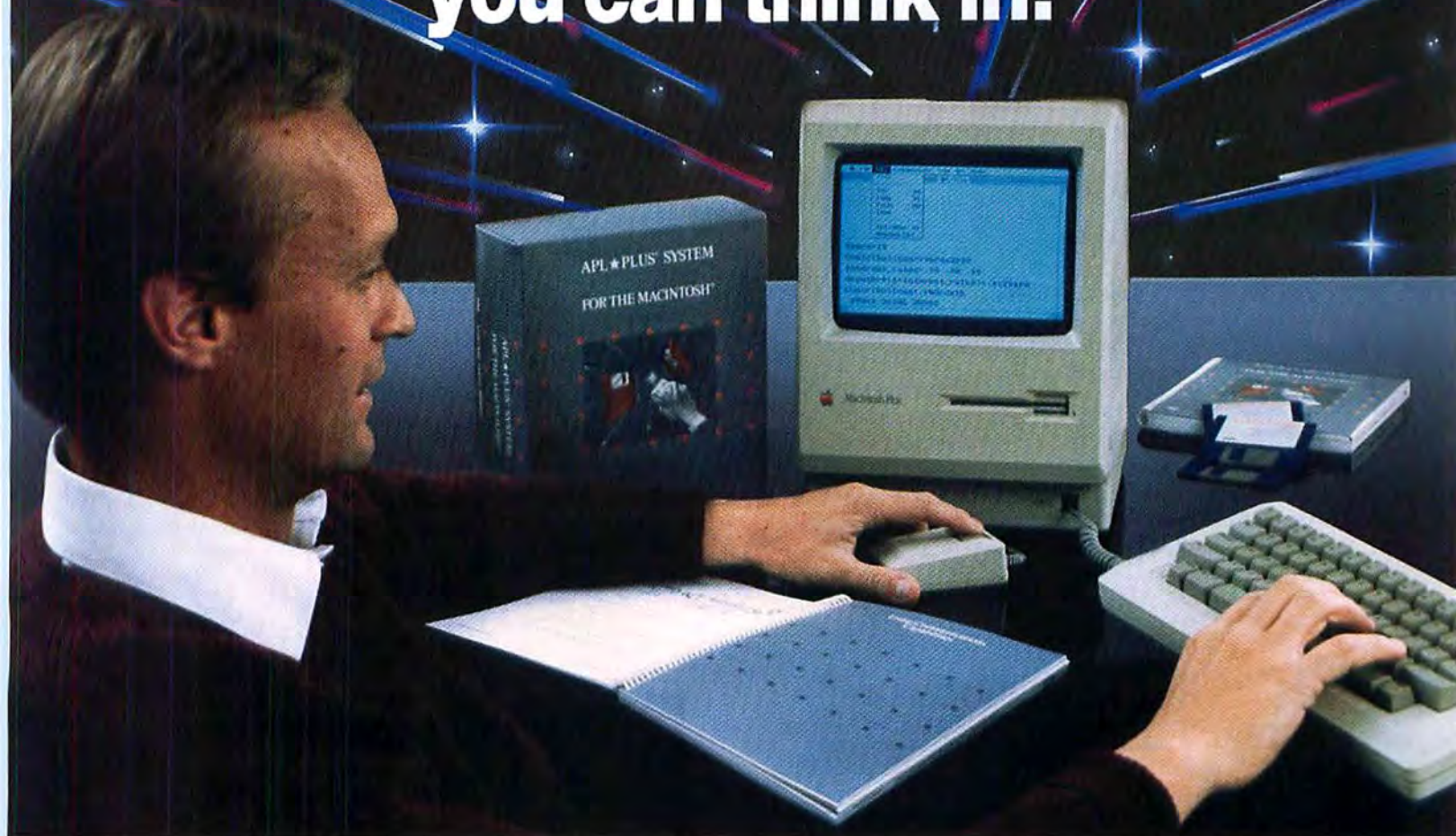
A Parking the heads moves the read/write heads to a safe area and locks them there when you switch the drive off. This protects the disk surface, and the programs and data recorded on it, from accidental damage during transit.

The Shut Down command lifts the heads away from the disk surface, providing partial protection. However, it does not move them away from the program/data area of the disk. A sudden shock could bring the heads into contact with the disk, destroying programs, data, and the heads.

You may wonder why hard disk drives don't automatically park their heads. Some do. It takes an extra 30 seconds or so to start up from a drive with parked heads, though, because the drive must recalibrate the heads. Automatic head parking is especially worthwhile if you move your drive often.

(continues)

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```

BASIC
20 S=0
30 FOR I=1 TO 100
40 INPUT X
50 IF X=0 GOTO 80
60 S=S+X
70 NEXT I
80 PRINT S/(I-1)
    
```

BASIC

A program to calculate averages

```

APL★PLUS
X←0
FOR I←1 TO 100
  X←X+X
NEXT I
S←X÷(I-1)
    
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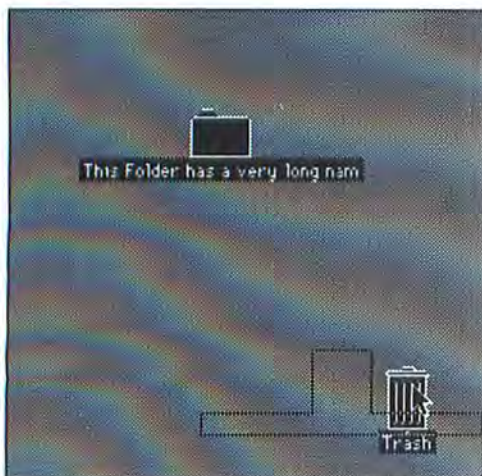
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Trashing Long Names

The right edge of the screen may stop an icon outline from approaching the Trash, but you can still discard the icon. Continue to drag until the pointer is over the Trash before you release the mouse button.

If you can park the heads on your hard disk drive before moving it, by all means do so. If you can't, then take extra care that the drive or the Mac (if it's an in-

ternal drive) won't fall over, bounce around, or get knocked about during transit. The front seat of your car is a poor spot for your Mac SE, unless you do buckle it up. For extra insurance, before transporting your hard disk you should make sure you have an up-to-date backup of important files.

Name Too Long for Trash?

Dropping a disk icon into the Trash is a fast way to eject the disk and eliminate its icon from the desktop, until you encounter a disk with a long title. It seems that the Trash Can has a very narrow opening, and the Trash Can is too close to the right edge of the screen to accept long-winded disk or document names. It is a simple matter to move the Trash icon to the left before using it, but I find I must do this again and again, every time I return to the Finder. This is definitely user-unfriendly.

Using *ResEdit*, it is easy to find the Trash icon in the Finder, but the icon's initial desktop location seems to be buried. Can you help?

Vanya Matzek
Cupertino, California

A You don't need *ResEdit* for this one. If an icon's outline hits the right edge of the screen and stops moving, don't stop dragging it toward the Trash Can. Keep pressing the mouse button and moving the pointer—ignore the icon outline. When the pointer reaches the Trash, the Trash icon is highlighted (see "Trashing Long Names"). Release the mouse button, and the icon you were dragging goes into the Trash.

The Plague of JClock

Tip: When I first found *JClock* by James T. Sulzen, I was impressed. I was fed up with the work required to view the Alarm Clock and was pleased to find a program that would put a clock in a continually viewable location—the menu bar. However, its presence seems to result in system errors; other users have reported the same.

You can't remove *JClock* simply by dragging its icon to the Trash. You must also recopy the System file from a disk that doesn't have *JClock* installed. Or, if your

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- More than 30 reports can be viewed on screen or printed.

Macintosh Specific

Back to Basics was written specifically for the Apple Macintosh, not simply converted from another computer version. It uses the Macintosh interface (mouse and visual icons) for system operation and groups functions into on-screen "file drawers" for organization and ease of use.

Back to Basics was a featured accounting system in Apple's initial ads for the Macintosh and is backed by Peachtree's outstanding support, labeled by *InfoWorld* as "the finest in the industry". Support is available as you need it, at a nominal charge directly from Peachtree or through our network of local authorized support centers.

Money Back Guarantee

When you purchase Back to Basics directly from Peachtree Software you're protected with a 30-day, money back guarantee (an option even the most expensive accounting products don't offer).

If you're not satisfied, simply return the complete product in saleable condition within 30 days and your

purchase price will be promptly refunded. For full details, call the toll-free telephone number below.

Invoicing Coming Soon

Back to Basics Invoicing will soon be available for the Apple Macintosh at an introductory price of \$95.

Hardware Specifications

- IBM Personal Computer, PC/XT, PC/AT with two floppy disk drives or one floppy disk drive and a hard disk.
- Apple II+, IIe, IIc, IIs with 128K and two disk drives or hard disk.
- Apple Macintosh 512K or Plus with two disk drives or hard disk.

Features That Made Back to Basics A Best Seller

GENERAL LEDGER

- On-line help displays Chart of Accounts
- MTD and YTD show on income statements
- Allows automatic journal entries
- Check processing and printing capability through Cash Disbursements
- Optional cost of sales ranges
- User modifiable Chart of Accounts included
- Allows up to 3 checking accounts
- Up to 10 departments with separate income statements

ACCOUNTS RECEIVABLE

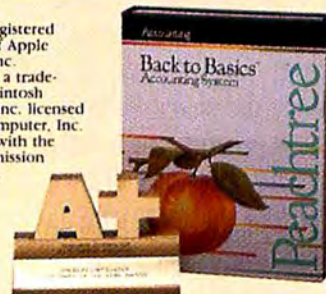
- Calculates receivables on balance forward basis
- Prints statements and mailing labels
- Allows automatic posting to General Ledger
- Accepts partial payments
- Calculates finance charges

- Up-to-date customer information can be scrolled for review at any time
- Customer ID's can be alpha or numeric
- Verifies customer credit limit
- Calculates up to 3 sales taxes per entry

ACCOUNTS PAYABLE

- Up to 10 vendor payment terms
- Calculates cash discounts
- Accepts partial payments
- Automatic posting to General Ledger
- Prints vendor mailing labels
- Up-to-date vendor information can be scrolled for review at any time
- Customer ID's can be alpha or numeric
- Prints computer checks or processes hand-written checks
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How To/Quick Tips

System file has special font and desk accessory installations, it may be quicker to use *ResEdit* to remove *JClock*. Here's how:

1. Start *ResEdit*.
2. Find and open the System file.
3. Open the INIT resources.
4. Select INIT "jclock" ID = 4.
5. Choose Clear from the Edit menu.
6. Close all windows, saving changes when asked.

Brad Gallien
Stanford, California

JClock is a shareware utility. There's also a companion utility called *Remove JClock*, which does what its name implies. Get it from a user group or an online information service like *CompuServe* (filename *REMOVE* in DL 2). The current version of *JClock* available on *CompuServe* is in the form of an Init resource, which means you install or remove it simply by dragging its icon into or out of your System Folder.

No-Mar MacTablet

Tip: To keep the stylus of your Summagraphics MacTablet from scratching the drawing pad, tape a clear sheet of acetate to the pad. Place your work under the sheet and trace.

Billy Wilkins
Columbia, South Carolina

Prevent Squashed Lines

Tip: In a recent issue, a reader asked how to prevent squashed lines at the top of a page printed on an ImageWriter II. I, too, have experienced this frustration and have found a simple solution. Just advance one sheet of paper through and let it hang there. Start printing on the next sheet. Apparently the extra sheet of paper provides just enough tension to prevent the squashing.

Don Houser
Brea, California.

We pay from \$25 to \$100 for tips published here. Send tips or questions to Quick Tips, Macworld, 501 Second St., San Francisco, CA 94107. Send electronic mail to *CompuServe* 70370,702 or *The Source* BCW440. All published submissions become the property of Macworld. □

Has that statistics package you thought was a tiger turned out to be something else?



Most Mac statistical packages call themselves 'professional,' 'comprehensive,' or 'complete.' But feed them some *real* problems, and you'll discover how toothless they really are. ■ They can't do multivariate procedures ■ Or analyze financial time series ■ Or fit nonlinear models ■ Or compute large, multi-way cross tabs

That's why, if you're serious about statistics, sooner or later you'll end up with SYSTAT. No other Mac package has SYSTAT's range of statistics and high resolution data graphics.

Mac Features: Pull-down menus, Clipboard, Desk Accessories and mouse control of spreadsheet data editor. Replay commands. Macintosh II™ and 68020/68881 versions available.

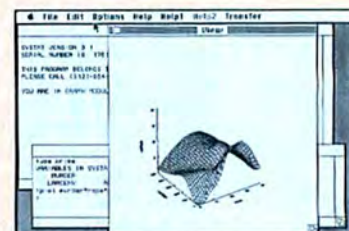
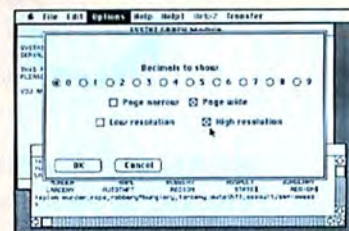
Graphics: More than 50 business and scientific types with PostScript™ support for Apple LaserWriter™ (300 dpi). *Two dimensional:* Error Bars, Scatterplots, Line and Vector Graphs, Vector, Dot, Bubble and Quantile Plots, Bar Graphs (single, multiple, stacked, range), Box Plots (single and grouped), Stem-and-Leaf Diagrams, Linear, Quadratic Regression, LOWESS Smoothing, Confidence Intervals (any alpha value), Smooth Mathematical Functions, Rectangular or Polar Coordinates, ANOVA Interaction Plots, Histograms (regular, cumulative), Fuzzygrams, Gaussian Histogram Smoothing, Scatterplot Matrices (Casement Plots). *Three dimensional:* Data Plots, Smooth Function Plots, Vector Plots, Linear, Quadratic Surface Smoothing, Locally Weighted Least Squares.

Statistics: Basic statistics, frequencies, t-tests, post-hoc tests, Multi-way crosstabs with log-linear modeling, association coefficients, PRE statistics, asymptotic standard errors, Nonparametric statistics (sign, Runs, Wilcoxon, Kruskal-Wallis, Friedman two-way ANOVA, Mann-Whitney U, Kolmogorov-Smirnov, Lilliefors, Kendall coefficient of concordance), Pairwise/listwise missing value correlation, SSCP, covariance, Spearman, Gamma, Kendall Tau, Euclidean distances, Linear, polynomial multiple, step-wise, weighted regression with extended diagnostics. Multivariate general linear model includes multi-way ANOVA, ANOCOVA, MANOVA, repeated measures, canonical correlation, Principal components, rotations, scores, Multidimensional scaling, Multiple and canonical discriminant analysis, Bayesian classification, Cluster analysis (hierarchical, single, average, complete median, centroid linkage, k-means, cases, variables), Time series (smoothing, seasonal and nonseasonal ARIMA, ACF, PACF, CCF, transformations, Fourier analysis), Nonlinear estimation (non-linear regression, maximum likelihood estimation, and more).

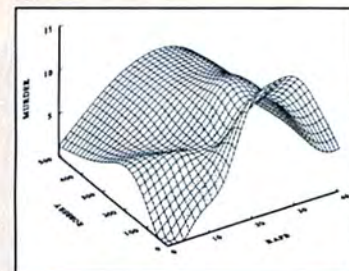
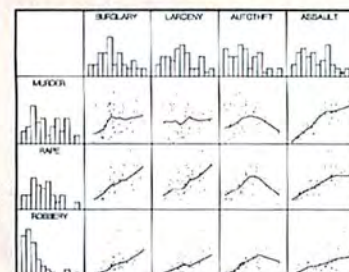
Data Management: Full screen spreadsheet data editor, Missing data, arrays, character variables, Process hierarchical, rectangular or triangular files or files with variable length records, Character, numeric, and nested sorts, Merge and append large files, Unlimited numeric and character transformations, Subgroup processing with SELECT and BY, Value labels and RECODE statements, Unlimited cases.

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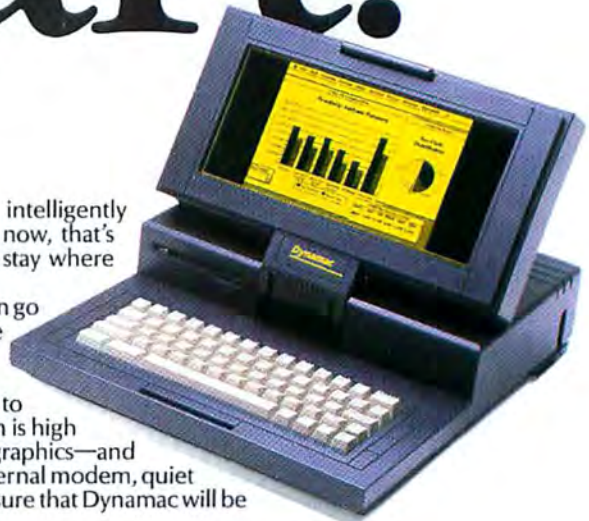
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Getting Started with Networking

Learning to share, stringing wires, and understanding communal computing

by Jim Heid

Imagine a network as an electronic free-way system where data races from one interchange to another at 186,000 miles per second. From a vantage point in the break-down lane, you might see parts of a document shoot from a Mac to a laser printer. A moment later, an "out of paper" message from the laser printer might travel in the opposite direction. Soon after, a road-weary document might pull into the network's rest area, a shared hard disk called a *file server*.

Remarkably, this highway has but one lane, built from a pair of copper wires twisted around each other. The travelers avoid crashing into each other and arrive at the proper interchange through a complex but effective scheme of data encoding.

But a network is more than a breeding ground for elaborate metaphors. Networks can be a great way to share expensive equipment and improve communication between coworkers—if you're willing to invest the time it takes to install one and educate its members in network etiquette. This month, we take to the electronic road-way to investigate the pleasures and pains of Macintosh networking.

When Apple Talks...

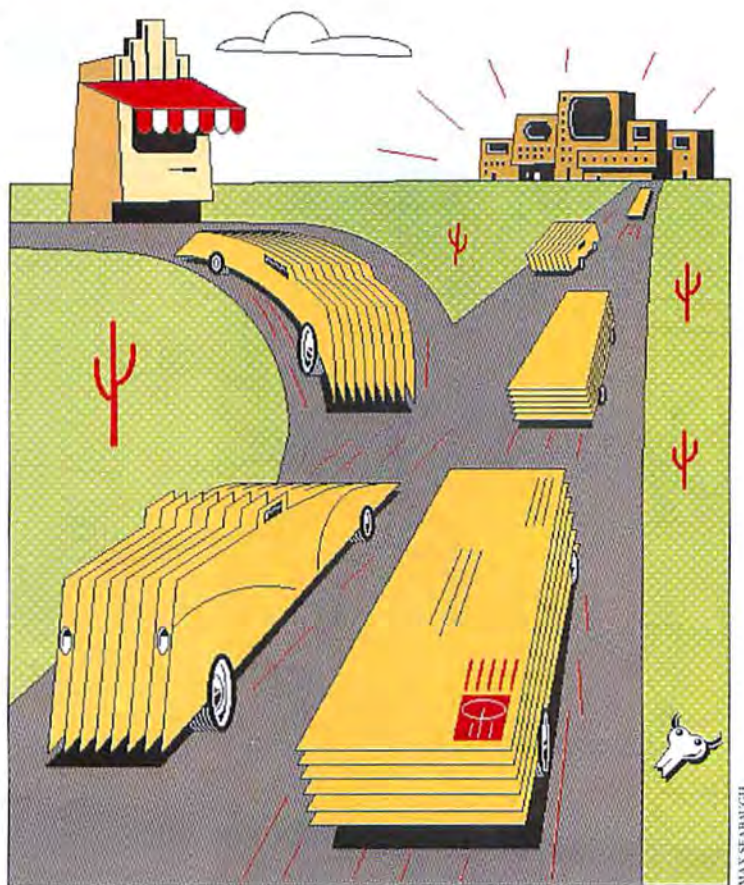
About a dozen network systems exist for personal computers, but Apple's AppleTalk has a near monopoly among Macs. And with good reason. Most networks for IBM PCs require a \$300-to-\$600 network expansion board for each machine on the network. AppleTalk capability, however, is built into every Mac. You need only add

cables and connectors. To return to the highway metaphor, every Mac contains its own on- and off-ramps; you just add the pavement between them.

For most Mac-equipped offices, AppleTalk's biggest benefit is that it lets up to 32 machines share big-ticket add-ons like a laser printer and a hard disk. Like a co-op vacation home, a LaserWriter is a less painful purchase when a large group can enjoy it. Also like that vacation retreat, a Laser-

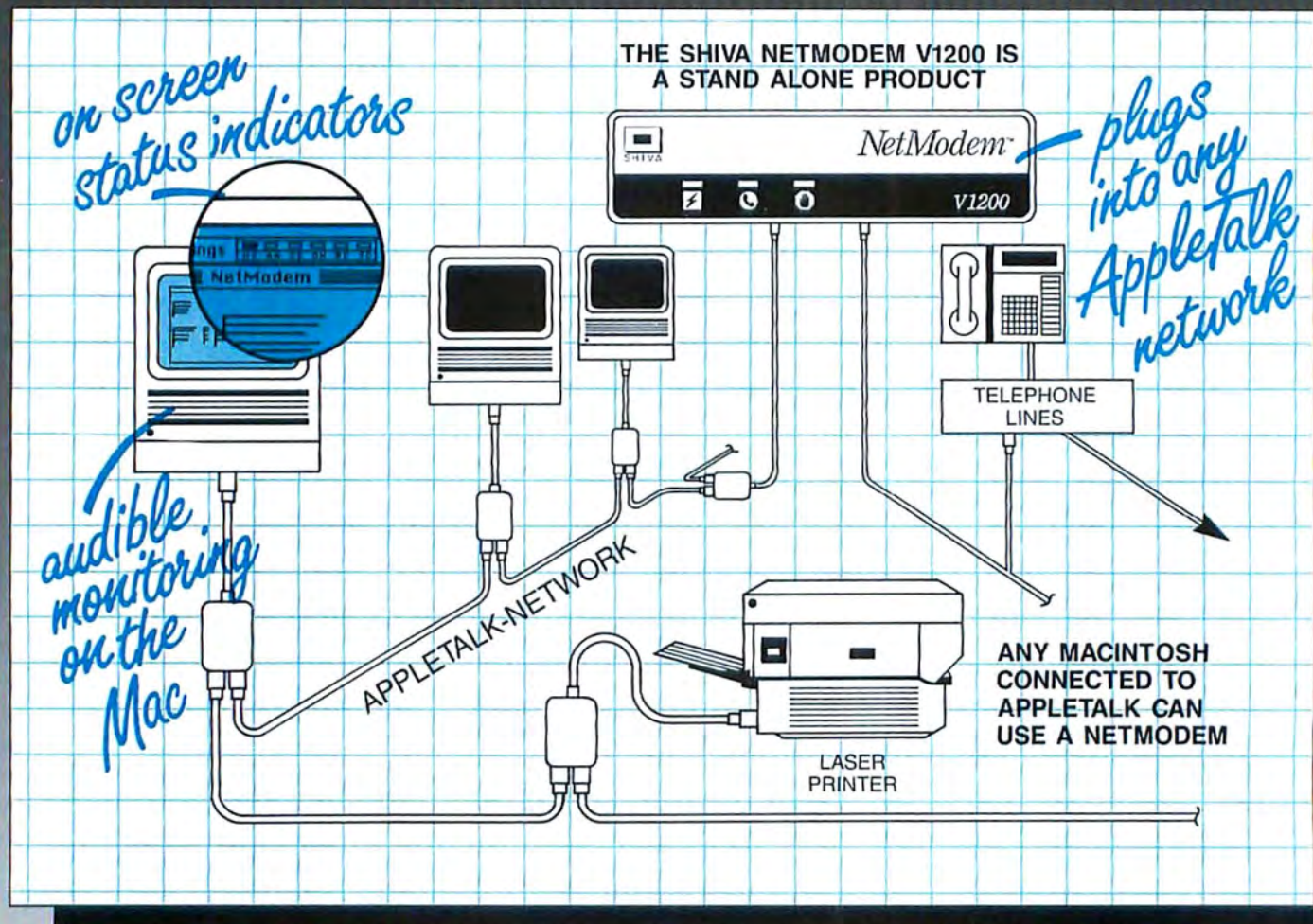
Writer can't accommodate everyone at once. LaserWriters and other PostScript printers contain built-in *print server* software that lets the printer handle print jobs on a first-come, first-served basis. If someone else's job is printing when you try to access the printer, you'll get a message that the printer is busy.

(continues)



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How To/Getting Started

(If you spend more time drumming your fingers than printing, consider getting a *print spooler*; a program that intercepts and holds data en route to the printer, returns control of the Mac to you, then converses with the printer while you work. For more information, see "Getting Started with Spooling," *Macworld*, March 1987, and "Speaking of Spoolers," *Macworld*, June 1987.)

A shared hard disk offers its own benefits. A central warehouse for documents, it saves everyone the trouble of passing floppies around to exchange files. In offices where several people work with the same documents, a shared hard disk could help clear up some of the confusion about whose versions are the most current.

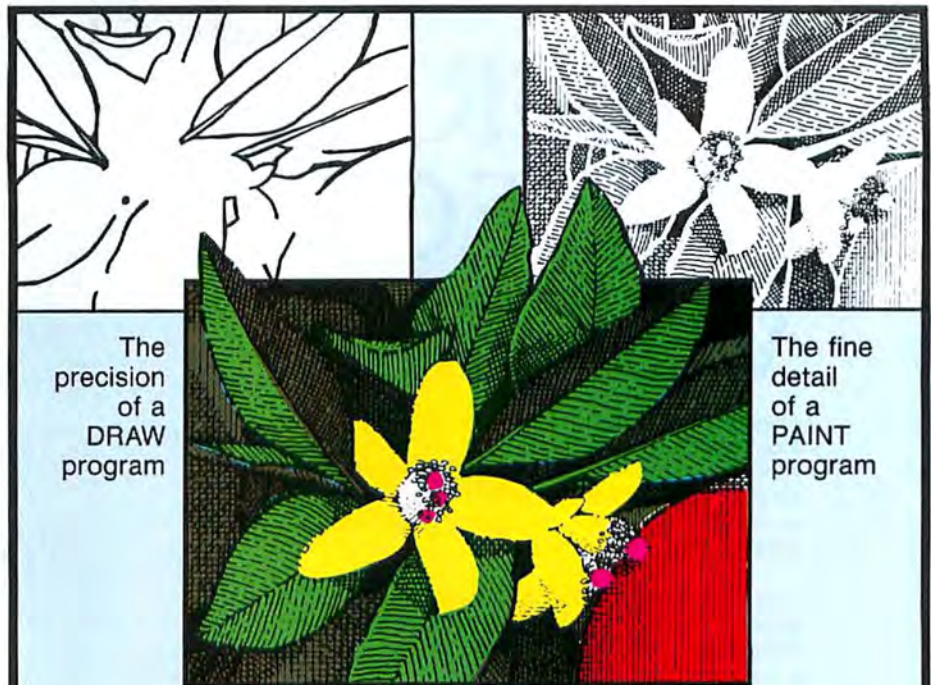
Unlike LaserWriters, most hard disks don't contain built-in server software. To share one, you need networking software such as Apple's *AppleShare*, Centram System's *TOPS*, or General Computer's *HyperNet*. Those programs allow network members to use a *remote* hard disk as if it were a *local* one plugged in right next to the user's Mac. The software also provides security measures that help prevent unauthorized users from riffling others' files. (*AppleShare* is previewed in "AppleShare: Multifaceted Networking," *Macworld*, March 1987, and the other products are reviewed in "A Network Divided," *Macworld*, October 1986.)

The Early Bird Gets the File

Because file server software turns a hard disk into a shared storage area, the possibility exists that more than one user could try to modify the same document at the same time—an event that can result in confusion, a destroyed document, or a system crash. Why? Imagine Dave and Beth simultaneously opening the same *MacWrite* document. Dave completely rewrites paragraph one. Beth, meanwhile, sees the old paragraph, thinks it's basically sound, and starts editing it. Get the idea? One user's changes can't magically appear on the other screen, and both users can't have the current version of the document.

One part of a file server's job, then, involves keeping track of who's opened what. It does so through *file-access protocols*—rules built into the file-serving software that specify how users can access files. A *file-locking* protocol prevents the situation I just described by locking a file to prevent alteration after someone has opened it.

(continues)



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System Requirements:
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How To/Getting Started

But some tasks, especially database management and accounting, benefit from users being able to simultaneously modify a file. Special *multiuser* versions of software applications allow people to work on the same file over a network. With a multi-user database manager, for example, a secretary can enter new client records, a sales representative can scan for product availability before booking an order, and a shipping clerk can update inventory figures—all at the same time from the same database.

A multiuser program handles those simultaneous requests without file clobbering through a *record-locking* protocol, which allows multiple users access to a file, although only one person at a time can modify a given record.

Before *AppleShare* debuted earlier this year, no standard file- or record-locking protocols existed for the Mac. Apple had built the highway, but hadn't finished defining how traffic should flow. That forced developers of file-server software to decide for themselves. Each came up with its own scheme, giving multiuser software developers three less-than-ideal choices: supplying separate program versions for each file server, supporting only one or two file servers (and reducing their potential market), or designing their own file-sharing protocols and building them into their application.


With *AppleShare* came the *AppleTalk Filing Protocol* (AFP), Apple's precepts for network file access. Having an Apple-sanctioned set of file-sharing rules makes multi-user life easier for software firms and users, although file-server developers have had to scramble to make their products compatible with *AppleShare* and *AFP*.

Dedicated or Distributed?

If you've used hard disks, you know they're far faster than floppies. You might think a shared hard disk extends those speed benefits to everyone on the network, but it isn't so. *AppleTalk* can transfer about 230,000 bytes per second, versus the roughly half-million bytes-per-second transfer rate of the Mac SE's SCSI port. That difference, combined with the extra communications overhead inherent in a network, makes a remote hard disk only slightly faster than a local floppy.

And performance slows as the network grows. When many users simultaneously start programs or copy files located on the server, you can discard your stopwatch and measure the network's per-

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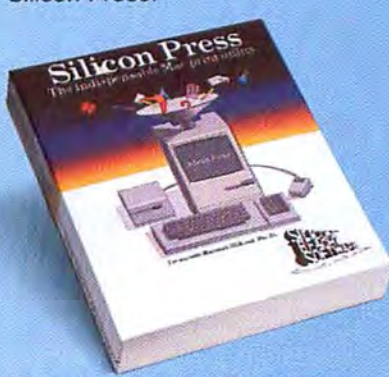


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C.J. Weigand, *The MACazine*, Aug '86

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MacInTouch, Apr '86



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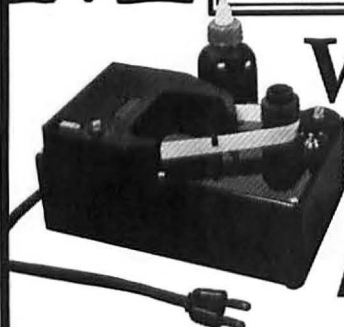
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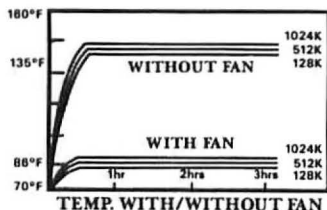
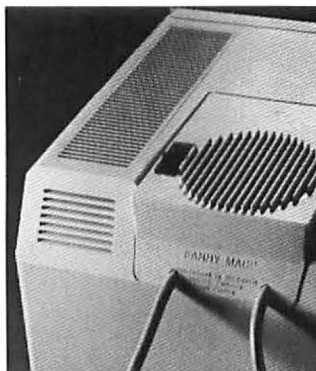
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How To/Getting Started

formance with a calendar. Aware of AppleTalk's limitations, file server manufacturers usually recommend that you use System files and large applications from a local floppy or hard disk rather than from the server.

One way to break up the bottleneck is to set up a *distributed network* that uses file server software such as Centram Systems' *TOPS*. Rather than tying all machines into a single hard disk, a distributed network turns two or more hard disks, each attached to its own Mac, into file servers. People who use large, complex applications or work with colossal documents can work at the machines with the hard disks, while others use the file server software to access the hard disks remotely for file sharing.

Another way to boost performance is to donate a Mac and its hard disk to the network as a *dedicated* file server. This approach, taken by *AppleShare*, eliminates the possibility of using that Mac locally. In relinquishing the Mac as a local workstation, you devote its resources to the network and allow it to concentrate on serving. And its life as a computer isn't completely over; a Mac running *AppleShare* can also run other types of network software, such as print spoolers and *electronic mail* packages.

Lines of Communication

A network can be more than a way to share files and equipment. With electronic mail (*E-mail*) software like Internet's *InterMail*, Videx's *Mail Center*, and Think Technologies' *InBox*, members of the network can use its wires to exchange messages. (*InBox* is reviewed in "Mac E-Mail Comes of Age," *Macworld*, February 1987; *InterMail*, in *Reviews*, May 1987; and *Mail Center* in "Special Delivery," December 1985.)

Creating an electronic post office involves entering the names of all the network's users along with optional security passwords. Then, each one can use the message center desk accessory to send communiqués and disk files to other members of the network, who are notified of the delivery by a message on the Mac screen. (E-mail packages have an audible alarm option, a good alternative if you don't mind being beeped at when you're busy with something else.)

E-mail products also have "carbon copy" options that let you send the same

(continues)

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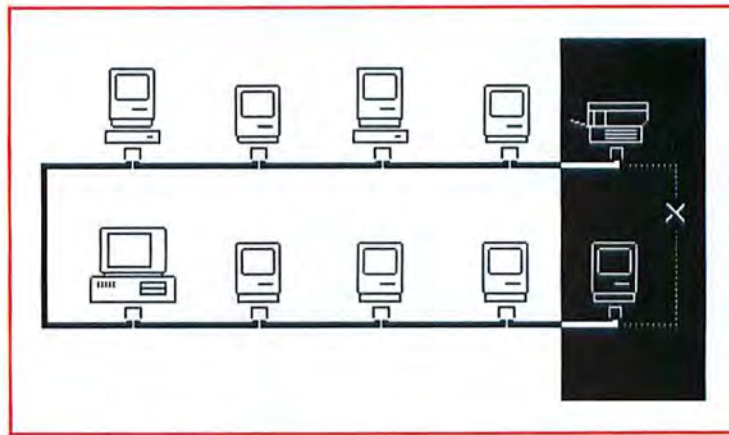
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message to multiple users, and they offer electronic replacements for those ubiquitous "while you were out" message slips.

Beaming messages to coworkers can save footsteps, and it certainly adds a workplace-of-the-future touch to an office, but don't think that E-mail is vital to your network. For one thing, setting up an electronic post office takes time and disk space. For another, the E-mail desk accessory that runs on each recipient's Mac takes a chunk out of memory that may already be in short supply on 512K machines. And E-mail systems may beam messages in a flash, but they'll sit unread if their recipients don't bother to answer the mail call.

Dialing for Data

I said earlier that creating an AppleTalk network involves putting pavement between machines. That pavement comprises a \$75 AppleTalk connector, which attaches to the Mac's printer port (or a laser printer's serial port), and cable, which sells for about \$2.50 per foot. The connector electrically isolates the network, helping to prevent wholesale equipment carnage should one Mac or another networked



A Network Diagram

AppleTalk connectors attach cables to all the networked devices—Macs, printers, or IBM PCs equipped with an AppleTalk expansion board. Avoid a common wiring trap: don't connect the devices at the end to form a circle.

component die. The cable isn't too different from what you'd find in a stereo system. It contains a pair of wires twisted around each other, surrounded by a braided wire shield that keeps electrical interference out and prevents the signals in the cable from interfering with nearby radios or TVs.

Considering the cost of IBM PC networks, spending about \$100 per Mac isn't bad. And it can be even cheaper. Farallon Computing's PhoneNet uses a building's existing telephone wiring and replaces Apple's \$75 connectors with ones that some mail-order suppliers sell for less than \$40.

PhoneNet sends signals on two unused phone wires, so your telephone system isn't affected. A PhoneNet network functions basically like an AppleTalk one, with a difference: a PhoneNet line can be up to 3000 feet long, versus AppleTalk's 900-foot limit. You can even mix and match PhoneNet and AppleTalk connectors with a \$6 adapter. If you'd rather not use your phone lines for the network, standard telephone cable also works.

(continues)

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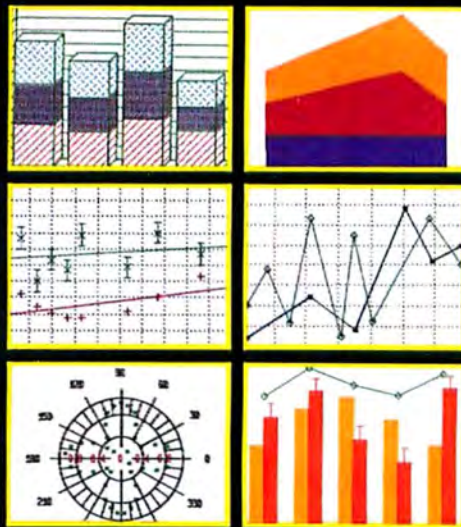
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Dialogue based on an Apple Tech Note written by Bryan Stearns, with assistance from Randy Carr.

How a Net Works

A transmission from a device on an AppleTalk network reaches all the devices on the network, but only the intended device responds. The server

then specifies a channel for further conversation so that the data from various machines doesn't get mixed up.

Whether you opt for Apple's connectors or Farallon's, it's easy to snap them together if the equipment is in close proximity. The wiring job may become quite complicated, however, depending on the area to be networked. You attach a connector to each Mac's printer port, plug a cable into the connector, and plug the other end into the next machine's connector. One mistake you can make is creating a circle by using one cable too many (see "A Network Diagram"). A highway isn't of much use if you end up where you begin; the same applies to an AppleTalk network, which must have a beginning and an end.

Another potential pitfall: leaving a cable unconnected. As far as AppleTalk is concerned, the end of the network is an AppleTalk connector with only one cable attached. When the network's traffic flows into one of these connectors, it's absorbed as it tries to leave the connector (see "How a Net Works"). If a cable is dangling somewhere without a connector, however, the signal isn't absorbed. The network never gets the message that it's the end of the line, and traffic comes to a standstill. Without being properly *terminated*, without a definite end point, the network doesn't work.

Networks built around Apple's cables have one other vulnerability: Apple's cables. With no thumbscrews or other secure means of attachment, the cables can loosen or disconnect accidentally when someone repositions a Mac or stumbles over a cable. Kensington Microware's AppleTalk clips keep cables and connectors united, and at \$25 for 25 of them, they are cheap insurance against broken links.

When your network is wired properly and securely, it's ready for use. If the network is strictly for LaserWriter sharing, you can simply turn the LaserWriter on and then use the Chooser desk accessory on each Mac to select the printer. For networks with a file server, you'll need to install the file-server software and, with some products, specify each network member's *user name* and security password. After that, you can share your heart out. You may want to educate the network's members in some basic rules of network behavior to get started on the right foot (see "Net Etiquette").

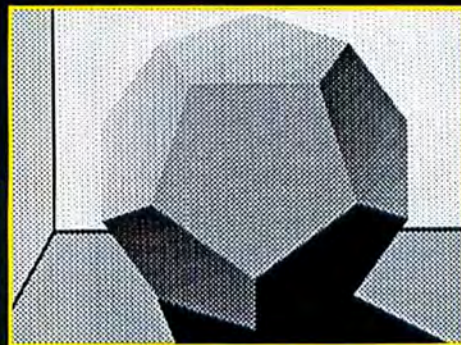
Assessing Net Gains

A network may require as much dedication from its tender as it does from its

(continues)

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How To/Getting Started

Net Etiquette

Following some basic rules can help make communal computing work smoothly:

■ **Run Applications Locally** Avoid running large applications from a server; they'll perform slowly and bog down the server. Small, fast-loading applications like *MacPaint* work well from a remote server, but a complex program like *Helix* can make a network snail-slow. Run large applications locally, ideally from a hard disk or a RAM disk; use the server primarily for document storage and sharing.

■ **Don't Run Unreliable Software** Never run prerelease software on a network. A crash for one may mean a crash for all.

■ **Don't Delete Casually** Don't throw away a file with a cryptic name—it might be a colleague's precious work file. Check with others before deleting files you don't recognize.

■ **Release Volumes You Don't Need** When you've finished with a server volume (a folder on AppleShare or a disk symbol on other network software), release it so that others can use it. Drag the volume's icon to the Trash Can on the desktop or use the network desk accessory to release it.

■ **Don't Break Connections** If you must unplug an AppleTalk connector from the net-

work, make sure all users have saved their work. Reliable network software can usually reestablish a connection, but don't count on that.

■ **Use the Disk Cache** With a Mac Plus, SE, or II, activate the Control Panel's disk cache to decrease the number of disk accesses.

■ **Use the Same System Version** Make sure each machine on the network is equipped with the same version of the System, the Finder, and printer drivers. And keep the System and Finder on local hard disks or floppy disks—never run them from the server.

■ **Share Applications Carefully** Most existing programs weren't written with network use in mind; they may crash if several users try to access them simultaneously. Make sure a program is designed for network use before storing it on a shared hard disk. Then there are the legal ramifications of networking: you may be required to buy a special license or purchase multiple copies of a program to use it on a network.

■ **Back Up Religiously** The crash of one person's hard disk leads to depression; the crash of a shared hard disk can lead to a riot.

file server. Setting up and using a network for anything more than LaserWriter sharing takes time, organization, planning, teamwork, and some faith. The Mac is a complex computer, and when you combine several Macs, you also increase the possibility that something will go wrong. Remember that you can always share files by handing someone a floppy disk, and you can still send a message with pencil and paper. Before taking the plunge, assess your office's

needs and make sure they warrant the time and money you'll spend.

If you're still convinced that networking is for you, forge on. Compared to network technology available on other personal computers, Macintosh networks are inexpensive and blessedly uncomplicated, thanks to the standard protocols, the Mac's friendly face, and the built-in AppleTalk connection. □

See *Where to Buy* for product details.

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Insights on Microsoft Word 3.0

*Savvy readers share their best tricks and tips
for the new version of Word*

Edited by Nancy E. Dunn

From a quick glance at the documentation for *Microsoft Word 3.0*, anyone could see lots of room for experimentation—and confusion. Any product with so many features provides good territory for exploration, so in May we asked readers to help uncover tips to collect in an article. We had no idea what the response would be or how many \$25 checks we'd be sending out in thanks. It's been the most interesting mail call in a long time; we might just make a habit of this.

Many people wrote in frustration—or despair, depending upon how much work was on the line—over problems in the original release of the new version. (One fellow offered to pay *us* \$25 for a satisfactory way to index a long book.) Many others sent in clever workarounds for problems the 3.01 release has apparently solved (at press time we were testing prerelease version 3.01g). A number of suggestions (those not attributed to readers) were compiled by the editor and based on research gathered from various sources.

The tips we present here still only scratch the surface of *Word 3.0's* richness. For example, this collection doesn't cover working with tabular material, multiple columns, or mail merge (which is covered in "Mastering Mail Merge" in this issue). But this won't be the last time we print hints for this program. Send additional insights to *Quick Tips*, *Macworld*, 501 Second St., San Francisco, CA 94107. We pay \$25 to \$100 for published tips.

Many readers sent in lists of their favorite keyboard shortcuts. Microsoft has loaded the new version of *Word* with keyboard equivalents for menu and mouse

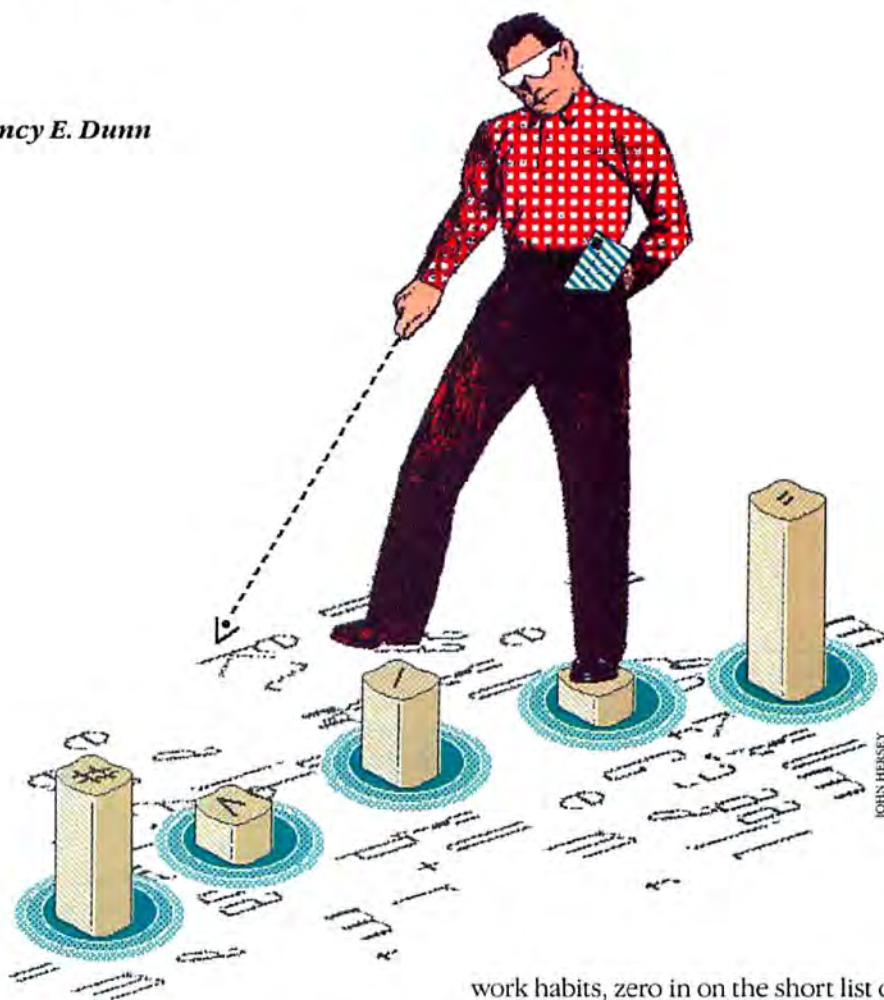
commands. Trouble is, there are way too many to recall, at least until we all devise Roy G. Biv schemes that help us remember them. In fact, almost anything you can do with the mouse you can do from the keyboard, whether scrolling or formatting. With the exception of full-time word processors and writers, however, nobody will be able to keep track of all the shortcuts. To avoid memory overload, start by spending some time with the Quick Reference Guide to get to know the range of time-savers available. Then, observing your own

work habits, zero in on the short list of commands that will help you the most; for example, cursor control commands or type style commands. You'll pick up the others as you go along. Here are a couple of reminders and undocumented shortcuts (see also "The Key to Commands").

Shortcuts and Reminders

- In Page Preview mode, instead of selecting the magnifying glass to zoom in on an area of your document, just move the

(continues)



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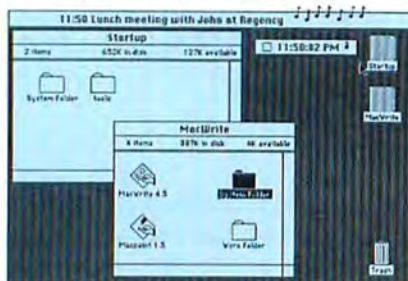
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arrow over the appropriate section and double-click.

Jim Wolcott
Huntington Beach, California

Thanks also to Tony L. Ludiker of Spokane, Washington, who sent in the same tip.

■ **⌘-Option-P** moves the cursor to the first character in the previous screen.
⌘-Option-, (period) moves the cursor to the final character of the next screen.

Carol Smith
Sacramento, California

■ If a keyboard shortcut doesn't work, check to see if you are in Short Menu mode (if you see the Full Menu selection on the Edit menu, you are in Short Menu mode). Shortcuts for menu items that don't appear on the short menus don't work unless you have selected Full Menu.

- The Clear key toggles the numeric keypad between cursor movement and number entry. Look for the *N* at the right end of the menu bar that indicates you're in Numbers mode.

Shortcuts on the Short Keyboard

■ You can select menu items from the keyboard even with the original short Macintosh keyboard. Press the **⌘** and Tab keys simultaneously to activate the menu bar for 5 seconds. Once it's selected, pressing a number from 0 to 8 opens a menu—0 for the Apple menu, 1 for the File menu, and so on. You may also select by typing the first letter of the menu name.

After you've selected a menu, use **⌘-Option-K** and **⌘-Option-L** to jump between the menus. Highlight a command on the menu by pressing the first letter of the menu item or by pressing **⌘-Option-O** for previous item or **⌘-Option-,** (comma) for next menu item. Once the item is highlighted, press **Return** or **Enter** to select the command.

Cancel the selection process at any time by pressing the Backspace key.

Shawn R. Jostyn
Lansing, Michigan

Stop, I Say, Stop

■ To exit Page Preview mode without resorting to menus, press **⌘-.** (period).

Brad Wong, M.D.
Honolulu, Hawaii

-	I	@	#	\$	%	^	D	*	()	_	.
	Q	W	E	A	T	V	U	I	O	P	()	
	R	S	D	F	G	H	J	K	L	:	?	
	Z	H	C	U	B	N	M	<	>			

□	=	/	*
7	8	9	-
1	5	6	+
0	1	2	3
			□

Selecting the word left of the insertion point:

⌘-Shift-keypad 4
(Version 1.05: Shift-Backspace)

[illegible]

Deleting the word left of the insertion point:

⌘-Option-Backspace
(Version 1.05: Option-Backspace)

~	!	@	#	\$	%	^	&	*	()	_	+	□	=	/	*
	Q	W	E	R	T	Y	U	I	O	P	()	7	8	9	-
	A	S	D	F	G	H	J	K	L	:	;	?	4	5	6	+
	Z	H	C	V	B	N	M	<	>	?			1	2	3	
													0	.	,	

Moving insertion point one word to right:

⌘-keypad 6
(Version 1.05: keypad 6)

[illegible]

Moving one word left:

⌘-keypad 4
(Version 1.05: keypad 4)

[illegible]

Inserting copied text:

1. Select the text.
2. Press **⌘-Option-C**.
3. Click where you want the text.
4. Press **Enter** or **Return**.

(Version 1.05: select text and then Option-click to insert it.)

~	!	@	#	\$	%	^	~	0	*	()	-	.	
Q	W	E	R	T	Y	U	I	O	P	{	}			
A	S	D	F	G	H	J	K	L	:	"				
Z	H	C	U	B	N	M	<	>	?					

Moving text to a new location:

1. Select the text.
2. Press ⌘-Option-X.
3. Click at the new site.
4. Press Enter or Return.

(Version 1.05: select text and then Option-Shift-click to insert it.)

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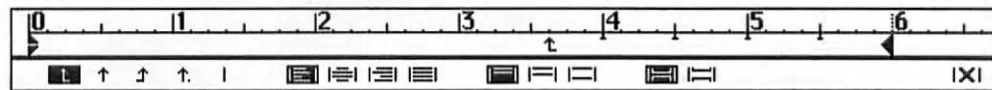
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How To/Insights



The Rule of Formats

The new version of Word includes a format ruler that closely resembles MacWrite's, with margin indicators and tab wells, justification, and line-

and paragraph-spacing icons. Clicking on the X at the extreme right deletes special formatting you have added to a paragraph.

I hereby give permission to the instructor to post my grade for this exam and for the course beside my social security number. _____ (signed)

I hereby give permission to the instructor to post my grade for this exam and for the course beside my social security number. _____ (signed)

Little Boxes

Pressing Return closes a box around a paragraph, so if you want to add vertical space inside a box you can do so with the Tab key. Here a signature blank was added by selecting Underline type style between two Tabs.

the end of the document, and use the magnifying pointer to look at the number before the last word listed.

Steve Charnovitz
Falls Church, Virginia

Narrowing the Gap

If you don't want to bother with the Paragraph dialog box, you can change the spacing between paragraphs simply by selecting Show Paragraph on the Edit menu (or pressing ⌘-Y), selecting the paragraph mark, and changing the font size for the paragraph mark. Use the ⌘-Shift-< and ⌘-Shift-> combinations to adjust font size from the keyboard.

Bill Jastram
Tualatin, Oregon

Formatting First Lines

On the format ruler, the left-margin indicators for the first line and the subsequent lines move together. That's fine if you rarely indent (or reverse-indent) the first line of a paragraph. But it is literally a drag if you always use indents: first you

move the pair of indicators to the indented measure and then you slide the second-line(s) indicator back to the left margin of the text. To move the indicators independently, hold down the Shift key while you drag one of them (see "The Rule of Formats").

Making Room in Boxes

I like to leave a sizable blank space inside a boxed paragraph, but if I press Return, the box closes abruptly after the last typed line. I add space by using the Tab key to extend the paragraph without closing off the box (see "Little Boxes").

Paul B. W. Miller
Salt Lake City, Utah

To add blank lines to boxes, hold down the Shift key while you press Return. A left-pointing arrow appears for each Return.

Marsha Seeley
San Francisco, California

Pagination Oddities

Version 3.0 sometimes produces long blank spaces in a printed document that don't show up on screen. The pre-release version of 3.01 we tested has apparently solved the problem, but to fix a spacey file you've created in 3.0, Shift-Repaginate (Shift-⌘-J) once and then save the file in 3.01.

Symbol Font Nuances

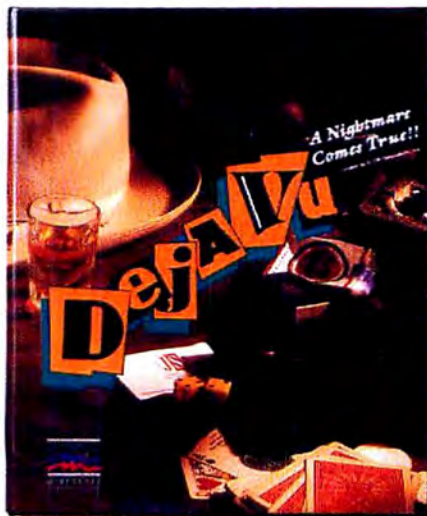
The new Word includes a special version of the Symbol font that you should install in your System file before doing any lengthy work involving formulas. The standard Symbol font produces occasional glitches.

Dick Grant, M.D., M.P.H.
Sudbury, Massachusetts

Editing Outlines

The outline design makes it difficult to add subheadings in two places: immediately after a subsection (that is, a heading

(continues)



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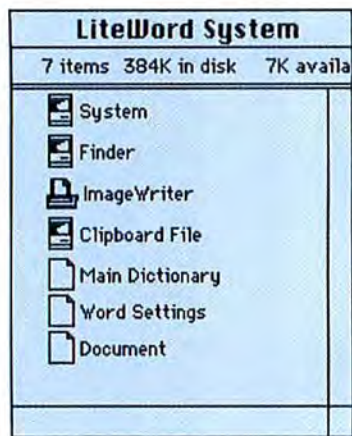
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Word 3.0 Lite

Here's a glimpse at the contents of Paul Miller's pared-down 400K two-disk set. Miller's arrangement even lets Word version 3.0 operate its spelling checker on an un-enhanced 512K Mac.



with all its subheadings collapsed) and after a paragraph of body text. To add something in the middle of an outline, position the insertion point at the *beginning* of the paragraph that follows the new material's intended location. Press ⌘-Option-Return to add a new paragraph.

This technique doesn't work at the end of an outline, however. If you want to

add text there, press ⌘-Option-. (period) to advance the cursor to the end, and then press Return.

Stanley K. Dorst
Pittsburgh, Pennsylvania

Headers: Beware of Colons

■ Colons in headers produce line breaks in table-of-contents entries. Use slashes or type emphasis to distinguish parts of a header to avoid unwanted line breaks on your contents pages.

The Monster Index

■ I found indexing a 265-page book an exercise in frustration until I discovered a workable shortcut. I indexed the book in three parts and exported the parts to *OverVue* 2.0, combined and sorted them, and returned to *Word* for final formatting.

Cary Magnum
Fair Oaks, California

■ A Microsoft representative says chaining files works better in 3.01 than it did in 3.0 but adds that the practical limit is about 1500 index entries.

The 512K Squeeze

■ Advice for anyone still working on a 512K Mac: trim down your System file to make room on two 400K disks for *Word* and its main spelling checker dictionary, with 49K left for documents (see "Word 3.0 Lite"). Use the Font/DA Mover to remove all but the Key Caps desk accessory and all but essential fonts. (I left four fonts in several sizes.)

(continues)

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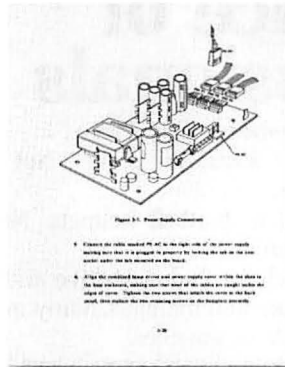
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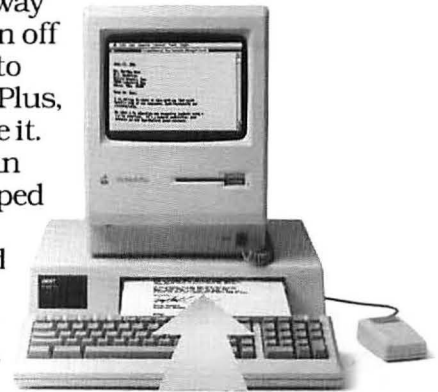
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Bug Fixes

The consumer outcry about the glitches, bugs, and even tragic flaws of the January release of *Word* 3.0 inspired one of the fastest revisions in the West. Although it has not been possible to exhaustively test the pre-release version of 3.01 (3.01g at press time) against our list of problems, the new version appears to offer significant improvements over the initial hasty release. Among the bug fixes (or "changes" and "improvements," as Microsoft prefers to call them) are printing procedures that enable you to

make collated multiple copies, pagination that works without leaving mysterious spaces in a printed document, draft mode printing on the ImageWriter that doesn't require an out-dated printer driver, and a conversion utility that now seems to function. Subjectively, even the beta 3.01g inspires more confidence than the shipping 3.0 release did; so far, in three weeks of working with it almost daily, I haven't experienced any problems with under-25K manuscripts.

Spell-checking a document exhausts so much of a 512K's memory that in Best quality, printing slows to a crawl. To speed up the pace, after you've corrected the spelling, quit *Word* to clear the spelling checker from memory. Then reopen the document and print it.

*Paul B. W. Miller
Salt Lake City, Utah*

■ Speaking of Key Caps, J. P. Godwin of Los Angeles points out that when you choose Key Caps, a special Key Caps menu appears at the right end of the menu bar. Select a font from that menu and the Key Caps show up in the font you want—very handy.

System Software Compatibility

■ Upgrade to System 4.1 to avoid problems on the SE, such as keyboard shortcuts that don't work. Also make sure you have version 3.0 (or later) of the Chooser. If the Chooser seems to forget you've already selected the LaserWriter, it may be because the System disk you're using contains an earlier version of the Chooser. □

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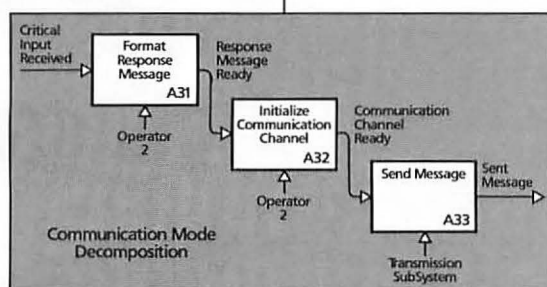
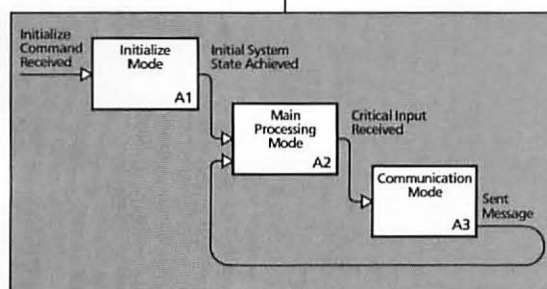
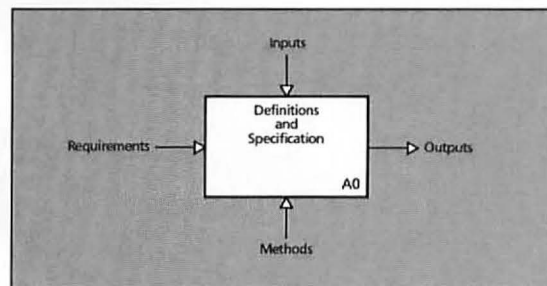
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Mac Communications Tools

A guide to the Mac's lively electronic bulletin board scene

by Dale Coleman

Do you know someone who always seems to have the latest and greatest shareware and public domain software for the Macintosh? Feel left out at parties when the conversation turns to Mac rumors? Find yourself alone on Friday night battling a mysterious bug that won't let you finish the report the boss expects Monday morning?

If you have a Mac, a modem, some inexpensive communications software, and a little free time, you can be in the know by dialing up one of the many electronic bulletin boards for Macintosh users.

You could think of a bulletin board system (BBS) as a permanent user group meeting—at any time you can connect to one to exchange information or to experience a sense of community. BBSs have been around almost as long as personal computers, starting back in the late 1970s. In the last 10 years or so, thousands of bulletin boards have gone online all over the country. A BBS is made up of a personal computer, a modem, BBS software, a lot of dedication by the sysop (system operator, the person responsible for it all), and (most important) participation by the users.

The major difference between a BBS and a commercial online information service like GEnie or CompuServe is the price. A few bulletin boards require a small annual subscription fee (usually \$20) and a few others request—but don't require—a small donation to help defray the costs of dedicating so much hardware to the project, but most BBSs are free.

The Typical BBS

You'll find the atmosphere on most bulletin boards relaxed and friendly, but BBSs and the information on them vary tremendously—one includes a conference for

Grateful Deadheads, for example. As you test the BBS waters, you'll discover that each one reflects the personalities of the people involved.

Most BBSs are divided into two main categories: messages and files. In the message section you can read messages left by others, reply to them, and leave your own. The message area typically contains sections organized by topics. For example, there may be sections devoted to programming, news, and questions answered. This is where you'll find gossip about forthcom-

ing products, timely news of software updates, tips, and advice (often from all over the world), as well as notices of hardware and software for sale and even job postings by companies and recruiters. Depending on the theme of the board, you may also find messages about hobbies, restaurants, travel, politics, the latest medical developments, and more.

(continues)



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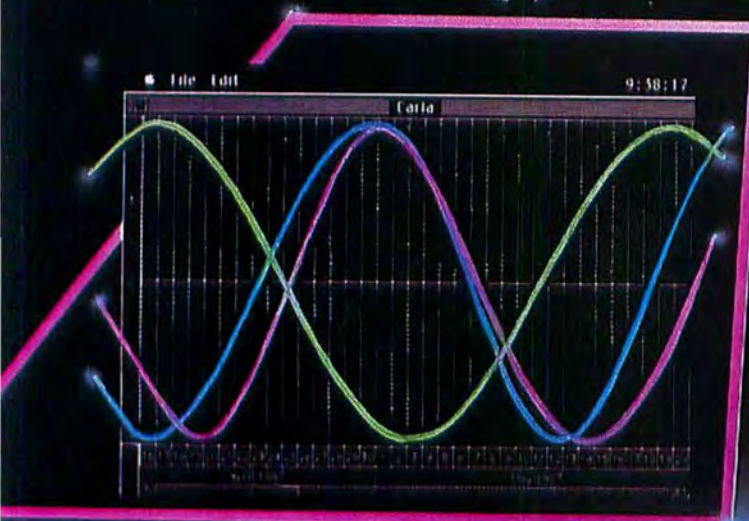
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How To/Mac Tools

You have the option of reading a specific message or reading all messages since a certain date—for example, since the last time you logged on. You might find it interesting to capture these messages into a text file so that you can read them later. Don't be afraid to reply to a message if you have something to say. This is a group effort, and everyone will appreciate your participation.

You'll usually find the files area divided by topic, too. You can expect to find sections devoted to communications software, utilities, games, clip art, and so on. This is where you'll find the latest versions of the popular public domain and shareware utilities. The Mac is blessed with a wealth of user-supported software, and the proliferation of BBSs is one reason why.

Getting Started

When you log on to a bulletin board, you are asked for your name. If you've never been on the board before, you then pick a secret password. The sysop may also ask that you fill out a questionnaire before you're validated for the board. Some sysops have other methods of validation that require you to wait a day and call again before you're okayed. Being validated simply means that you have access to the files available for downloading and that your time allowance is increased, usually from 15 minutes for nonvalidated callers to one hour for validated ones. The next time you call, you only have to give your name and password to gain access to the system.

One of the first things you notice is that bulletin boards don't look much like the standard Mac environment. In fact, many boards are running on MS-DOS machines. Instead of the familiar pull-down menus, you see a bewildering array of menu selections, but don't be put off. They're usually organized logically and have a help option available for those who get stuck.

After you log on, read the bulletins, which contain information about the system. Most sysops include a special bulletin for first-time users that describes the system and how to use it. The sysop may also have some special rules for the use of the system. Obey them. Remember, you're a guest here.

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How To/Mac Tools

ready knows. If you find yourself addicted to calling bulletin boards all over the country, consider a service from Telenet called PC Pursuit. For a flat fee of \$25 per month (billed to your bank credit card), you can call as many bulletin boards as you want in the evenings and on weekends, as long as the boards you're calling are in cities supported by PC Pursuit.

PC Pursuit's major drawback is the time required to use it: transferring files takes almost twice as long as a normal call, since your data has to travel through several extra modems to get to its destination. Also, only 300 and 1200 baud are currently supported. Even with these limitations, the service can be a great money saver for the active BBS user. The advent of PC Pursuit has enabled hundreds of people to participate in long-distance boards that they otherwise couldn't afford. For more information on PC Pursuit, call 800/835-3638, or dial its bulletin board at 800/835-2987.

Call Waiting

When you communicate with another machine over the phone, you must disable call waiting. If you don't, the first incoming call will break your connection with the remote computer, no questions asked.

If your phone company has upgraded to electronic switching exchanges, you can temporarily disable call waiting for the duration of any call by preceding the number you're dialing with *70, or 1170 if you're using a pulse phone. (To find out if it will work, just put the code in front of a number when you dial. If the service isn't available, you'll get a recorded message that your call can't be completed as dialed.) You'll need to send the modem a pause between the command to disable call waiting and the number you're dialing. With the Hayes command set, the pause command is a comma, for example: ATDT *70,555-1212.

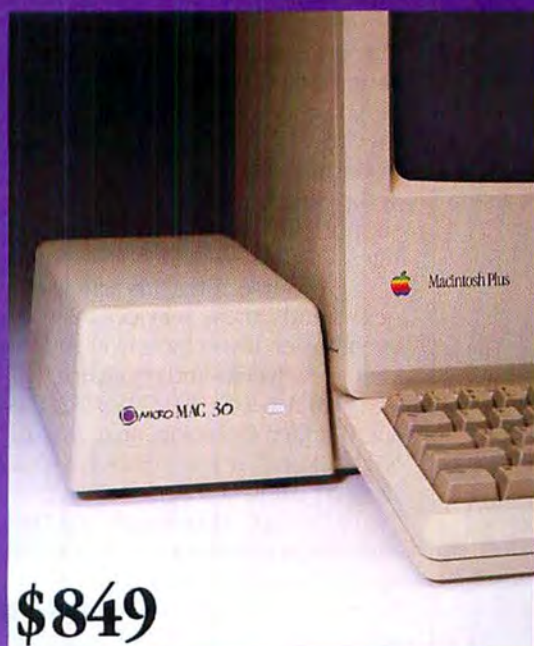
Ideally, you should have a line that you use only for the Mac so that your voice line won't be tied up for hours at a time. The cost of installing a second line varies from phone company to phone company, but you can expect to pay about \$200 for the installation and about \$15 to \$20 per month for the line itself, excluding any long-distance charges.

A Select Few

The content and quality of bulletin boards vary, but some stand out from the crowd. The friendliness and dedication of

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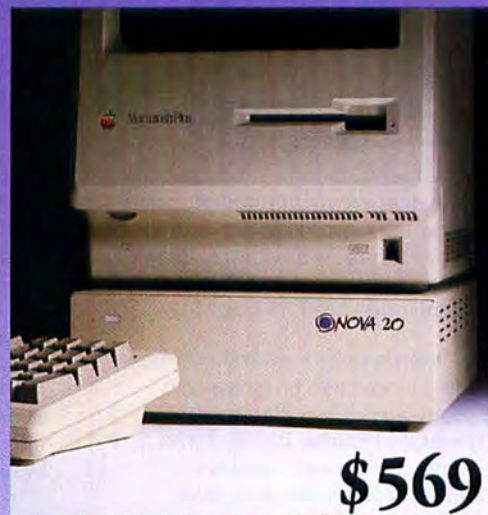
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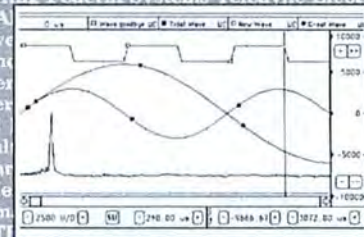
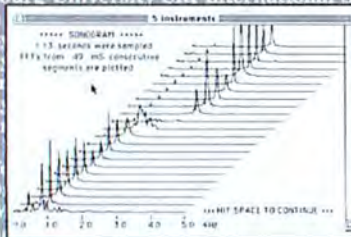
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the sysop and users, the extent of the file section, and the activity in the message areas account for the popularity of these BBSs.

Here's a sample of some of the best Mac-oriented bulletin boards around the country, along with a description of each one. These boards share two things: they're all very popular and they all benefit from the active participation of both the sysops and the users. All of these boards support 300-, 1200-, and 2400-bps transfer rates.

Of course, after this article hits the newsstands, these services may become even busier. If you have trouble logging on, wait a few weeks and try again.

■ **M.A.G.I.C.** 303/791-8732. Based in the Boulder, Colorado, area. Sysop: Steve Sande. Runs on a Mac 512KE with a Hard Disk 20, using *Red Ryder* Host.

M.A.G.I.C. (Macintosh and GS Information Center) started last October. It has quickly become one of the most popular boards in the country with over 450 registered users. As with other boards listed here, you may have difficulty getting on, since some days this BBS receives 60 to 80 calls.

The message section is very active, containing lively conversations about a variety of subjects including the potential of various baseball teams during spring training and valuable hints about how to play *Dark Castle*. M.A.G.I.C. is popular with PC Pursuit users, so there are lots of messages from all over, particularly Washington, D.C.; Seattle; and San Francisco. Sande's board is also one of the first anywhere to have a separate file section devoted to public domain and shareware software for the Apple IIGS.

■ **MacCircles** 415/484-4412. Based in the San Francisco area. Sysop: Pat O'Connor.

MacCircles started in May 1985 on a Lisa 10 that gradually acquired three Profile hard disks (which must be some kind of record). One day O'Connor came home to find all the disks completely full, and she knew it was time to change strategies. MacCircles now runs on a Mac Plus with a Jasmine 80 and a Bernoulli 20/20, using *Red Ryder* Host.

O'Connor is currently experimenting with exchanging messages with a BBS in her hometown, Tucson, Arizona. Comparing messages from the two boards is a good way to tell how people's attitudes about bulletin boards seem to change from

(continues)

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How To/Mac Tools

Communications Basics

Modems come in a variety of flavors, but the two important features are Hayes compatibility and baud rate. Make sure your modem accepts the basic Hayes command set, since most of the communications programs available for the Mac work best with these commands. Baud rate simply measures speed, the rate at which you can transfer information to and from another computer. A 300-baud modem may suffice for reading messages, but sending or receiving even a short file at this slow speed can use up all your allotted time on a bulletin board.

Much more common are 1200-baud modems, which you can buy from a variety of sources at very reasonable prices. 2400-baud modems are even more desirable, but you'll pay two to three times as much

for the privilege of sending and receiving data twice as fast. If you frequently call bulletin boards long distance and pay by the minute, 2400-baud modems will be your best buy. (Most sysops report that about 10 percent call at 300 baud, 25 percent at 2400 baud, and the rest at 1200 baud.)

Communications software includes commercial, public domain, and shareware offerings. Perhaps because BBSs are partly responsible for the explosion of user-supported software, you might feel at home using one of these, such as *TermWorks* or *Red Ryder*. I recommend *Red Ryder*, both for its incredible flexibility and because it supports the 1K Xmodem form of file transfer available on many BBSs—it's faster than the Xmodem standard.

place to place. Users in the San Francisco area generally send messages that are quite serious and technically oriented, while the folks in Tucson seem more inclined to loosen up and carry on conversations on a wide variety of topics. All in all, this is a great place to meet people and make new friends.

■ *MACropedia* 312/295-6926. Based in the Chicago area. Sysop: Dave Alpert. Runs on a Mac Plus with a MagNet 40/40 drive, using *Red Ryder* Host.

Alpert, one of the most experienced sysops anywhere, started his first BBS in 1979 with an Apple II. He converted the board to Mac topics shortly after the Mac's introduction.

MACropedia's greatest strength is the 30 megabytes of public domain and shareware software available—over 1100 files. Alpert is also very attentive to the board, spending about 10 hours per week answering mail and testing the uploaded files, although he says the *Red Ryder* Host software is so sophisticated that he could let the board run itself, if he were so inclined.

(Note to sysops: Contact Alpert for subtle but effective solutions for dealing with that problem caller you may have. Leave him a private message.)

■ *Check-In* 305/232-0393. Based in the Miami area. Sysop: Dave Game. Runs on a Mac 512KE with *Red Ryder* Host.

Check-In began last October, and it's already one of the most active boards in the country. This board focuses on late-breaking Mac news and gossip, perhaps reflecting the personality of the sysop, who's a local Miami TV news personality.

If you want to find out about the latest news in the industry, Check-In, which features 40 to 50 bulletins every month, is one of the best places to do it. For example, Check-In regulars were among the very first to hear of Guy Kawasaki's departure from Apple Computer. Game spends a lot of time on this board, weeding out the boring and unnecessary files that you often find on the commercial services.

(continues)

■ **MacQueue I and MacQueue II** 415/661-7374 and 415/753-3002, respectively. Based in the San Francisco area. Sysop: Léo Laporte. Runs on IBM PCs and clones with two Seagate 20MB hard drives.

There are two MacQueue boards, and each is a mirror image of the other. MacQueue runs on IBM PC clones with the unique *Fido* software that was originally developed by Tom Jennings. Fido boards throughout the country are organized into networks that share information with each other. Laporte has long been involved in the development of the Fido EchoMac conference and is the West Coast coordinator.

Fido EchoMac sounds complicated, but it simply means that during the wee hours of the morning the boards on the network automatically call each other and share their message base. So if you ask a question in the EchoMac section, you may get several answers from the other side of the country in a day or two.

MacQueue I and II contain an incredibly large public domain and shareware software library (over 70MB). There are lots of messages of interest to software developers, and the message section also

contains the usual Mac gossip and questions-and-answers about Mac-specific problems.

Rumor has it that employees of well-known Silicon Valley computer firms regularly log on to MacQueue under assumed names and set participants straight on pending product announcements. While this can't be verified, MacQueue I and II are among the best of the Mac grapevines.

MacQueue is an excellent example of a well-organized board. The latest uploads are always listed, along with the Top Ten downloads of the week. Laporte is a master of the capsule file description; you never have to guess what's in a file. Be warned, however, that MacQueue is one of the busiest boards in the nation, so even with two lines you'll need a little extra patience to get on. Perhaps that's what gave Laporte the idea for *QDial* (see "BBSs Made Easy").

■ **DeskToppers** 312/356-3776. Based in the Chicago area. Sysop: Randy Bennett. Runs on an IBM PC clone with 100MB of hard disk storage, using *TBBS* 2.0 software. Expects to install multiple-phone-line capability by the end of the year.

DeskToppers started in July 1986 and now sports nearly 500 public domain and

shareware programs. This board offers lots of information about desktop publishing. The service keeps an updated list of all the Mac bulletin boards in the country and isn't afraid to say which ones are the best. If you're just starting out and are looking for a list of boards in your area, check this one first.

A unique feature of this board is the monthly *Eye for the News* Macintosh magazine. It's available for downloading and in traditional printed form. DeskToppers' logical organization of the menus and the message sections will make you feel comfortable right away.

Regional Treats

If you'd rather try a local bulletin board, or if the acclaimed BBSs on our list are all tied up, try one of these bulletin boards recommended by DeskToppers sysop Randy Bennett. The BBS software each service runs is listed to edify other sysops and the equally technically minded—people who call in to the BBS can use any communications software as long as the baud rates match up.

(continues)

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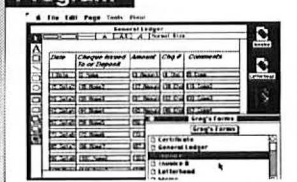
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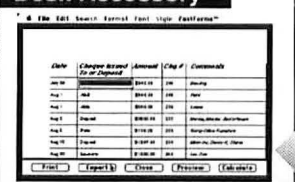
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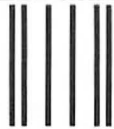
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BBSs Made Easy

You can choose from a variety of tools to help you get the most from your time on BBSs. You'll find these shareware utilities—indispensable for serious BBSing—on many bulletin boards, on GENie, and offered by most user groups. Remember, if you use shareware, send in your money.

QDial

Since most bulletin boards have only one phone line, it can be quite a task to log on to some of the more popular ones. You may quickly run out of patience when you find your Mac tied up redialing a number. You can solve this problem with the desk accessory *QDial*, which continues to dial while you use your Mac for other things (though you can't use another communications program while *QDial* is working). When *QDial* makes a connection, it beeps at you and holds the connection long enough for you to close whatever docu-

ment you're working on and load your communications program.

MockWrite

MockWrite, a desk accessory from CE Software, allows you to write and edit ASCII text. During a communications session, you can use it to compose a message with standard Mac editing techniques and then upload the finished message to the bulletin board.

Packit III

You'll find *Packit III* indispensable for uploading and downloading files. *Packit III* allows you to group several files together into one file (say an application and its documentation) and, if you choose, compresses the files so that you can send and receive them more quickly. Lots of the files available on BBSs are stored in *Packit III* format, so you'll need the program to unpack the files you've downloaded.

In the Midwest: Royalty Mansion in Indiana (300/1200/2400 bps), 219/923-2486. Uses *MacMansion* software.

In the Northeast: Mac Development BBS in New Jersey (300/1200/2400 bps), 201/747-8814. Uses *Mouse Exchange BBS* software. LaserBoard in New York (300/1200/2400 bps), 212/348-5714. Uses *Red Ryder* Host software.

In the Northwest: MacSystem in Oregon (300/1200/2400 bps), 503/357-9329. Uses *FidoNet* software. Sea/Mac in Washington (300/1200/2400 bps), 206/725-6629. Uses *MacMansion* software.

In the South: Connection BBS in Louisiana (300/1200/2400 bps), 504/831-7541. Uses *Red Ryder* Host software. Mac-Memphis in Tennessee (1200 bps only), 901/756-6867. Uses *Mouse Exchange BBS* software.

In the Southwest: EyeNet in Arizona (300/1200/2400 bps), 602/941-3747. Uses *Red Ryder* Host software. SCA, Inc., in Texas (300/1200/2400 bps), 214/380-9063. Uses *FidoNet* software.

On the West Coast: Hughes Aircraft Mac BBS in southern California (300/1200 bps), 213/348-5714. Uses *Red Ryder* Host software. MacFido Tribune in northern California (300/1200/2400 bps), 415/923-1235. Uses *FidoNet* software. □

See *Where to Buy* for product details.

This article is adapted from The Macintosh Bible by Dale Coleman and Arthur Naiman, published by Goldstein & Blair, Box 7635, Berkeley, CA 94707 (\$21 ppd).



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Updates

This list brings you the highlights of software updates recently received but not yet tested. The first price is the upgrade cost for registered owners; the second is the current list price.

Accountant Inc. version 2.0 has fully automated period- and year-end procedures. Period-end shows net income in current inventory in balance sheet; year-end automatically closes income and expense accounts, deducts withdrawing account balance from net income, converts existing net income to equity, and updates the inventory balance in the general ledger. Zoom feature has been added to document windows. Journals will now allow option of calculating taxes automatically. Revised manual. Softsync, Inc., 162 Madison Ave., New York, NY 10016, 212/685-2080. Free; \$299.95 new.

CalendarMaker version 3.0 will read *Smart Alarms, More*, and standard text files. Can import multiple calendar files to create a master calendar. Individual text styles can be mixed within a single day's notes. Condensed and Expanded fonts have been added to the style menu, and you may choose from 24 different icons to represent a calendar month. Full calendar screen preview and floating notes capabilities. Month title and credit line can be modified. Julian date option. Prints text files. CE Software, 80170 Third St., Des Moines, IA 50312, 515/224-1995. \$10; \$39.95 new.

Comic Strip Factory version 1.5 has a fully implemented Undo function, Autoscrolling, a Transfer command, and an enhanced user interface. Also includes PartMaker II, a utility that converts graphics from all popular paint programs into comic-style graphics. Foundation Publishing, 10301 Yellow Circle Dr., Minneapolis, MN 55343, 612/935-4230. Free; \$89.95 new.

ConcertWare + version 4.0 and *ConcertWare + MIDI* are completely revised. The Instrument Maker module now includes an instrument library with visual representation and audio capabilities so that you can test sounds within the library. In addition to a new volume control, the Music Player now offers a tempo control that lets users increase or decrease tempo in precise increments. Menus have been rearranged. The Music Writer now includes 32nd notes and a ruler for formatting selections such as adjusting space between staves. You may add free-form text for notation and lyrics, and import PICT files. New Find Text/Measure facility. Header includes extra line for copyright notice. Great Wave Software, 5353 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-1990. \$20 to \$70 depending upon owner's version and the level of upgrade; *ConcertWare +* \$69.95 new, *ConcertWare + MIDI* \$139.95 new.

Copy II Mac version 6.5 supports up to three 3.5-inch drives on the Mac SE. Lets you recover the file name, type, creator, and date when undeleting files. Also includes CPS TagFix, which corrects a bug in

the 128K ROMs and improves performance of the Mac SE's upper drive. Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5782. \$15 plus \$3 shipping and handling; \$39.95 new.

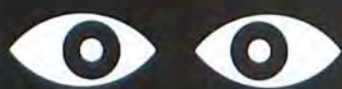
DiskTop version 2.0 finds documents on all attached disk drives. Launches programs or documents by double-clicking and copying multiple files or folders. Allows you to access Shut Down from the Apple menu. CE Software, 801 73rd St., Des Moines, Iowa 50312, 800/523-7638. \$7; \$39.95 new.

DNA Inspector II + is HFS compatible. ⌘-key equivalents have been added. The restriction enzyme analysis routine can construct minimaps for all the enzymes in the current table, and can produce an ImageWriter printout of 100 aligned maps of your DNA. Now includes a sliding base composition routine and a powerful search feature. The 19 separate program modules have been combined into 5, and you may choose an adult male or female synthesized voice. Textco, 27 Gilson Rd., Box 180, RR2, West Lebanon, NH 03784, 603/643-1471. \$295 (with \$245 rebate for returning original disks); \$295 new.

MacInUse version 2.0 is compatible with *AppleShare* and other network products. Includes an F-key feature that allows you to trigger the recording of tracked data without quitting an application. Can track applications running under

(continues)

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Switcher. Allows the network administrator to design information screens. SoftView, Inc., 4820 Adohr Ln., Ste. F, Camarillo, CA 93101, 805/388-2626. \$10; \$79 new.

Mentor (formerly called *MacLightning*) checks 140 words per second, has an expanded 100,000-word Merriam-Webster dictionary, and does not limit the number of words you can add to it. *Mentor* is capable of complete hyphenation and is network-compatible. *Mentor Plus* has a 75,000-word dictionary, including definitions. Target Software, 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892. *Mentor* \$25; \$99.95 new. *Mentor Plus* \$100; \$199.95 new.

MicroPhone version 1.1 improves VT100 emulation by supporting selective text styling and lets you use the Watch Me function. Compatible with the new desktop bus keyboards. The new version also has a faster screen update for 2400-baud modems. Mac SE- and Mac II-compatible. Now bundled with *Glue* from Solutions International. Software Ventures, 2907 Claremont #220, Berkeley, CA 94705, 415/644-3232. \$10 or \$55 for upgrade and *Glue*; \$149 new.

Microsoft Excel version 1.04 fixes bugs. It is fully compatible with the Mac II and supports *AppleShare*. The new version includes a Change Links command. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080. Free; \$395 new.

NutriCalc Plus corrects bugs and includes over 150 new foods, including fast foods and name-brand frozen foods. CAMDE Corp., 4435 S. Rural Rd. #331, Tempe, AZ 85282, 602/821-2310. Free; \$225 new.

Object Logo version 1.5 copies, pastes, and prints graphics. The new version has improved event-handling. Supports *Macintalk* and the Mac's four-voice synthesizer. Coral Software Corp., P.O. Box 307, Cambridge, MA 02142, 617/547-2662. \$5; \$79.95 new.

The Print Shop version 1.2 fixes a major bug that may affect hard disks. Brøderbund Software, 17 Paul Dr., San Rafael, CA 94903, 415/492-3200. Free; \$59.95 new.

Real Estate Investment Analysis version 5.1 evaluates real estate investments under the Tax Reform Act. RealData, 78 N. Main St., South Norwalk, CT 06854, 203/255-2732. If purchased after Nov. 1, 1986, \$28; before Nov. 1, 1986, \$48; all versions preceding 5.0 \$98 with return of original disks; \$195 new.

Thunder version 1.1 is approximately three times faster than the previous version. Now compatible with *More* 1.1, *Acta*, and *Microsoft Works*. Electronic Arts, 1820 Gateway Dr., San Mateo, CA 94404, 415/571-7171. \$15 with return of original disk, plus \$3 shipping and handling; \$49.95 new.

ThunderScan version 4.0 prints PostScript halftones. Saves in file formats used by *PageMaker* and other page-composition programs. Thunderware, Inc., 21 Orinda Way, Orinda, CA 94563, 415/254-6581. Registered owners \$25, plus \$5 if you haven't returned your warranty card; \$249 new. □

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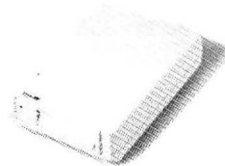
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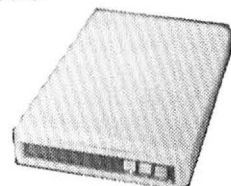
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- c. In 7-12 months
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4. For how many personal computers do you buy products? (Include both company and personal units, please.)

- 1. 1
- 2. 2-4
- 3. 5-9
- 4. 10 or more

5. How many of the above are Macintoshes?

- a. 1
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Public domain software and shareware are available through online information services, through user groups such as Berkeley Macintosh Users Group (415/849-2684) or the Boston Computer Society's Mac special-interest group (617/367-8080), or through mail-order clearinghouses such as Educomp, 742 Genevieve, Ste. D, Solana Beach, CA 92075, 619/259-0255, 800/843-9497, 800/654-5181 in California, or The Public Domain Exchange, 2074-C Walsb Ave., Dept. 609, Santa Clara, CA 95050, 408/496-0642, 800/331-8125.

Pages 108 to 113 *The QuickDraw Solution*

C-Server

Solana Electronics, 7887 Dunbrook Rd., Ste. A, San Diego, CA 92126, 619/566-1701. 512K minimum memory; requires AppleTalk. \$595.

General Computer Personal LaserPrinter

General Computer Corp., 215 First St., Cambridge, MA 02142, 617/492-5500. 512K minimum memory; requires RAM cartridge for 512K Mac; hard disk recommended. \$2599.

LaserWriter

Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 512K minimum memory; requires AppleTalk. \$4999, LaserWriter Plus \$5799.

Linotronic 300

Allied Linotype Co., 425 Oser Ave., Hauppauge, NY 11788, 516/434-0095. 128K minimum memory; requires AppleTalk. \$59,950.

MultiTalk

Abaton Technology Corp., 7901 Stoneridge Dr. #500, Pleasanton, CA 94566, 415/463-8822. 512K minimum memory; requires AppleTalk. \$695.

Pages 124 to 131 *The Desktop Publishing Shopper*

Cricket Draw

Version 1.1. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512KE minimum memory; external drive and LaserWriter recommended. \$295.

GraphicWorks

Version 1.1. Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667, 800/221-9884, 800/942-7315 in Illinois. 512K minimum memory; requires external drive. \$99.95.

JustText

Version 1.0. Knowledge Engineering, GPO Box 2139, New York, NY 10116, 212/473-0095. 512K minimum memory; external drive and LaserWriter recommended. \$195.

MacDraw

Version 1.9 (400K disk); version 1.0 (800K disk). Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. \$195.

MacTeX

Version 2.0. FTL Systems, Inc., 234 Eglinton Ave. E #205, Toronto, Ontario, Canada M4P 1K5, 416/487-2142. 1MB minimum memory; requires external drive; PostScript printer and hard disk recommended. \$750.

Microsoft Word

Version 3.01. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; requires 800K of drive storage; Mac Plus with external drive recommended. \$395.

PageMaker

Version 2.0. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104, 206/622-5500. 512K minimum memory; requires hard disk for 512K, 800K external drive for 512KE; Mac Plus with hard disk and PostScript printer recommended. \$495.

PageOne

Version 1.0. McCutcheon Graphics, Inc., 500 Cochrane Dr., Unit A, Markham, Ontario, Canada L3R 8E2, 416/479-9292. 1MB minimum memory; requires hard disk. \$2000, for MacTeX owners \$1500.

Ragtime

Version 1.1. Orange Micro, Inc., 1400 N. Lakeview Ave., Anaheim, CA 92807, 714/779-2772. 512KE minimum memory. \$395.

ReadySetGo

Version 4.0 (referred to in article as version 3.1). Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9073. 512K minimum memory; external drive required for 512K; Mac Plus recommended. \$495.

Scoop

Version 1.0. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512KE minimum memory; \$495.

Textures

Version 1.0. Addison-Wesley Publishing Co., One Jacob Way, Reading, MA 01867, 617/944-6795. 512K minimum memory; requires external drive; hard disk recommended. \$495.

Trapeze

Version 2.0. Data Tailor, Inc., 1300 S. University Dr. #409, Fort Worth, TX 76107, 817/332-8944, 800/443-1022. 512K minimum memory; external drive recommended. \$295.

XPress

Version 1.03. Quark, Inc., 2525 W. Evans #220, Denver, CO 80219, 303/934-2211. Permits three copies; 512KE minimum memory; requires external drive or hard disk. \$695.

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Version 5.0. Consulair Corp., 140 Campo Dr., Portola Valley, CA 94025, 415/851-3272. 512K minimum memory. \$425.

HyperCharger 020
General Computer Corp., 215 First St., Cambridge, MA 02142, 617/492-5500. 1MB minimum memory; requires Mac SE. \$1499, with optional 68881 floating-point coprocessor \$1699.

MacFortran/020
Version 2.3. Absoft Corp., 2781 Bond St., Auburn Hills, MI 48057, 313/853-0050. 512K minimum memory; hard disk recommended. \$495.

MacWrite
Version 4.5. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 128K minimum memory; 512K with external drive recommended. \$125.

MegaScreen SE
MicroGraphic Images, 20954 Osborne St., Canoga Park, CA 91304, 818/407-0571. 1MB minimum memory; requires Mac SE. \$1995.

Orion SE
Peak Systems, 1201 Spyglass, Austin, TX 78746, 512/328-0747. 1MB minimum memory; requires Mac SE. \$1995, optional 68881 floating-point math coprocessor \$295.

Prodigy SE
Levco, 6160 Lusk Blvd. #C-203, San Diego, CA 92121, 619/457-2011. 1MB minimum memory; requires Mac SE 1MB version \$1495, 2MB version \$1995, 4MB version \$2795, optional 68881 floating-point math coprocessor \$295.

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E-Machines, Inc., 7945 S.W. Mohawk St., Tualatin, OR 97062, 503/692-6656. 512K minimum memory. \$1995.

Turbo Pascal

Version 1.0. Borland International, Inc., 4585 Scotts Valley Dr., Scotts Valley, CA 95066, 408/438-8400, 800/255-8008, 800/742-1133 in California. 512K minimum memory. Mac Plus with hard drive recommended. \$99.95.

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Mastering Mail Merge

Bulk Mailer

Version 3.0. Satori Software, 2815 Second Ave. #590, Seattle, WA 98121, 206/443-0765. 128K minimum memory; 512K recommended. \$149.

Bulk Mailer+

Version 3.0. Satori Software. (See *Bulk Mailer* for company address and phone number.) 512K minimum memory; Mac Plus with hard disk recommended. \$350.

Client/Mac

Version 1.0. Software Complement, 8 Pennsylvania Ave., Morton, PA 18336, 717/491-2492. 512K minimum memory; requires *Omnis 3 Plus* and external drive; hard disk recommended. \$99.

Excellent Exchange

Heizer Software, 1941 Oak Park Blvd. #30, Pleasant Hill, CA 94523, 415/943-7667. 512K minimum memory; requires *Microsoft Excel*; external drive recommended. \$4 for catalog and demo/sample program.

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Version 4.7. DataPak Software, Inc., 14011 Ventura Blvd. #507, Sherman Oaks, CA 91423, 818/905-6419. Key-disk copy protection; installs on hard disks. 512K minimum memory; external drive recommended. \$249.95.

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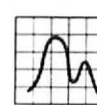
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Version 2.0. Forethought, Inc., 250 Sobrante Way, Sunnyvale, CA 94086, 408/737-7070, 800/622-9273. 512K minimum memory; requires 800K of drive storage. \$295.

Market Master for the Macintosh

Version 2.0. Breakthrough Productions, 10659 Caminito Cascara, San Diego, CA 92108, 619/281-6174. 512KE minimum memory; hard disk recommended. \$275.

Microsoft Excel

Version 1.04. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; external drive recommended. \$395.

Microsoft File

Version 1.04. Microsoft Corp. (See *Microsoft Excel* for company address and phone number.) 128K minimum memory; external drive recommended. \$195.

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Microsoft Works

Version 1.01. Microsoft Corp. (See *Microsoft Excel* for company address and phone number.) 512K minimum memory; external drive recommended. \$295.

Omnis 3 Plus

Version 3.24. Blyth Software, Inc., 2929 Campus Dr. #425, San Mateo, CA 94403, 415/571-0222. 512K minimum memory; requires external drive; hard disk recommended. \$495.

WorksXchange

Heizer Software, 1941 Oak Park Blvd. #30, Pleasant Hill, CA 94523, 415/943-7667. 512K minimum memory; requires *Microsoft Works*; external drive recommended. \$4 for catalog and demo/sample program.

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D-Scan CH5312

Seiko Instruments U.S.A., Inc., 1130 Ringwood Ct., San Jose, CA 95131, 408/943-9100. Requires Mac II. \$12,495 with video interface, \$8995 without.

Lightspeed Color Page Layout System

Lightspeed Inc., 47 Farnsworth St., Boston, MA 02210, 617/338-2173. 2MB minimum memory. \$29,995 (includes Mac II).

Linotronic 100, Linotronic 300

Allied Linotype Co., 425 Oser Ave., Hauppauge, NY 11788, 516/434-0095. 128K minimum memory; requires AppleTalk. Linotronic 100 \$31,950, Linotronic 300 \$59,950.

Scanmaster

Howtek, Inc., 21 Park Ave., Hudson, NH 03051, 603/882-5200. Requires Mac II. \$5995.

Spectrum 1000/8

SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043, 415/964-8884. Requires Mac II and monitor. \$1495.

SuperMac 19" Color Monitor

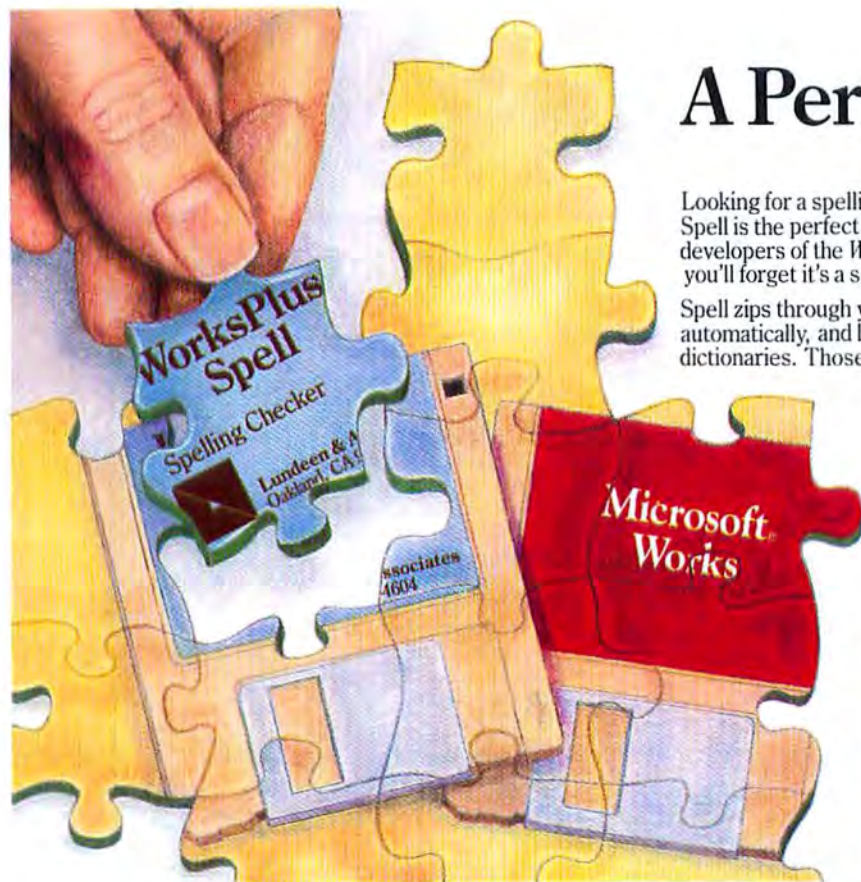
SuperMac Technology. (See Spectrum 1000/8 for company address and phone number.) Requires Mac II and video adapter card. \$2995.

Page 150 The Original Gets Better

PageMaker

Version 2.0. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104, 206/622-5500. 512K minimum memory; requires hard disk for 512K, 800K external drive for 512KE; Mac Plus with hard drive and PostScript printer recommended. \$495.*

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Version 4.0 (version 3.0 mentioned in review). Letraset USA, 40 Eisenhower Dr., Paramus, NJ 07653, 201/845-6100, 800/526-9073. 512K minimum memory; external drive required for 512K; Mac Plus recommended. \$495.

Scoop

Version 1.0. Target Software, Inc., 14206 S.W. 136th St., Miami, FL 33186, 305/252-0892, 800/622-5483. 512KE minimum memory. \$495.

WriteNow for Macintosh

Version 1.0. T/Maker Co., 1973 Landings Dr., Mountain View, CA 94043, 415/962-0195. 128K minimum memory. \$175.

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Easy E-Mail

Desktop Express

Version 1.0. Dow Jones & Company, Inc., P.O. Box 300, Princeton, NJ 08543, 609/520-4000, 800/257-5114. 512K minimum memory; requires modem. \$149.

Glue

Version 1.05. Solutions International, 29 Main St., Montpelier, VT 05602, 802/229-0368. 128K minimum memory. \$55.95.

OfficeTalk

Version 4.12. OfficeTalk, Inc., 345 Montgomery Ave., Bala Cynwyd, PA 19004, 215/664-7400, 800/345-0133. 512K minimum memory; requires modem. Address fee \$50; rate for prime time (8 a.m. to 8 p.m. EST) 80¢ per minute, nonprime time 40¢ per minute.*

PageMaker

Version 2.0. Aldus Corp., 411 First Ave. S #200, Seattle, WA 98104, 206/622-5500. 512K minimum memory; requires hard disk for 512K, 800K external drive for 512KE; Mac Plus with hard drive and PostScript printer recommended. \$495.

Cricket Draw

Version 1.1. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512KE minimum memory; external drive and LaserWriter recommended. \$295.

Microsoft Word

Version 3.01. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; requires 800K of drive storage; Mac Plus with external drive recommended. \$395.

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Version 3.1. Systat Inc., 1800 Sherman Ave., Evanston, IL 60201, 312/864-5670. 512K minimum memory. \$595.*

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Printing Potential

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Version 2.62M. SoftStyle, Inc., 7192 Kalaniana'ole Hwy. #205, Honolulu, HI 96825, 808/396-6368, 800/367-5600. 512K minimum memory. \$245.

Microsoft Works

Version 1.01. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; external drive recommended. \$295.

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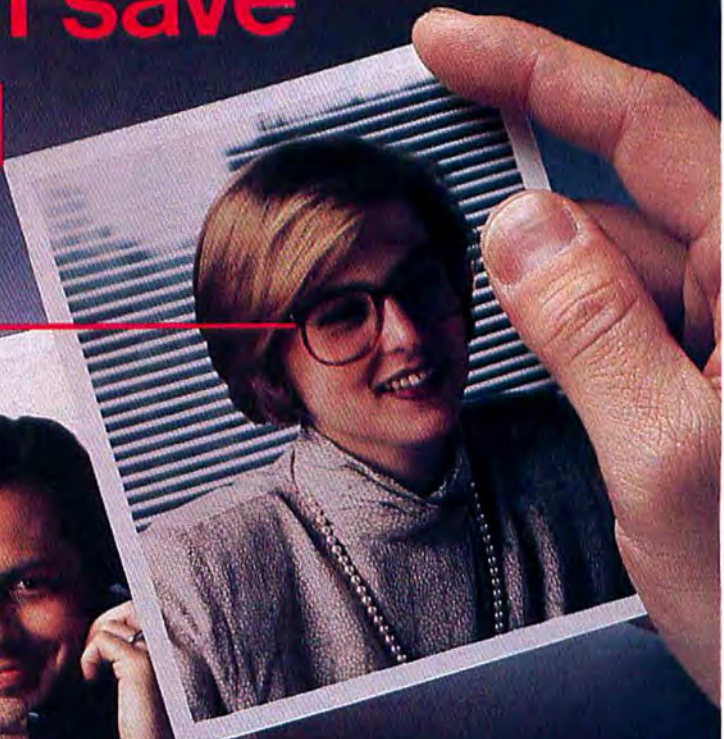
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Printworks for the Mac

Version 3.1. SoftStyle, Inc. (see Mac-Enhancer for company address and phone number.) 512K minimum memory; requires dot matrix printer. \$75.*

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K minimum memory; Mac Plus recommended. \$99.

Page 155

MacEverything

Cricket Draw

Version 1.1. Cricket Software, Inc., 30 Valley Stream Pkwy., Malvern, PA 19355, 215/251-9890, 800/345-8112. 512KE minimum memory; external drive and LaserWriter recommended. \$295.

LaserPaint

Version 1.1. LaserWare, Inc., P.O. Box 668, San Rafael, CA 94915 415/453-9500, 800/367-6898. Key-disk copy protection. 1MB minimum memory; hard disk or external drive recommended. \$495.*

SuperPaint

Version 1.0. Silicon Beach Software, Inc., P.O. Box 261430, San Diego, CA 92126, 619/695-6956. 512K minimum memory; Mac Plus recommended. \$99.

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Dark in the Heart of Texas

OmniLaser 2108

Texas Instruments, Inc., P.O. Box 2909, M/S 2240, Austin, TX 78769, 800/527-3500. 512K minimum memory; requires AppleTalk. \$5995.*

Page 158

Film Scoring Simplified

Clicktracks 2.0

Version 2.0. Scores Unlimited, 16 Dean St. #4C, Brooklyn, NY 11201, 718/624-2571. 512K minimum memory. \$84.95.*

Cue: The Film Music System

Version 1.01. Opcode Systems, 444 Ramona St., Palo Alto, CA 94301, 415/321-8977. Key-disk copy protection. 512K minimum memory; Mac Plus needed for *Switcher* operation. \$499.*

Page 160

Reading by Computer

Portal

Version 1.0. Activision, Inc., 2350 Bayshore Pkwy., Mountain View, CA 94043, 415/960-0410, 800/227-9759. Key-disk copy protection. 512K minimum memory. \$49.95.*

Page 161

For FORTH Programmers

Mach 2

Version 2.11. Palo Alto Shipping, P.O. Box 7430, Menlo Park, CA 94026, 415/854-7994, 800/443-6784. 512K minimum memory; 512K with external drive or Mac Plus recommended. \$99.95.*

Page 162

Two Electronic Editors

Doug Clapp's Word Tools

Version 1.0. Aegis Development, Inc., 2210 Wilshire Blvd. #277, Santa Monica, CA 90403, 213/392-9972, 800/345-9871. 512K minimum memory; requires 800K of drive storage; hard disk recommended. \$79.95.*

Tools for Writers

Version 1.1. Kinko's Academic Courseware Exchange, 4141 State St., Santa Barbara, CA 93110, 805/967-0192, 800/235-6919, 800/292-6640 in California. 128K minimum memory. \$17 plus \$8 shipping and handling.*

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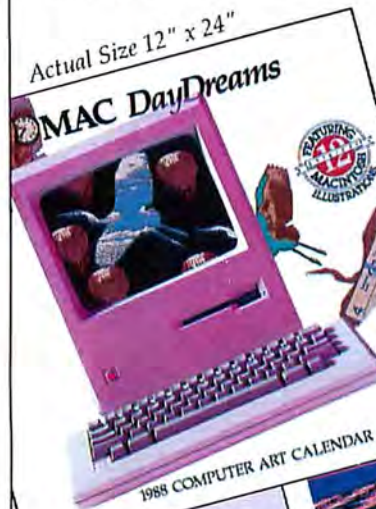
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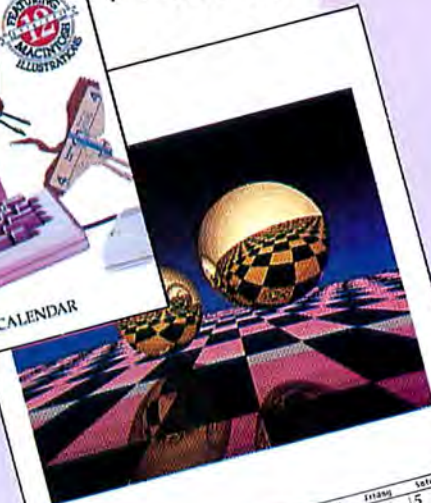
Version 1.1. Public domain software by Paul DuBois, 1220 Capitol Ct., Madison, WI 53706. 128K minimum memory.*

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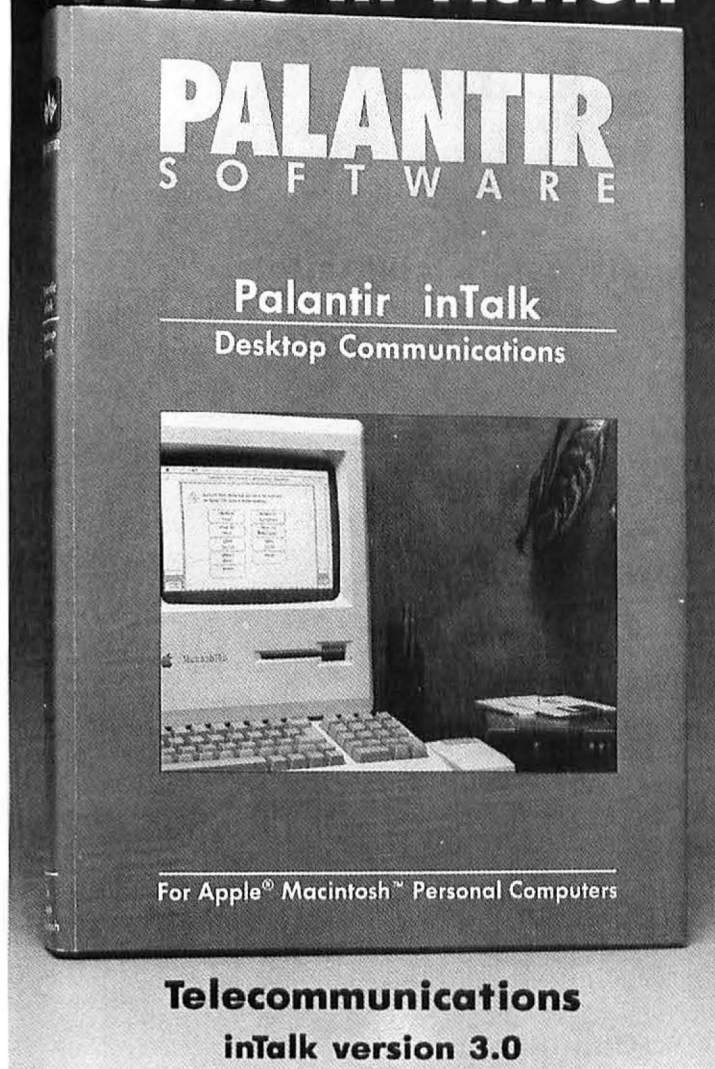
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miniWriter

Version 1.36. Shareware by Maitreya Design, P.O. Box 1480, Goleta, CA 93116. 128K minimum memory. \$12.*

Smart Quotes

Version 1.0. Shareware by Oak Square Publications, P.O. Box 1238, Allston, MA 02134, 617/782-5669. 512K minimum memory. \$10.*

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Using the LaserWriter with the PC

PSPrint

Version 1.01. Tangent Technologies, Ltd., 5120 Peachtree Pkwy. #100, Norcross, GA 30092, 404/662-0366. Requires PC (IBM or compatible), AppleTalk, and DB-9 connector. \$150.*

TOPS Print

Version 1.08. Centram Inc., 2560 Ninth St. #210, Berkeley, CA 94710, 415/549-5900. Requires 512K PC (IBM or compatible), AppleTalk cables, and TOPS card for the PC; 640K recommended. \$189.*

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A Pair of Deuces

Magic20

Magic Products, 9709 Brown Ln., Ste. E, Austin, TX 78754, 512/837-8191. 512KE minimum memory; requires SCSI port for the 512KE. \$545.*

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Peak Systems, 1201 Spyglass, Austin, TX 78746, 512/328-0747, 800/225-7509. 512KE minimum memory; requires SCSI port for the 512KE. \$1095.*

Page 168

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ShadowGate

Version 1.0. Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062, 312/480-7667, 800/221-9884, 800/942-7315 in Illinois. Key-disk copy protection. 512K minimum memory. \$49.95.*

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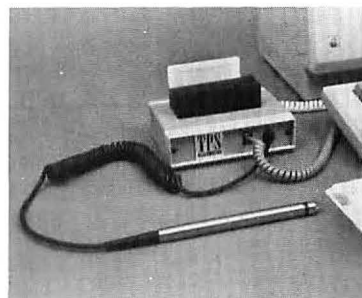
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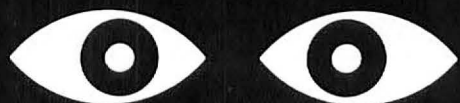
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Pages 199 to 212 Getting Started with Networking

AppleShare

Version 1.0. Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014, 408/996-1010. 512K minimum memory; requires AppleTalk network and a dedicated Mac Plus, \$799.

AppleTalk Clips

Kensington Microware Ltd., 251 Park Ave. South, New York, NY 10010, 212/475-5200, 800/535-4242. \$25 for package of 25.

Double Helix 2000

Version 2.0. Odesta Corp., 4084 Commercial Ave., Northbrook, IL 60062, 312/498-5615, 800/323-5423. 512K minimum memory; hard disk recommended. Single-user version \$495, 3-node multiuser version \$695, each additional node \$100.

HyperNet 2.0

Version 2.0. General Computer Corp., 215 First St., Cambridge, MA 02142,

617/492-5500. Key-disk copy protection; installs on hard disks. 512K minimum memory; requires hard disk. \$299 per server.

InBox

Version 2.0. Think Technologies, Inc., 135 South Rd., Bedford, MA 01730, 617/863-5590. 512K minimum memory; hard disk recommended. Start-up kit \$350, each additional installer disk \$125.

InterMail

Version 1.0. Internet, 20 Amy Circle, Waban, MA 02168, 617/965-5239. 512K minimum memory; hard disk recommended. Up to 4 users \$299.95, up to 10 users \$499.95, up to 20 users \$749.95, unlimited number of users \$949.95.

Mail Center

Version 1.701. Videx, Inc., 1105 N.E. Circle Blvd., Corvallis, OR 97330, 503/758-0521. 512K minimum memory; requires AppleTalk. 2-Pack \$299, 6-Pack \$499.

TOPS

Version 3.18.87. Centram Inc., 2560 Ninth St. #210, Berkeley, CA 94710, 415/549-5900. 512K minimum memory; requires AppleTalk; hard disk recommended. \$149 per Macintosh, \$389 per PC.

Pages 215 to 224 Insights on Microsoft Word 3.0

Microsoft Word

Version 3.01. Microsoft Corp., 16011 N.E. 36th Way, Box 97017, Redmond, WA 98073-9717, 206/882-8080, 800/426-9400. 512K minimum memory; requires 800K of drive storage; Mac Plus with external drive recommended. \$395.

Pages 229 to 244 Mac Communications Tools

MockWrite

Version 4.3.4. CE Software, 801 73rd St., Des Moines, IA 50312, 515/224-1995. 128K minimum memory. \$35; bundled with *MockPackage Plus*.

PackIt III

Version 1.2. Shareware by Harry Chesley, 1850 Union St. #360, San Francisco, CA 94123. 512K minimum memory. \$10.

QDial

Version 1.6. Public domain software by Léo Laporte. 128K minimum memory; requires Hayes-compatible modem. Free.

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Version 9.4. FreeSoft Co., 10828 Lacklink Ave., St. Louis, MO 63114, 314/423-2190. 512K minimum memory; requires Hayes-compatible modem. \$40.

TermWorks

Version 1.3. Shareware by James Rhodes, 401 Eastwood, Lufkin, TX 75901. 128K minimum memory; requires Hayes-compatible modem. \$20. □

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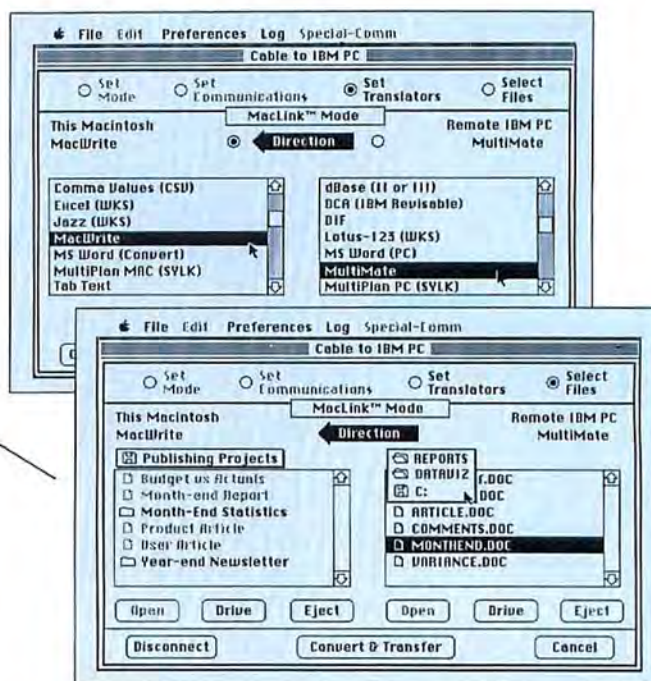
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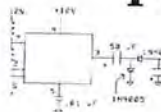
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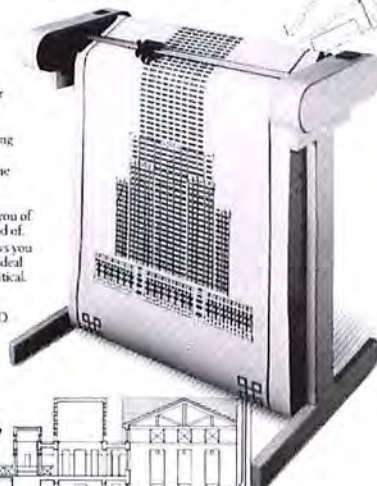
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Macworld Best-Sellers

Months on chart

Last month

This month

Business Software

27	1	1	Microsoft Word <i>Microsoft</i>
7	2	2	Microsoft Works <i>Microsoft</i>
19	3	3	Microsoft Excel <i>Microsoft</i>
15	4	4	PageMaker <i>Aldus</i>
11*	6	5	MacWrite <i>Apple Computer</i>
9	—	6	FullPaint <i>Ann Arbor Softworks</i>
24	7	7	MacDraw <i>Apple Computer</i>
11*	8	8	MacPaint <i>Apple Computer</i>
1	—	9	Cricket Draw <i>Cricket Software</i>
1	—	10	Filemaker Plus <i>Forethought</i>

Education Software

11	1	1	Math Blaster <i>Davidson and Associates</i>
11	2	2	KidsTime <i>Great Wave Software</i>
7	3	3	MasterType <i>Scarborough Systems</i>
9	—	4	Typing Tutor III <i>Simon and Schuster Software</i>
2	—	5	Early Games <i>Springboard Software</i>

Entertainment Software

11	1	1	Flight Simulator <i>Microsoft</i>
7	2	2	Dark Castle <i>Silicon Beach Software</i>
11	3	3	MacGolf <i>Practical Computer Applications</i>
7	—	4	Gato <i>Spectrum Holobyte</i>
1	—	5	Shanghai <i>Activision</i>

Networking/Data Communications

11	2	1	AppleTalk <i>Apple Computer</i>
7	1	2	TOPS <i>Centram Systems</i>
10	3	3	MacServe <i>Infosphere</i>
3	4	4	AppleShare <i>Apple Computer</i>
1	—	5	PhoneNet <i>Farallon Computing</i>

Months on chart

Last month

This month

Hard Disk Drives

7	1	1	Apple Hard Disk 20/20SC <i>Apple Computer</i>
11	3	2	DataFrame 20 <i>SuperMac Technology</i>
1	—	3	Macintosh Internal 20SC Hard Disk <i>Apple Computer</i>
2	5	4	Rodime 20 Plus <i>Rodime Peripheral Systems Division</i>
7	—	5	FX-20 <i>General Computer</i>

Books

11	1	1	Excel in Business <i>Douglas Cobb, Microsoft Press</i>
10	3	2	Inside Macintosh <i>Addison-Wesley</i>
11	4	3	The Printed Word <i>David A. Kater and Richard L. Kater, Microsoft Press</i>
7	—	4	Microsoft Macinations <i>Mitchell Waite, Robert Lafore, and Ira Lansing, Microsoft Press</i>
1	—	5	Macintosh Bible <i>Dale Coleman and Arthur Naiman, Goldstein & Blair</i>

Product Watch

Editors' choice:

Other recent products of particular interest:

EtherTalk *Apple Computer* Ethernet adapter board

HyperCard *Apple Computer* information-organizing tool kit (software)

NetModem *Sblva Corporation* AppleTalk modem

Source: Exclusive InfoCorp survey of more than one hundred Macintosh retailers and selected mail-order suppliers. Covers sales during May 1987.

* Formerly bundled with the Mac.

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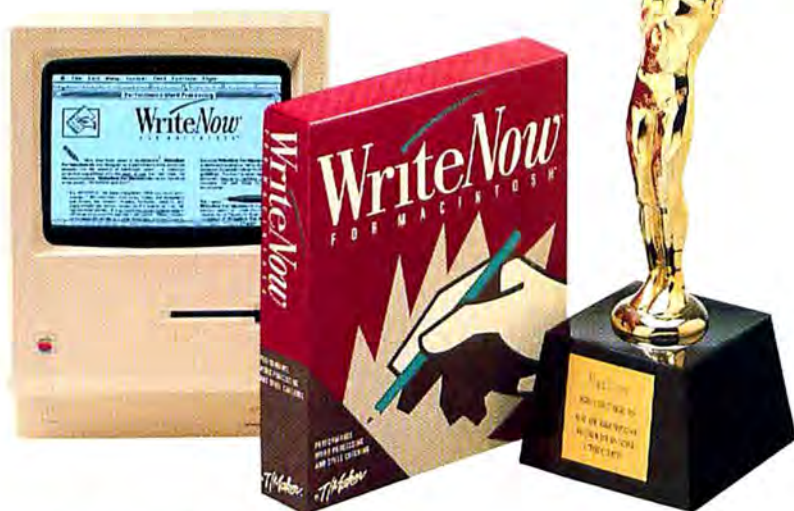
Steve Jobs,
NeXT Inc.

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MacWorld Magazine

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Vicky Jo Varner,
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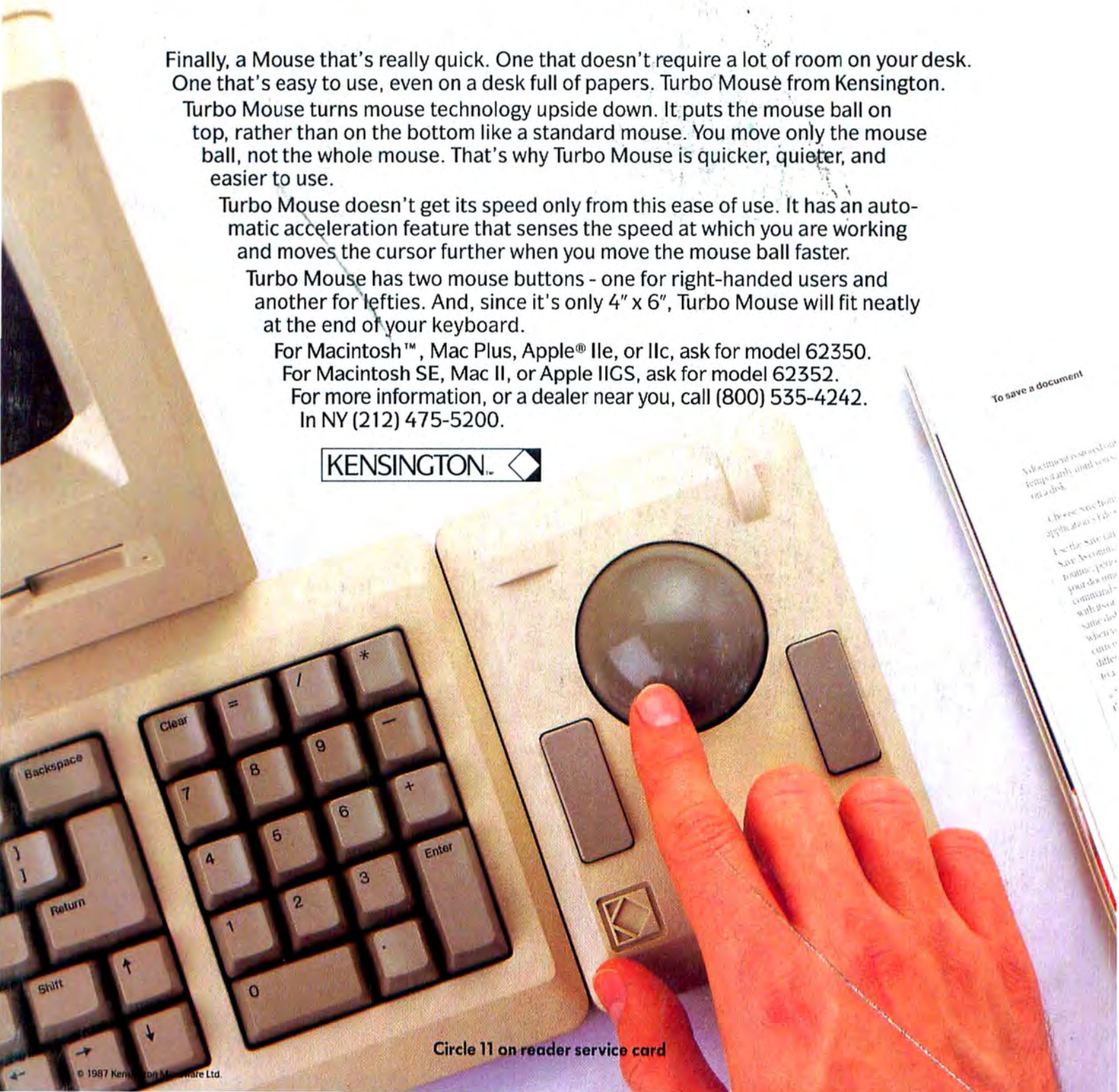
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