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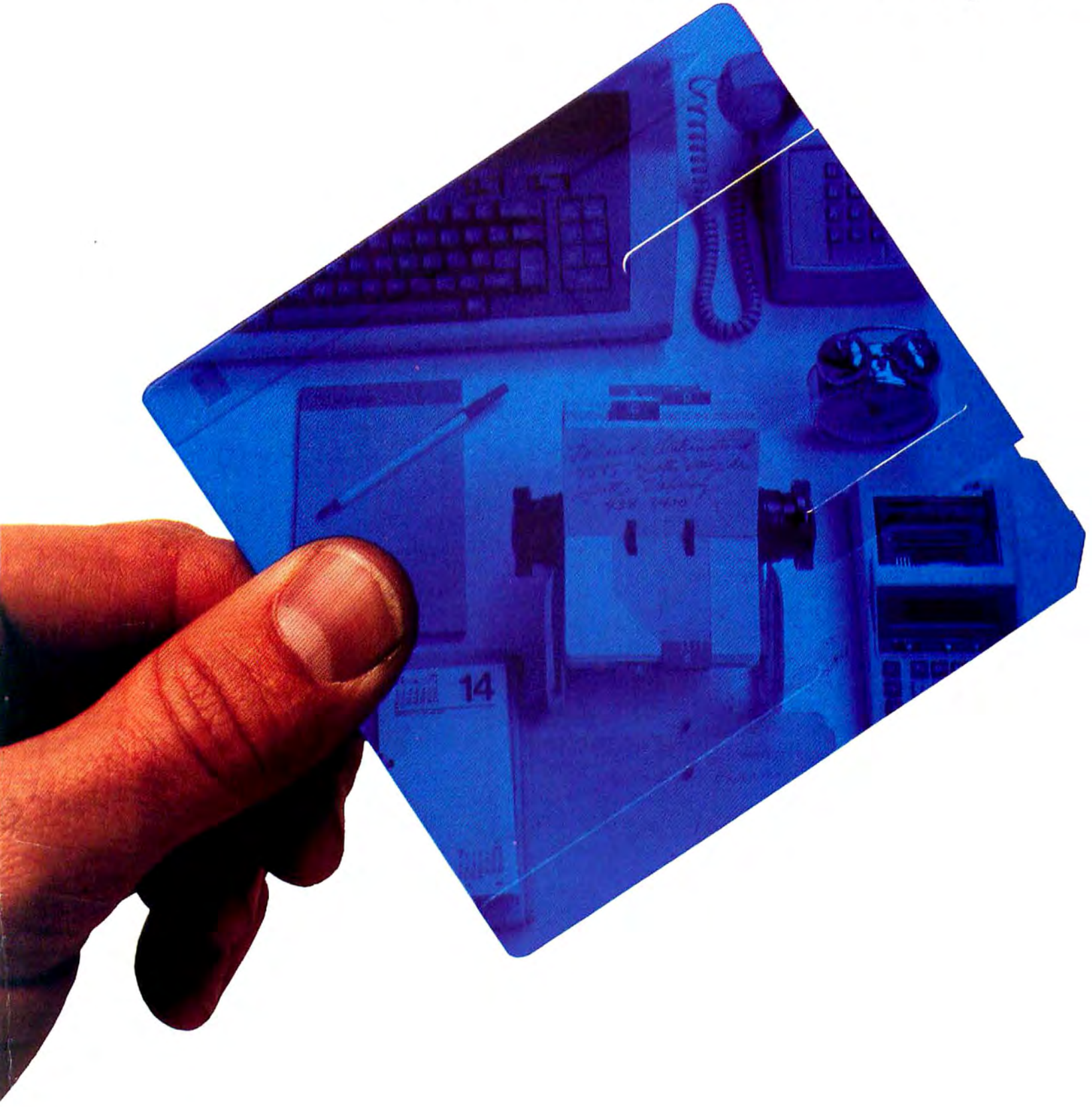

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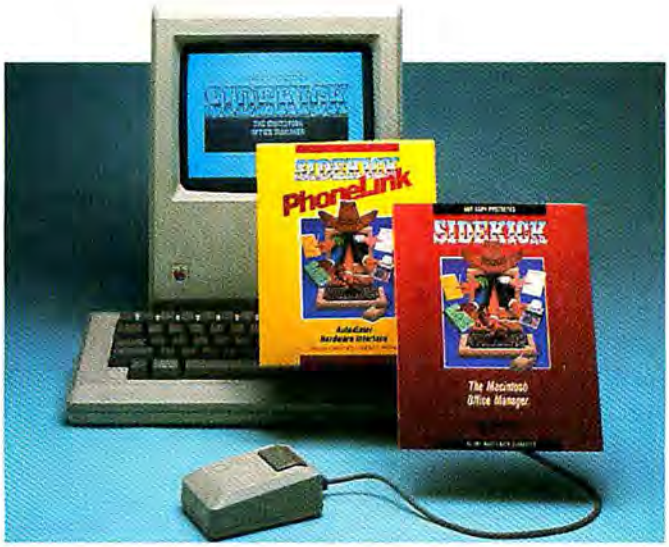

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MACWORLD

April 1986 — *The Macintosh™ Magazine*

Getting Started

80 Developing a Megabyte Strategy
Danny Goodman

A megabyte of memory may give you just the elbowroom you crave for your work on the Mac, but how do you make the most of it? This comparison of memory management techniques helps you devise a strategy that complements your work load and work habits.

Review

86 A Change for the Plus
David Ushijima

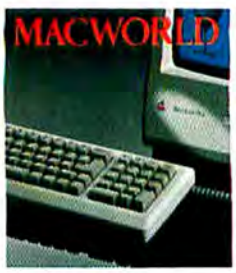
Get acquainted with the Macintosh Plus from the inside out and learn why the new machine is faster and more versatile than its predecessors.

96 Beyond Spreadsheets
Keith Thompson

Execucom Systems' *Mindsight* brings a professional financial decision-making tool to the Mac, modeled on—and compatible with—the same company's product for mainframes.

102 Decisions, Decisions
Charles Spezzano

When making up your mind makes your head spin and your gut feelings turn to butterflies, SoftStyle's decision support software, *Decision Map*, can help you sort out your options.



On the Cover
On the face of it, the Macintosh Plus shows little change except the keyboard; take a closer look in "A Change for the Plus," page 86.

Hands On

106 Projecting Your Thoughts
Reed McManus

An outline can organize more than mere words. See how the flexibility of Living Videotext's *ThinkTank 512* paves the way to well-planned projects and presentations.

112 Take It from the Top
Laurence Kirsch

The ability to produce attractive documents convinced many people to buy the Mac. Here's a handful of tips for using the formatting features of *Microsoft Word* to make your letters and memos sing.

Community

116 Making Waves on Silicon Beach
Nicholas Lavroff

A young San Diego firm plunged into the Macintosh software market and made a splash with innovative sound and graphics in products such as *Airborne!* and *Enchanted Sceptres*.

Photo/illustration credits
Mark Hanauer, 53, 117-120; John Hersey, 107; Ed Kashi, 57; Jeffery Newbury, 103; George Steinmetz, 13, 63; Fred Stimson, cover, 81, 86-95, 129; David Suter, 23; Rudy VanderLans, 35; Mick Wiggins, 96-97, 125, 132.

Software designers bring airborne sounds down to earth and into the Mac. Read how in "Making Waves on Silicon Beach," page 116.

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Steven Levy

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Programming without keys, rock 'n' roll and the Mac, a high-tech stargazer, and other news and notes for the Macintosh community.

63 Get Info
Lon Poole
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125 Macware Reviews
Edited by Erfert Nielson
- *MailManager* Put the Mac to work printing form letters, mailing lists, and labels.
- *ProModem 1200* ProModem's buffer takes care of communications while you occupy the Mac with other tasks.
- *Financial Cookbook* Add figures, stir, and let this program assist you with your personal finances.
- *Wizardry* Meander through mazes and battle monsters in this classic fantasy role-playing game.
- *WillWriter* Prepare a valid will on the Mac with an easy-to-use program and its excellent manual.
- *Speller Bee* This unique spelling tutor says words out loud and thus transforms the Mac into a tireless teacher.

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Edited by Jim Heid
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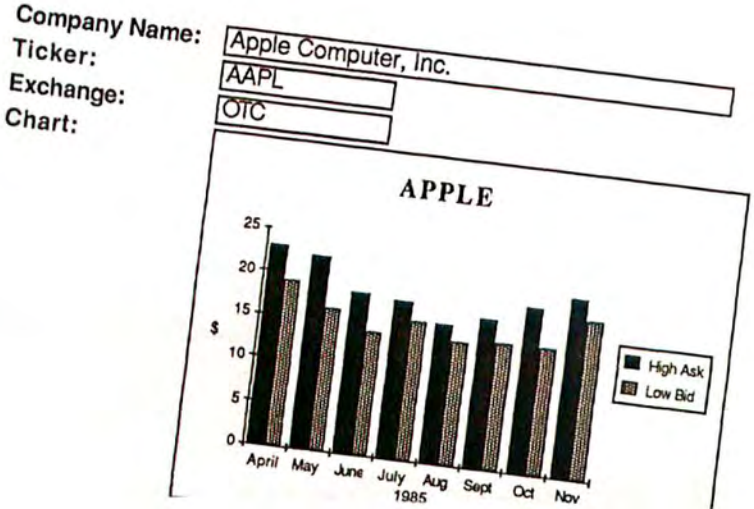

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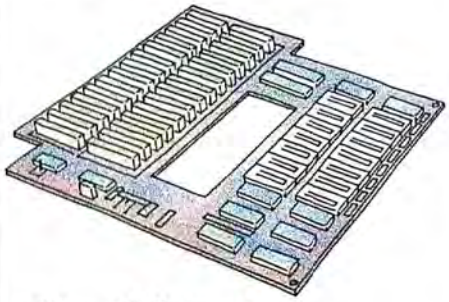

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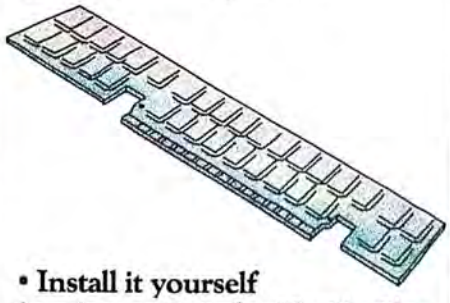

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David Bunnell

The Macintosh Today and Tomorrow

Apple faces some tough decisions on its way to making Macintosh technology available to more people

Apple is in a strong position to win. It has its act together now as a solid company.

I don't know who invented the violin, but I doubt if that person was the Mozart of the medium. I think it's safe to say that the world's first great violinist was not the same person who created that venerable stringed instrument.

Isn't that the way it goes with any invention?

High technology is no exception.

This idea was driven home to me at the Macworld Expo held in San Francisco last January. At the keynote presentation, entitled "The Macintosh Today and Tomorrow," members of the audience took great exception to some of the remarks various panel members made about Apple losing its innovative edge in the computer marketplace.

One panelist was Philippe Kahn, controversial CEO of the software company Borland International, who started working with computers at the Xerox Palo Alto Research Center (PARC). He raised the audience's hackles when he challenged Apple's claim that the Macintosh computer represented technological innovation.

"The Macintosh wasn't the new technology it claimed to be," he said. "Nothing is new with the Mac. People say that the Mac breaks new ground in technology. It doesn't. The Mac is just a clever way to market old ideas that have been around for almost ten years now. Everybody who was working with computers when the Mac was introduced already knew about mice, pointing devices, windows, and Smalltalk and languages like it. They were perfectly aware of such environments. Steve Jobs's group very cleverly took those ideas and announced that it was going to change the world with computers and revolutionize things with high tech. The problem is that the Mac wasn't high tech; it was really old technology."

It took a no-nonsense Macintosh evangelist in the audience to set Kahn straight. Chris DeSantis, a systems analyst and software developer for the Mormon church in Salt Lake City, gave Kahn a taste of Mac brimstone during the audience participation session.

DeSantis said, "I've been thinking about technological advances for quite a while. One thing I've noticed here in this room is that while all of us are here for different reasons, everyone came to learn something about software or hardware. Most of us are here because we like the Apple, we like the Macintosh, and we like that technology.

"About eight months ago I visited Xerox PARC for the first time," he continued. "And that was the very first time I ever heard of windows aside from the Macintosh. I had never heard of Smalltalk or LISP, even though their precursors have been around at PARC for a long time. So to me the Macintosh is a wonderful, brand-new technology, and I think everyone here has some appreciation of that."

The audience gave DeSantis a huge ovation. He had touched a sensitive chord. There may not be anything new about the Macintosh, because the mouse and icons were all developed years ahead of it. But the Macintosh was definitely innovative because it brought that technology to a new level of accessibility. People could afford to have the technology for themselves.

Herein lies a hidden principle: In the marketplace, accessibility is the real mother of invention. Innovation is merely its maiden name.

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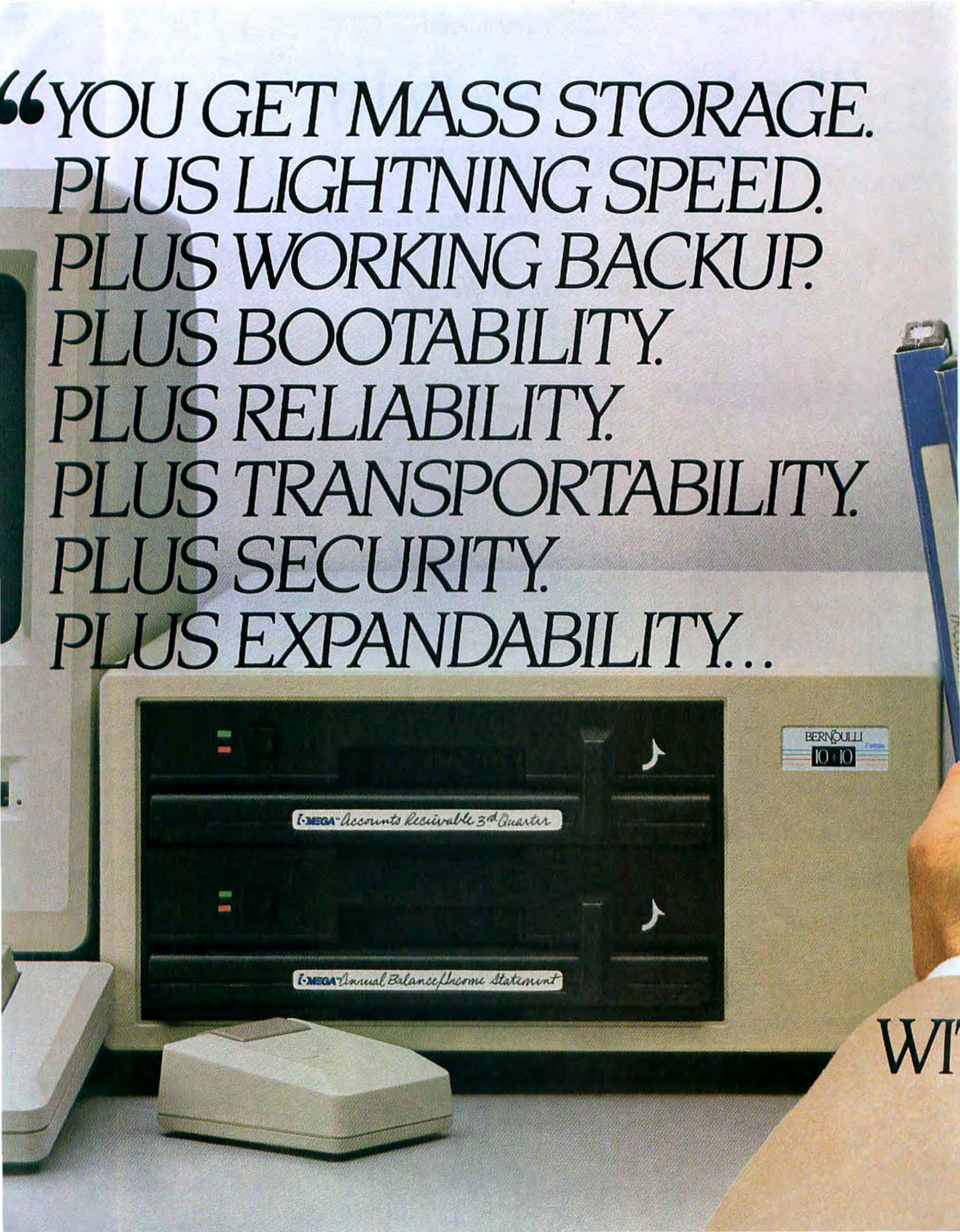
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(continued from page 13)

Apple recently took another major step on the path toward innovation when it announced its new products and plans for 1986 at the Apple World Conference, held concurrently with the Macworld Expo.

No, I am not referring to the introduction of the 1-megabyte Macintosh Plus, though that was certainly welcome news.

I personally believe that the most significant part of Apple's announcement was when Apple chairman and president John Sculley declared that the suggested retail price of the 512K Macintosh was being lowered by $500.

One of the problems with the Macintosh is its price. It's even more expensive than some of the IBM PC clones available. Originally, of course, the Mac was designed for the larger businesses, where cost is not so much a factor.

The original pricing plan for the Mac disregarded two of the most viable arenas for the Macintosh: small business and education. The Mac was way overpriced for those potential customers. And now Apple is promoting the Mac for some very specific applications: desktop publishing, productivity, and communications, with the machine connecting remote computers and databases over the phone through networks.

However, I still maintain that the Macintosh's real value is for education and small business.

This points out the dilemma that confronts Apple today: whether the Macintosh should enter the two areas—education and small business—that have always been the special preserve of the Apple II.

Sculley noted proudly in his Apple World Conference address, "Apple's products continue to grow in popularity and customer loyalty, despite new competitive entries. In fact, two of the three most popular families of personal computers in the world are Apples."

He neglected to point out that the two Apple machines are in effect competing with each other. The Apple II is obviously in the more powerful position, considering not only the greater number of people who use it but also the huge amount of software available for it.

But I ask you, of these two machines, which one is the more viable for Apple to support and develop?

I believe the answer is self-evident. The Macintosh is clearly the superior machine in every way. A couple of summers ago, we conducted an experiment at our editorial offices, testing different personal computers with a carefully selected group of eight kids. We had them evaluate various machines and software to see what they thought was best. The kids ranged in age from 8 to 16, they were all very bright, and all had previous computer experience.

John Sculley, head of Apple Computer, faces the challenge of unifying the company's product lines.

Our computer "test lab" had a Macintosh, an Apple II, an IBM PC, an Atari 800, a Commodore 64, and the Radio Shack Color Computer. The Mac was the group's unanimous choice as the best computer. It was voted the easiest to use, the most fun, and the most productive. It was the computer all the test participants wished they had. Of course, the only reason a lot of kids can't have a Mac is its high price.

I thought the test results were very positive and augured well for the future of the Macintosh.

Two years later I still have the same positive feelings about the Mac's technology. But now I'm somewhat concerned about its stature at Apple.

(continues on page 20)

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Standard ROM	192K	192K	64K	64K	16K
Number of Keys	95	89	95	59	63
Mouse	Yes	Yes	No	Yes	Optional
Screen Resolution (Non-Interlaced Mode) Color Monochrome	 640x200 640x400	 640x200*** 640x200***	 640x200 720x350**	 None 512x342	 560x192 560x192
Color Output	Yes	Yes	Optional	None	Yes
Number of Colors	512	4096	16	None	16
Disk Drive	3.5"	3.5"	5.25"	3.5"	5.25"
Built-in Hard Disk (DMA) Port	Yes	No	Yes	No	No
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David Bunnell

(continued from page 16)

What is the future of the Mac? I think we got a peek at Apple's answer in Sculley's speech at the conference when he addressed compatibility between the Apple II and the Macintosh. Apple will upgrade the Apple II and make it more Mac-like. Last fall Apple brought out a 3 ½-inch disk drive for the Apple II, and soon both machines will be able to read the same disks.

This is extremely reassuring, especially since there was some serious speculation that Apple was considering dropping the 512K Macintosh altogether, instead of merely lowering its price. Rumor had it that Apple was ready to eliminate the machine because the company wanted people to buy Apple IIs.

I think that would have been a very shortsighted view. If the Mac has already become the computer of choice in universities, thanks to Apple's own efforts, then why shouldn't high school, junior high, and grade school students use Macs? And why shouldn't students eventually have low-cost color Macs, which would be even more useful to them?

Apple's plan is to create a 16-bit Apple II that will be even more Mac-like.

Perhaps at some future point, Apple will discover the need to actually merge the two machines. The reasoning would be simple. Even with new levels of Mac/Apple II data compatibility, people would still have to grapple with two completely separate operating systems. All Apple computer users would benefit from a unified product line.

If the Mac and the Apple II were completely compatible, many more people would buy Apple machines, and the world of Apple computers would be parallel to the world of MS-DOS machines. By having two operating systems and two different groups of customers, Apple weakens itself.

Even though Apple reported good earnings in the last quarter of 1985, it should be noted that they achieved this with cost cuts. It did not reflect an actual growth in revenue. In fact, Apple's total revenue has been dropping.

Apple needs to be in a position of growth relative to MS-DOS computer customers. To maintain the necessary strong outside development of software and related products, it needs to offer developers a single, big, and unified group of Apple users.

I think that if Apple had not been divided politically and emotionally into two different computer companies, the smart thing would have been to phase out the Apple II altogether and offer low-cost Macintoshes.

As it stands today, if Apple itself doesn't make the Apple II obsolete with the Macintosh, someone else will do it with an MSX computer, the Amiga, or the Atari ST. These machines will be bought for education, small businesses, and homes.

I believe that Apple is in a strong position to win. It's got brains behind it, it has $440 million in the bank, and it has its act together now as a solid company.

I think one of the surprises about Apple is that John Sculley has become very well versed in the technology and has become a strong technical thinker. Other personal computer companies are beginning to realize that this is one of his major strengths. He's no longer just a guy from Pepsi who knows about marketing and advertising. He's become a personal computer guru in his own right.

Having a leader of Sculley's caliber and vision is the salvation of Apple. One of the criticisms of Scully that I heard about in the past was that he didn't have a technical background or a deep understanding of what the personal computer is and where the technology is going. Now he does. He's learned it on the job, and he will probably never go back to selling sugar water again.

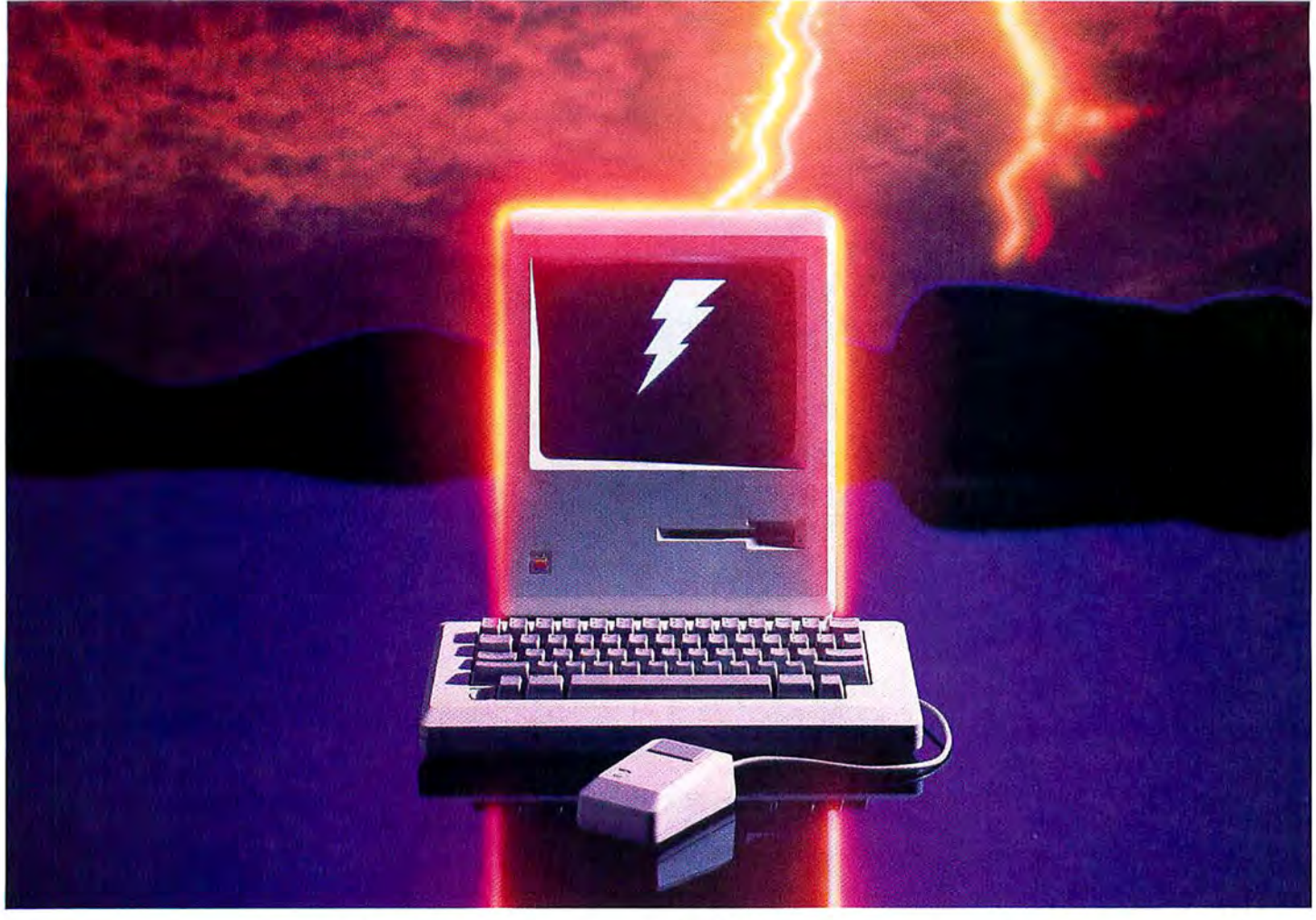
The challenge he faces is to have the strength to resolve the dilemma of Apple's two conflicting operating systems. He has to move Apple forward without making a major blunder, as discontinuing the 512K Mac would have been. That was a close call.

At some point in the future, it's likely that Apple's two operating systems will more or less merge into each other. Apple may even sell one machine under two names to satisfy the standard-bearers of the old guard.

I believe that at precisely that point Apple would achieve a true fusion of innovation and invention. Such a move would be like cutting the Gordian knot, in a way. But I believe that is where Apple's future lies.

By adding invention to their innovation, Apple will make another historic leap forward.

We will see. □



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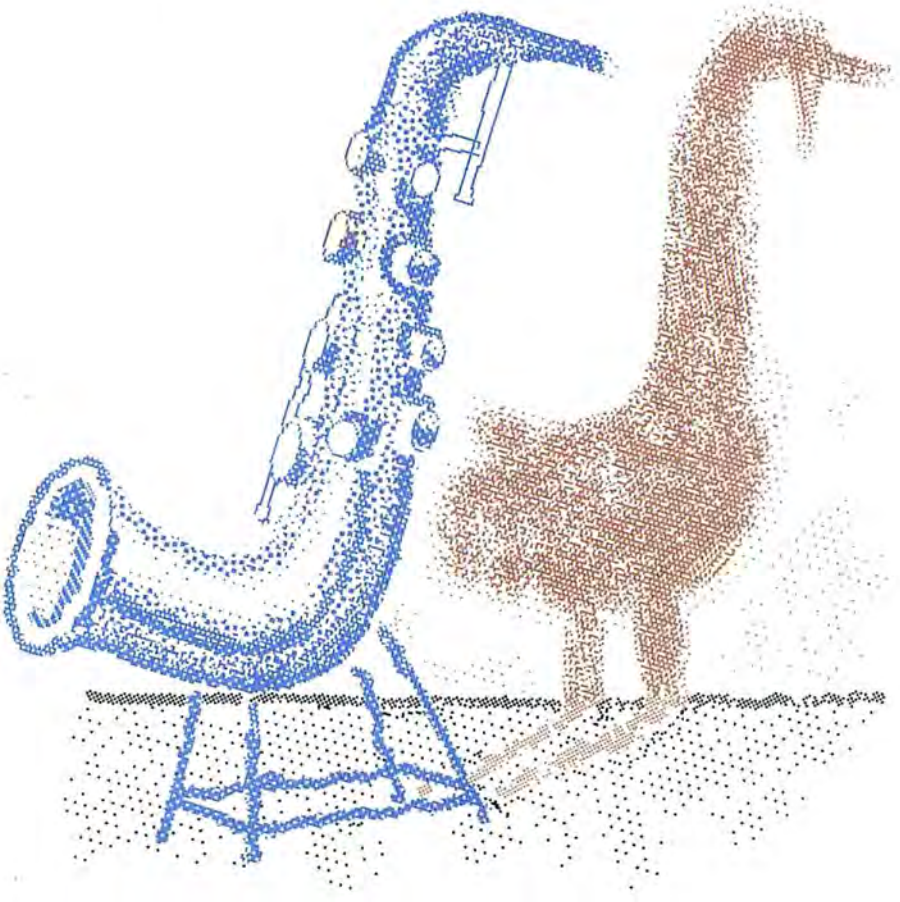
Steven Levy

Jazz: Software in a Minor Key

Lotus's Jazz was groomed to be the epitome of Macintosh software—find out why it flopped



Back in the early days of computer hacking, the young wizards of MIT had an expression that reverberated far beyond the boundaries of writing code. It was "The Right Thing." I recall the jolt I felt when the implications of intoning that expression were first explained to me. At first I mistakenly made a connection with The Right Stuff, as in the phrase Tom Wolfe popularized in referring to the insouciant valor of test pilots. But as one legendary hacker explained, The Right Thing very specifically meant "the unique correct elegant solution . . . the thing that satisfied all the constraints at the same time, which everyone seemed to believe existed for most problems." The Right Thing was often elusive, but once someone found it, no one would ever imagine approaching the problem in any other way. It was the straight line between two points.

All of this came to mind the other day when I was speaking to Leon Navikas, a manager at the Lotus Development Corporation. Leon was the mission leader of the team that developed the software originally called Macintosh Business Product, which was eventually released, with much fanfare and a rather oblique television commercial, as *Jazz*. In the midst of an explanation of the trade-offs that had to be made to squeeze the program into 400K—filling an entire floppy disk—Leon uttered this sentence:

"Instead of doing macros, we did a word processor."

Now, I don't think that Leon was saying that one day his team was faced with a choice of implementing macros (the user-created shortcuts that make spreadsheets like Lotus's *1-2-3* so powerful) or putting a word processor into the package. Rather, he was reflecting that an earlier design decision—reached by the top brass of Lotus including founder and chairman Mitch Kapor and president Jim Manzi—had set a certain course for *Jazz*. This plan meant that so-called power features were to be sacrificed so that *Jazz* could handle all the basic computer applications that a middle manager might use during the course of the business day. *Jazz* would be the only software this "nonpower" user would ever need. So instead of macros, the most beloved feature of Lotus's biggest success, *Jazz* would have a word processor somewhat weaker than *MacWrite,* which comes free with every Macintosh.

I'm sure that when the folks at Lotus made this decision, they felt it was The Right Thing. In hindsight it seems like a disaster. By taking this misguided approach to Macintosh computing, *Jazz* is more Mantovani than Miles Davis, almost a software equivalent of elevator music. And by comparison, *Jazz*'s prime competition, Microsoft's *Excel* spreadsheet, is full-tilt rock 'n' roll. And you don't need a subscription to *Billboard* to figure out that rock 'n' roll outsells jazz.

Since I like the folks at Lotus and know they are devoted to creating great software (albeit at top dollar), I resisted this conclusion. Until the day I got a copy of *Excel*. It was then that I faithfully keyed in

(continues on page 26)

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This program even lets you remove the Finder from your disk; saving valuable space. You can always run Finder from an other disk. Or, you can run Finder as an application using SHAZAM.

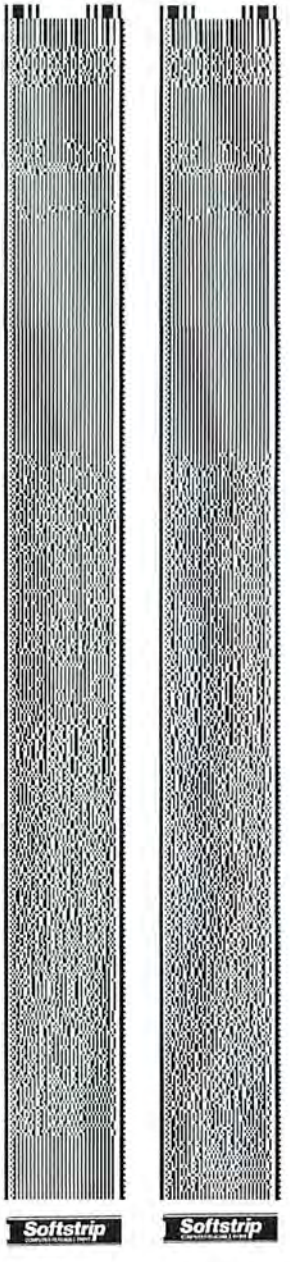
Read in the strip of the program you're interested in. BROWSE is the first strip on the right, and SHAZAM is the next one over. Double click the appropriate icon to execute the program. Use it the same way you'd use your Finder.

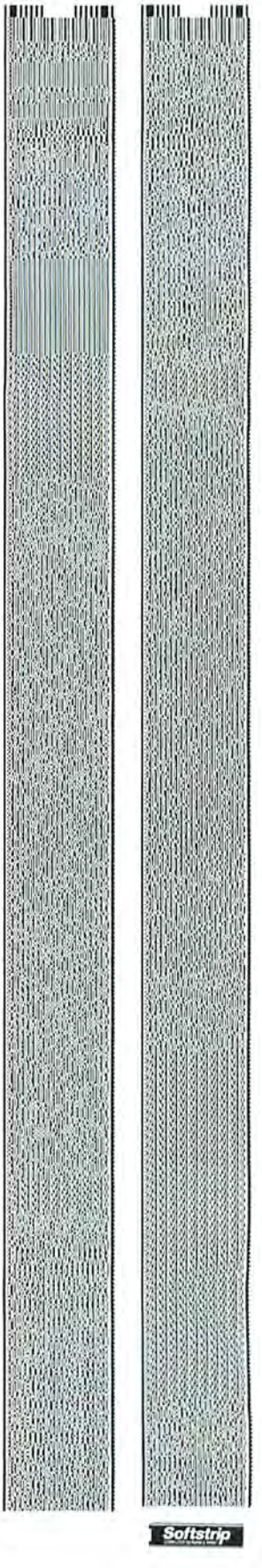
Both of these programs are part of the MUSICWORKS UTILITIES, which are a collection of small, but very useful, programs written by Bob Rees.

CUSTOMIZE YOUR BUSINESS HEADINGS

The two data strips on the far right contain a program called HEADINGS, which is part of the Mac Art for Business program collection by Patricia Frank. With it you can add flair to your business stationery, memos, reports, and business forms. It helps you design headings that add a graphic touch to those printed papers you have to create during the day.

Read in the strips. Load it into MacPaint or use it with any Macintosh word processor. From the Finder, double click on the HEADINGS icon. If MacPaint is also available, the file will be opened. From within MacPaint, choose Open from the File menu, click on HEADINGS, and click the Open button.





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StripWare Library Nos. 182-184

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1 2

(continued from page 23)

the 10K spreadsheet that I had used during the baseball season to track the statistics of certain players. As spreadsheets go, it perfectly reflected the limitations of my accounting ability—there were some formulas (like instant registration of earned run averages) and mass calculations but absolutely nothing beyond the demands of that archetypal knowledge worker at whom *Jazz* was directed.

With *Jazz,* whenever I keyed in new figures, I had been forced to wait for the program to register each entry. Typing in a figure was like tossing a pebble in a pond—an unsettling ripple spread throughout the length of the spreadsheet. (Turning off the Automatic Recalculation function mitigates this only slightly.) Using *Jazz,* I had often been tempted to place one of those ethereal Windham Hill records on the stereo and meditate to the soothing undulations of the figures on the screen.

The *Excel* spreadsheet accepted my entries without flinching. I knew then which approach was The Right Thing.

The Lotus people object to this comparison; *Jazz* product marketing manager Eric Bedell insists that *Excel* is more for "spreadsheet junkies" and claims that *Jazz* is "productivity" software, while *Excel* is "production" software. The basis for this confounding distinction is that "production" software is used to churn out data in great quantities, whereas "productivity" software is for managers who fiddle with less data, write memos incorporating the data, and integrate the data into modem dispatches. This does not take into account the fact that word people are no less tolerant of rippling spreadsheets than are spreadsheet junkies. And are no less disgruntled that their communications function has no way to automatically log on to an information service, to note one of *Jazz*'s most apparent shortcomings.

Furthermore, almost everyone would probably like to take advantage of Macintosh bit-mapping to highlight certain spreadsheet cells with italics or boldface—something you can't do because of *Jazz*'s trade-off limitations.

"We're not everything to everybody," says Bedell, and who can reasonably complain about that? But at the same time, Bedell says that one of *Jazz*'s notable features is that it lets users "turn on the machine and not have to turn it off to switch disks [for other applications]." Well, if you claim that as a feature, then you have to be everything, at least to a lot of people. And of course, *Jazz* isn't.

The irony is that the Macintosh has a natural solution to the problem of integrating applications with a minimum of hassle. By strongly directing software publishers to follow a standard user interface, most Macintosh programs use the same logic, and often the same commands, as other programs in the software base. It's usually easy to swap data from one program to another through the Clipboard. And with the *Switcher* program, any user can create an integrated package by considering hundreds of choices and choosing the applications that seem The Right Thing for a particular task.

The exchange of data among applications in the *Switcher* is not as flawlessly smooth as it is among the modules of *Jazz,* and the user doesn't have the benefit of the innovative HotView, the *Jazz* function that

(continues on page 30)

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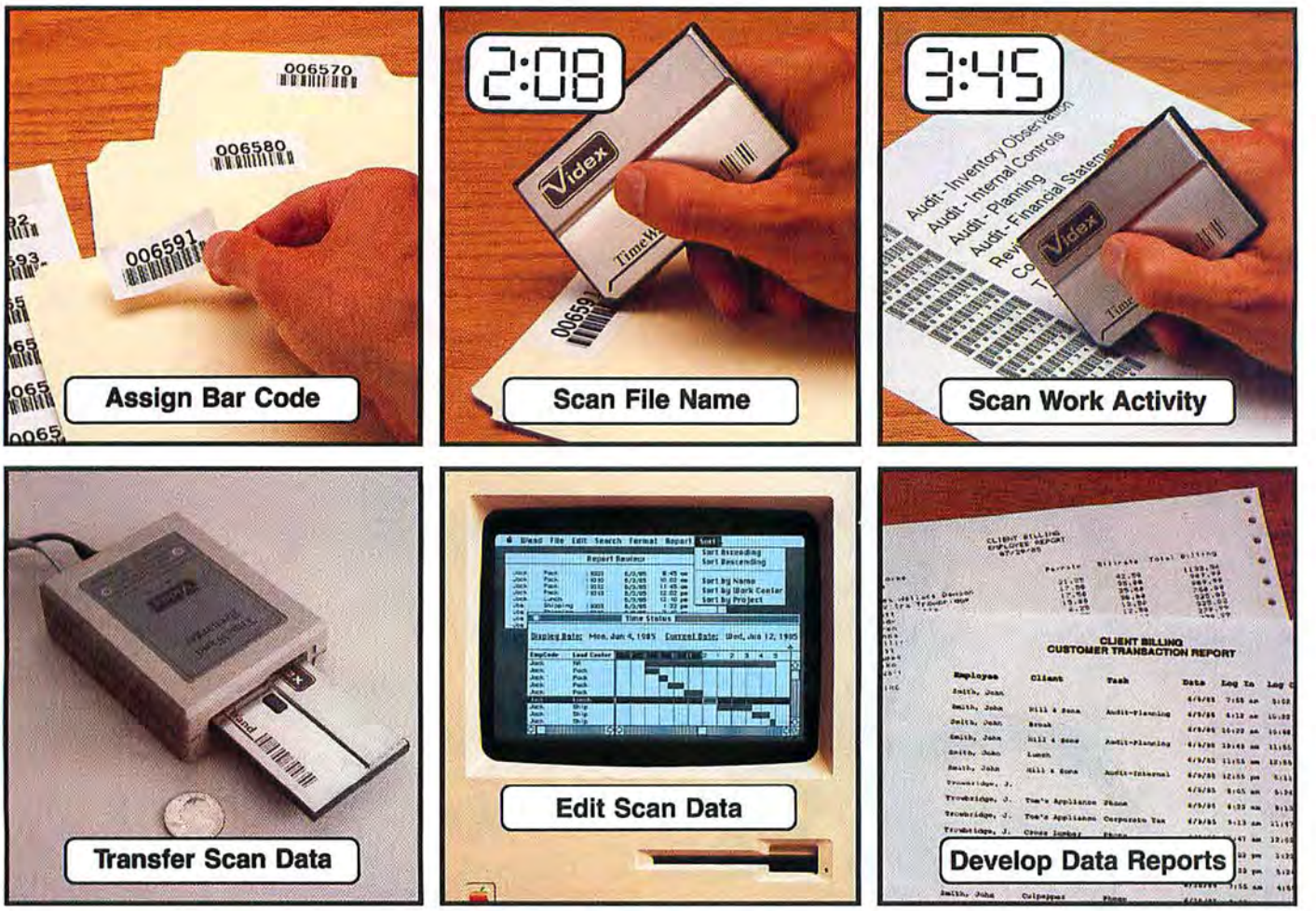

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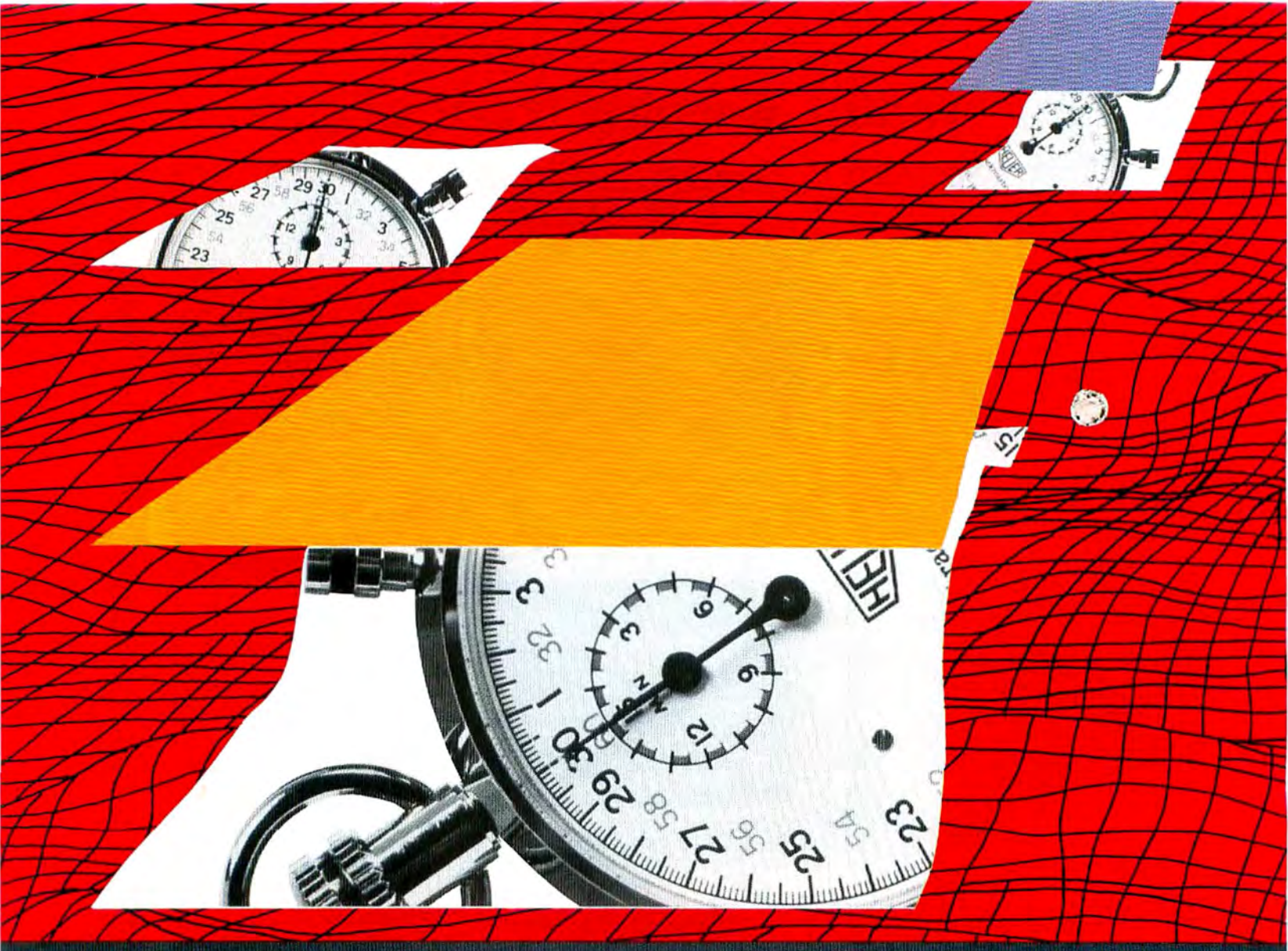

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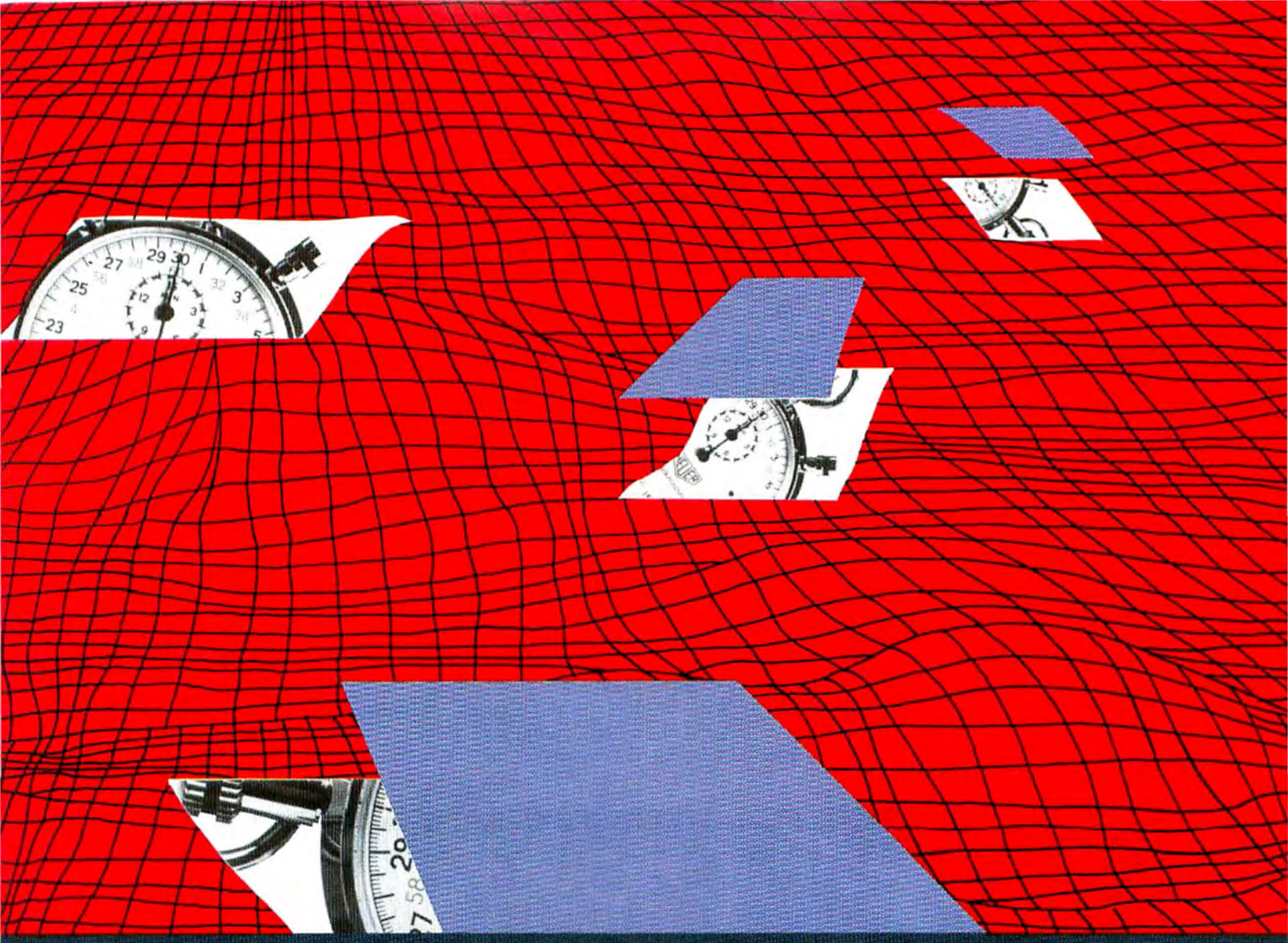

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Steven Levy

(continued from page 26)

reflects a change made in one module by updating information in other modules. But the benefits of using a more powerful application like *Excel* in the first place far outweigh that extra measure of integration. Especially since even a casual user demands more power than the anemic word processing and communications modules included in *Jazz*.

How did Lotus go so wrong? My belief is that the designers were so dazzled with the ease-of-use possibilities in the prototype Macintosh they viewed in mid-1983 that they focused too deeply on the Mac's potential to convert computerphobes to desktop mouse jockeys. The original intent of *Jazz* was to duplicate *1-2-3* on the Mac, but as the project went forward, the Lotus people saw a chance to make *Jazz* "the easiest product in the world to use—a program that wouldn't overwhelm people with features." So to convert middle managers who shied away from computers, they sacrificed the very features that had made Lotus programs software giants—speed and power.

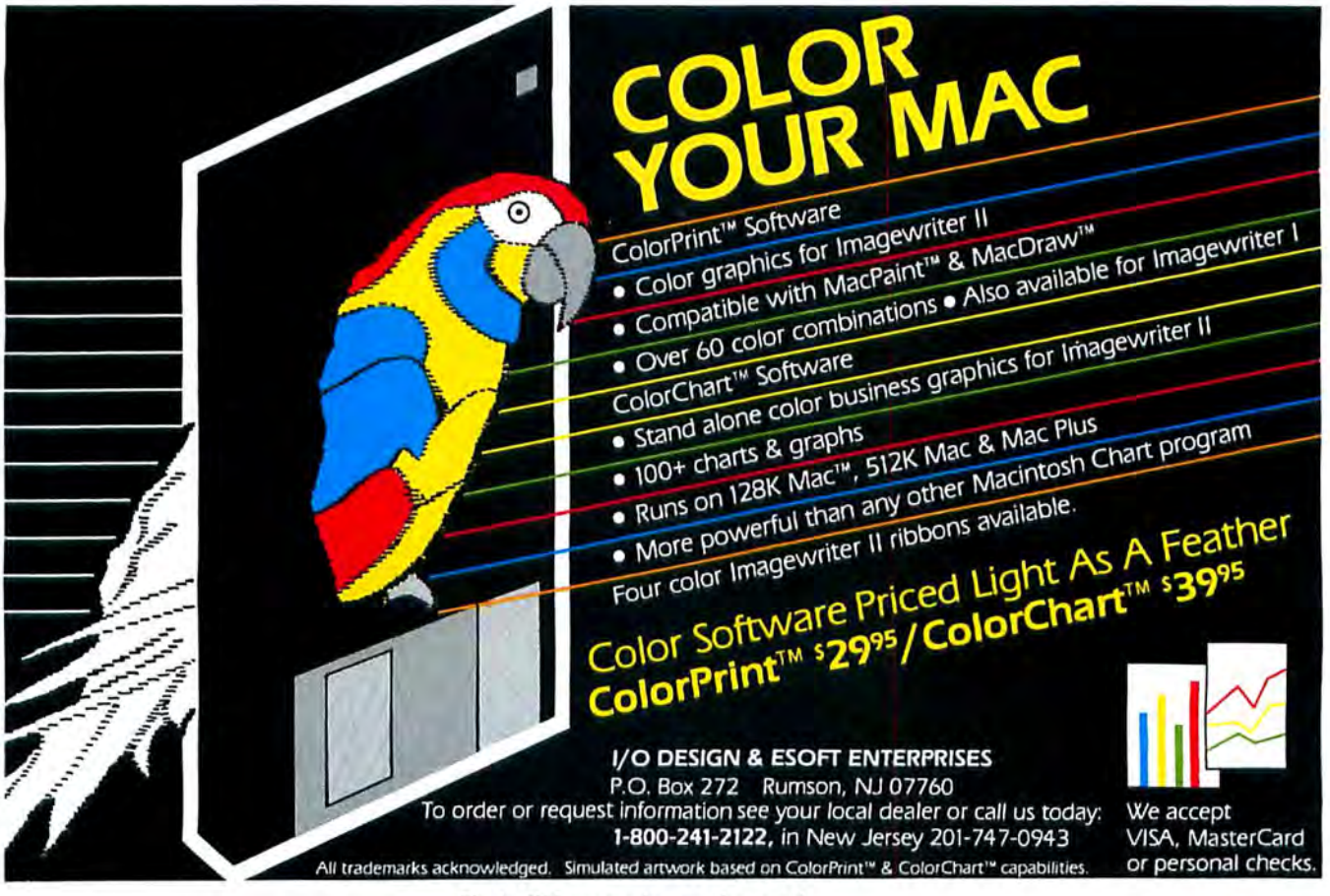
Not realizing that the *Switcher* would one day link most Macintosh programs, the crack team of programmers spent incredible energy creating the five major modules of *Jazz* and performing the herculean task of meshing them flawlessly. Then came the mind-bending task of squeezing them all onto one disk. In the process of painstakingly debugging the program, Lotus lost its perfect record for shipping software by its announcement date. But the company is rightfully proud that the finished product had no serious bugs. It was a virtuoso programming feat, packing those integrated functions so tightly, but oh so unnecessary, since users can more easily link programs together with the *Switcher* and avoid the pricey—$595 list—*Jazz* purchase.

Indeed, it looks like corporations that have considered both the *Jazz* system and the *Excel* alternative are thinking like the accounting firm of Peat, Marwick, Mitchell & Co., perhaps the biggest corporate Macintosh installation. Audit partner Dick Webb says that the 5000 Macintosh users at Peat Marwick will be using *Excel*. "We spent a lot of time with Lotus, and it wasn't an easy decision," he says. But ultimately the macros and speed of *Excel* won the day. "Besides," says Webb, "we like the idea that you can use it with the *Switcher*."

Lotus claims that *Jazz* is not directed to large corporations but toward small businesses. However, Bedell admits that sales of *Jazz* have been disappointing. Lotus initially shipped 35,000 copies to fill a back order created during the months of prerelease publicity, and this helped make *Jazz* one of the best-selling Macintosh products of 1985, according to the research firm InfoCorp. But subsequent sales have been flat, flat, flat. Bedell blames this on unspectacular Macintosh sales during those months, but that does not account for Lotus's failure to meet its heady expectation that half of all new Macintosh owners would run their Macs to the sound of *Jazz* music.

Essentially, the real failure of *Jazz* is its flawed approach to Macintosh computing. Lotus concentrated on building a self-contained, moderately powerful system. But its energy would have been better spent creating a product as strong as its

(continues on page 32)



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(continued from page 30)

IBM programs and figuring out ways to integrate them with the other innovative software that Apple was encouraging software publishers to produce. When I spoke to them in December, both Bedell and Navikas reaffirmed Lotus's commitment to *Jazz* and the Macintosh, thus refuting a rumor I hadn't even confronted them with. (Interestingly, Mitch Kapor himself, whom I had previously found a delightful conversationalist, refused to discuss *Jazz* with me.) They strongly hinted that *Jazz*'s next release would have macros, log-on telecommunications procedures, and more speed in the spreadsheet—and would cost no more than release one. Thank God for small favors.

But I am not sure that merely jazzing up *Jazz* is The Right Thing to do. If Lotus is seriously committed to the Macintosh, maybe some of its programming wizardry would be better spent coming up with some entirely new innovations. Perhaps Leon Navikas, still the development manager in charge of the Lotus Macintosh team, has something like that in mind when he speaks of the philosophy that might shape the (as yet unannounced) new release: "You don't win by playing catch-up. That's not our style."

Bold words. But I hope he's right and prefer not to be skeptical about his chances. Just because a musician fumbles during the first set doesn't mean that he won't hit the nirvana notes when he picks up the horn at the late show. We all should be looking forward to hearing the hot music of *Jazz*'s second release. A leapfrog past the competition would be good for Lotus and certainly good for the Macintosh.

Steven Levy begins his tenure as a monthly columnist for Macworld. *He is the author of* Hackers *and is currently working on a nonfiction crime book. He welcomes your comments and suggestions. You can contact him electronically on The Source CPA004 or CompuServe 72075,635, or you can write him in care of* Macworld, *555 De Haro St., San Francisco, CA 94107.* □

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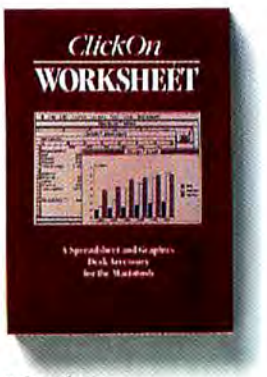

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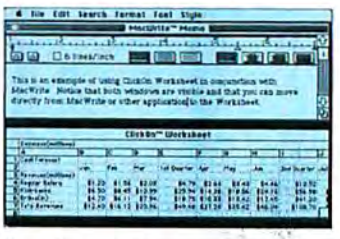

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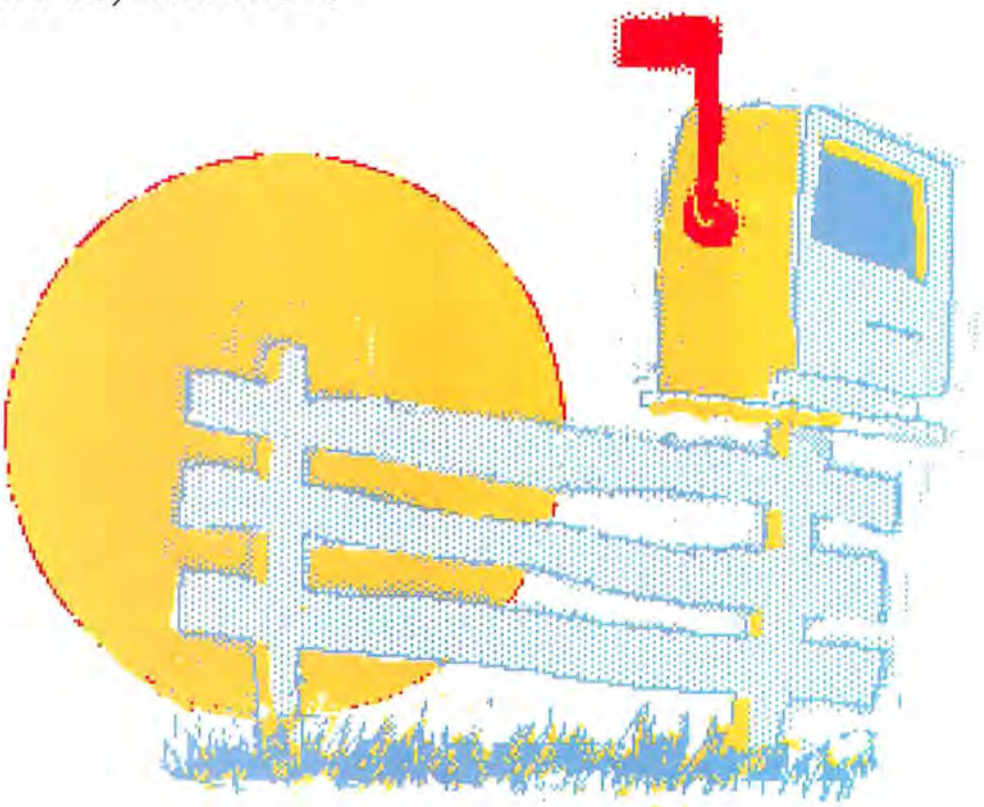
Letters

Readers write about marketing strategies, art forms, Macintosh BASIC, and more



Art for Art's Sake

Some ideas about *MacPaint* from the standpoint of a classically trained artist: the test of a tool's strength is its ability to handle the fundamentals of a system, in the case of *MacPaint* the plastic elements like line, form, mass, and color. *MacPaint* has obvious restrictions. It can't now handle color, and the size of the image is limited. Most importantly, *MacPaint* can't draw a true curve. We can work around some of these limitations. Textures can produce an impression of color, as is standard practice in monochrome painting and etching. We can also produce works of different sizes within the limits of the page and can smooth curves with FatBits.

The point, however, is not just that *MacPaint* deserves to be taken seriously, but that within its limits the formal problems faced by every artist remain. Composition, perspective, mass, line, and form all have to be considered and used or abused according to creative opinion. Like any other tool, *MacPaint* deserves to be pushed to its limits. More people should experiment boldly, given *MacPaint*'s great features–not the least of which is its ability to make a clean erasure. But the computer won't do your work. You've got to pay attention to what you do.

Michael Kei Stewart
Marshfield Hills, Massachusetts

New Tricks

Who would believe that a 60-year-old grandmother born in the roaring twenties could learn to operate a computer?

After a year of retirement in the country I became bored and itchy, so I decided to write the next best-selling cookbook–but not on my cranky old typewriter. My son gave me a couple of back issues of *Macworld,* and that did it. I cashed in some of my IRA savings and bought the Mac.

There's hope for all senior citizens who don't want to spend the rest of the century just living in the present. If I can learn a trick or two at my advanced age, anyone can.

June L. Matthews
Loganville, Georgia

Basically Disappointed

As a loyal Macintosh fan despite it all, I announce that Apple marketing has shot itself in the foot again. I bought my Mac in March 1984 because of Macintosh BASIC by Apple. I had been using an HP-9836 at work, and its BASIC was fantastic. It had subprograms, parameter passing, everything I wanted . . . except speed, because it was interpreted. When I read about Macintosh BASIC, it sounded like Apple was writing a compiler around HP's BASIC. All this, compiled, and a mouse too. I placed my Mac order and began the long wait for MacBASIC, which seemed to be stuck at T minus two months and holding. Around November 1984, Apple gave up even issuing promise dates–the first conversion of "vaporware" to "vacuumware." Graceful move there, Apple. I'd ask for my $2500 back on my 128K Mac, if I could live without it.

Scott B. Millett
Ridgecrest, California

According to a Microsoft spokesperson, after Apple scrapped its version of BASIC, which had achieved wide renown through extensive distribution of beta test disks, Microsoft purchased the rights to parts of the Macintosh BASIC code. Microsoft may incorporate parts of that code in future products, but nothing has yet been announced.–Ed.

(continues on page 39)

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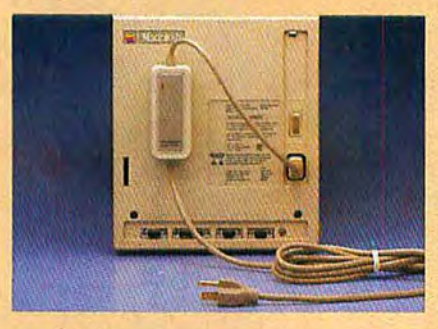

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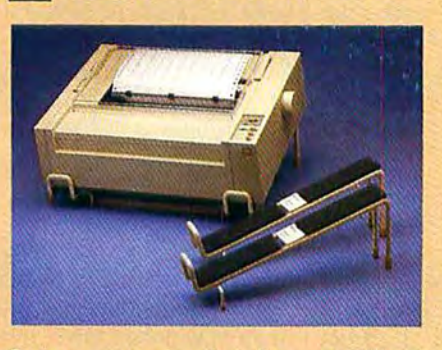


Raises your Apple® Imagewriter® at a slight angle so you can monitor its performance more easily. It solves the problem of where to store paper—several hundred sheets are accommodated neatly underneath. (Also fits most other dot matrix printers.)

4 A-B Box

If you want to take advantage of the AppleTalk™ network, a Laserwriter™ printer or a hard disk in addition to your Imagewriter and modem, you'll have three peripherals competing for the two serial ports on your Macintosh. The A-B Box gives you the extra serial port you need. Just plug two of your peripherals into the A-B Box and plug the Box into one of your Macintosh serial ports. Then simply divert your data output to the peripheral of your choice—press A to send to one, B to the other. Fits perfectly underneath your external disk drive.

5 Tilt/Swivel

Gives you the flexibility to tilt and swivel your Macintosh to the viewing angle most convenient for you.

6 Polarizing Filter

The solution to a glaring problem. Made exclusively for Kensington by Polaroid®, it protects your eyes by reducing reflected screen glare by up to 99%. Also improves screen contrast. Easy to install.

7 Disk Case & Disk Pocket

Provides safe storage for 36 Macintosh disks. Comes with a packet of spare disk labels. Also includes a handy Disk Pocket for safe transportation of up to 5 disks.

8 Dust Covers

Protect your system from the elements. Anti-static dust covers for your Macintosh, Macintosh XL, Imagewriter, Imagewriter II and External Disk Drive.

9 Mouse Pocket

A safe, clean place to keep your Mouse when not in use. Attaches to the side of your Macintosh. Fits under the Maccessories Dust Cover.

10 Mouse Cleaning Kit

A full year's supply of the cleaning materials you'll need to keep your mouse rolling at top speed. Also includes the Mouse Pocket.

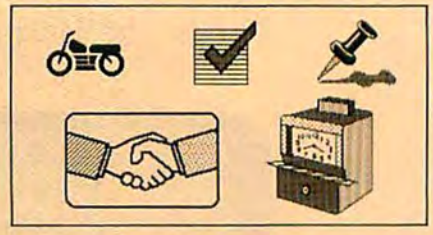
11 Mouseway

A dirt and static-resistant work surface keeps your Mouse rolling smoothly. Protects your desk, too.

12 Disk Drive Cleaning Kit

A full year's supply of the cleaning materials you'll need to keep your drives running smoothly.

13 Graphic Accents



A collection of over 250 professional illustrations, covering everything from business to holidays. Use them for reports, newsletters or greeting cards. Graphic Accents are stored in standard MacPaint™ files, for ease of use.

14 Professional Type Fonts

Styled after the most popular type faces in the publishing industry. Type Fonts for Text contains 16 fonts in sizes 12 to 24 point. Type Fonts For Headlines (for the 512K Mac) contains the same fonts in sizes 24 to 72 point. Including versions of Times Roman, Helvetica, Optima, Futura, and a dozen others.

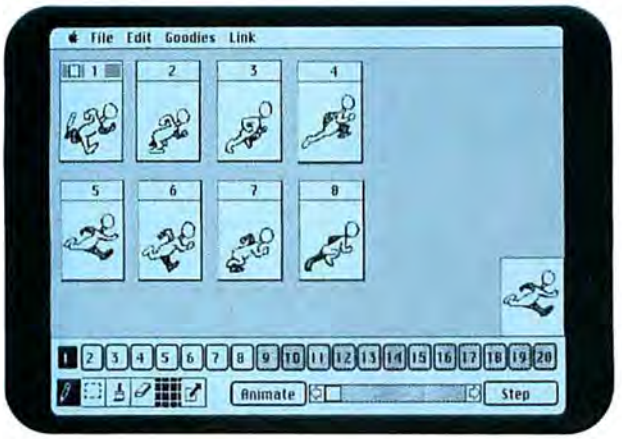
Maccessories are available at Apple dealers everywhere. For more information write or call: Kensington Microware Ltd., 251 Park Avenue South, New York, NY 10010. (212) 475-5200. Tlx: 467383 KML NY.

Trademarks: Maccessories/Kensington Microware Ltd., Apple, Macintosh, Imagewriter, AppleTalk, Laserwriter, MacPaint/ Apple Computer, Inc.; Polaroid/Polaroid Corp.; Fonts by XIPHIAS. © 1985 Kensington Microware Ltd.

The Graphics Magician®

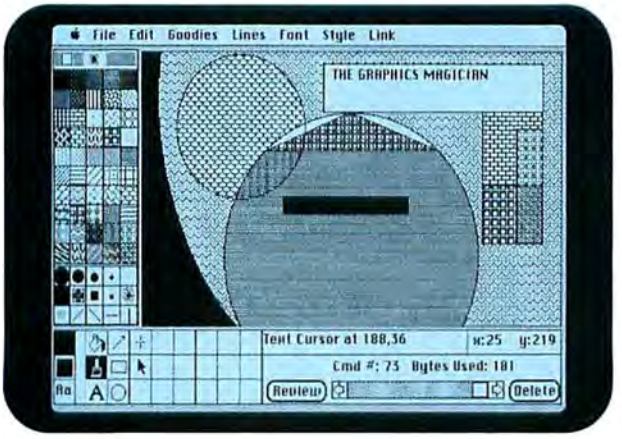
PAINTER AND ANIMATOR

for the Macintosh by Eagle Berns and Roger Lawrence



ANIMATION

Create and choreograph animated shapes as small as a few pixels or as large as the entire screen. Clip shapes out of MacPaint images, or draw them yourself . . .



COMPACT PICTURES

Draw pictures that require only a fraction of the space normally taken (instead of saving images, The Graphics Magician saves the artist's moves) so hundreds of pictures fit on a single disk!

USE IT IN DEMOS, PRESENTATIONS, OR YOUR OWN PROGRAMS!

Like most other "animation" software, you can create demos and presentations. But with The Graphics Magician, you can also access and control everything from your own programs! Calling and controlling the animation and graphics routines from BASIC, Pascal, or machine-language is simple!

Furthermore, The Graphics Magician is not copy-protected, and we do not charge a licensing fee for use in your own software (we do require an acknowledgement). Discover why The Graphics Magician for the Apple II is the end-users' favorite graphics software (Softalk Readers Poll 1983, 1984, A+ Readers Poll 1985). And how it's so much better on the MAC!

See it at your favorite store or phone (800) 323-0884.

P·LARWARE™

from Polarware/Penguin Software, Inc.

Apple is a trademark of Apple Computer, Inc. and Macintosh is a trademark licensed to Apple Computer, Inc.; The Graphics Magician is a registered trademark and Polarware is a trademark of Polarware/Penguin Software, Inc.; Penguins have a super-bowl on Tuesday night.

Circle 480 on reader service card

(continued from page 35)

A Case for Analog Art

I like your journal very much, in style and form. The only thing in excess is computer pixel graphics. My 4-year-old son learned to use the mouse and *MacPaint* instantly, but I have to admit I still prefer his hand drawing, like the picture of the Mac enclosed.

Gabor J. Kemeny
Manhattan, Kansas

Martin Kemeny

BASIC Books

Part of the fallout from the cancellation of Apple's Macintosh BASIC: the otherwise fine books from Hayden, Sybex, and Addison-Wesley that describe a language substantially different from the only version of BASIC now on the market—Microsoft BASIC. Be forewarned not to buy these books still available on the shelves of bookstores around the country.

Tim Ryan

You are right; the books about Macintosh BASIC describe a different version of the language. However, many people knowingly purchase the books anyway because they include clear documentation of technical details such as how to access Toolbox calls.—Ed.

Macintosh Advocate

As a fellow attorney, I would like to expand on the points made by David R. Clowers in his letter in the November 1985 issue of *Macworld*. We have heard frequently from Apple that the Macintosh is appropriate for serious business applications, but its marketing strategy has been far different—at best picturing the Mac as a counterculture technological revolution, and at worst as a computer hacker's toy. Even Lotus Development Corporation, which manufactures *the* business program, somehow fell into the same trap when its advertisements for *Jazz* suggested back-room late-night entertainment rather than a powerful business package.

These companies must realize that while the cuteness of a high-technology product may attract customer attention, businesspeople make buying decisions based almost entirely on usefulness and performance. Compare IBM's Charlie Chaplin ads with the sometimes bizarre promotion of the Macintosh, and you have some idea why the PC has been so phenomenally successful in the business market.

Apple tried to have it both ways with the Macintosh—a serious business computer that was also "the computer for the

(continues on page 44)

RECORD HOLDER
Data Manager for the Macintosh™

WHY PAY HUNDREDS OF DOLLARS FOR A FILING SYSTEM ...AND SETTLE FOR SECOND BEST?

Introducing **Record Holder™**, the *best* Data Manager for the Mac, at a ridiculously low introductory price of **$49.95**

Record Holder is a full function data manager that allows you to store up to 32K of text and is so easy to use that you can get a report out in less than 5 minutes.

Easy To Learn
- Comprehensive manual includes a tutorial section.
- You never feel lost with over 100 HELP screens.

Easy To Use
- Need not define the length of your fields. All fields are variable in length.
- What you see is what you get. Designing both Screen and Report is as easy as clicking and dragging with the mouse.
- Make mailing labels in seconds.

Flexible
- Allows text fields of up to 32,000 characters.
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Loaded With Features
- Unique Table of Contents Window allows global view of your database and instant access to any record.
- Powerful and flexible searching capabilities.
- Allows Totals, Averages and Count as well as Running Totals and Running Counts for Report generation.
- Up to 124 sort levels for Report generation.
- Allows unlimited number of Report Formats per file.
- Automatic SAVE feature to ensure data integrity.
- Compatible with the Macintosh 128K, 512K and the XL.

For more info, call: **(203) 872-1024**
To order by credit card, call toll free (7 days a week, 24 hrs. a day):
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In Maryland, Call: **1-800-638-8890, op. 229**
Or send check or money order to:
Software Discoveries, Inc.
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Master Card/Visa Accepted.
Add $5 for shipping and handling.
CT residents please add 7.5% sales tax.

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Circle 435 on reader service card

The Icon Review Showcase

Choose from our Collection of Select Macintosh Products All at Fantastic Savings!

All of us at Icon Review are active Mac users. We have hands-on experience with what works and what doesn't. Our highly qualified network of Mac experts help us evaluate specialized products. We believe in the quality and value of these products. We won't sell anything we wouldn't use ourselves!

MacLightning $69
From Target Software

Here's the spelling checker Mac users have been waiting for! Only MacLightning watches your keystrokes and beeps when you type a misspelled word! If you prefer to work in silence, you can use MacLightning at the end of the session to check selected text or an entire document. Installed as a desk accessory, MacLightning alerts you to spelling errors in MS-Word, Jazz, Excel, and most other applications. And MacLightning is FAST, checking more than 60 words per second! We particularly like MacLightning's unique graphic user interface, and heartily recommend it as a breakthrough design in spelling checkers.

Macbottom $1149
From PCPC

This new 20-megabyte Macbottom wins our vote as the most Mac-like personal hard disk. We like it even better than the Apple Hard Disk 20. Macbottom is just as fast, plus it powers up automatically, and is more compact and portable. The Macbottom has earned our respect for its high performance, its reliability, and the friendliness of its software. Software enhancements permit convenient backup to floppies (entire volume, changes only, or selected files) and allow you to mount volumes from a desk accessory quickly. Volumes can be resized. The built-in print spooler saves you time. No installation required — just plug it into the printer port and go! Warranty is for 6 months parts and labor. We strongly recommend Macbottom. You can trust it to save your data and your time.

OverVUE $149
From ProVUE

OverVUE 2.0 is our favorite database at Icon Review. OverVUE is the FASTEST database we've seen, sorting 1,000 records in only two seconds! Its outstandingly versatility lets you display your data in many ways on the screen and on paper. OverVUE's most powerful features include macros, built-in charting, and relational joining functions. OverVUE offers you the best balance of power and ease-of-use in database managers at any price.

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Templates for OverVUE!
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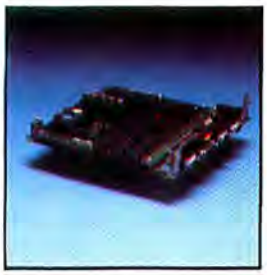

Icon Review Memory Upgrade

Good news! Your memory upgrade is already done! Just place your order, and we'll send you the upgraded board via Federal Express. Use the enclosed tools and instructions to open your Mac, swap boards, and you're up and running without even taking your Mac off your desk! The 120-day warranty outlasts Apple's upgrade warranty by a month. The two megabyte upgrades include a fan and contain PROMS that are reprogrammable to adapt to further system changes from Apple.

28K to 512K	$269
512K to 2 Meg	$659
128K to 2 Meg	$799

MacServe

From Infosphere **$249**

MacServe adds exciting new features to your AppleTalk network. It lets any of the leading hard disk drives, including SCSI drives for the Mac Plus, act as a disk server, so that all network users can share its volumes. MacServe can partition ANY hard disk into volumes (even an Apple HD 20!), with different volumes working under either Apple's new HFS or the old file system to prevent software compatibility problems. MacServe offers each network user password protection, incremental backup, and access to multiple printers. The print spooler queues up multiple jobs, saving you time. Let MacServe unleash the full potential of your AppleTalk network today!

SuperCrunch

From Paladin **$189**

This powerful new spreadsheet with integrated graphics and database will help you get the most from your Mac! Its 63 icons make SuperCrunch easy to learn and use, and help you initiate commands and macros quickly. Unique 3-dimensional worksheets provide all the benefits of linked worksheets without the fuss. Supports both recorded and programmed macros, extensive auditing features, and voice synthesis to speed proofreading! Get all the spreadsheet power you'll ever need with SuperCrunch!

Dinner at Eight & Silver Palate Collection

From Rubicon

Now Dinner at Eight can give you convenient access to recipes from the Silver Palate, Manhattan's most exciting gourmet shop. Imagine assembling your dinner party menu of exciting Silver Palate dishes, then relaxing while Dinner at Eight scales the ingredients for the number of servings you specify, and prints out the recipes (which you can splatter without guilt) as well as a list of combined ingredients for convenient shopping. It even coordinates cooking times and recommends the wine!

Dinner at Eight	$35
Silver Palate	$29

LoDOWN Hard Disk Drives

From LoDOWN

Here's our pick for the best SCSI drive for the Mac Plus! SCSI gives much faster performance than even internal hard drives on an old Mac 512K. LoDOWN uses the high-quality Lapine drive, and it is quiet. Its well-ventilated case needs no fan and contains a built-in surge suppressor! LoDOWN requires only the new HFS system with 5.1 Finder. You can use a cable up to 25 feet long, autoboot, and chain up to eight LoDOWNs for as much storage as you need. Available in sizes that fit your needs and prices that fit your budget!

LoDOWN SCSI Drives

10 Meg	$695
20 Meg	$895
40 Meg	$1795
80 Meg	$3495

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BUSINESS

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Word Tools NEW! $CALL

Assimilation
Business Essentials $65

Blythe Software
Omnis 3 SPECIAL $249
Most powerful database manager

Borland
Sidekick $45
Desk/phone/schedule organizer extra ordinaire!
Phone Link NEW! $CALL
Lets Sidekick dial for you.

BrainPower
Power Math SPECIAL $52
Powerful symbolic equation solver
StatView 512K SPECIAL $99
Excellent stat package—strong recoding and case selection

Brainstorm
Overture $89

Cricket Software
StatWorks $79
Great value with best statistical graphs

DataPak Software
My Office $95
Super graphic office on a disk!
Executive Office $299
NEW! Extra power for the professional

Dow Jones
Spreadsheet Link SPECIAL $57
Download from electronic data services

Electronic Arts
Financial Cookbook SPECIAL $32
Answers your financial planning questions

Execucom
Mindsight NEW! $139
Business planning and decision analysis

Harris Technical Systems
Profit Projections/Breakeven Analysis $49
Quick analysis and graphics—easier than spreadsheets

Hayden Software
I Know It's Here Somewhere $34
Easy-to-use personal filer

Layered
Excel Notes NEW! $59
Jazz Notes NEW! $59

Micro Planning Software
MicroPlanner $199
Sophisticated project management and scheduling
MicroPlanner Plus $299
Enhanced version requires 512K

Microsoft
Chart $75
Excel $229
File SPECIAL $112
Multiplan $107
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Dollars and Sense $82
ForeCast $45
Tax planning—works with Dollars & Sense

Nolo Press
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Faster, enhanced

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Helps develop strategies, solve problems
Sales Consultant NEW! $CALL

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SuperCrunch NEW! $189

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Simplifies creating/maintaining properly formatted bibliographies

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Best balance of power and ease-of-use in databases
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Fully professional list management

Softstyle
Decision Map SPECIAL $75
Innovative decision support and modeling

State-Of-The-Art
Electric Checkbook SPECIAL $39

Telos
Business Filevision NEW! $199

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Chang Labs
Rags To Riches
- **Acct's Pay.** SPECIAL $105
- **Acct's Rec.** SPECIAL $105
- **Gen. Ledger** SPECIAL $105
- **3 Modules** SPECIAL $249

(All the above)
- **Inventory** NEW! $105

Micromax
Gallery Finance $169
Special Edition includes Cash Disbursement, GL, and either AR or AP

Peachtree
Back to Basics
- **Gen. Ledger** SPECIAL $89
- **Accounts Payable** NEW! $89
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Sierra Information Systems
Accountants Choice
- **Acct's Pay.** $259
- **Gen. Ledger** $259
- **System Manager** $59
- **Demos (ea.)** $15

Professional small business accounting—hard disk required

Softview
Mac-in-Tax '85 SPECIAL $49
Just in time for taxes!

GRAPHICS

Adobe
Laser Fonts $CALL

Altsys Corp.
Fontastic Font Editor $25
Make your own fonts

Ann Arbor Software
Full Paint NEW! $69
Same features as MacPaint PLUS opens up to four documents at once, includes stretch, rotate, and more!

B. Knick Drafting
MacPerspective SPECIAL $119
Time-saving tool for drafting

Broderbund
Print Shop NEW! $CALL

Casady Company
Fluent Fonts SPECIAL $29
Fluent Laser Fonts NEW! $CALL

Challenger Software
Mac 3D NEW! $129

Cricket Software
Cricket Graph NEW! $139

Data Food
Draw Forms $30
Requires MacDraw
MacForms $42
Requires MacPaint

Diversions
Underware Color Pack $19
Underware Color Pens $11

Druid
Classic Fonts $35
For LaserWriter

Enabling Technologies
Easy 3D NEW! $79

Enterset
Quick Paint SPECIAL $29
Browse, cut, and paste MacPaint files from Desk Accessory

Hayden Software
Art Grabber SPECIAL $29
VideoWorks $58
Astonishing visual effects!

Innovative Data Design
MacDraft SPECIAL $139
Most powerful drafting tool for the Mac

IO Design
Color Print NEW! $25
Print your graphics in color!

Kensington
Professional Type Fonts $29
Professional Type Fonts (512K) Headlines $42

Magnum Software
Slide Show Magician $39

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Ready-Set-Go NEW! $CALL

Mesa Graphics
Plot-It $79
Plotter drivers for Mac

Micro Spot
Mac Plot $139
Plotter drivers for Mac

Shaherazam
Mac-A-Mug NEW! $CALL

Silicon Beach Software
Accessory Pak #1 $24
Cut and paste whole MacPaint pages and more!

Simon & Schuster
Mac Art Department SPECIAL $24
Tells how to use graphics effectively, includes great clip art

Symmetry
Picture Base NEW! $48
Organize your picture files for easy access!

T/Maker
Click Art Effects SPECIAL $29
Add tools to MacPaint
Click Art Letters SPECIAL $31
Click Art Personal Graphics $31

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Assimilation
MIDI Composer $22
MIDI Conductor $75

Electronic Arts
Deluxe Music Construction Set SPECIAL $32

Great Wave
Concertware+ $39
An education in music
Concertware+ MIDI $CALL

Kette Group
MacNifty Music Studio $CALL
MacNifty Sound Digitizer $CALL
MacNifty Stereo System $59
Great sound for the Mac—includes speakers

Mark Of The Unicorn
Professional Composer $239

Opcode
MidiMac Interface $99
MidiMac Sequencer $119
MidiMac Patch Librarian $39
MidiMac Patch Editor for DX/TX $75

Rubicon
Songpainter $37

Tempo
From Affinity Microsystems **$79**

Macros save you time by recording and replaying command sequences, but only Tempo lets you edit your macros, launch and quit programs under macro control, enter data during macro execution, and branch logically from one macro to another! Fly through command sequences at the speed you choose!

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MacServe *NEW* **$249**
XL Serve *SPECIAL* **$99**
Partitions Mac XL hard disk, network disk server, print spooler & more!

Prometheus
ProModem 1200 M **$319**
All options available —Call!

HARDWARE

Assimilation
Mac Turbo Touch **$95**
Replace your mouse with this trackball
Numeric Turbo **$129**
Trackball with numeric keypad

AST
Ram Stack—.5 meg. **$599**
Ram Stack—1 meg. *SPECIAL* **$799**
Ram Stack—1.5 meg. **$999**
Additional memory for your Mac XL

Cannon
PC20 Personal copier **$CALL**
PC25 Personal copier **$CALL**

Cuesta
90 Watt Datasaver **$299**
200 Watt Datasaver **$399**
Protection from power blackouts

Ergotron
MacBuffer 256K *NEW* **$CALL**
MacBuffer 512K *NEW* **$CALL**
MacBuffer 1024K *NEW* **$499**
Hot new print buffer

GTCO Corporation
MacIntizer **$479**

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Memory Upgrade
128K to 512K **$269**
512K to 2 Meg. **$659**
128K to 2 Meg. **$799**

Kensington
Control Center **$65**
Surge Suppressor **$34**

Koala Technology
Mac Vision **$175**
Puts images from your video camera into Mac

Kurta
PenMouse+ *NEW* **$CALL**
Quality digitizing tablet with cordless stylus

Mouse Systems
A+ Mouse (optical) *SPECIAL* **$57**

NEC
Color PinWriter Printer **$CALL**
Colormate Kit **$CALL**

New Image Tech
Magic Video Digitizer **$249**
The best!

Systems Control
Mac Gard **$55**
Protect your Mac from power surges

Thunderware
Thunderscan **$175**

TurboCharger 2.0
From Nevins Microsystems **$55**

TurboCharger saves you time by using a disk cache to speed up your Mac's performance. Apple has included a disk cache in the new Mac Plus, but you'll want TurboCharger 2.0 on your Mac 512 or Plus for its more convenient features. For example, TurboCharger automatically sizes its cache for the application you're using. TurboCharger has a library of optimum cache sizes for most popular applications, and you can add more to the library if needed. It's compatible with hard disks, networks, HFS, and the 128K ROM. If you hate staring at the wristwatch icon, you need TurboCharger!

DISK DRIVES

Abaton
Drive 5.25 *NEW* **$CALL**
Lets Mac read any IBM-compatible format disk, run CP/M programs, and more! UNDER $600!

IOmega
Bernoulli Box *NEW* **$CALL**
New SCSI version available!

LoDown
LoDown SCSI 10 Meg Disk *NEW* **$695**
LoDown SCSI 20 Meg Disk *NEW* **$895**
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LoDown SCSI 80 Meg Disk *NEW* **$3495**
LoDown Tape 20 Meg *NEW* **$795**
LoDown Tape 60 Meg *NEW* **$1595**

MacVentures
QuickDrive *NEW*
500K External RAM Disk **$399**
2 Meg External RAM Disk **$799**
Extension Modules **$CALL**
Battery Backup **$119**

Mirror Technologies
Magnum Ext. 800K Drive **$375**
Mirror 20 Meg SCSI Drive **$CALL**
Mirror 20 Meg Tape Backup **$CALL**

Paradise Systems
Mac 10 *SPECIAL* **$599**
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PCPC
Macbottom 20 Megabyte **$1149**
Most Mac-like personal hard drive

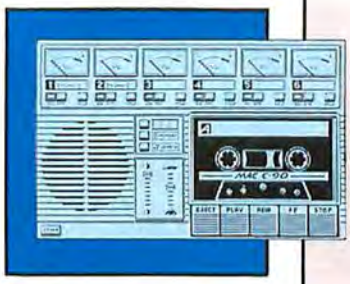
Tecmar
Mac Drive —10 Megabyte *SPECIAL* **$669**

Western Automation Labs
Dasch
500K External RAM Disk **$399**
1000K External RAM Disk **$699**
2000K External RAM Disk **$799**

ACCESSORIES

Assimilation
Mac Daisy Wheel Connection *SPECIAL* **$69**
Mac Port Adapter *SPECIAL* **$59**

Beck Tech
Fanny Mac *SPECIAL* **$79**
Fan fits in Mac's handle



Studio Session
From MacNifty **$69**

The most exciting sounds we've heard from a Macintosh are created by MacNifty's Studio Session! Digitally-captured instrument libraries give Studio Session its true-to-life sound. Its extensive music editor supports six voices, note-by-note entry, a phrase library, a block editor, transposition, signature ties, and slurs. Gives your Mac high-quality sound without a hardware synthesizer! Make the most exciting Mac music with MacNifty Studio Session!

Facts of Mac Posters (2) **$17**
Mac schematics chart

Caribbean Enterprises
THE Bag *NEW* **$129**
Quality leather tote bag for Mac

Computer Friends
MacInker *SPECIAL* **$55**
Save $$ by re-inking ribbons—includes ink!

Eichner
Disk Holder **$25**
Disk Holder with Lock **$33**

Ergotron
Mac Tilt **$79**
Swivel stands for Mac & 2nd drive

Icon Review
Head Cleaner **$19**
Mac Cracker *SPECIAL* **$20**

Innovative Technologies
The Easel **$14**
Cloth case carries and displays disks
Pocket Pack **$9**

Kensington
Printer Stand **$19**
Polarizing Filter **$CALL**

Kette Group
MacNifty A-B Switch **$27**
MacNifty A-B-C-D Switch **$45**

MacAttire
Dust Covers *NEW* **$7 to $20**
Individual covers available for Mac, keypad, external drive, ImageWriter, LaserWriter, and more!

MacHelp
MacHelp Reference Cards **$12**
Cards perch on Mac or keyboard providing quick reference. Choose from Jazz, MS-Word, Multiplan, Excel, MacPaint, or MacWrite

Micro Store
Disk Book **$22**
Highest quality, notebook-sized carrier for 32 diskettes—made in U.S.A.
Small Disk Book **$14**
Holds 10 diskettes

Mountain Equipment, Inc.
Mac Carrying Case **$79**
The Best! Heavy-duty and stylish
ImageWriter Carrying Case **$59**

Mousetrak
MousePad *SPECIAL* **$8**

Ring King
Sound-Write™ **$99**

Leatherware
Disk Wallet *SPECIAL* **$29**
Packs 6 disks in your jacket pocket—in fine leather, executive style!

DISKETTES

Sony 3½" (10) *SPECIAL* **$22**
The Best!
Sony 3½" (10) DS/DD **$36**

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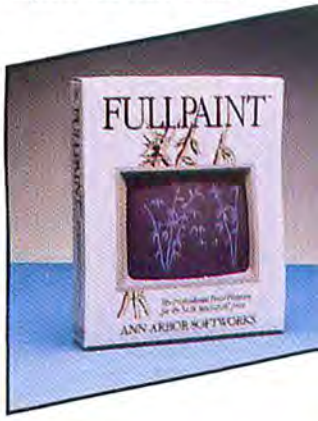

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(continued from page 39)

rest of us." From the beginning the machine has been priced beyond the reach of "the rest of us," while Apple's marketing strategy has assured the disdain of businesspeople at the other end of the spectrum, including most of my fellow attorneys. When a product is marketed away from business, as the Macintosh has been, you can hardly expect business buyers to give it a lot of attention on their own initiative. Of course, this translates into a shortage of business software for the Macintosh, which intensifies the cycle of business indifference.

Microsoft's promotion of *Excel* has been a welcome change in the marketing of Macintosh products. Those of us who believe the Macintosh is a better business product than its competitors, not just a groovy-but-inferior substitute, hope that enlightened marketing of this kind will turn the fate of the Macintosh around.

Markley S. Roderick
Pennsauken, New Jersey

Singing the Blues

I had been looking at music programs recently because I wanted to copy and print music for a friend. When I read about *Deluxe Music Construction Set* ["They're Playing Our Song," *Macworld*, February 1986], I immediately ordered it. I was excited as music on my external speaker came out smooth and clear.

My first disappointment was the manual, which was confusing and incomplete. Then I tried to print out just one page of a score and couldn't. I tried to squeeze more music on the page vertically and couldn't. I tried to stop my Mac once the printing started, but there is no mention of how. Slurring was difficult without crashing the program.

Peter Bloeme
Brooklyn, New York

The initial release of Deluxe Music Construction Set *does not include a way to print a range of pages. The program does make provision for controlling the spacing between staves to squeeze more music on a page.* Construction Set *programmer Jeff Brown says* ⌘*-period sometimes works to stop printing; press the keys repeatedly until you get results. Brown says that adding slurs sometimes does cause the program to crash; Electronic Arts plans to issue a new version of the program to correct the slur problem and a few other glitches. A supplement to the manual is planned to accompany the update. In addition, because a 128K Mac prints only ten measures at a time, Electronic Arts recommends using a 512K Mac for applications that require printing. The revision, which may be available as early as the end of this month, is also slated to include enhancements such as MIDI compatibility. The new version will cost more, but an Electronic Arts representative says registered owners are entitled to an upgrade for a modest fee.—Ed.*

Memory Lapse

Micro Conversions was the first firm to break the 512K barrier for the Mac. We are the only ones I am aware of to offer memory expansions compatible with internal disk drives such as the HyperDrive. We have expandable systems providing up to 4 megabytes of RAM.

(continues on page 46)

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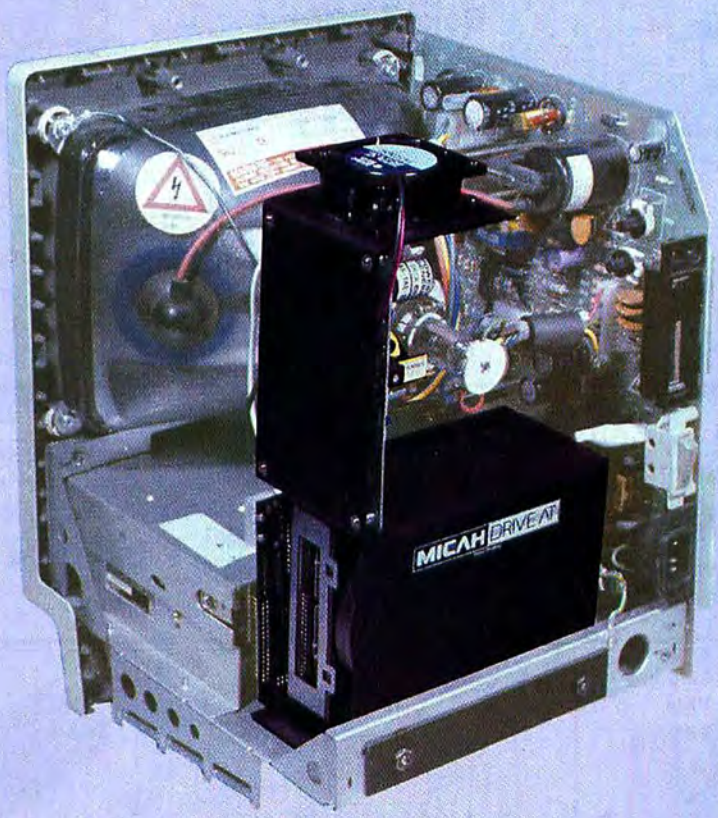

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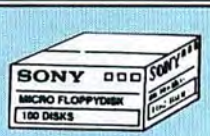

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(continued from page 44)

I was flabbergasted that the Micro Conversions product received such short shrift in "Megabytes and Beyond" in the February issue of *Macworld*. Apparently you not only reviewed our oldest product and described it incorrectly, but you had some trouble with it, which you didn't bother to look into and correct so you could complete the testing.

James C. Ackerly
Micro Conversions
Arlington, Texas

We eventually corrected the problem we encountered with the 1 Meg Upgrade and we were able to run the business applications that we tested on the other products. We regret that we failed to mention the results of our software test, but we felt that the reliability problem overshadowed the compatibility issue.

When we tested the four memory upgrade products, the only product available from Micro Conversions was the 1 Meg Upgrade. Micro Conversions has since released the 1/2/4 Megabyte Upgrade. Several times we requested the 1/2/4 Megabyte Upgrade product from Micro Conversions; however, we were told that the product was still under development. Since it is our policy to evaluate only products that have already been released, we could not include the 1/2/4 Megabyte Upgrade.—David Ushijima

Communications Problems

The review of our *inTouch* communications software ["No Static At All," *Macworld*, December 1985] contained several errors. MacinTouch is not the software publisher for *inTouch;* Palantir Software is. Also, *inTouch* does have MacBinary protocol. There were several mistakes in the table as well. You were not correct when you indicated that *inTouch* can't adjust settings within sequences, doesn't copy in table form, and has no remote access features.

In addition, *inTouch* has features you didn't mention. It saves selected text to a file, appends selected text to a file, and has a built-in text editor.

Kerry J. Williams
Palantir Software
Houston, Texas

(continues on page 50)

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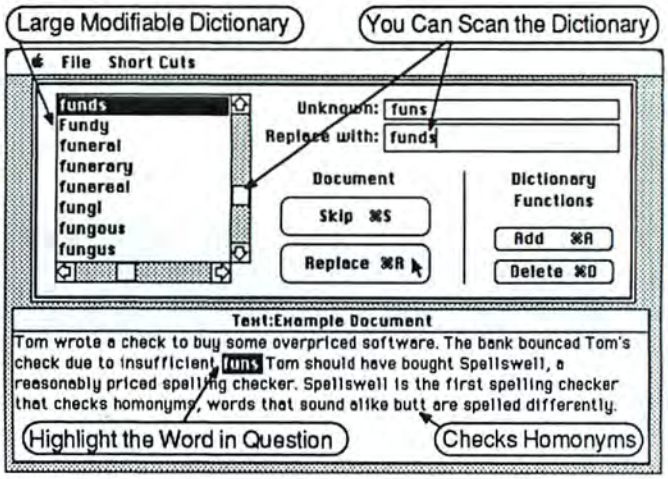

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e departments, small business/professional services, independent consultants, research establishments...

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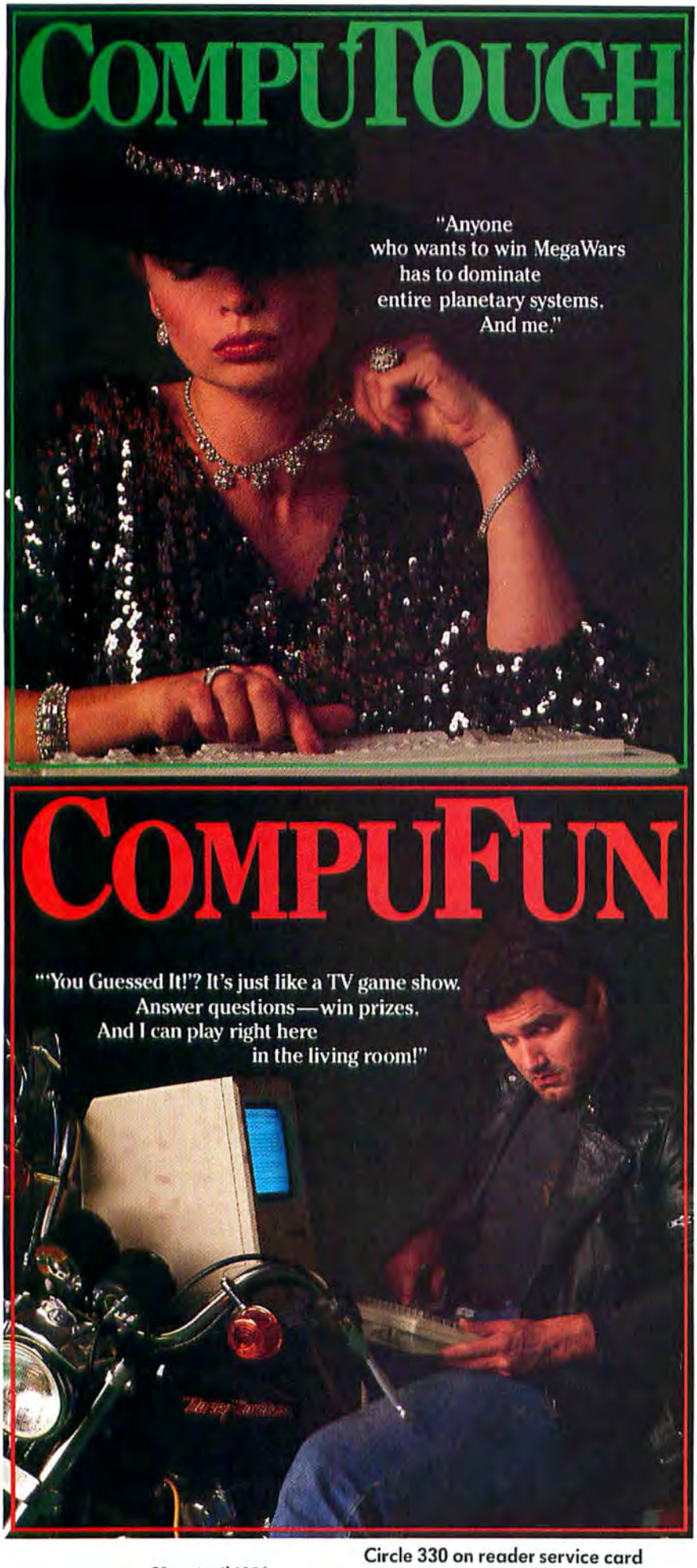

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Letters

(continued from page 46)

I was not informed of the pending contract with Palantir Software but was told that MacinTouch Software was the publisher of inTouch.

The version of inTouch *that I tested did not support MacBinary. I was told that a new version was in development and noted that fact in the article. The new version I've since tested does support MacBinary.*

There were two errors in the comparison table, as Mr. Williams points out. inTouch *does permit communications settings to be adjusted within an autopilot sequence, and it does permit the sending and receiving of files from a remote computer. While the program can capture text on disk in table form—with successive spaces replaced by a tab character for pasting into a spreadsheet program—its Copy command does not copy in table form.*

Finally, space limitations forced the omission of a section of the table that listed terminal emulation features. inTouch *does have excellent terminal-emulation features, including support for CompuServe's VIDTEX graphics terminal, which allows you to receive graphics such as weather maps from CompuServe.—Jim Heid*

A Little Static

We were surprised to read about a company calling itself MacinTouch Software in "No Static at All" in the December issue of *Macworld*. MacInTouch is a trademark and service mark of Ford-LePage, Inc., which is not associated in any way with either Palantir Software, the company that sells the *inTouch* telecommunications program, or with MacinTouch Software. *MacInTouch* is a 40-page newsletter for Macintosh professionals, published monthly since June 1985 by Ford-LePage, Inc., at P.O. Box 786, Framingham, MA 01701, 617/526-5808.

Ric Ford
Framingham, Massachusetts

More Static

Jim Heid's review of telecommunications software ["No Static At All," December 1985] makes short shrift of the many virtues of *Red Ryder*. While some other telecommunications packages may be comparable, it is clear from Heid's own chart that *Red Ryder* has the most complete set of features of any program available for the Mac.

Heid feels that *Red Ryder* is for people who are "willing to forego *Smartcom II*'s simplicity in exchange for macros and the ability to access files from a remote computer." Isn't that just the point? Why telecommunicate if you can't take maximum advantage of the whole process?

Scott Watson (not Scott Norman, as Heid incorrectly put it) should be applauded for having written a superlative piece of software at an incredible price. Watson also maintains his own bulletin board service for the exclusive use of *Red Ryder* users. Where else can you get support like that?

John Tarnoff
Los Angeles, California

I disagree that I gave Red Ryder *short shrift. I ranked it second among the five programs I reviewed and still consider it one of the best Macintosh communications programs.* Smartcom II, *however, is a better program for beginners, thanks to its easy autopilot facility and its extensive use of icons.*

Mr. Tarnoff is correct in pointing out that Red Ryder*'s creater is Scott Watson, not Scott Norman. I apologize to readers confused by the error, as well as to Scott Watson.–Jim Heid*

Giving Us the Business

Well, I hope you got that out of your system: 125 pages about the Macintosh as a "serious business computer," without any discernable content. Perhaps if the Winter 1986 Special Business Edition sold enough magazines, or Macs, or whatever it was supposed to sell, we won't have to see one like that for a long while.

I've already bought a Macintosh. The machine inspired me and continues to do so. I don't need a magazine to convince me that the Mac is a useful–perhaps the most useful–machine for almost any micro application.

Tyler Groo
Paulina, Oregon

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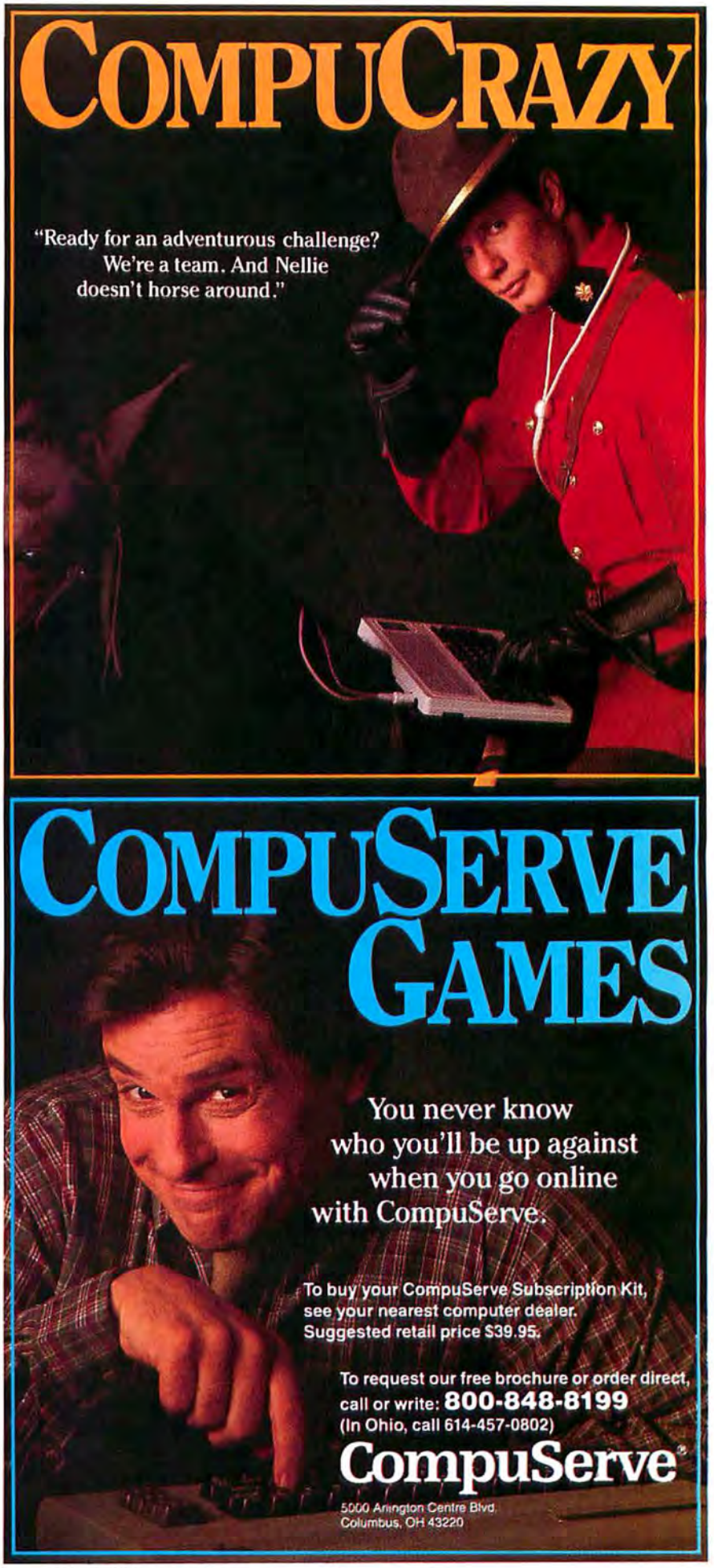

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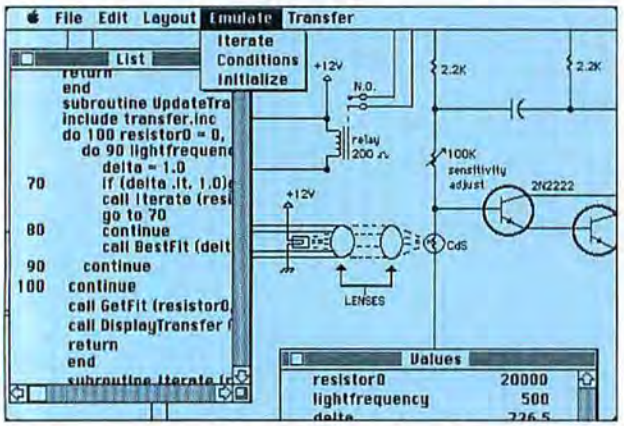

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- Single-step through your program.
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- Dynamically link routines as needed while executing.
- Statically link subprograms for faster execution.

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- Apple's source code editor—optimized for faster programming.
- Apple's resource compiler—takes advantage of special Macintosh capabilities.

System Requirements
- 128K Macintosh.
- One disk drive.

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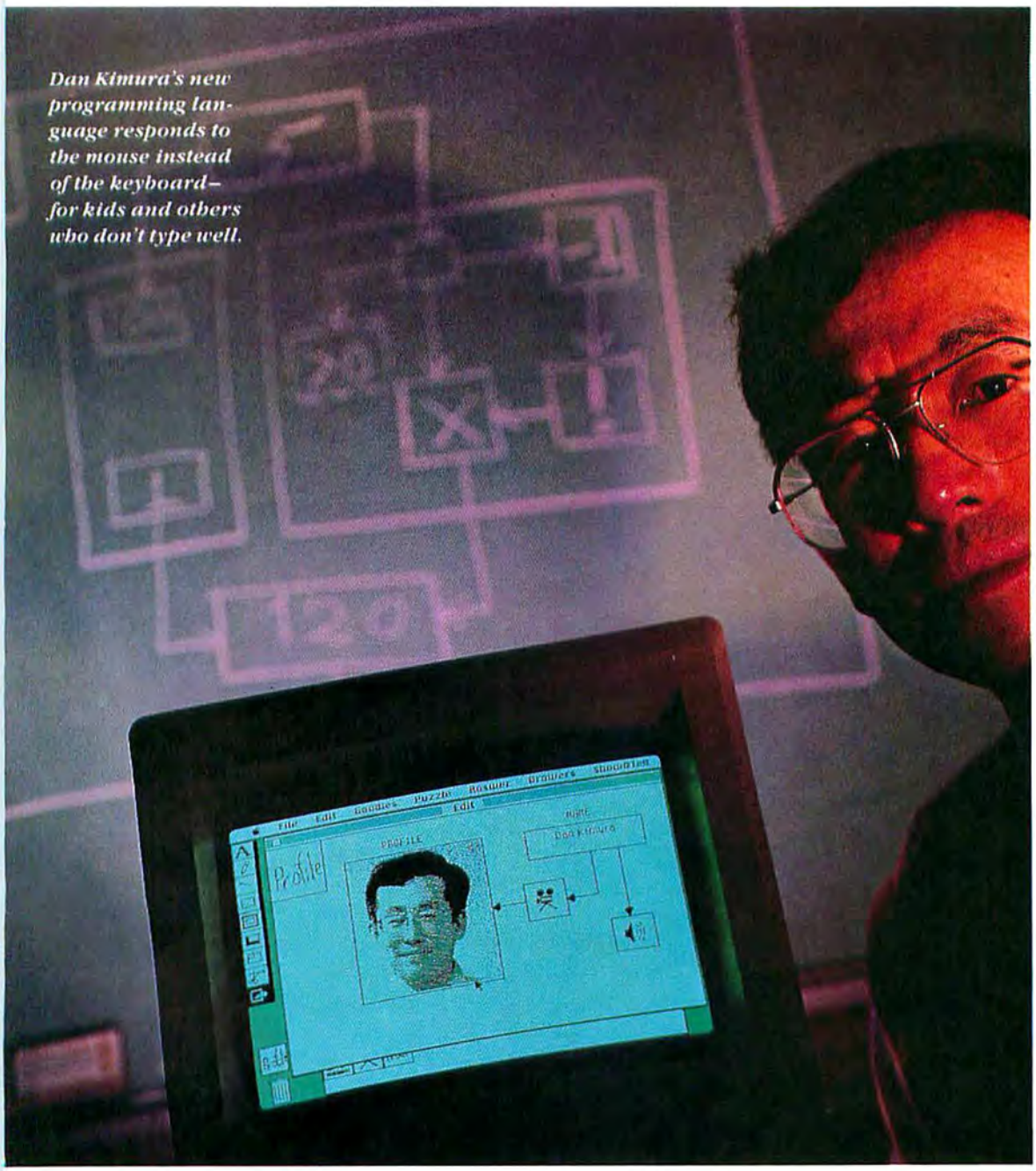
Macworld View

A programming language that bypasses the keyboard, a sleek new niche for the Mac, the missing link for home banking, and more



Dan Kimura's new programming language responds to the mouse instead of the keyboard—for kids and others who don't type well.

Show & Tell

At Washington University, in St. Louis, professor T. D. Kimura has developed what he calls a "keyboardless programming language." The language is called Show & Tell and features user-drawn icons, the mouse, and custom menus on the Macintosh. "If you can use a visual device like the Finder to find files," Kimura explains, "why not the same idea for programming?"

As in Brainpower's *ChipWits*, on-screen boxes and arrows represent and are used to construct all the operations, procedures, and relationships of traditional programming languages like BASIC or Pascal.

Kimura started his project about a year before the Macintosh was released, basing it on work done at Xerox and MIT. A professor of computer sciences, Kimura had just supervised the installation of a mainframe-based UNIX medical records system at the school's teaching hospital, only to find that most doctors "cannot type or even locate keys on a keyboard." The

(continues on page 55)

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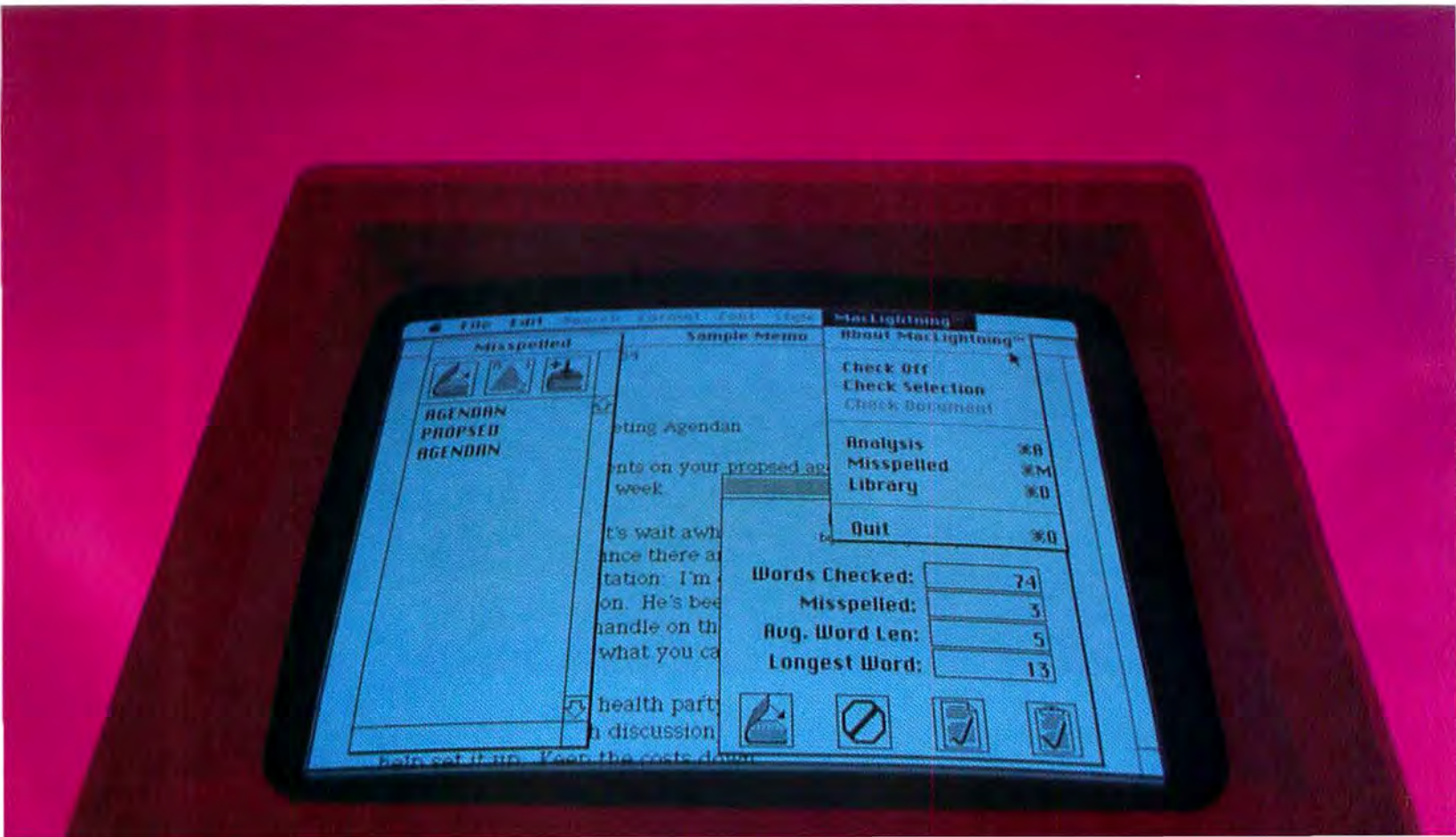


Show & Tell (continued)

multimillion-dollar installation was being used by the nurses, not the physicians it was designed to help. So he set out to build a system that "even a doctor could use."

In its present configuration Show & Tell is aimed at children. A Japanese software house, Computer Service Corporation, has put $300,000 of development money into the project. Kimura expects the language to be available in Japan and the United States this year, both on the Macintosh and on several Japanese micros. Not only does he hope that Show & Tell will simplify the teaching of programming concepts, but he plans to have it act as a kind of universal educational database. "I'm working on a geography database," explains the professor, "in which you ask questions and set up relationships without having to type a single word." Eventually he'd like to see Show & Tell become the query language for a large database, like an encyclopedia, so that even a doctor who types with one finger could create complex queries and easily extract data.—*Jeffrey S. Young*

Money Link

The promise of electronic home banking has been trumpeted for years. We were supposed to stop driving to the bank and start taking care of all our banking business by modem. It was going to be part of the paperless society. But something didn't gel.

Sure, the computers were in lots of homes, and most of the big banks offered some form of home banking. But customers didn't flock to sign up. And simultaneously automatic teller machines have become very popular, so it isn't that the public is afraid to punch keys and enter command codes. Where's the breakthrough product for the personal computer banking revolution?

Monogram, developer of the best-selling *Dollars and Sense* home finance program now running on the Macintosh, IBM PC, and Apple II series, has recently signed agreements with two of the nation's largest financial institutions—New York's Citibank and the Bank of America, in California—to provide home banking customers with a special service called MoneyLink. For a monthly fee, along with the cost of some software, both banks are offering this innovative new system that enables financial information from a customer's bank account to be directly downloaded, through the MoneyLink interface (which provides security capabilities too), into personal accounts set up and maintained in *Dollars and Sense.*

When you log on to MoneyLink, information from the bank is filed to the proper accounts in your computer's *Dollars and Sense* model. You then go off line, manipulate the information on your checking, savings, and credit card accounts, select transfers and payments to creditors, and look at your financial picture with the modeling and analytical tools contained in *Dollars and Sense.* Then log back on, upload the adjusted information, and see the work of a day's check writing done in seconds. Funds are transferred electronically to any account within the system. MoneyLink's main benefit is that you can manipulate your banking information on any day, not just at the statement date.

Once installed, the system is easy to use, but it does take some sophistication to design a working framework for your financial modeling. And making the most of the system requires regular involvement. For most people, letting the bank reconcile accounts each month is adequate. But for people or companies who want to stay at the forefront of technology and have more control over their financial information, MoneyLink offers a solution.—*Jeffrey S. Young*

Signs of the Times

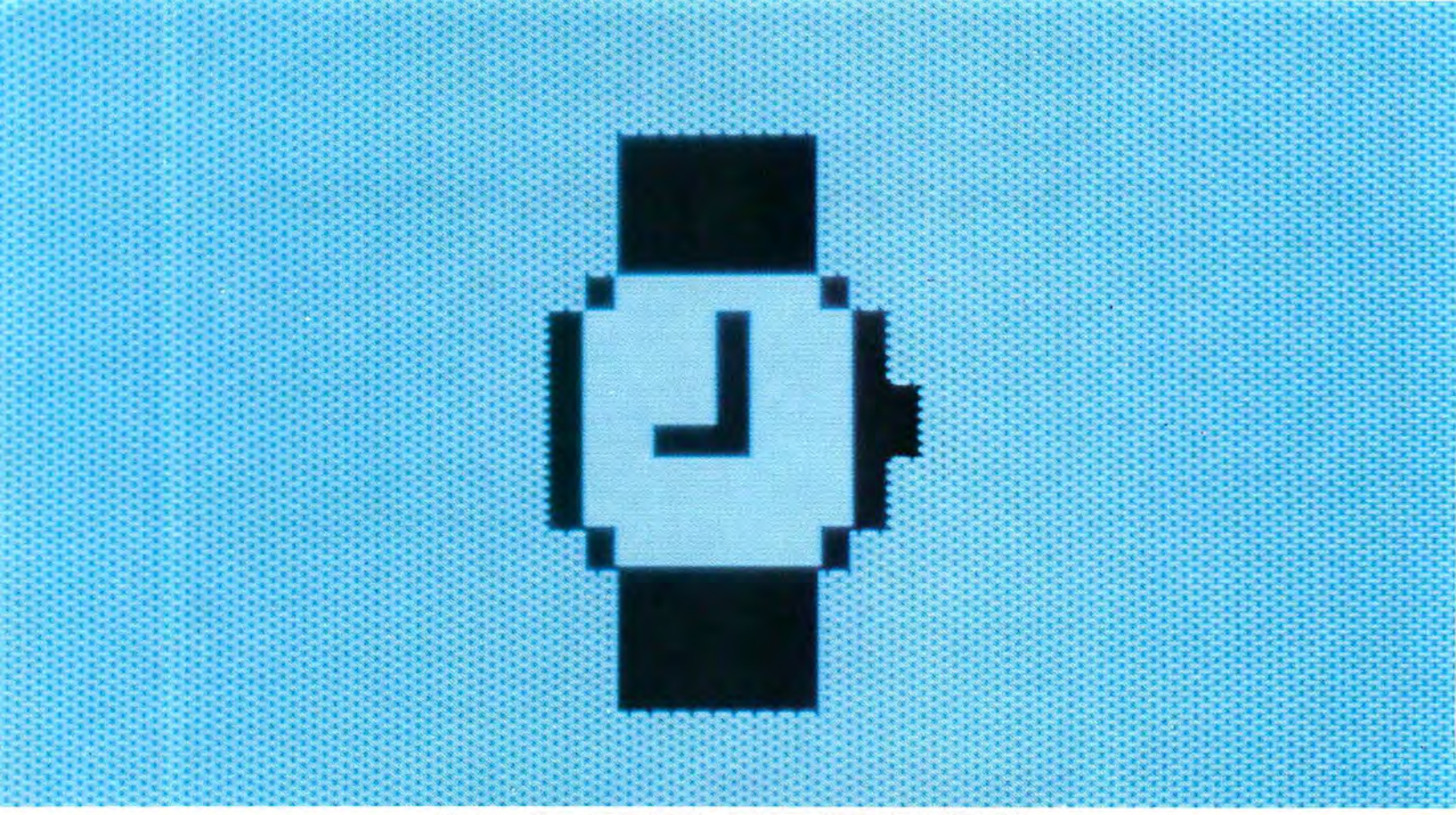
In the midst of a Marin County, California, neighborhood festival, a modern astrologer was observed working the charts and star tables with equipment that will soon no doubt be de rigueur for any self-respecting soothsayer: a 512K Macintosh, an Imagewriter, and an astrology program from Matrix Software.

The astrologer is Edwin Rosenzweig, and as chance would have it, he's a programmer with his own Macintosh software company, Pterodactyl Software, as well as the coauthor of a forthcoming book from Hayden on 68000 assembly for the Macintosh.—*Jeffrey S. Young*

Mac Furniture

You know a computer has come of age when a special desk is created for it by a high-tech furniture design firm. The MacTable pictured here was designed by two of Denmark's top designers, Jakob Jenson and Derek Denis. The pair's award-winning designs, which include the Bang & Olufsen stereo system, have been exhibited in museums such as the Museum of Modern Art in New York. For more information contact Scandinavian Computer Furniture, Inc., 305/557-5777.

At last, designer furniture for the Mac.



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The next demonstration will require a little imagination. Imagine a Macintosh with software that protects your data against loss by copying it onto diskettes. A print spooler that lets you go on to other jobs while your printer is occupied. And a security program that protects your files from unauthorized entry. You've just imagined a Macintosh with HyperDrive.

The next demonstration requires no imagination at all. Just stare at your Macintosh. Since HyperDrive is the first hard disk that's installed inside the Mac, it also preserves the Mac's appearance and portability.

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Macintosh Auditing

Peat, Marwick, Mitchell & Co., the international accounting firm, was one of the first major companies to endorse the Macintosh. Since May 1984, Peat Marwick's auditors have logged more than 3 million hours with the company's SeaCas (Systems Evaluation Approach–Computerized Audit Support) software. And more than 12,000 auditors have been trained to use the Macintosh and SeaCas. The company recently announced a program to upgrade its more than 5500 Macintoshes to take advantage of the extra memory, storage, and speed of the Macintosh Plus. In addition, the SeaCas software has been enhanced to exploit the Mac Plus's new features.

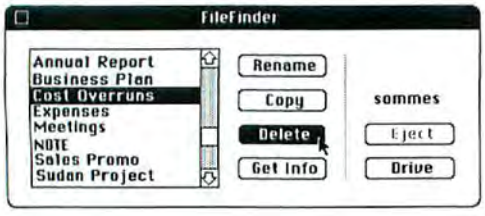
In a related matter, the international accounting firm Arthur Young and Company, with nearly 300 offices worldwide, has developed a proprietary software system for the Macintosh called AY/ASQ (Arthur Young/Audit Smarter, Quicker). The system consists of several integrated auditing modules, as well as data management, graphics, telecommunications, and word processing.

According to William L. Gladstone, chairman and managing partner of Arthur Young, "We set as one of our important objectives selecting a microcomputer that would meet our needs for ease of learning, transportability, and data integration capabilities and still be connectable to the wide variety of computer technologies used by our clients. The system developed for the Macintosh represents two years and 50,000 hours invested in development and testing."

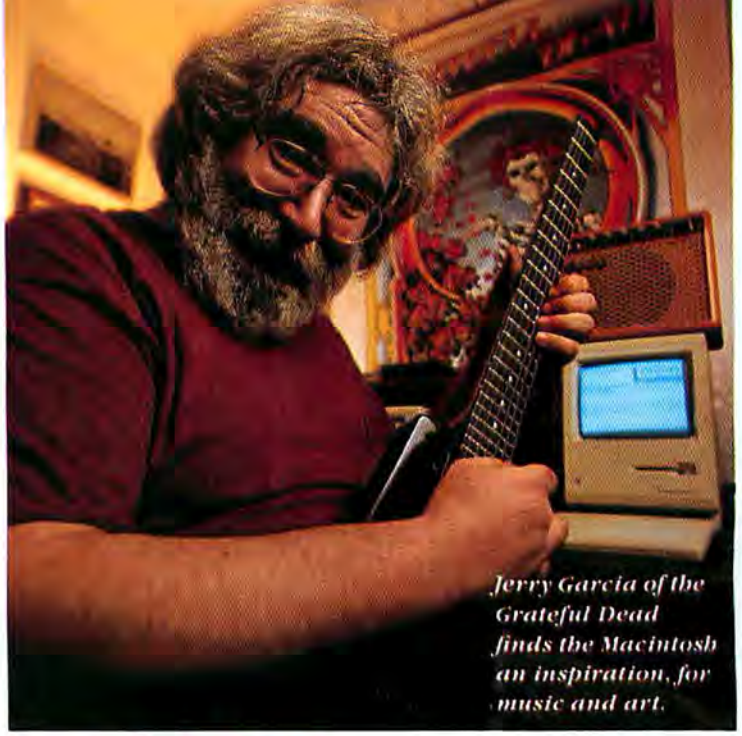
With the release of AY/ASQ, Arthur Young becomes the first major CPA firm to incorporate expert systems technology into the audit planning process. The AY/Decision Support Module guides auditors through the entire audit process. During the initial planning the auditor identifies high-risk areas. The decision support system then offers a selection of key auditing procedures performed in similar situations. In addition, the system can recommend special procedures customized for specific situations or industries. By mid-1986 the company expects to have the new system implemented in the firm's 88 domestic offices.

FileFinder

Have you ever wanted to delete, rename, or view document and disk information while you work within an application? That's what *FileFinder,* a desk accessory from Nashoba Systems, lets you do. The current version of the program works on a 128K or 512K Mac. A future version is planned that will work with Apple's Hierarchical File System.



File Finder
This desk accessory allows you to modify files within applications in ways previously limited to the Finder.



Jerry Garcia of the Grateful Dead finds the Macintosh an inspiration, for music and art.

Grateful Dead

There's no mystery about it. In the eighties the Macintosh has swept into the world of modern music and become the computer of choice for musicians working with keyboards, synthesizers, and synthesizers' even more advanced counterparts, emulators. Inexpensive MIDI interface boxes and music programs enable professional musicians to compose on an electronic keyboard instrument, see their music transcribed into standard notation on the Macintosh, use the mouse to edit the composition on screen, and then play their work back through the keyboard instrument. The higher-priced emulators are able to take advantage of digital recording devices and can store actual sounds–a string quartet or a quartet of barking dogs–as data on Macintosh disks, manipulate the sounds electronically, and then play them back through a keyboard.

So how does the Macintosh and this high-tech music equipment affect a rock 'n' roll band? In the case of the Grateful Dead, a premier band of the sixties that is still going strong in the eighties, the impact has been substantial–but not yet so much in terms of their music. Bassist and songwriter Phil Lesh has recently been using the Macintosh to compose multipart scores but is dissatisfied with the composition programs available on the Mac. He's excited enough about the Mac, however, to devise a unit that allows him to guide the mouse while onstage so that he can select and use digitized sound loops stored in the computer. Percussionist Mickey Hart has done much of the sound effects work for the TV show "The Twilight Zone" using a Mac and an emulator.

The band's electronics wiz, John Cutler, has been writing programs to drive amps and combinations of equipment, as well as designing his own custom circuit boards. The Dead's administrative offices use four Macintoshes to handle all correspondence, account-

(continues on page 59)

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Grateful Dead (continued)

ing, and scheduling. And the band's longtime publicist, Dennis McNally, has been transferring his years of notes to Mac disks for a forthcoming book.

Then there's guitarist and songwriter Jerry Garcia. In many ways he's the ultimate sixties performer, an emblem now for the flower generation—someone you might not expect to be into computers. But no. "Music and machines have been around each other for a long time," says Garcia. "I've had my eye on computers, but the Macintosh was the first one I figured I could use."

He uses the Mac to create music, too—Grateful Dead style. "I was looking at the *MusicWorks* grid one day, and it reminded me of an Aztec blanket," Garcia remembers, "so I picked up my guitar and wrote a song called 'Aztec Blanket.'"

Garcia was impressed by *MacPaint* and dove into creating animation art for the band's 20th anniversary celebration. But since the Mac is still without color, he uses an airbrush to enhance his drawings. "The Mac is like a whole new doorway that I can go through," Garcia enthuses. "It's a new language with which I can express myself. The ideas just bubble up. I hadn't done painting since art school—I picked up the guitar, and, well, I got sidetracked for a while. Now, thanks to the Mac, I'm drawing all the time. And they all influence each other. It's synchronicity, man. Far out!"—*Jeffrey S. Young*

Communications Alliance

Last year Apple announced plans to integrate its Macintosh computers with a variety of computer and telecommunications networks. To facilitate that objective, Apple and Northern Telecom, a leading supplier of digital PBX (private branch exchange) equipment in the United States, have created an operating agreement that allows Macintoshes to be networked over standard twisted-pair telephone lines. Macintoshes can be connected to computers and peripherals of other manufacturers, such as IBM, DEC, and Hewlett-Packard, over phone lines. Northern Telecom has already equipped more than 17,000 sites with its digital telecommunications systems.

According to Roger Fetterman, director of Northern Telecom's integrated systems program, Apple and Northern Telecom will discuss customer equipment, how the companies will work together in the field, and opportunities for joint product development and marketing.

I suspect that many of you have had strange or enlightening encounters with the Macintosh. Or perhaps you've heard of someone else's unique application of the Mac. Your contributions are welcome. Macworld *pays up to $50 for each item published. Send your contributions to* Macworld View, *555 De Haro St., San Francisco, CA 94107. I look forward to hearing from you.* □

Macworld Best-Seller Software

This month	Business	Last month	Months on chart
1	Microsoft Excel, *Microsoft*	6	1
2	Jazz, *Lotus Development*	1	5
3	Microsoft Word, *Microsoft*	2	9
4	Microsoft Multiplan, *Microsoft*	4	9
5	Microsoft File, *Microsoft*	3	8
6	MacDraw, *Apple Computer*	5	6
7	Dollars and Sense, *Monogram*	7	9
8	Odesta Helix, *Odesta*	8	5
9	pfs:file, *Software Publishing*	14	8
10	MegaForm, *Megahaus*	–	1
11	OverVUE, *ProVUE Development*	–	0
12	pfs:report, *Software Publishing*	–	4
13	Microsoft Chart, *Microsoft*	9	9
14	ThinkTank, *Living Videotext*	13	4
15	MacTerminal, *Apple Computer*	–	6

Source: InfoCorp survey of over 300 retail stores

Software Watch

Editors' choice: other recent software of particular interest

MacDraft, *Innovative Data Design*
Graphics

Insight Accounting System, *Layered Accounting*
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Hard Disk Util, *FWB Software*
Utility

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6	✓	Form 3468 — Investment Credit
7	✓	Schedule D — Capital Gains and Losses
8	✓	Schedule E — Supplemental Income Schedule
9	✓	Schedule G — Income Averaging
10	✓	Schedule SE — Computation of Social Security Self-Employment Tax
11	✓	Schedule W — Deduction for a Married Couple When Both Work
12	✓	Form 2441 — Credit for Child and Dependent Care Expenses
13	✓	Form 6251 — Alternative Minimum Tax Computation
15	✓	Forms 2119, 3903 - Sale of Residence, Moving Expense
17	✓	Forms 2106, 5695 - Employee Expenses, Energy Credit
18	✓	Schedule R — Credit for the Elderly and Disabled

All of these schedules are on a single spreadsheet.

Fill in only relevant blanks. See the federal tax owed or your refund.

On a separate spreadsheet with Multiplan.

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1	✓	Form 1040 and Accompanying Schedules Listed Above
2	✓	Multiyear Form 1040 and Accompanying Schedules
3	✓	Comparison of Joint and Separate returns
4	✓	ACRS depreciation schedule including investment credit, expensing, and recapture of depreciation and investment credit upon sale.
5	✓	Straight Line depreciation schedule including investment credit, expensing, recapture of depreciation and investment credit upon sale.

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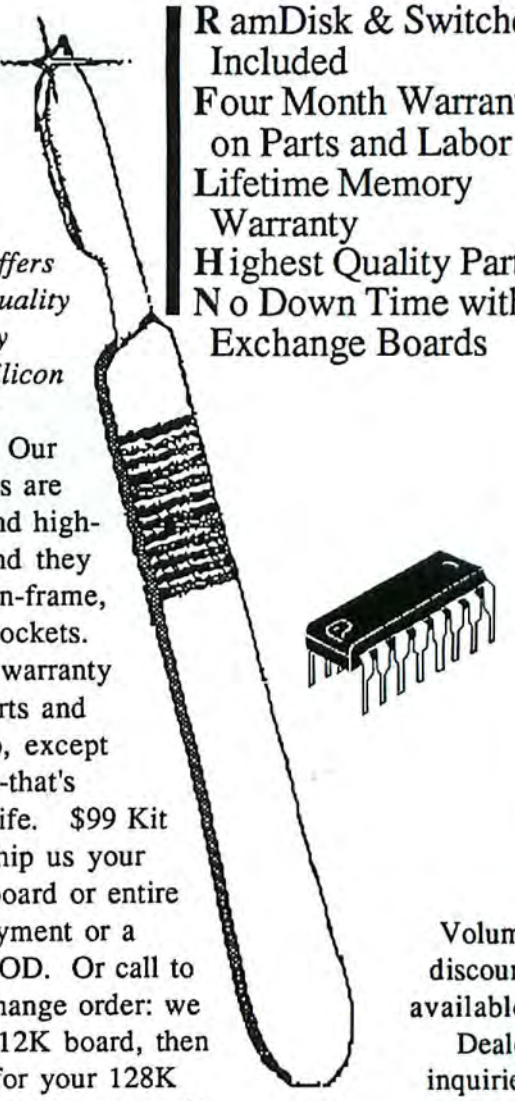

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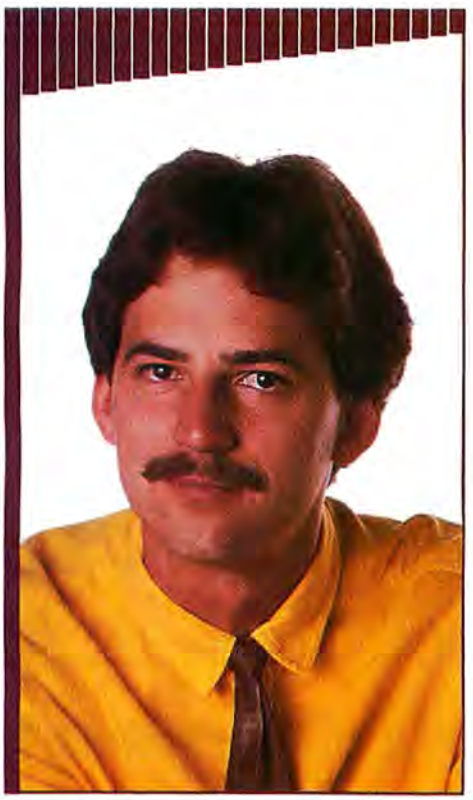
Get Info

Answers to questions about printing disk catalogs, customizing MacDraw patterns, and confronting the icon of unhappiness

Lon Poole



Apple's HFS—hierarchical file system—does not limit the number of files on a disk.

This month: how to print disk catalogs that show every file in every folder, why the number of files per disk is limited, what the Sad Mac icon means, how to customize patterns in MacDraw, *and what to do when you Macintosh Pascal programmers want to print data that's in the Text window. Finally, in response to the November 1985 column, some readers suggest better ways to find the center of circles and draw equilateral triangles in* MacPaint.

Disk Catalog

Q. Most of my correspondence is stored on disk in folders. Whether I select Print Catalog or print a screen shot of the desktop, I can't get a complete list of folders and documents. Is there a way to print all document titles, alphabetically or chronologically, without disturbing my folder system?

Bill Steinbicker
Eden Prairie, Minnesota

A. Neither the Print Catalog command nor the screen shot feature (pressing ⌘-Shift-4) prints a directory of every file in every folder on a disk.

Mac Disk Catalog (New Canaan Microcode, 136 Beech Rd., New Canaan, CT 06840, 203/966-6969) constructs a catalog of one or more disks. It displays two windows: one window lists the disks in the catalog, and the other lists files. For each file on every disk, the window shows the name, date created, date modified, size, creator, type, and disk (volume). Files can be listed by name, by date of creation or modification, by creator, or by type. All this information can be printed out. Folders on disks that use the original, flat Macintosh file system are completely ignored. *Mac Disk Catalog* comes in two versions: the $39.95 *MDC* 1.3 for 128K Macs and the $49.95 *MDC* 2 for 512K and larger Macs. Version 2 handles five times as many files as version 1.3—about 5000—and has a search feature to help you find a file in the catalog.

MacLabeler ($49.95 from Ideaform, 908 E. Briggs, Fairfield, IA 52556, 515/472-7256) creates a directory of one disk at a time. The program's directory lists all files on the disk, all folders on the disk, or all folders and the files in each.

For each file listed, the directory includes the name, size, type, date created, and date modified. Files can be listed by name, by size, by type, or by date created. The chief purpose of the program is to print disk labels based on the directory. You can edit the label before printing it.

As of this writing, neither *Mac Disk Catalog* nor *MacLabeler* could properly catalog a disk that uses Apple's hierarchical file system, which was developed for the company's Hard Disk 20, although upgrades are planned.

Printing Macintosh Pascal

Q. Macintosh Pascal programs write to the standard output device, which is the Text window. Is there any way to send information in the Text window to a printer?

Jonathan Su
La Crescenta, California

(continues on page 64)

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(continued from page 63)

A. A Pascal program cannot retrieve text from the screen and print it, but it certainly can send text to the printer instead of, or in addition to, the Text window, as the short program in "Triple Output" illustrates.

The WriteLn procedure sends output to the Text window. The WriteDraw procedure sends output to the drawing window. There is no special procedure for sending output to the printer, so the program treats the printer as if it were a text file. The program uses a Rewrite procedure to associate a text file identifier, outdev, with the "file" destined for the printer. Then a WriteLn procedure directs output there.

You may want to choose where output will appear at different times. "You Choose" shows one approach. If you type *S*, this program assigns the standard output device (the Text window) to the text file (in this case named outdev) used for output. Otherwise, a Rewrite procedure opens the printer for output. The same text file identifier, outdev, is used in both cases. Thus one WriteLn procedure can handle output to either destination.

More Files on Single-Sided Disk

Q. My data files are typically 2K in size. Because the Macintosh limits the size of the directory to approximately 100 files per disk, much of my disk space remains unused. I prefer not to concatenate these data files into a smaller number of larger files. Is

(continues on page 66)

Triple Output
This short program prints the contents of Macintosh Pascal's Text window.

List Triple

```
program TripleOutput (output);
  const
    sample = 'The quick brown fox jumps over the lazy dog.';
  var
    outdev : text;
begin
  WriteLn(sample); {output to text window}
  MoveTo(0, 10); {set pen location in drawing window}
  WriteDraw(sample); {output to drawing window}
  Rewrite(outdev, 'printer:'); {open printer}
  WriteLn(outdev, sample); {output to printer}
end.
```

You Choose
This program lets you specify in a single keystroke the output destination of Macintosh Pascal text.

List UChooz

```
program UChooz (input, output);
  var
    outdev : text;
    choice : char;
begin
  WriteLn('Type P for printer, or S for screen');
  ReadLn(choice);
  if (choice = 'S') or (choice = 's') then
    outdev := output {use standard output device--text window}
  else
    Rewrite(outdev, 'printer:'); {open printer}
  WriteLn(outdev, 'The quick brown fox jumps over the lazy dog.');
end.
```

The C for the Macintosh

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compiler	compile/link	run	size
Manx Aztec	49	7	13,274
Megamax	114	7	13,816
Softworks	201	9	46,914
consulair	152	10	17,654
Hippo 2	102	13	30,648

The following sieve benchmark timings are reprinted with permission of Macworld, 555 De Harro St., San Francisco, CA 94107, from the May, 1985 issue from "Mac Wins By a Length" in the Open Window column.

Language	Run Time
Aztec C 1.06C	6.55
McFORTH 2.0	20.01
Modula-II	71.60
MBASIC 2.00	1170.00
Pascal	1270.00

Sieve timings for Manx Aztec C68k 1.06g:

with register variables 3.37 secs 5,007 bytes
without register variables 6.02 secs 5,140 bytes

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Circle 374 on reader service card

(continued from page 64)

there a straightforward way to allocate more space for the directory when initializing disks?

Richard A. DiDio
Philadelphia, Pennsylvania

A. The flat file system normally used on single-sided (400K) disks limits the number of files on a disk depending on the length of file names. The directory can handle up to 108 files with names of 6 characters or fewer and up to 84 files with names of from 14 to 22 characters. A little algebra suggests you probably have 200K available when you encounter the limit of directory size, so half the disk space is wasted.

Apple's hierarchical file system (HFS), which does not limit the number of files on a disk, alleviates the problem. It's used automatically on Apple's hard disk and on double-sided disks, but not on single-sided disks. You can, however, initialize a single-sided disk to use HFS.

You set up a new disk for HFS at the end of the initialization process, when you finish typing the disk name. At that time, hold down the Option key as you press Return.

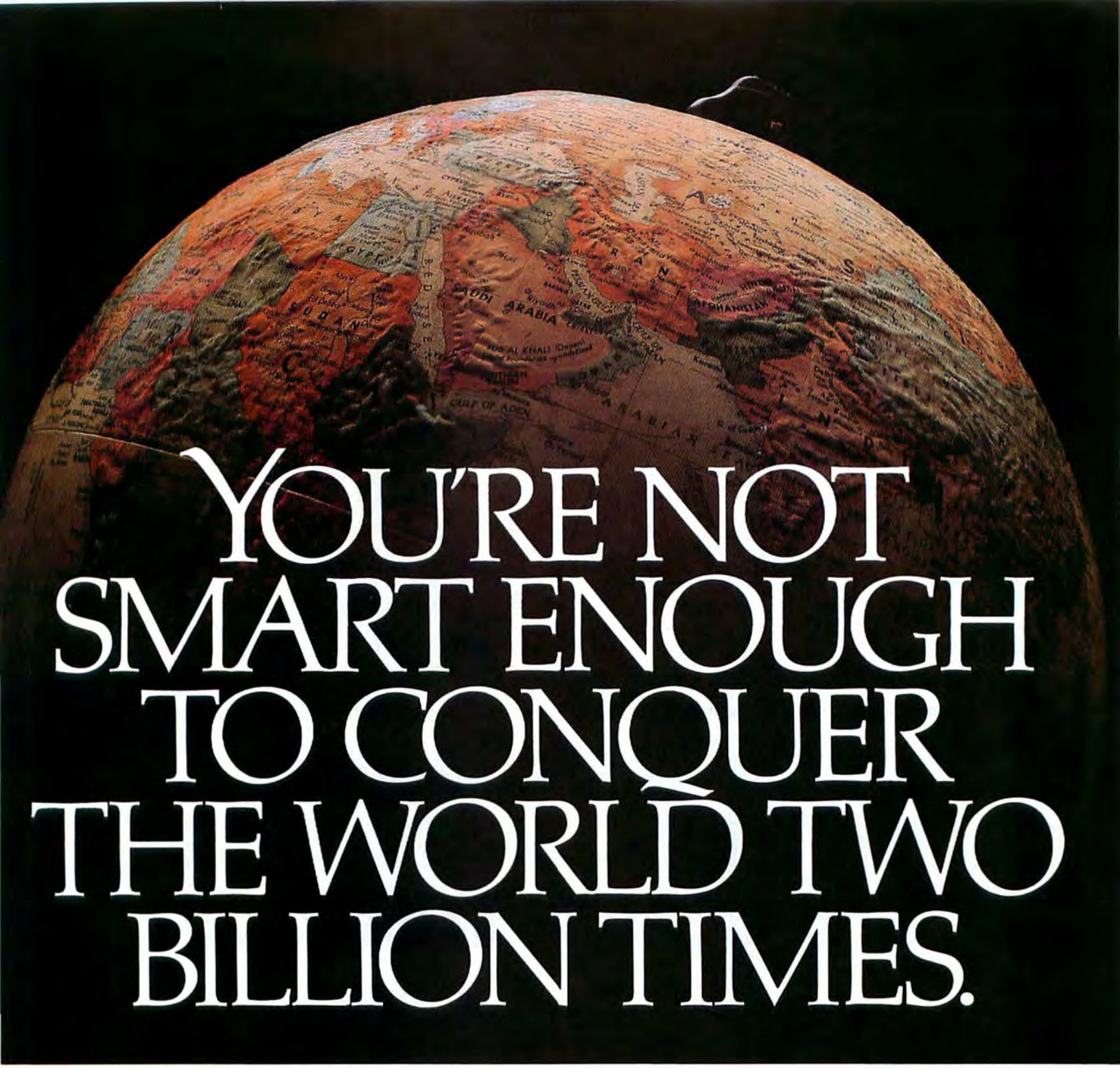
You must erase old disks to convert them to HFS. Choose Erase from the Finder's Special menu and then hold down the Option key as you click the Initialize button in the dialog box that appears. For best results hold down the Option key until the box disappears.

HFS is standard on the Mac Plus and is part of the ROM upgrade for older Macs. Another version of HFS transfers from a disk to RAM at startup. The RAM version accompanies Apple's hard disk, the HD 20, but Apple is not officially distributing it otherwise. You may be able to get a copy from a friendly computer dealer or a user group. Otherwise, buy the ROM upgrade.

Sad Mac

Q. Anybody who has started up the Macintosh with the wrong disk has had the unfortunate experience of being confronted with the notorious Sad Mac icon centered

(continues on page 68)



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Circle 233 on reader service card

(continued from page 66)

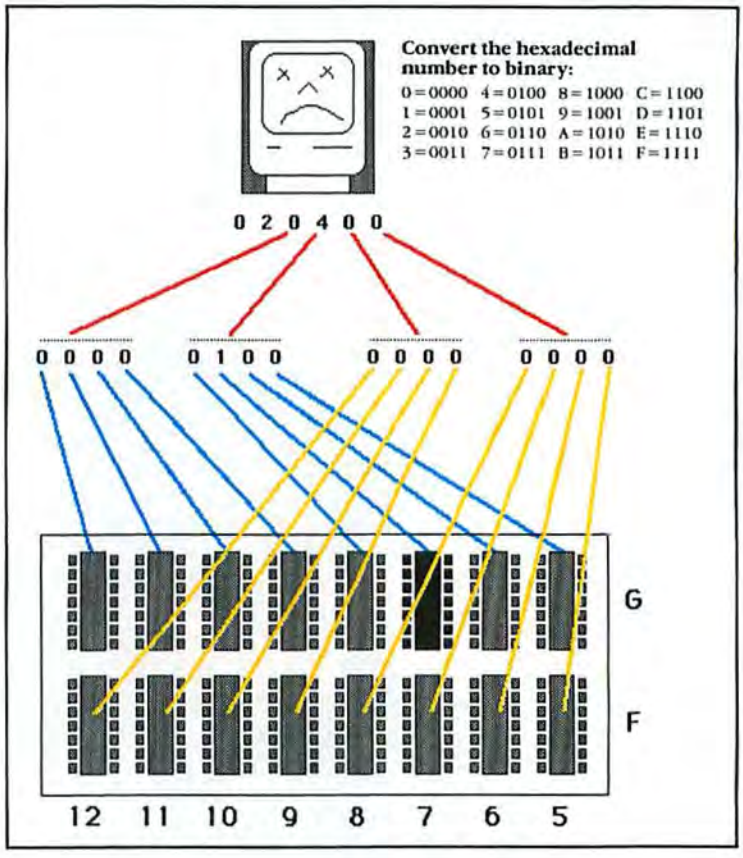
in the black screen. Below this unpleasant little display is a code number. Would you explain how to interpret the code?

Geoff Dutton
Watertown, Massachusetts

A. When you turn the Mac on or press the reset switch, several memory and system diagnostic tests take place. If any test fails, Sad Mac appears. The code number below it indicates the nature of the malfunction. The first two digits indicate the type of error. When the first two digits indicate a RAM test failure (02, 03, 04, or 05), the last four digits identify the suspect RAM chips. You must convert the last four digits, which are hexadecimal, to a 16-digit number to learn which chips are bad (see "When the Chips Are Down"). If the memory and system tests fail, you can't do much but take the Mac in for repairs.

After the memory and system tests, the disk startup process begins. If the Sad Mac icon appears after the disk starts spin-

(continues on page 72)



When the Chips Are Down

When the first 2 digits of the number below the Sad Mac icon are 02, 03, 04, or 05, the Mac has failed a diagnostic test of its RAM. The last 4 digits make up a hexadecimal number, which, when converted to its 16-digit binary equivalent, identifies the suspect chips with the digit 1. In this example, 020400 indicates that the sixth chip in the top row is the culprit.

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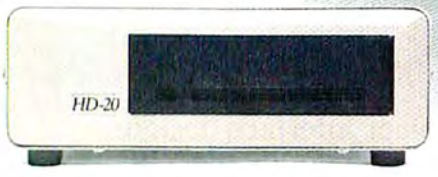

Adding storage and speed to a Macintosh Plus is easy. Place the HD-20 or HD-30 under your Macintosh and save desk space. Connect the drive to the SCSI expansion port and you can transfer data 16 times faster than many current hard disks.

Turn it on and it automatically boots up. The HD-20 and HD-30 both support Apple's new Hierarchical File System, and they are expandable to add more memory devices or tape back-up units.

See MDIdeas' HD-20 and HD-30 at your authorized Apple Dealer and be sure to ask about Apple's "We're in Business with Macintosh Plus" promotion. During this promotion all purchasers of the HD-20 and HD-30 will receive a free booklet entitled, "Hard Disk Usage for the Macintosh" and free hard disk back-up software.

Offer expires 4/30/86.

HD-20–$1095 HD-30–$1595

MDIdeas, Inc.

1111 Triton Drive, #205
Foster City, CA 94404
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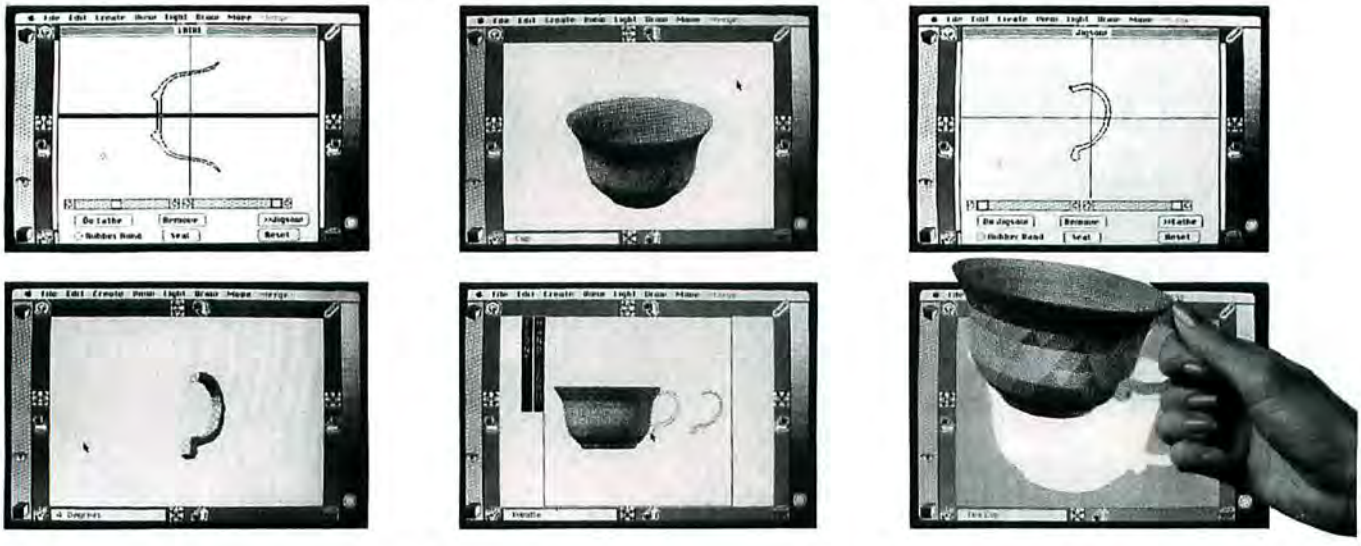
Circle 467 on reader service card

Discover what Easy3D,™ your Mac and your imagination can do.



Even though Easy3D is fast becoming popular with architects, artists and engineers, you don't have to be a technical genius to use it. Thanks to its advanced interface—created by specialists trained in the behavioral sciences—you'll find that, with little or no training, you'll be able to create and manipulate complex, shaded three-dimensional models of lamps, jet planes, buildings, logo's, package designs, and more.

Just draw a basic outline and use the lathe or jigsaw to transform it into a solid, shaded figure. Not a wire frame.

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Shaded surface embossing

Compatible with:

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PageMaker,™ LaserWriter,™ ImageWriter™

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Stretch it, shrink it, blow it up, rotate it, and combine it with other objects. Then set it in a 3D scene and transfer your finished image (up to 8" x 10") into a complementary program—such as MacPaint™— for use in your layouts ...drawings...proposals...you name it.

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Circle 403 on reader service card MW036

For all of you who thought Dennis Brothers was crazy to give away MacTEP,™ here's MicroPhone.™ The one he's selling.

When the Macintosh first came out, the most powerful personal computer ever built didn't have the brains to make a phone call.

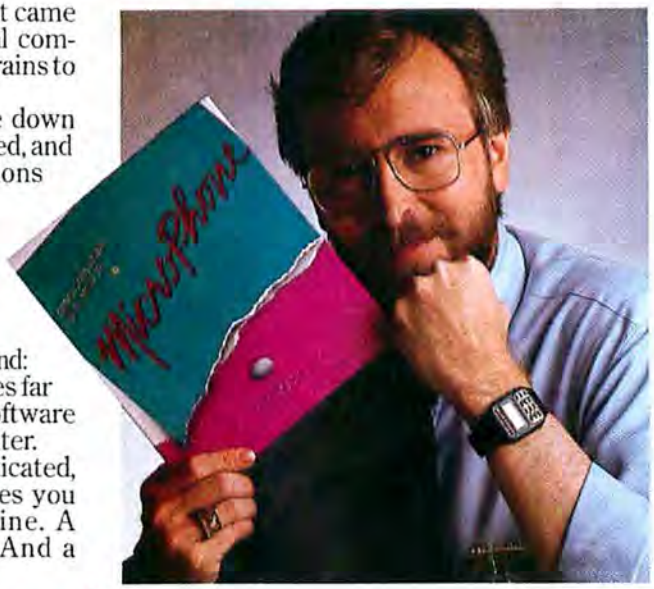
So Dennis Brothers tore down his Mac, figured out how it worked, and wrote Mac's first communications program, MacTEP.

Which he proceeded to give away.

MacTEP was a classic. The first standard in Mac communications.

Now he's created the second: MicroPhone. A program that goes far beyond any communications software currently offered for any computer.

MicroPhone is so sophisticated, it cuts through the worst tangles you encounter when you go on-line. A delight to the experienced. And a saviour for the novice.



Run on automatic.

When you open MicroPhone to the desktop you'll find a comprehensive collection of icons pre-programmed to access all major information services: CompuServe,® Dow Jones News/Retrieval,® The Source,℠ Delphi,™ the works.

A few clicks and you're in. With automatic log-in and sign-on.

But that's just the beginning of its ability to automate the whole telecommunications process. For MicroPhone features the most powerful, yet simplest to set up macros ever seen on a program.

Write your own script.

Dennis gives you two ways to create these macros. The first is to set MicroPhone in the Watch Me,™ the recording mode.

The program looks over your shoulder as you conduct a communications session following your keyboard and menu commands.

MicroPhone can remember not only an uninterrupted string of keyboard commands, but also wait-for-prompt conditions. In fact, virtually any series, no matter how long or complex.

The entire sequence is saved. To be invoked at any time with a single key command.

The second way to generate macros is through MicroPhone's unique "Script" window. Open it and you'll discover an extensive set of functions which can be called up and linked with a series of mouse clicks. The resulting macro is extremely powerful. The method is Mac-simple.

Using Watch Me or the Script window, or a combination of both, you can automate log-ons, file transfers and unattended operations. And navigate back into the farthest reaches of any database with a single stroke.

Let's get technical box.

Runs in terminal emulation mode at speeds up to 57.6K Baud. Emulates DEC™ VT52,™ VT100™ and TTY type terminals. Supports TEXT (ASCII) and XMODEM (Christensen) protocols, send and receive. Supports MacBinary. Runs on 128K and 512K Macintosh. LaserWriter compatible. Includes Switcher for use with other Macintosh programs. Compatible with Hayes, Apple and other leading modems. Built-in full text editor licensed from Dreams of the Phoenix Inc. Documentation by Neil Shapiro.

Make files fly.

Sending and receiving files is faster and easier with MicroPhone, too. Using XMODEM protocols and MacBinary, MicroPhone transmits or receives anything you can create on a Macintosh. Including MacPaint documents, text, spreadsheets, charts, database tables, or programs.

MicroPhone allows you to scroll back and forth at high speed to review your session. Then you can select any portion of your session, print it, save it to a file, or copy it to the Clipboard for use by other Macintosh programs.

MicroPhone also features an editor desk accessory for composing text in mid-session using familiar Macintosh editing techniques.

But enough talk. See for yourself what Dennis Brothers has done now to advance the cause of telecommunications. Just take any major credit card in hand and call us toll free to place your order.

Dennis isn't giving it away this time. But at **$74.95,** almost.

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You know how to telecommunicate the hard way. Now do it the easy way. Call 24 hours toll free. Outside California, 800-DENNIS-7. Within California, 800-DENNIS-8. In Canada, 800-DENNIS-9. Or send a check, money order or credit card number for $____ for ____ copies of Dennis Brothers' MicroPhone @ $74.95 each.

In USA and Canada add US $5.00 for postage and handling per product ordered. All other countries add US $10.00. In California add 6% ($4.50) sales tax. ALL FOREIGN ORDERS: please make payment by bank draft, payable in US dollars, drawn on a US bank. No C.O.D. or Purchase Orders. If you are not 100% happy, return MicroPhone within 30 days for a full refund.

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What separates us from our competition? Simply a combination of the best service in the industry, highly competitive pricing, and an ever widening range of products. Above all we care about our reputation and we are willing to work on a lower margin while delivering what others only claim—and we do it all on a day-in day-out basis.

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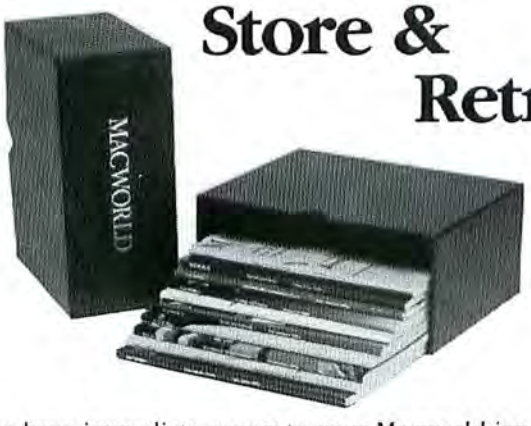

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(continued from page 68)

ning, the first two digits of the code number under the icon are 0F, and the next four digits indicate the type of error (see "Sad Mac Codes"). If you get a Sad Mac with an 0F code, try restarting with the ⌘ and Option keys held down to rebuild the desktop file. If that doesn't work, try starting up with another disk. You may be able to fix a faulty startup disk by replacing its System file.

You can stop the Mac from proceeding to the disk startup process after it completes the memory and system tests by holding the interrupt switch (on the side of the Mac) while you restart. If all systems are go, the code 0F000D appears beneath the icon. Press the reset switch (but not the interrupt switch) to restart.

(continues on page 175)

Sad Mac Codes

Code	Meaning
01____	ROM test
02____*	RAM test (bus subtest)
03____*	RAM test (byte write)
04____*	RAM test (mod3 test)
05____*	RAM test (add uniqueness)
0F0001	Bus error
0F0002	Address error
0F0003	Illegal instruction
0F0004	Zero divide
0F0005	Check instruction
0F0006	Trap instruction
0F0007	Privilege violation
0F0008	Trace
0F0009	Line 1010
0F000A	Line 1111
0F000B	Other exceptions
0F000C	Nothing
0F000D	NMI (interrupt button)

*When the first two digits are 02, 03, 04, or 05, the last four digits identify the suspect RAM chips.

Sad Mac Codes

When you turn on the Mac, it undergoes a series of system and memory tests. If it fails any test, the Sad Mac icon shows up. The six-digit number below the icon is the key to Sad Mac's unhappiness. When the first two digits are between 02 and 05, the last four indicate which RAM chips have not passed inspection (see "When the Chips Are Down").

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It's Taking Off!

Our first ad for the View Control System™ did more than raise a few eyebrows. We set a record for *Macworld* reader response, pulled in lots of orders, and inspired a flood of callers to ask, "does that crazy looking headset really work?" Read what users are saying about it.

Users agree. It works. The View Control System from Personics moves the cursor where you look on the screen. It's much faster than a mouse or trackball and doesn't take up space on your desk. Why not try the VCS for 30 days and see for yourself? Join us for a test flight. There's absolutely no risk.

Use Your Head!

Now you don't have to reach for the mouse to move the cursor. The VCS gives you swift, precise cursor control with natural movement of your head. Look right and the cursor moves right. Look down and left and the cursor instantly follows. Thanks to a remarkable algorithm for head-to-cursor translation, no broad motion is required, just a few degrees of rotation. Before long, using the VCS will feel like a natural extension of vision.

The VCS works with any 128K or 512K Mac. No hardware or software modifications are required. A button pad clips on your keyboard right below the space bar so you can *click* or *drag* with the touch of your thumb. If you want, connect your mouse or trackball along with the VCS and use them interchangeably.

Just $199.00 and Easy to Order

We sell factory direct so ordering couldn't be easier. Call us toll-free. If you're ready to order, please have your major credit card in hand when you call. University and corporate purchase orders accepted.

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When your VCS arrives, try it for 30 days. If you're not completely satisfied, return it for a full refund. Get set for your test flight. The VCS is taking off!

Product Review

It's all quite interesting and sexy in a technological way, but how well does it work? I have used the VCS for a week. The first day was something of a strain, as I found myself overshooting screen targets and making exaggerated head motions. After a few days, using the system became second nature. My thumbs fell readily on the buttons below the space bar, and the cursor always seemed to be just where I was looking. After a week, you'll wonder how you managed without it. On the whole, the View Control System represents a real advantage over the mouse for many Mac tasks.

ICON–*Magazine of the Assoc. of Apple 32 Users.*

Customer Letters

I just received my VCS and am more than delighted with its performance. I couldn't believe that it would be able to work one pixel at a time but it does, and that with less than an hour's use. It's the best thing yet that I have seen for controlling the Macintosh.

My daughter and I are certainly enjoying our "flying mouse." Not only is it terribly ingenious, it really works very smoothly and with fine sensitivity. Congratulations on an innovative advance.

I am a university professor and I do a substantial amount of writing. I just finished a monograph of about 64 single-spaced pages. I used the VCS for the entire project and it performed beautifully. If there were a market for my mouse, I might sell it.

Join us for a test flight.

Circle 85 on reader service card

Personics™ Corporation
2352 Main Street, Building 2, Concord, MA 01742
(617) 897-1575

(continued from page 72)

Custom MacDraw Patterns

Q. Unlike *MacPaint, MacDraw* doesn't let you change the 32 patterns in its Fill and Pen menus. Is there some way to customize the patterns in *MacDraw?*

Orville Woodruff
Norcross, Georgia

A. *MacDraw*'s patterns are resources that you can edit with Apple's resource editor program, *ResEd.* First, make a copy of your *MacDraw* disk. Experiment on the copy, never on the original. If you have only one disk drive, insert your *MacDraw* copy and remove all the files except for *MacDraw* and the System Folder. Then copy *ResEd* onto your disk.

- Start *ResEd.* A small window appears for each disk you insert, listing all the applications and documents on the disk.
- Find *MacDraw* in the appropriate disk window and double-click on it. Another small window opens, listing all the resources in *MacDraw* by their four-letter codes.
- Find the resource named PAT# in the *MacDraw* window, and double-click on it. A small window titled Pattern Lists opens, showing a dozen of the patterns contained in *MacDraw.*
- Double-click on any pattern. A small pattern-editing window opens (see "Customizing MacDraw Patterns"). Three pattern choices appear at the bottom of the window. A selection rectangle surrounds the pattern currently selected for editing. A larger sample of the selected pattern appears in the upper-right corner, and a FatBits enlargement of the pattern appears in the upper-left corner. Edit the pattern as you would any pattern in *MacPaint.*

Rename your custom version of *MacDraw* to distinguish it from the regular version. Changes you make to patterns affect any *MacDraw* document. The changes occur retroactively in an old document when you open it, but the changes are not permanent. You can always reedit patterns or reopen the document with a version of *MacDraw* that has the standard patterns.

Geometry Revisited

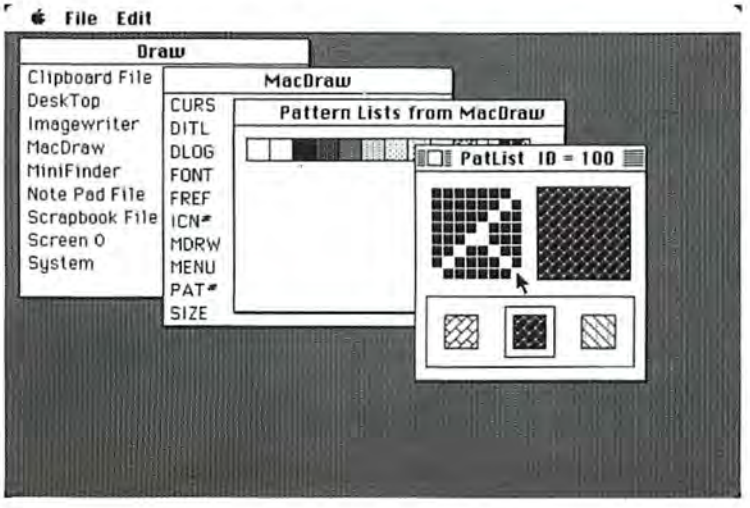
In November 1985 this column described methods for finding the center of a circle and for constructing an equilateral triangle in *MacPaint.* Several readers have written to suggest easier and faster methods. Tony Bernez of Goleta, California, realized that *MacPaint* pastes objects at the center of the drawing window (unless a selection rectangle is active in the window) and came up with the following way of finding the center of a circle:

- Select the circle with the lasso.
- Cut the selected circle and immediately paste it, which places the circle at the center of the drawing window.
- Use the pencil to draw a single dot anywhere on screen and select the dot using the lasso.
- Cut the dot and immediately paste it, which centers the dot in the drawing window.

Because the circle and the dot are centered in the drawing window, the dot is centered inside the circle. This method centers any shape inside another but works best with shapes that are horizontally and vertically symmetrical. It works as long as the grid is off (check the Goodies menu) and the circle or other object does not touch the edge of the drawing window.

Larry Tesler, writing from his office at Apple headquarters in Cupertino, California, offers an easy method for constructing an equilateral triangle:

- Draw a circle and put a dot at its center. For best results draw the circle with the grid on and make the circle an even number of grid units in diameter.
- Lasso the circle, hold down the Shift and Option keys, and drag a copy of the circle to one side so that it just touches the original circle.
- With the duplicate circle still lassoed, hold down the Option key (but not the Shift key) and drag another copy of the circle to just touch the first two circles.
- Erase the circles, leaving the center dots. Connect the dots using the polygon tool. The resulting triangle is equilateral.



Customizing MacDraw Patterns
MacDraw *doesn't have a pattern editor built in, so you need the* ResEd *resource editor to change the patterns under the Fill and Pen menus. Once you open the pattern-editing window, the rest is FatBits.*

Get Info *answers questions about the Macintosh and how it works. When you need advice about using the Mac, drop me a line. I cannot respond to all letters, but I will answer the most representative questions. Send your question about the Macintosh, Macintosh software, and Macintosh programming to* Get Info, Macworld, *555 De Haro St., San Francisco, CA 94107. Send electronic mail to CompuServe 70370,702 or The Source BCW440. All published submissions become the property of* Macworld.

Lon Poole is a Contributing Editor of Macworld. □

Founders' sale.

Happy days are here again. Too bad Lucian and Lucius Tinker weren't around to see Marlow (pop. 550) transformed from a sleepy little rural village into an upbeat microcomputer paradise. We've spruced up a few of the old hotels and mill buildings to house our burgeoning Mac business. But the old beams are still there, and real wooden clapboards still grace the exterior walls. With all due respect to Silicon Valley we're pretty fond of life up here in the hills.

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The more things change... Yes, it took a long time, but the Tinker twins are finally getting the recognition they've always deserved. Two honest and intelligent faces symbolizing many of the characteristics that make MacConnection the leading name in Macintosh mail order.

You see, folks like the Tinker twins wouldn't think twice about spending an hour getting a neighbor's cow out of the mud. And today, our Mac technical specialists wouldn't think twice about spending time helping one of our customers out of an electronic quagmire.

Lucius and Lucian always had the time to answer a stranger's questions. They dealt fairly with friend and foe alike. And they always did a job when they said they were going to.

Perfect Score SAT $47

But we can't live up to *all* their standards. It's hard to find real silk ties these days. Those starched collars are sort of uncomfortable. And buttoning the top button of our jackets looks a little strange. But business in Marlow is as personal and forthright now as it's always been. The Tinker twins wouldn't have it any other way.

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Forethought
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order magic in the

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Lode Runner ..... 24.
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A Mind Forever Voyaging *(advanced)* .. 27.
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Deadline *(expert)* ..... 29.
Spellbreaker *(expert)* ..... 29.
Starcross *(expert)* ..... 29.
Suspended *(expert)* ..... 29.
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MacWars *(hours of fun)* ..... 27.
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Mac Robots *(pre-school program)* ..... 27.
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Sapphire *(3 outlets; EMI/RFI filtered)* ... 44.
Ruby *(6 outlets; EMI/RFI filtered; 6 ft cord)* 50.
Epson
AP-80 *(Imagewriter compatible)* ..... call
FX-85 ..... call
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LQ-1000 *(letter quality dot matrix)* ..... call
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Hayes
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Smartmodem 2400 ..... call
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IOMEGA
Bernoulli Box *(dual 10-MB storage)* 2475.
10-Meg Cartridge ..... call
Head Cleaning Kit ..... call
Kensington
External Disk Drive Cover ..... 8.
Mouseway ..... 8.
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Universal Printer Stand ..... 17.
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Paradise Systems
Mac 10 *(10 megabyte hard disk)* ... special
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Switch Box ..... 36.
PKI
Sydewyndr 400k External Drive ..... 225.
Systems Control
MacGard *(surge protection)* ..... 55.
Thunderware
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Video 7
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Sony 3½" Disks *(box of 10)* ..... 21.
Fuji 3½" Disks *(box of 10)* ..... 21.
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Verbatim 3½" Disks *(box of 10)* ..... 23.
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Clean Image Ribbon Co.
Clean Image Ribbon Kit ..... 12.
Computer Coverup
External Disk Drive Cover ..... 4.
Imagewriter (II) Cover ..... 8.
Wide Imagewriter Cover ..... 8.
Mac & Keyboard *(two covers)* ..... 10.
Diversions
Underware Ribbon ..... 10.
ColorPack *(includes Colorpens)* ..... 19.
Environmental Software Company
The Clutch *(holds 8 disks)* ..... 9.
MACATTIRE
High quality rip-stop nylon dust covers.
External Drive Cover *(400k & 800k)* ..... 7.
Numeric Keypad Cover *(fits Turbo Touch)* 7.
Imagewriter (II) Cover ..... 11.
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Laserwriter Cover ..... 17.
Mac (Plus) & HD20 & Keyboard Cover 17.
I/O Design
Imagewriter Color Transfer Ribbon ..... 10.
Imageware ..... 45.
Imageware wide ..... 49.
Macinware ..... 59.
Innovative Concepts
Flip & File Micro *(holds 25 disks)* ..... $9.
Flip & File *(holds 40 disks)* ..... 18.
Innovative Technologies
The Pocket Pak *(holds 6 disks)* ..... 10.
The Easel *(holds 20 disks)* ..... 14.
The Disk Directory *(holds 32 disks)* .... 21.
Kalmar Designs
Teakwood Roll-top Case *(holds 45 disks)* 14.
Teakwood Roll-top Case *(holds 90 disks)* 21.
Magnum
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Microsoft Press
Microsoft Multiplan: Of Mice and Menus 13.
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Excel in Business ..... 18.
Moustrak
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Imagewriter Ribbons Six Pack ..... 27.
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Developing a Megabyte Strategy

Danny Goodman

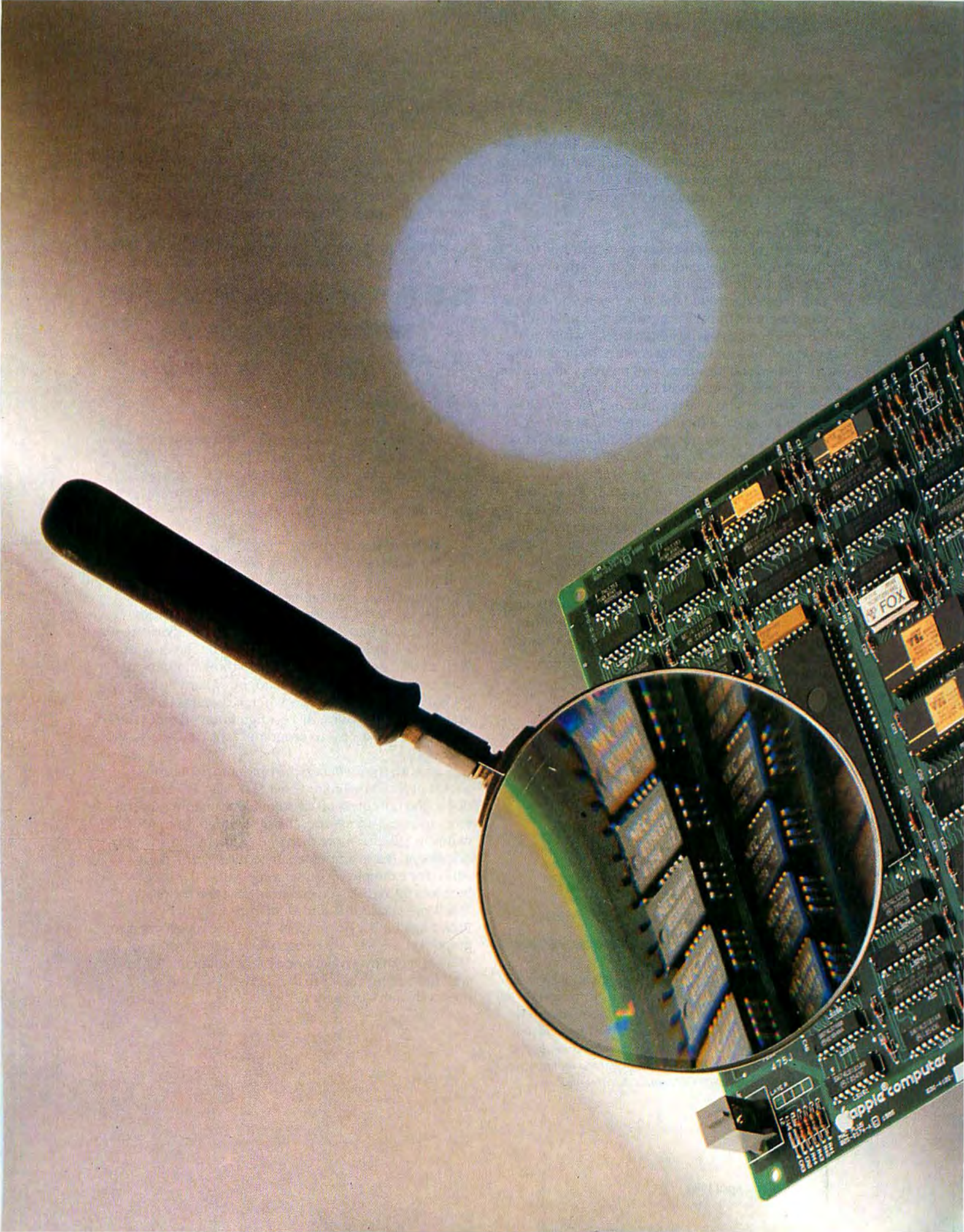
On a hike in the mountains, sometimes you come over a ridge or reach a summit and become engulfed in an expansive view that makes you gasp in awe. Sitting before a Macintosh newly outfitted with a megabyte or more of memory may inspire the same feeling. One million bytes is a large portion of memory—56 percent more RAM than a fully loaded IBM PC. As if vast memory space weren't enough to boggle the mind, several commercial and public domain memory utility programs—RAM disks, cache memories, and instant program switchers—promise to solve the problem of managing it all. All it takes to gain control of your megabyte is an understanding of the possibilities and how to apply them to various Macintosh work patterns. Here are some guidelines for establishing a practical strategy that complements your work habits.

Chances are that you have a megabyte Macintosh because you felt crowded at times by a 512K Mac. A megabyte of memory provides comfortable breathing room for three popular program configurations: running large programs like *Jazz* or database programs that let large files fill available memory; loading two or more programs into memory at once and switching between them instantly with the help of Apple's *Switcher* or a similar utility; and setting aside portions of memory for electronic (RAM) disk or cache memory utilities, both of which speed up program execution (for a discussion of these utilities see "The Mac's Best Performance," *Macworld,* October 1985). A fourth possible configuration consists of a combination of the first three, depending on the amount of memory your programs require. By examining each of these configurations, you can discover which is the most efficient for your work.

Big Documents

Not long after Apple introduced the 512K Macintosh, most people realized that some of the then-new 128K software, like *Microsoft Word,* functions more quickly when more memory is available. Even *MacPaint,* which was designed to fit comfortably on a 128K Mac, scrolls better when it runs on a 512K. Similar opportunities for enhanced performance now exist for programs specifically designed for the 512K Mac. *Jazz,* for example, suffers from memory management problems on a 512K Mac. Other programs, such as *OverVUE,* stretch the limits of 512K RAM when working with large documents. Even *Microsoft Excel,* which manages well inside 512K, might reach memory's limits too soon for people who devise enormous spreadsheet models.

But when you operate these and many other 512K programs by themselves in 1 megabyte of Macintosh RAM, performance improves and maximum document size increases dramatically. As long as the program recognizes memory over 512K (and most of the popu-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lar productivity programs do), documents can be bigger, more documents can be open at a time, and the program can run faster. An *Excel* spreadsheet, for example, explodes through the 512K limit of 52,700 data cells to 140,000 cells in a 1-megabyte Mac. Clearly, even if you devote the entire memory to a single program, large programs or applications that call for large documents benefit from a megabyte of memory.

Program, Please

When the *Switcher* was first demonstrated to Macintosh user groups early last year, nearly everyone in the Macintosh community was eager to get a copy of the utility. People coveted the *Switcher* because it overcomes one of the Mac's performance pitfalls. The *Switcher* eliminates the customary delay while quitting one program and starting another by permitting you to load several programs into memory at once and switch between them almost instantaneously.

But people who take advantage of the *Switcher* encounter logistical difficulties when loading certain memory-hungry programs into a 512K Mac. Perhaps the most limiting effect of the *Switcher* is that squeezing the desired combination of programs into memory usually forces you to assign only a small amount of memory to each program; thus, programs operate sluggishly, since they must reach out to the program disk for nearly every operation. For programs like *Microsoft Chart* and *Microsoft Word,* this can be disconcerting. And unless you reserve enough space for a program like *MacPaint,* it operates in the 128K mode, with phlegmatic, disk-intensive scrolling.

With a megabyte, however, those concerns all but disappear. A megabyte provides enough RAM for programs to go into the *Switcher* with enough memory to operate smoothly (see Table 1). And there's room to spare for another program or two and plenty of space to work with good-sized documents. Previously difficult or impossible *Switcher* combinations function smoothly within 1 megabyte. For example, pairing *Excel* with *Word* facilitates the shift of spreadsheet data or graphics into a *Word* report. A megabyte of RAM makes the *Switcher* an excellent choice if you work with several programs at once, cutting and pasting information between documents.

A megabyte allows programs to operate smoothly in the Switcher.

Application	Preferred Memory Size	Takes Advantage of More Memory?
Finder 4.1	106K	Yes
Helix	512K	Yes
Jazz	512K	Yes
MacDraft	256K	Yes
MacDraw	128K	Yes
MacPaint	178K	No
MacWrite	128K	No
Microsoft Chart	192K	No
Microsoft Excel	304K	Yes
Microsoft File	288K	Yes
Microsoft Multiplan	160K	No
Microsoft Word	160K	No
OverVUE	128K	Yes
PageMaker	256K	Yes
Paint Cutter	244K	Yes

Table 1

Application programs work more effectively with the Switcher *in a megabyte of memory. Preferred memory size refers to the amount of memory the* Switcher *first attempts to allot to an application. The third column indicates whether or not the program can take advantage of more memory than the preferred size. When configured with the preferred memory size, some programs can create only small documents.*

Behind the Scenes

Perhaps the extra memory of a megabyte Macintosh will be most appreciated when used with two types of memory management programs: RAM disks and disk caches. The more popular RAM disk tricks the Macintosh into thinking part of its memory is an extra floppy disk drive, which appears on the desktop with its own disk icon. A RAM disk stores and retrieves data much faster than either a floppy or hard disk. A RAM disk on the Mac excels when it contains programs and system files; this configuration provides the fastest possible access to programs, fonts, and desk accessories.

As with the *Switcher,* the optimum application of a RAM disk can be limited on a 512K Mac. Primarily due to the bulkiness of a System file containing several fonts and desk accessories, hardly enough room remains in 512K for more than one program and an open document. But inside a megabyte, a RAM disk flourishes. For example, if you set aside half of the megabyte as a RAM disk, you can store a System file plus *MacWrite, MacPaint,* and *MacDraw* and still have 512K available for documents. And if the megabyte upgrade you use lets you create a RAM disk larger than 512K, you can even combine a big program like *Excel* with the System Folder in the RAM disk for impressively quick operation.

The first rule for using a RAM disk is don't consider it a reliable repository for document files. This caution stems from the unreliability of the AC power that keeps the information stored, not from any inherent unreliability of the hardware. Don't count on memory as a document storage device unless you also plan to regularly save the material to a disk—as often as every 15 minutes during a highly productive stretch.

Storing programs and the System Folder on a RAM disk is the best procedure if you generally work with one or two programs and don't often transfer data between them. If you work with programs that handle documents in memory only, keep in mind that the amount of memory you devote to a RAM disk reduces the memory available for documents. If you work with large programs or a few medium-sized programs, you may not be able to handle exceptionally large documents.

If you tote the Macintosh along on business trips, it is quite an advantage to have the power of two disk drives without having to stow an external drive. Using a RAM disk even improves program performance for hard disk owners. Unfortunately, you may not be able to install some copy-protected programs on a RAM disk. Programs that require a key disk, such as Microsoft's programs, allow you to drag a copy of the program onto a RAM disk. The first time you start such an application from the RAM disk, you must insert the key disk: After that, Microsoft's copy-protected programs—and some others—don't ask for the key disk unless you turn off the machine and start over. Placing both the System and the application in a RAM disk frees the internal drive for document disks. A program called *Hard Disk Util* from FWB Software avoids the problems of storing copy-protected programs on a RAM disk. With *Hard Disk Util* most programs can be modified so they can be permanently stored on a hard disk or automatically loaded onto a RAM disk without using a key disk.

Disk Caches

Another memory-management utility gaining popularity is the cache. A cache's presence is less obvious than a RAM disk's, but it speeds up operation just the same. Essentially, a cache stores frequently used sections of a program in memory. Once a section of the program is stored in the cache, it can be retrieved from memory, at lightning speed, instead of from the disk drive. A cache, such as Nevins's *TurboCharger,* also stores desktop information in RAM. Quitting to the desktop is extremely fast and doesn't involve any disk reading.

In a megabyte Mac, a cache memory utility has plenty of room to spread out. As with RAM disks, some caveats accompany caches. Caches are incompatible with a few programs, such as *ThinkTank* and *OverVUE.* Furthermore, the only caches currently designed to work with hard disks are those offered by a few hard disk manufacturers, and these products work solely with the manufacturers' own hard disk drives.

Mix and Match

Combining memory-management software can yield substantial benefits in convenience and operating speed. If you want to see a speed demon in action, load a 512K RAM disk with the System, the *Switcher,* and some small applications like *Multiplan* and *MacTerminal.* Then start the *Switcher* from the RAM disk and install both *Multiplan* and *MacTerminal* into the *Switcher.* In other words, you run absolutely everything connected with the programs from the RAM disk, while you store documents on a floppy disk in the internal drive. Even if you have selected the *Switcher*'s normally time-consuming Clipboard conversion option, the transfer between programs is instantaneous and without the slightest whir of a disk drive.

Before you begin combining memory-management utilities and programs, be sure to test them thoroughly for compatibility. For example, Assimilation's

A megabyte of memory provides a flexible environment to tailor to your own work habits and style.

Mac Memory Disk can't be set up to automatically start up and load files into a RAM disk when used with *TurboCharger.* And as Apple migrates to HFS, you should exercise special caution because many utilities may have problems with the new file system.

Fixed Accessories

With the popularity of desk accessories that do everything from minding an appointment book to transferring data over a telephone modem, it's easy to develop a rather large System file. And if you like to have several fonts available at all times, then the System can grow to over 200K, especially if you add other essentials such as the 46K Finder 4.1 and a printer driver (15K and up). It may be impractical, if not impossible, to keep the same set of desk accessories and fonts on every single-sided application disk because of the 400K space limit. But a megabyte of memory can come to the rescue, providing the same general effect as storing a System file on a hard disk.

You can use a megabyte of memory to manage a large system overhead by creating a RAM disk principally devoted to system files and resources such as

desk accessories. This includes support files, which store data such as phone numbers or notes, that you add to certain desk accessories.

The setup I use most often, a 400K RAM disk in a 1-megabyte Beck-Tech MacMegabytes memory upgrade, contains a System file with 13 desk accessories and 20 fonts (10 font styles in various sizes), the Finder, the Imagewriter driver, the *Switcher,* and *Turbo-Charger,* as well as seven desk accessory support files including calendar dates, phone book, *Sidekick*'s QuikSheets, and an Assimilation *Mac Tracks* file. Because these accessories are located in the RAM disk's System file, they start up within a second or two, without a sound from any disk drive.

Because the MacMegabytes memory is contiguous memory, the 400K RAM disk leaves well over 512K available for programs, including powerhouses such as *Jazz* and *Excel* (see "Megabytes and Beyond," *Macworld,* February 1986). With the System in RAM disk, the external drive is also free for storage disks. Thus, you end up with a fairly integrated environment and plenty of empty RAM for big applications like *Jazz, Excel,* and *Odesta Helix* (see Figure 1).

The most automatic way to set up such a system is with a RAM disk similar to the public domain program *Ramstart,* which is available on CompuServe or from user groups. The program lets you group together, in one folder on the startup disk, all the files that you want in the RAM disk. In one unattended step, *Ramstart* creates the RAM disk in any size you specify, copies the desired files, and ejects the startup disk. To avoid changing disks between applications, place programs together on disks without System files. After the startup disk is ejected, you insert the disk storing application programs into the internal drive. You can then insert the document storage disk into the external drive.

Applications such as *MacWrite, MacPaint, MacDraw,* and *MacProject* all fit on a single 400K disk without a System file. If the programs you use regularly call for special fonts such as *Multiplan*'s Seattle font and *Excel*'s Geneva-10, then use the Font Mover to transfer them to your RAM disk startup disk's System file and remove the System and Finder files from your application disks.

If you frequently transfer data between applications, there remains adequate memory to load a few programs into the *Switcher.* You can start the *Switcher* from the RAM disk, but you still have to leave the application disk in the internal drive because as you switch to each program, the Mac reaches out to the program disk for instructions. Most of the time you don't need to switch between programs often enough to warrant using the *Switcher.* Consequently, changing between programs is usually best accomplished with the MiniFinder or through a public domain desk accessory utility called *Transfer,* which presents a dialog box that lists programs you can open next.

Placing desk accessory support files on the RAM disk can be hazardous; if you lose power, develop a system error, or carelessly turn off the computer at the end of a work session without backing up the files, you

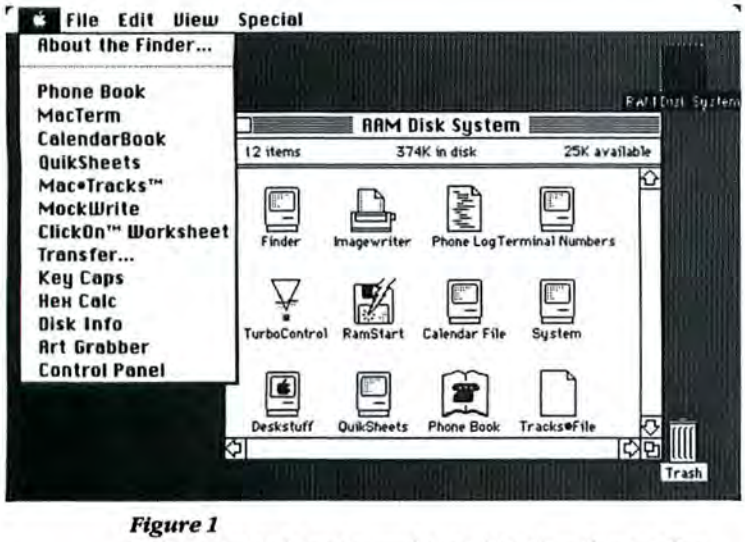

Figure 1

This startup disk loads a useful combination of system files, desk accessories, and support files into a 400K RAM disk. A full complement of desk accessories provides an integrated system for instant communications, text editing, spreadsheets, and pasting MacPaint *pictures into word processing documents.*

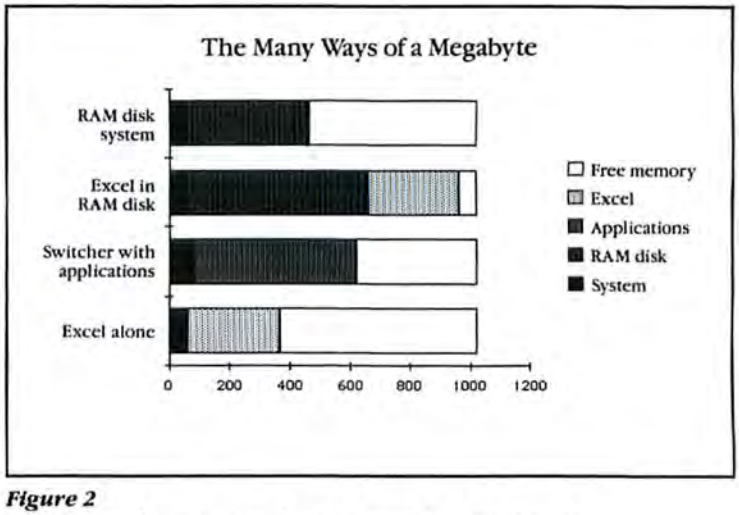

Figure 2

A megabyte of memory can be put to work in a number of ways. The graph shows models of memory allotment for several approaches to efficient work. The proportions above are only approximate; the actual amounts vary depending on the size of the System Folder, application programs, utilities, and Switcher *options.*

lose the files. One way to minimize lost material is to create a *Mac Tracks* macro that automatically backs up for you. Since the *Ramstart* RAM disk always places the support files in the same places in the RAM disk desktop window, you can instruct a *Mac Tracks* macro to open the window, select the support files, copy them to the RAM disk startup disk (click OK in the dialog box that warns about copying files when the names on the target disk already exist), and eject the startup disk. The next time you create the RAM disk, the updated support files will be copied to the RAM disk.

Cache memory is less obvious than a RAM disk, but it speeds up operation just the same.

Recommendations

As you can see, a megabyte of memory offers many ways to make your Mac more productive (see Figure 2). If 512K RAM limits your document size, particularly in large programs like *Jazz, Excel, Helix,* and *OverVUE,* then run your program flat out in a full megabyte and leave as much room as possible for huge documents. This strategy also applies to hard disk owners who work with big documents and database files. If you work at length with one or more programs, without switching between programs, a RAM disk may be the best use of your megabyte. If you work with fairly large documents, be careful when you load more than one small or medium-sized (up to about 200K) program into a RAM disk. If your work entails frequent transfers of information between documents in different programs, consider dedicating some of the extra memory to the *Switcher.* And if your work doesn't follow one of these predominant patterns, set up a 400K RAM disk and load its System with programs like desk accessories.

Beyond a Megabyte

For all the new possibilities a megabyte of RAM creates, it has its limits. For example, if you combine *Excel* and *Word* in the *Switcher* and place the three in a RAM disk along with a large System Folder, you don't retain much room for documents in memory. If you upgrade to more than a megabyte, you can group programs and utilities with even more flexibility than 1 megabyte permits. With 2 megabytes of RAM, for instance, you can create a desktop publishing system by loading several programs into the *Switcher*—programs such as *PageMaker, Word, MacPaint, MacDraw, Paint Cutter,* and ThunderScan's digitizing software. In turn, you can place this entire *Switcher* assembly, along with a 400K System Folder, into an immense RAM disk and have plenty of room remaining for large documents.

No matter which way you decide to use the full megabyte or more of memory, you're likely to be rewarded with increased speed, flexibility, and convenience. Perhaps the most characteristic advantage of so much memory is that it provides a flexible environment that you can tailor to your own work habits and style. You can find combination strategies for a RAM disk, the *Switcher,* and cache memory for nearly every application. Only after experimenting will you discover the setup that best matches the way you work. And with the freedom to shape the Macintosh's memory into a machine of your own making, you may discover that the Mac takes a bold step toward fulfilling the potential convenience of its trend-setting design. □

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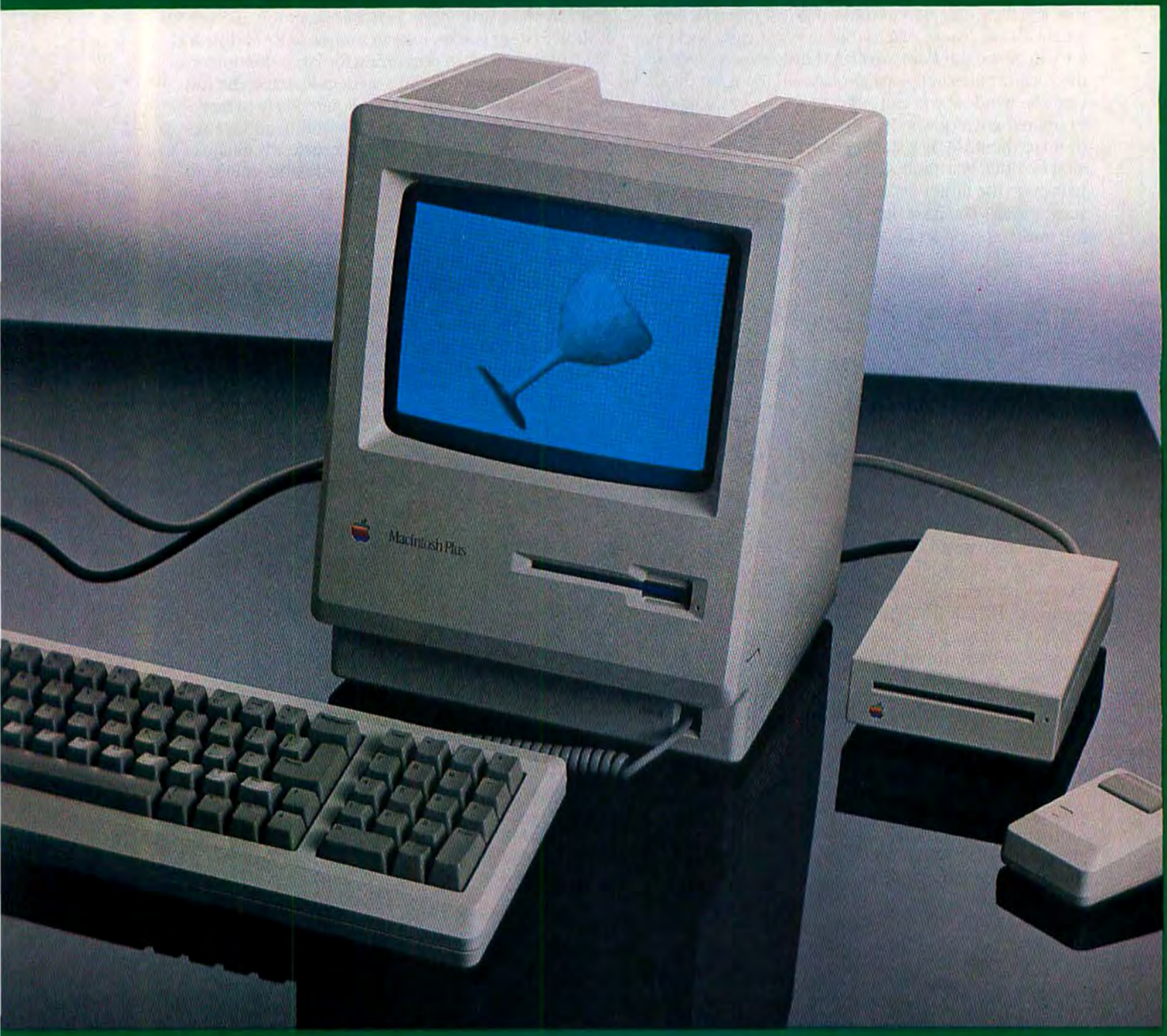
Hard Disk Util
FWB Software Co.
2040 Polk St. #215
San Francisco, CA 94109
415/474-8055
List price: $89.95

Mac Tracks 2.0
Assimilation, Inc.
485 Alberto Way
Los Gatos, CA 95030
800/622-5464, 800/421-0243 in California
List price: $29

Switcher
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
408/996-1010
List price: $19.95

TurboCharger
Nevins Microsystems, Inc.
210 Fifth Ave.
New York, NY 10010
212/563-1910
List price: $95



+ + + +

Cheers! With a megabyte of RAM, a SCSI port, a double-sided disk drive, faster system code, and other improvements, the new Macintosh Plus is something to celebrate.

A Change for the Plus

David Ushijima

In the year and a half since Apple introduced the 512K Macintosh, the clamor from the Macintosh community for a more powerful machine has been deafening. Third-party developers have answered the demand for more memory and have otherwise managed to open a closed case. Now the Macintosh Plus promises to make a megabyte of memory and fast peripherals the standard in Macintosh computing. But, alas, no slots.

Change was long overdue for the Macintosh. By introducing the Macintosh Plus, Apple triggered the Macintosh's metamorphosis from a closed system with limited memory to an expandable system that offers more of the performance features found in competing high-end personal computers. Although technically the Macintosh Plus is still a closed system—there are no slots for add-on boards—Apple has developed an interim solution for expanding the Plus: plug-in memory modules and a medium-speed external bus to which devices from other manufacturers can be attached.

While the external changes—a larger keyboard and a new emblem—are minor, the internal changes are significant. The Plus contains an 800K floppy drive, a Small Computer System Interface (SCSI), new system code that resides in 128K of ROM, and the capacity for up to 4 megabytes of RAM memory.

SCSI Peripherals

To allow for expansion, the Plus's designers chose SCSI (pronounced "scuzzy"), a method used by a number of other manufacturers to connect peripheral devices and computers. Unlike the printer and modem ports, which transfer information at 29K bytes per second, the SCSI port transfers information at 320K bytes per second.

The SCSI specifications were developed by the American National Standards Institute, which devises standards that guide manufacturers in developing compatible products. SCSI was initially based on the Shugart Associates System Interface (SASI), a well-proven method of connecting Winchester disk drives to mini- and microcomputers. But unlike SASI, which was designed to optimize the transfer of data between a hard disk drive and a microcomputer, SCSI allows the transfer of information among a mix of up to eight devices and computers (see Figure 1). Furthermore, the devices need not be disk drives. In fact SCSI devices include scanners, streaming tape drives, optical disk drives, and network servers, as well as other computers (see "Plus Products").

The idea of an expansion port isn't new to the Macintosh; Apple promoted AppleTalk as the means of expanding the 512K Mac. Even though AppleTalk was fast for a serial port, it was far too slow for high-speed devices like hard disk drives. One advantage SCSI has over AppleTalk is that SCSI transfers information eight bits at a time rather than one bit at a time. While AppleTalk is still available on the printer and modem ports, the ability to transfer data up to 11 times faster makes SCSI a much better choice when speed is a concern.

In theory, one benefit of using SCSI should be that devices designed for one machine could be attached to other computers. In reality, each manufacturer implements its own version of the specification, Apple being no exception. Therefore SCSI peripherals designed for other computers, like the IBM PC, cannot attach directly to the Macintosh Plus. They can, however, be adapted for the Plus, a process that requires changing the device's driver software and installing a special SCSI interface cable. One such convert is AST Research's 4000 storage system, a 74-megabyte hard disk and 60-megabyte streaming tape system that AST adapted from its Colossus, a product originally designed for the IBM PC. Iomega has also adapted its

Plus Products

These peripherals and boards were developed or adapted for the Macintosh Plus and are mentioned in the article.

3Server Expansion Disk
3Com Corp.
1365 Shorebird Way
Mountain View, CA 94043
415/961-9602
List price: $4995, DiskPlus Accessory Kit $150

AST-4000
AST Research, Inc.
2121 Alton Ave.
Irvine, CA 92714
714/476-3866
List price: $6995

The Bernoulli Box
Iomega Corp.
1821 West 4000 South
Roy, Utah 84067
800/556-1234, 801/778-3000 in Utah
List price: 5 megabytes $1795, 10 megabytes $2495, 10+10 (10 megabytes fixed, 10 megabytes removable) $3495, 20 megabytes $3095, 20+20 $4495, 10+10 Network Server $3750

Sun Talk
Sunol Systems, Inc.
1177 Quarry Ln.
Pleasanton, CA 94566
415/484-3322
List price: 10-megabyte to 110-megabyte hard disks $2195 to $7195, with tape backup $3545 to $8545

LoDown
LoDown
P.O. Box 5146
Pleasanton, CA 94566
415/426-1747
List price: 10-megabyte hard disk $795, 20 megabytes $995, 40 megabytes $1995, 80 megabytes $3995, T20 tape backup $895, T60 $1795

HD-20, HD-30
MDIdeas, Inc.
1111 Triton Dr. #205
Foster City, CA 94404
415/573-0580
List price: HD-20 $1095, HD-30 $1595

MacSuper 20
Levco
6160 Lusk Blvd. #203
San Diego, CA 92121
619/457-2011
List price: to be announced

MICAHDrive
MICAH, Inc.
15 Princess St.
Sausalito, CA 94965
800/523-9394, 415/331-6422 in California
List price: 10-megabyte MICAHDrive $1495, 20 megabytes $1895, 2-megabyte upgrade $595, 4-megabyte upgrade $895

TOPS
Centram Systems West, Inc.
2372 Ellsworth Ave.
Berkeley, CA 94704
415/644-8244
List price: IBM connection $350, Mac connection $150

MacServe
Infosphere, Inc.
4730 S.W. Macadam
Portland, OR 97201
503/226-3620
List price: $250

SpectraFAX Scanner
SpectraFAX Corp.
2000 Palm St. S
Naples, FL 33962
813/775-2737
List price: $3995, optical character reader board $995, facsimile machine board $1995

MacMegabytes 2+
Beck-Tech
41 Tunnel Rd.
Berkeley, CA 94705
415/548-4054
List price: $995

MagNet 20
Mirror Technologies
2209 Phelps Rd.
Hugo, MN 55038
800/328-6795, 612/426-3276 in Minnesota
List price: $1595

IBM PC line of Bernoulli boxes for the Mac Plus. Iomega offers a family of disk drives ranging from 5 to 40 megabytes that use the SCSI bus.

The real significance of the Plus's SCSI port is that it will prompt developers to introduce more peripherals into the Mac market. Hard disk drives that connect to the SCSI port have been announced by AST Research, Iomega, 3Com, Sunol, LoDown, Mirror Technologies, and MDIdeas. Two manufacturers, Levco and MICAH, have developed hard disk drives that mount inside the Mac like the HyperDrive. Both these drives contain their own internal SCSI connection, which operates like the Plus's SCSI port. MICAH's drive is reportedly faster than a HyperDrive 10. Centram and Infosphere have both announced software that allows a SCSI hard disk to operate as a network file server.

One of the most intriguing new SCSI devices is a color page scanner from Spectrafax. This scanner, which contains an IBM-compatible expansion bus, has

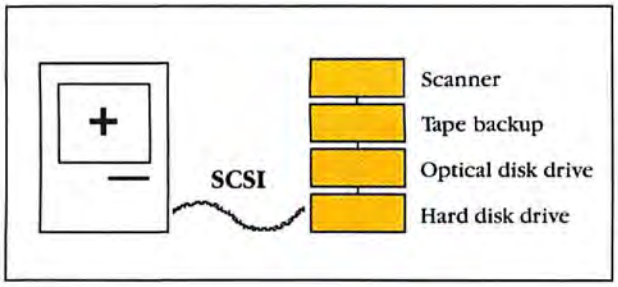


Figure 1
By daisy chaining (connecting one device to another), up to seven peripherals can be attached to the Mac Plus's SCSI connector.

two optional features. The first is a plug-in board that turns the scanner into an optical character reader. The second is a board that transforms the scanner into a facsimile machine capable of transmitting document images at 9600 bits per second.

Megabyte Expansions

While the 512K Macintosh wasn't designed for memory expansion, that hasn't deterred third-party vendors from offering memory upgrades. Companies such as Levco, Beck-Tech, Micro-Conversions, and MassTech offer memory upgrades of from 1 to 4 megabytes (see "Megabytes and Beyond," *Macworld,* February 1986). However, the non-Apple upgrades either modify the Mac's digital board or clip onto the Mac's 68000 processor. Both methods void Apple's warranty.

For the Macintosh Plus, Apple has made memory expansion a little easier. A new system of mounting RAM chips, called the Single Inline Memory Module (SIMM), allows eight memory chips to be mounted on a small circuit board, which then plugs into a socket on the digital board (see Figure 2). Using 256K-bit RAM chips, you can plug in four SIMM boards for 1 megabyte of RAM. When 1-megabit chips become available later this year, each SIMM board will be able to hold a megabyte. Using a combination of 256K and 1-megabyte SIMMs, you will be able to expand memory from 1 to 4 megabytes. One company, MICAH, has announced the MICAHMemory 2/4 RAM board, a 2- or 4-megabyte RAM expansion kit that plugs into a SIMM socket.

Stephen Beck, president of Beck-Tech, feels that with the introduction of the Macintosh Plus, Apple validated the concept of the megabyte machine. Beck-Tech, one of the first companies to offer megabyte upgrade kits for the 128K and 512K Macs, has announced MacMegabytes 2+ , a 2-megabyte RAM upgrade for 128K or 512K Macs.

The Macintosh Plus is bound to affect the memory upgrade market significantly. Stanislaw Lewak, of Levco, foresees the need among 128K and 512K Mac owners for a viable alternative to the Mac Plus upgrade. Levco's MonsterMac, which can add up to 4 megabytes of memory, also contains provisions for an optional hard disk of the less-expensive IBM PC variety. Levco has also announced the Mac-20FP, which contains up to 4 megabytes of RAM as well as a 68020 processor and a 68881 numeric coprocessor. The Mac-20FP reportedly increases performance significantly and runs all software that follows Apple's developer guidelines.

While the trend will be to offer 4 megabytes of RAM when 1-megabit chips become available, the Mac's current design prevents memory from expanding any further. Although the 68000 processor can directly address 16 megabytes, the Mac's ROM resides above the space allotted for 4 megabytes of RAM. Because the location of the ROM is fixed in the current Macintosh design, expanding beyond 4 megabytes must wait for a future machine.

Doubling the ROM

Although much of the Plus's ROM code (firmware) has changed, the functional changes to the Mac's software were minimal. Many of the firmware changes optimize the Plus's performance. In addition, some of the routines that were previously stored on disk in the System file have been moved into the ROM. The overall result is a faster machine (see "The Plus Compared") that gives you more usable space on disk for documents and applications.

The ROM, which has doubled in size to 128K (see "Memory Revealed"), now contains the code for the hierarchical file system (HFS) and an improved version of QuickDraw, the routines that enable the Mac to create its detailed graphics. Moving the HFS, which

(continues on page 92)

Figure 2
Each SIMM board can hold either 256K or 1 megabyte of RAM and can easily be removed.

Memory Revealed

Stephen Chernicoff

The Macintosh has two kinds of memory: *read-only memory* (ROM) and *random access memory* (RAM—also known as *read/write memory*). ROM contains the built-in machine code of the Macintosh operating system and User Interface Toolbox. Any program running on the machine can use this built-in code to perform common tasks, such as memory and file management, and to manipulate windows, menus, icons, and all the other standard features of the Macintosh user interface.

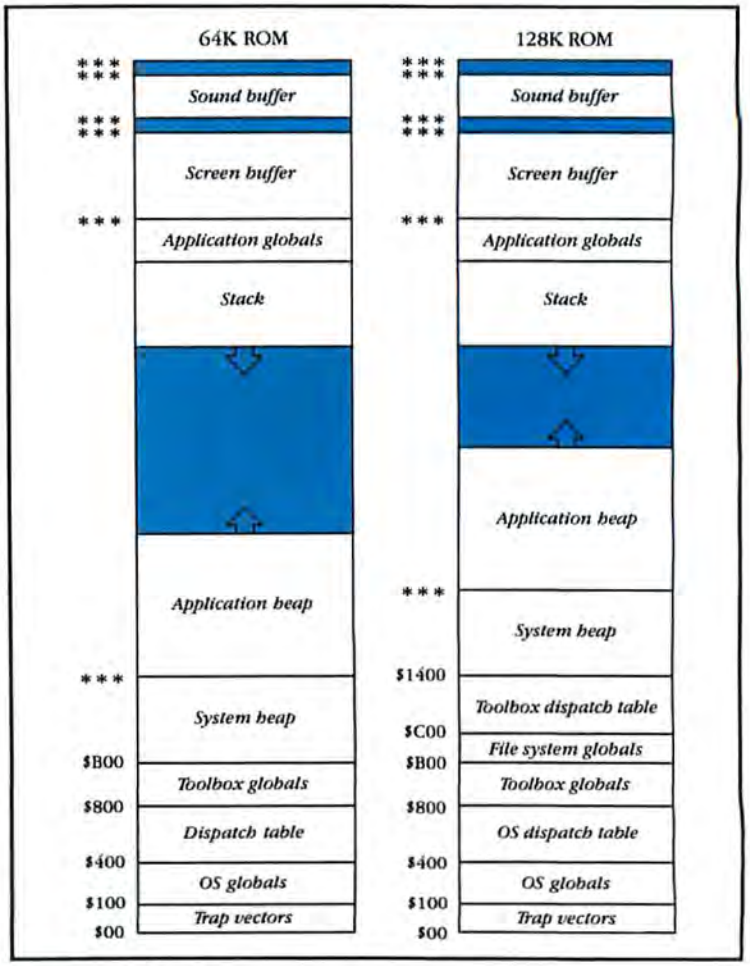
Since the contents of ROM are permanent and unchangeable, this portion of memory is unavailable for an application program's working storage. Any space the application needs for its own use must be allocated in RAM, using the part of the operating system known as the Memory Manager.

The original-model Macintosh has 64K of ROM and 128K of RAM. The "Fat Mac" introduced in September 1984 has four times the RAM capacity of the original—512K. The Macintosh Plus comes standard with 1 megabyte, or twice as much memory as the Fat Mac, and can be expanded to 2 or even 4 megabytes. (A megabyte is 1024 kilobytes, or 1,048,576 bytes.) The Memory Manager is designed to adapt automatically to different memory configurations so that the same program runs without change on any size machine and automatically uses whatever amount of RAM is available.

The Mac Plus contains a new, 128K ROM, which replaces the original 64K version. The new ROM includes everything that was in the old one, plus a few extra goodies—most notably a hierarchical file system that's better suited to large-capacity disks.

RAM Organization

RAM addresses always run from 0 up to the maximum number of bytes in a machine. In a 128K Macintosh the last byte of RAM is at address $1FFFF. (The dollar sign denotes a number expressed in hexadecimal, or base 16. Hexadecimal $1FFFF is equivalent to decimal 131,071.) In a 512K Mac the last RAM address is $7FFFF; in the Mac Plus or machines that have been upgraded to 1, 2, or 4 megabytes, it's $FFFFF, $1FFFFF, or $3FFFFF, respectively.



Memory Mapped

The layout of the Macintosh's memory differs depending on the ROM version installed. Addresses for locations above $B00 (64K ROM) or $1400 (128K ROM) vary depending on the amount of RAM installed. See "Memory Address Table" for the addresses marked with asterisks.

Similarly, ROM addresses always start at $400000 and run up to $40FFFF for the original 64K ROM and $41FFFF for the new 128K version.

The exact layout of information in RAM depends on which ROM is installed in the machine (see "Memory Mapped"). The version of the system code in the 64K ROM reserves the first $B00 (2816) bytes of RAM for use by the system itself. Addresses $0 to $FF hold *trap vectors,* pointers that identify the memory locations of the machine-language routines for handling various errors, like attempting to divide by zero, and special conditions, such as events generated by peripheral devices. The *dispatch table,* which contains the locations of all the operating system and Toolbox routines in ROM, is at addresses $400 to $7FF. The operating system and Toolbox keep their *system globals*—memory locations reserved for their own use—at $100 to $3FF and $800 to $AFF, respectively.

Under the new, 128K version of the system code, the amount of space reserved for system use at the beginning of RAM is increased from $B00 to $1400 (5120) bytes. Addresses $B00 to $BFF hold an extra block of system globals for use by the new file system. Also, instead of a single dispatch table for the operating system and Toolbox combined, there are separate tables for each: the operating system's table spans addresses $400 to $7FF, and the Toolbox's runs from $C00 to $13FF.

At the end of memory are the *screen buffer,* which stores the image to be displayed on the Macintosh screen, and the *sound buffer,* which stores the sounds emitted by the built-in speaker. The screen and sound buffers are always located in the same places relative to the end of RAM; "Memory Address Table" gives the actual memory addresses for various memory configurations. The *application global space,* which contains global variables for application programs along with other information about the application as a whole, is located just before the screen and sound buffers in memory.

The space between the end of the system globals and the beginning of the application globals is available for allocation as needed during the execution of a program. This area is shared between two forms of allocation, the *stack* and the *heap,* which grow toward each other from opposite ends of the space, as shown in "Memory Mapped."

The stack is used mainly for holding parameters, local variables, return addresses, and other temporary storage associated with an application program's subroutines (procedures and functions).

The heap is divided into two parts, the *system heap* and the *application heap.* As you might expect, the system heap is used by the system for its own memory needs. The application heap is used by the application program. In addition to the program's data, the application heap contains the machine code for the program itself.

Memory Revealed was adapted from Macintosh Revealed, Volume 1, *by Stephen Chernicoff, Hayden Book Company, 1985.*

Memory Size	System Heap (64K ROM)	System Heap (128K ROM)	Screen Buffer	Sound Buffer	End of Memory
128K	$B00-$4E00	$1400-$5700	$1A700-$1FC7F	$1FD00-$1FFE3	$1FFFF
512K	$B00-$CB00	$1400-$D400	$7A700-$7FC7F	$7FD00-$7FFE3	$7FFFF
1MB	$B00-$CB00	$1400-$D400	$FA700-$FFC7F	$FFD00-$FFFE3	$FFFFF
2MB	$B00-$CB00	$1400-$D400	$1FA700-$1FFC7F	$1FFD00-$1FFFE3	$1FFFFF
4MB	$B00-$CB00	$1400-$D400	$3FA700-$3FFC7F	$3FFD00-$3FFFE3	$3FFFFF

Memory Address Table
The addresses of the system heap, screen buffer, sound buffer, and end of memory for five memory sizes. The location of the system heap varies with the ROM version installed.

The Plus Compared

David L. Foster

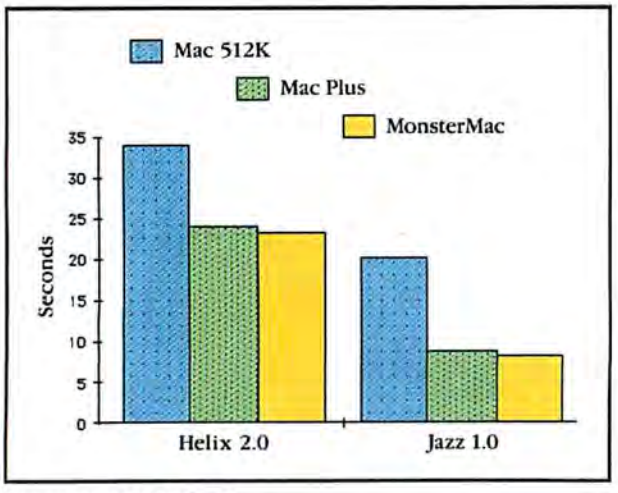
After months of eager anticipation, I was intrigued about exactly what performance improvements would appear in Apple's new Macintosh. Although it seemed certain that doubling the Macintosh's internal memory and using double-sided 800K floppy drives would enhance the Plus's capabilities relative to those of the 512K Macintosh, I was also interested in measuring the Plus against the fastest of the third-party upgrades, the 2-megabyte MonsterMac from Levco Enterprises (see "Megabytes and Beyond," *Macworld,* February 1986).

Since the time available for my evaluation was much too short to come to any conclusions about software compatibility, I concentrated on testing the speed at which the three machines perform tasks like opening applications, writing or reading data from disk storage, and performing numeric calculations. Because the release version of the 128K ROM was not available to third-party manufacturers when this article went to press, the MonsterMac was equipped with a prerelease version of Apple's 128K ROM; the 512K Macintosh was tested off-the-shelf. Since no SCSI hard disk drive was available, I wasn't able to evaluate the Plus's unique ability to interface with such devices.

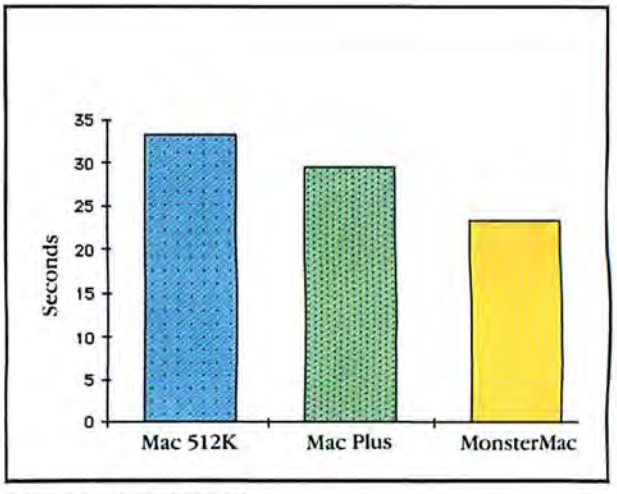
Off to a Fast Start

One of the more dramatic performance enhancements I observed during my tests was the greatly increased speed with which the Mac Plus opens applications (see "Opening Applications"). In general, programs open from 30 to 60 percent faster than on the 512K Macintosh, due to changes to the Resource Manager in the new 128K ROM. When the Finder launches a program, the Resource Manager loads and compacts the resource files much faster than the old Resource Manager. The new version uses disk caching techniques to minimize unnecessary disk accesses. Because the speed-up in opening applications is due to the 128K ROM, the MonsterMac shared the same performance increase.

Unless you spend most of your time opening and closing many applications, you're probably much more concerned with performance within an application. For example, the speed with which numerical computations are performed is a crucial issue if you frequently use spreadsheets, statistical analysis packages, or three-dimensional drawing programs. When I calculated the standard deviation of 32,000 numbers in an *Excel* spreadsheet, the Mac Plus was 11 percent faster than a 512K Mac (see "Computational Speed"). The MonsterMac turned in a time 19 percent faster than the Plus, a performance made possible because of the way the MonsterMac's memory is organized.



Opening Applications
The time required to open Helix *2.0 and* Jazz *1.0 starting from the Finder's desktop was determined with both applications residing on a Hard Disk 20.* Helix *and* Jazz *respectively loaded 30 percent and 56 percent faster on both the Plus and the MonsterMac.*



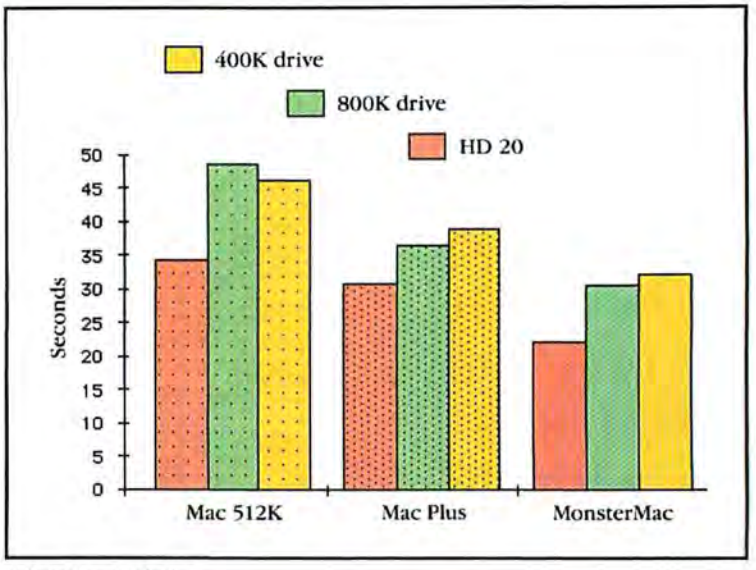
Computational Speed
The time required for Excel *to calculate the standard deviation of 32,000 numbers was determined on all three machines.*

A Boost in Disk Performance

The Plus comes with an 800K double-sided floppy disk drive. I wondered if such drives offer any enhancement besides additional storage space, so I ran a simple Microsoft BASIC program to write and then read a 64K file to disk. The results were nearly identical for both single-sided and double-sided drives (see "Disk Read/Write"). Still, the Plus and the MonsterMac accessed both 400K and 800K floppy drives at far greater speeds than the 512K Mac.

The combination of quicker access and the new Resource Manager makes opening applications from floppies much faster. For example, opening *Helix* from the Plus's 800K drive requires 39 seconds; compare that to the 98 seconds needed by a 512K Macintosh with two 400K floppies, a 2.5-fold difference. The slightness of the speed advantage of the 800K drive over the 400K drive was demonstrated by the fact that loading *Helix* from a Plus equipped with an external 400K drive required only 3 additional seconds. Once again the MonsterMac bested the Plus by opening *Helix* from an 800K external drive in 33 seconds, 6 seconds faster than the Plus and only 9 seconds slower than launching *Helix* from Apple's Hard Disk 20.

New, improved QuickDraw routines speed up most screen display operations by about 30 percent. Programs that deal with lots of QuickDraw objects, like *MacDraw, MacDraft,* or *Easy3D,* feel much faster on both the Plus and the MonsterMac because these machines redraw complex objects at discernibly faster rates. Three-dimensional drawing programs like *Easy3D* are especially snappy on the MonsterMac due to its superior computing speed.



Disk Read/Write

A Microsoft BASIC program was used first to write, then to read, a 64K data file. Notice that the new ROM provides disk read/write speeds that are 15 to 25 percent faster for both the Plus and the MonsterMac. The 20 to 25 percent faster memory in the MonsterMac gives this upgrade an additional 10 to 20 percent speed enhancement over the Plus.

But Is the Mac Plus Compatible?

Since the 128K ROM implements Apple's new hierarchical file system, or HFS (see "A Hierarchy and 20 Megabytes," *Macworld,* January 1986), the Plus will doubtless share many of the same software compatibility problems that users experience when using the Hard Disk 20 system. A number of programs either crash or fail to work properly in the HFS environment. Many programs can't access files if they're stored in folders because folders represent separate directories in HFS. Most development systems, including MDS and Consular C, must have all their associated files at the root or desktop level to work properly. Since several months will probably pass before new versions of the software appear for HFS, you should make sure that your favorite software is fully compatible with HFS before you upgrade the ROM or buy a Plus.

Pluses and Minuses

The Macintosh Plus, true to its name, does offer more than the 512K Mac. However, most of the Plus's performance enhancements arise from changes and additions that Apple made to the Mac's ROM memory. The Plus, or any Mac with upgraded ROM, opens applications dramatically faster, particularly when they are based on floppy disks. Although the Plus is slightly faster at computations than a 512K, it is significantly slower than the MonsterMac.

(continued from page 91)

was previously stored on disk, into the ROM frees up approximately 30K of disk space and does away with the need to load the HFS code from disk into RAM when the Mac is started. Apple estimates that improvements to QuickDraw produce a 30 percent increase in speed when graphics and text are displayed. The routines that control the SCSI port have also been added to the ROM. Putting the SCSI manager in ROM allows the Mac Plus to start directly from a SCSI hard disk.

The Macintosh Plus establishes a megabyte of RAM as the standard Mac work environment.

Another major improvement in the Macintosh Plus is a change to the Resource Manager that speeds up starting specially formatted applications. The 128K ROM also allocates space for a disk cache, an area of RAM used for storing disk information. The cache decreases the number of disk accesses a program requires, thereby speeding up applications that read and write repetitively from the same disk areas.

Figure 3
The arrow keys added to the right side of the Plus's keyboard result in a half-size right Shift key, which can be awkward to use at first.

A large portion of the space in the 128K ROM is populated by resources that were previously stored on disk in the System file. The resources that were relocated include the AppleTalk drivers, the Standard Apple Numerics Environment (SANE), the floppy and hard disk drivers, the serial port driver, and the sound driver.

The User Interface

Two changes affect the Mac's standard windows. The first is a feature that works like double-clicking on the title bar in *Microsoft Word* or *Excel*. Clicking on the zoom box that appears in the upper-right corner of a window enlarges the window to its full size. A second click restores the window to its previous dimensions. The second change is that windows can now scroll horizontally as well as vertically. Existing applications must be rewritten to take advantage of horizontal scrolling and the zoom box.

Two other improvements come in the area of text handling. Apple has modified the Font Manager to allow the Plus to use up to 65,536 fonts and has refined the Mac's text display techniques to enable it to do kerning—a typesetting practice in which the space between certain character pairs is adjusted to compensate for variations in character shape. With kerning, for example, a small *a* can be tucked under the crossbar of a capital *T* for a more pleasing appearance. The spacing of boldface and italic characters has also been improved. Current applications, including *Word* and *MacWrite,* do not yet take advantage of the Font Manager changes.

Lastly, the Mac Plus can handle menus that are too big to fit on a screen. If the list of menu items extends beyond the bottom of the screen, you can scroll through the menu to select the command you want. But while this feature sounds tailor-made for the desk accessories menu, the number of desk accessories you can install is still limited to 16.

Upgrade Paths

New products typically mean obsolescence for personal computer owners. Apple has gone to great lengths to ensure that Mac owners can upgrade to the Plus, though at a price. Because of the way Apple has packaged the upgrade from a 128K or 512K Mac to a Macintosh Plus, deciding to upgrade is like choosing from the myriad options on a new car. If you want the benefits of a double-sided 800K floppy drive, you must buy the 128K ROM and the drive, which are bundled together for $299. Conversely, you can't buy just the upgraded ROM but must settle for the ROM and the drive together. HD 20 owners who currently own a 512K Mac need to purchase the ROM upgrade package if they want to boot from the hard disk.

If you want either the megabyte of RAM or the SCSI port, you need to purchase the new digital board

Figure 4
The circular, 8-pin modem and printer connectors require an adapter cable (shown at right) to accommodate existing peripherals. The external drive and mouse connectors are unchanged; the 25-pin SCSI connector (fourth from the left) is new.

from Apple ($599 for 512K machines, $799 for 128K machines). People who already have third-party memory upgrades have to pay the 128K upgrade price. If you don't need the SCSI port, adding a memory upgrade from a company like Levco, Beck-Tech, or MassTech is a viable alternative. And if the only reason you're in the market for a SCSI port is to take advantage of the faster SCSI hard disks, you should consider one of the internal hard disks from MICAH or Levco.

If you need a numeric keypad or want cursor control keys (see Figure 3), you can buy the Mac Plus keyboard as a separate option ($129). Although Microsoft products such as *Word* and *Excel* respond to the cursor control keys, don't assume that all applications will. If you buy the keyboard for the cursor keys, be sure to try it beforehand with the application you'll be using.

Lastly, if you need an external 800K floppy drive, you can purchase one for $499. But be aware that before you can attach the 800K drive, you need to purchase the ROM and 800K disk upgrade package. Although the 800K drives read both single- and double-sided disks, Apple recommends using 800K disks with the hierarchical file system.

The only physical incompatibility you'll find when you upgrade is due to the new printer and modem connectors on the back panel of the machine; these were changed to make room for the SCSI connector (see Figure 4). In place of the DB-9 connectors there are two circular sockets (Apple calls them mini 8-pin connectors), similar to the ones found on the ImageWriter II. In going from 9 pins to 8, Apple has eliminated the 5-volt signal that peripherals like ThunderScan and MacVision expect to see. While upgrades for both products are on the way, you should be aware of possible compatibility problems with some peripherals. The digital board upgrade comes with one adapter cable that has a DB-9 connector on one end and a mini 8-pin connector on the other. You can purchase additional cables for under $20. The caveat for people who want to use an existing printer and modem: expect to pay the $20 for an additional adapter.

The Macintosh Plus establishes a megabyte of RAM as the standard Macintosh working environment. Even in the IBM world, where two methods exist for expanding memory, a megabyte of RAM is still not standard. In fact, IBM PCs, XTs, and ATs cannot be upgraded to more than a megabyte of RAM in such a way that all programs can take advantage of the extra memory. Equally significant are the high-performance peripherals that the Plus's SCSI port brings to the Mac.

Prior to Apple's announcement of the Plus, expectations for the new Macintosh were high. Compared to the visions of new processors, higher-resolution color graphics, larger displays, and slots, the Plus is a disappointment. However, the Plus does mark Apple's intent to open up the machine to other manufacturers. By making the Plus easier to expand and by actively encouraging outside developers to design hardware and software for the Macintosh, Apple has brought higher-performance peripherals and the capability for much more powerful software to the Macintosh family. □

▲▲▲▲▲▲▲▲▲▲ *David Ushijima is* Macworld*'s Technical Editor.*

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Macintosh Plus
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
408/996-1010
List price: $2599

Beyond Spreadsheets

Keith Thompson

MindSight brings mainframe financial analysis to the Macintosh

Professionals whose jobs involve substantial budget forecasting and business planning have long had the advantage of mainframe decision support systems. Such planners have endured cumbersome mainframes in order to create complex financial models beyond the reach of a microcomputer spreadsheet. But as the Macintosh has found its way to executive desks, sophisticated decision support software has followed close behind. The result is a powerful combination of mainframe capability and Macintosh functionality.

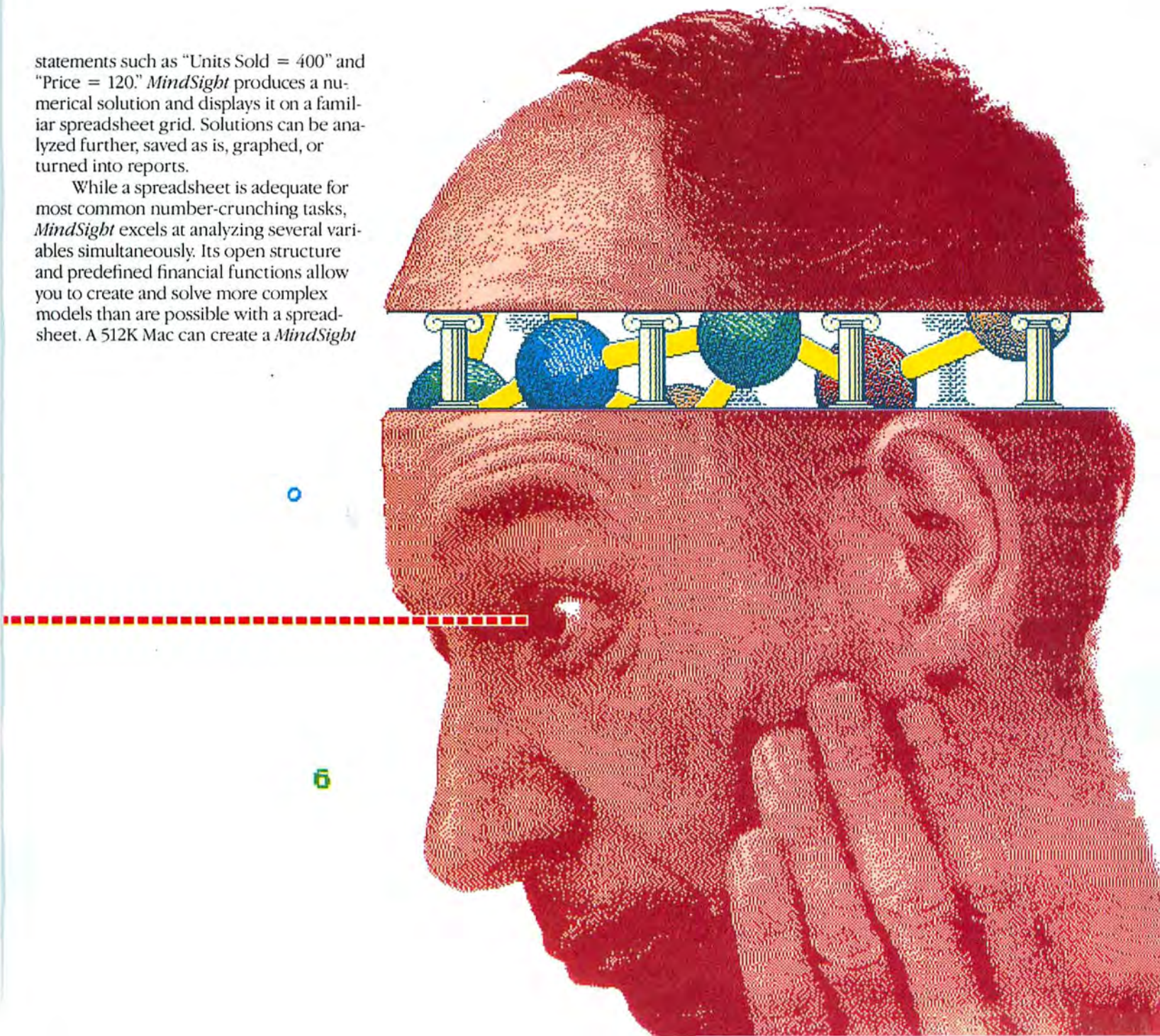
Execucom Systems' *MindSight* is the first financial decision support system (DSS) for the Macintosh. Execucom is new to Macintosh software but no stranger to DSS; the company is well known for its Interactive Financial Planning System (IFPS), which operates on over 20 mainframe systems. Execucom transferred the most powerful features of IFPS to *MindSight,* taking full advantage of the Mac's icon-based interface and pull-down menus along the way. The resulting hybrid, which requires 512K and two disk drives, makes itself at home as a stand-alone program or as a working companion to a mainframe sibling.

More Than a Spreadsheet

You can appreciate *MindSight* most easily by comparing it to its most common relative, the tried-and-true spreadsheet. Both create models representing business situations. For example, "Revenue = Units Sold * Price" is a simple, single-line business model. While a spreadsheet forces you to translate the model into numerical formulas that you enter into a familiar row-and-column matrix, *MindSight* lets you describe your model exactly as you see it above, using English-like statements created with the program's modeling language. *MindSight* then applies the model's generic statement to a set of specific values you designate. The revenue statement, for example, is solved by adding definitive

statements such as "Units Sold = 400" and "Price = 120." *MindSight* produces a numerical solution and displays it on a familiar spreadsheet grid. Solutions can be analyzed further, saved as is, graphed, or turned into reports.

While a spreadsheet is adequate for most common number-crunching tasks, *MindSight* excels at analyzing several variables simultaneously. Its open structure and predefined financial functions allow you to create and solve more complex models than are possible with a spreadsheet. A 512K Mac can create a *MindSight*



model with as many as 1200 spreadsheet columns and 2000 variables.

MindSight's true power comes into play when you apply different assumptions to your model solution. The program performs three types of "interrogations," each easily invoked from a single pull-down menu.

With MindSight you can compare several different 'what-if' scenarios directly.

Like a spreadsheet, *MindSight* allows you to change the value of one or more variables to test out different solutions. However, while a spreadsheet forces you to alter your original data with each "what-if" calculation, *MindSight* lets you save each scenario in a separate case file for direct comparisons.

With its Goal Seek feature, *MindSight* leaves spreadsheets behind. Goal Seek allows you to designate a target figure for any variable and see how other variables must change to meet it. *MindSight* calculates different values for a selected variable to reach the desired goal.

The Analyze function allows you to work on particular sections of a model without affecting its other components. When you analyze a variable, *MindSight* displays only the variable itself and any variables that occur in its definition.

MindSight is powerful enough for comprehensive business plans and forecasts, but it's also well suited to narrow applications in specific industries. Banks use the program to create template models for qualifying loan applicants. The templates contain all the formulas necessary for analyzing a loan; the loan officer simply enters the applicant's specific financial data. *MindSight* performs designated financial ratio analyses and produces a report comparing the applicant to the bank's loan criteria. Real estate investors create models

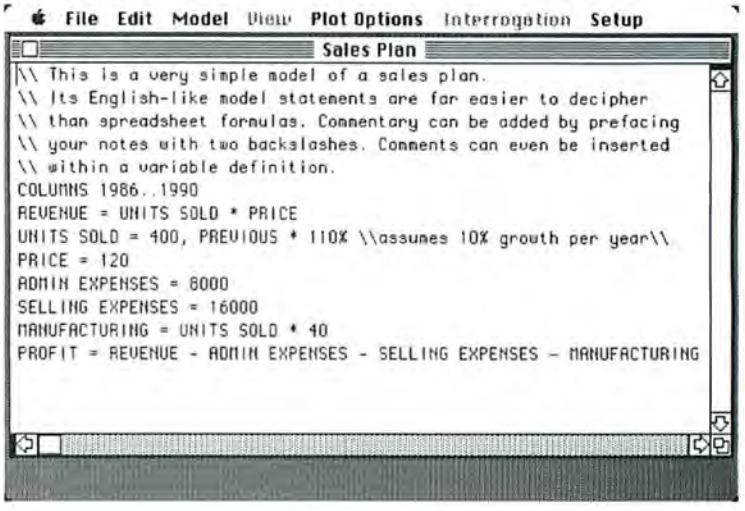
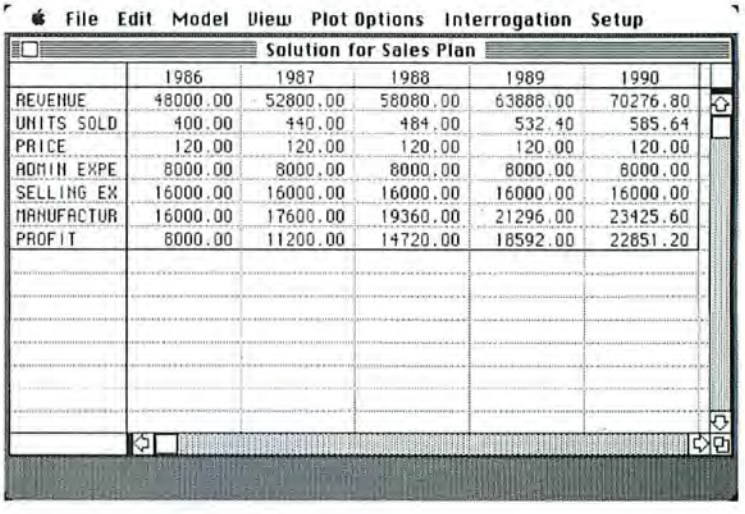


Figure 1
MindSight *models are composed of English-like statements that describe a business situation mathematically. Model size is limited only by the amount of disk space available.*



	1986	1987	1988	1989	1990
REVENUE	48000.00	52800.00	58080.00	63888.00	70276.80
UNITS SOLD	400.00	440.00	484.00	532.40	585.64
PRICE	120.00	120.00	120.00	120.00	120.00
ADMIN EXPE	8000.00	8000.00	8000.00	8000.00	8000.00
SELLING EX	16000.00	16000.00	16000.00	16000.00	16000.00
MANUFACTUR	16000.00	17600.00	19360.00	21296.00	23425.60
PROFIT	8000.00	11200.00	14720.00	18592.00	22851.20

Figure 2
The model's solution appears in a familiar spreadsheet grid. The rows correspond to the user-defined variables, and the columns usually correspond to time periods. Columns may also represent other divisions such as the different departments in a large organization.

that calculate the tax benefits of ownership and the pre- and post-tax cash flows for any investment property. *MindSight*'s amortization, Accelerated Cost Recovery System (ACRS) depreciation, and straight-line depreciation subroutines automate the most complex aspects of the analysis.

Powers of the Language

The key to *MindSight*'s flexibility is the wealth of financial, mathematical, and statistical operations built into its modeling language. Twenty-eight built-in functions automate common business computations such as sums, standard deviation, moving averages, logs, and linear regression. Six predefined calculations, or subroutines, automate more complex calculations. For example, *MindSight*'s straight-line depreciation subroutine calculates all required variables (period depreciation, book value, and cumulative depreciation) from a single formula. The other program subroutines are loan amortization, ACRS depreciation, declining balance depreciation, generalized declining balance depreciation, and sum-of-years' digits depreciation.

High Level, High Speed

Surprisingly, *MindSight*'s complexity does not slow the program appreciably. Any program using a high-level language devours time as it translates that language into machine language. *MindSight* incorporates two features, Compile Save and Compile Get, that allow you to compile your model once and then reuse it—or reuse amended versions of it—without recompiling.

There are several advantages to building a model with an easily deciphered high-level language. English expressions make the model accessible to people without special training in computer language; it is easy for other model-builders to understand and use the models you have written; and every model is self-documenting. Problems in a *MindSight* model can be spotted and changed far more easily than those in most spreadsheets, for which you must call up each cell in turn and scrutinize cryptic, cross-referenced formulas.

A Model Example

A close look at a simple sales model gives an idea of how *MindSight* neatly integrates its skills with the Mac's interface. Keep in mind that *MindSight* handles models far more complex than this example; *MindSight*'s template models, for example, are as long as 80 lines. To scrutinize a small company's cost, price, and profit alternatives for the years 1986 to 1990, enter model statements in *MindSight*'s model window as shown in Figure 1.

MindSight's nonprocedural language allows you to enter model statements in any order. You should enter statements in the order you want to see your solutions, however, because the program displays its results in the same order as the model's statements. Be forewarned, too, that *MindSight*'s unstructured, blank-sheet approach puts the burden wholly on you to carefully consider the logic of your model. The program catches syntax errors, undefined variables, and modeling-language errors but cannot identify errors in logic.

The Columns statement sets out the number and titles of columns in the model's spreadsheet solution. In the example, five columns are labeled 1986 through 1990. If you want to extend the model to cover ten years instead of five, simply replace 1990 with 1995. You can also specify each column and its title individually.

The remaining statements define the model's variables. Enter the name of each variable followed by an equal sign and then enter the variable's values, known or unknown, to the right of the equal sign. The Solve command translates the model into spreadsheet format, with each variable in its own row (see Figure 2).

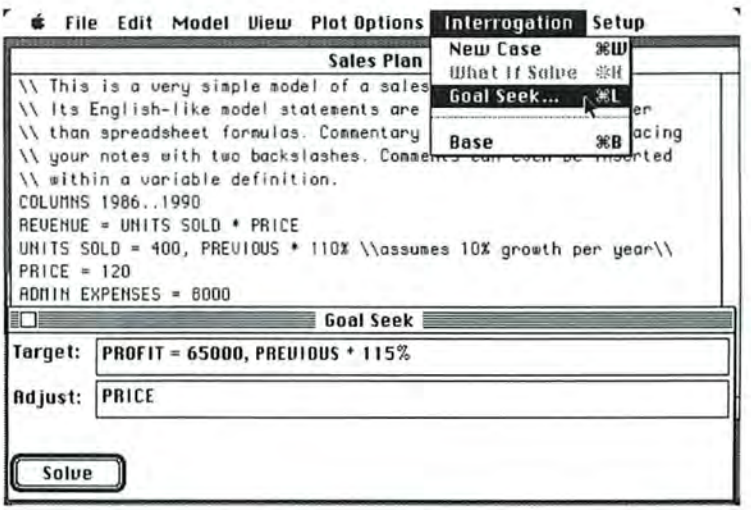


Figure 3
To use the Goal Seek feature you specify a target value for any variable and then identify a variable that can be changed to help reach the target. In this example, targeted profit is $65,000 for the first year with a 15 percent annual increase, and price is the selected adjustment variable.

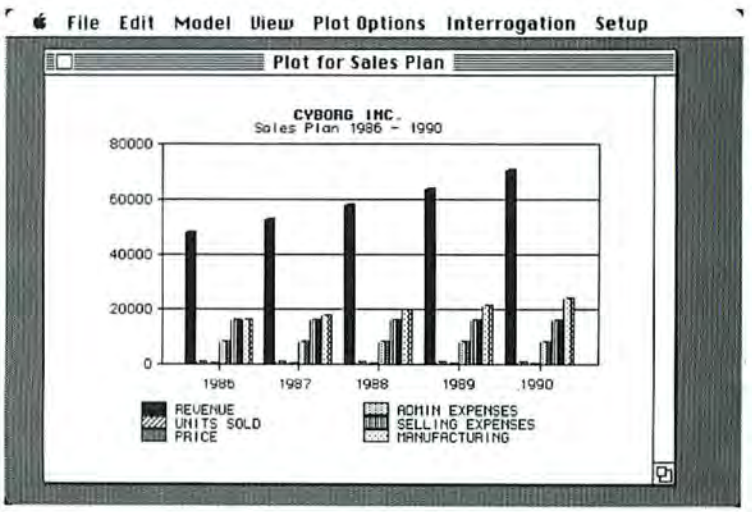


Figure 4
MindSight *solutions can be plotted as percent bars, line graphs, pie charts, two-dimensional clustered bars, three-dimensional bars, and stacked bars. You can plot up to six variables and twelve columns, set the range and scale of all values plotted, and designate titles for* x *and* y *axes.*

MindSight provides shorthand methods for describing a model. For example, the statement "Units Sold = 400, Previous * 110%" establishes 400 as the number of units sold the first year and then increases the total for each successive year by 10 percent.

The data used to solve a model need not reside in the base model. You can solve one model with variables from another model by selecting the appropriate files with the Solve Using command. Or you can consolidate data from several different files, a handy tool for combining the data of separate company divisions.

The commands on the Interrogation menu manipulate the sales model's assumptions. New Case lets you change data in the base model and save the new model for later comparison or printing. In the sales model, you can compute separate best-case, worst-case, and acceptable-case sales plans.

With the Goal Seek command you designate a goal, such as a desired annual profit, and let *MindSight* recalculate variables, such as unit price, to reach that goal (see Figure 3). *MindSight* displays the updated solution in a new window, which can be saved as a separate file.

Graphs and Reports

Plotted model solutions are particularly useful for comparing the results of "what-if" and Goal Seek analyses. *MindSight* can graph all or selected portions of a model in six different chart styles: percent bars, line graphs, pie charts, two-dimensional clustered bars, three-dimensional bars, and stacked bars. You can add titles, add a legend, and set the graph's scale and range (see Figure 4).

Charts can be moved through the Clipboard to any Macintosh application.

Comprehensive reports are easy to produce; simply select the GenReport command. GenReport offers default settings as well as 17 options for customizing a report. You can design and save report formats to be called up any time you select GenReport.

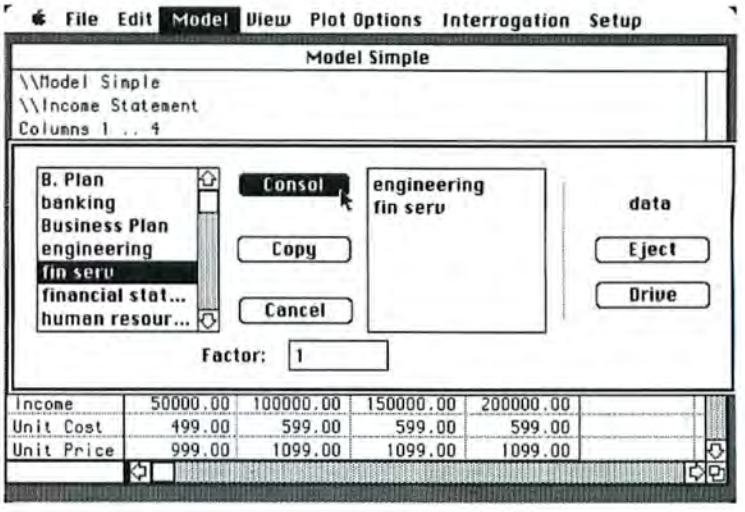
Mac to Mainframe

Although *MindSight* generates large models on a 512K Mac, it cannot compete with the massive number-crunching ability of a mainframe, nor can it perform memory-devouring operations such as sensitivity analyses. If you want such capability, you must kick your model upstairs with *Link,* a *MacTerminal*-like communications utility. *Link* transfers files to and from a host computer and allows the Macintosh to work as a remote terminal running Execucom's IFPS. The experienced IFPS user takes advantage of *MindSight*'s autonomy to prepare models on the Mac without waiting for mainframe access and turns to the mainframe for only the most demanding analyses.

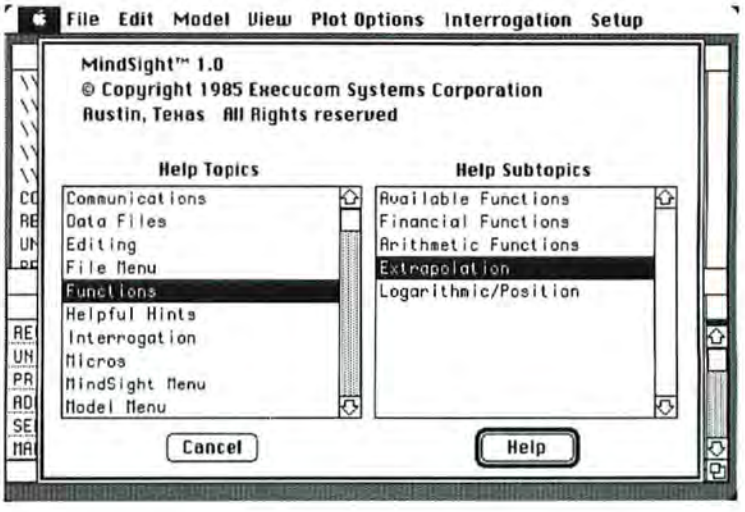
Financial Wizardry

MindSight should be an adjunct to, not a replacement for, spreadsheets. A spreadsheet remains the basic tool for keeping track of a business's numbers, because it excels at recording what has already happened. *MindSight,* on the other hand, excels at planning and analysis.

Spreadsheet users will discover that *MindSight* provides financial modeling power unavailable on a spreadsheet. It is far faster to rewrite a few variables in a well-constructed *MindSight* model than to change formulas embedded in a spreadsheet, and *MindSight*'s predefined functions and subroutines automate many complex operations. But power has its price. *MindSight* (and any other DSS for that matter) takes at least twice as long to master as a spreadsheet. If you are well grounded in financial analysis, learning time is spent simply mastering *MindSight*'s modeling language. Once you're comfortable with the language, you can build and test complex models with minimal effort.



Up to seven MindSight *model solutions can be consolidated into the currently active solution. As each successive file is processed, its values are added to the base solution. Consolidation is particularly useful for combining the results of separate company divisions into one model.*



MindSight's *extensive on-line help facility provides information on menu choices, model building, model statements, and other pertinent topics. You access the system from anywhere in the program by choosing Help from the Apple menu.*

Financial planning novitiates face a tougher challenge. *Execucom* provides a lengthy, well-written tutorial and excellent on-line help but does not explain how to apply *MindSight*'s extensive features. Beginners will most appreciate *MindSight*'s 15 templates, which include models for business plans, financial statements, and product planning. New users should latch on to these ready-made templates and simply alter individual model statements to fit specific needs rather than building complex models from scratch. Surprisingly, *MindSight*'s manual neglects to mention any of these templates.

If complex models are overtaxing your spreadsheet, you should seriously consider switching to *MindSight;* the program handles more variables, data, and formulas than the best spreadsheet. You can tap into *MindSight*'s powerful functions and subroutines without mastering the mathematical formulas behind them, but you must learn how to construct logical models. All told, however, the biggest challenge you face with *MindSight* is fully exploiting its potential. □

Keith Thompson contributes to several microcomputer magazines. He is the author of The Macintosh Office, *published by Ashton-Tate.*

MindSight
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Decisions, Decisions

Charles Spezzano

DecisionMap incorporates your knowledge and intuition in a graphic aid for making decisions

A manager's business is decision making—allocating resources, hiring key personnel, and planning strategies. Even if you're convinced you don't need a word processor or a database manager to do your job, you'll be hard pressed to deny the usefulness of a software tool that assists you in making decisions. DecisionMap *is a decision-making aid that helps you create a logical framework for any type of decision, whether hiring a new employee, selecting a college, or choosing a new car.*

You've just become a division manager for Wonder Foods, a packaged-goods company. You're responsible for a wide range of breakfast foods, including a line of beverages that has not been selling well. Hiring the right marketing manager for that line of products is your top priority. Fortunately, a number of well-qualified people applied for the job. Unfortunately, the field has been narrowed down to three candidates, and they all look so good that you can't begin to decide among them.

When you think about the three choices, you feel like you're trying to juggle a hundred ideas and facts. You know each candidate's strengths and weaknesses, but there are just too many factors to manipulate in your head.

If such mental acrobatics overwhelm you, *DecisionMap* from SoftStyle may help to resolve your confusion. Part of a new genre, called *decision support software, DecisionMap* lets you choose and weight the factors on which you'll base your decision. Then you rank the alternatives—in this case the three candidates—on each factor, and the program shows you the candidate with the highest overall ranking.

Creating the Map

No matter what the decision, the first step in using *DecisionMap* is to identify the specific factors that influence the decision. You enter those factors in a treelike map; the decision to be made is the root, and the various factors break into branches, or levels (see Figure 1). You keep breaking down factors into subfactors until you identify all the criteria you consider important to the decision. Each decision level holds up to five factors, but the number of levels possible depends on available memory.

The new genre of decision support software: help for ranking alternatives.

The hypothetical division manager described earlier might decide that administrative skills, interpersonal skills, and experience are the three main (Level 1) factors to consider in evaluating each candidate's potential as a marketing manager for breakfast beverages. Each factor in Level 1 breaks down into subfactors (Level 2), much like an outline. Each subfactor can have its own subfactors branching out at successive levels to the right across the map. Since *DecisionMap* displays the subfactors for only one factor at a time, no single screen shot can show an entire decision-making model as laid out in Table 1.

Weighting Factors

After specifying the relevant factors, the next step is weighting them. This procedure is highly subjective, but it is a key component in the decision-making process. Decision support software like

JACK FLYNN
JILL MITCHELL
PHIL MARINO

DecisionMap is designed to help people manage their subjectivity by systematically structuring their impressions and feelings. Nevertheless, the program cannot prevent you from consciously or unconsciously weighting the factors to achieve a predetermined result.

In deciding which candidate's experience best qualifies him or her for the job of marketing manager, for example, you must decide which of the five Level 2 subfactors is most valuable. If the line of breakfast beverages fails to grab a significant share of the market because of poor packaging, you might give the most weight to the Packaging subfactor.

Only *summary* factors–factors that have been divided into subfactors–are weighted. To weight a summary factor, you click on one and choose Weight from the Factors menu. *DecisionMap* displays a bar chart representing each of the subfactors for that summary factor (see Figure 2). You weight each subfactor with the pointer, stretching or shrinking each bar to the height that seems right. If that procedure seems a bit intuitive and you want to be more precise in positioning the bars' heights, you choose the Numeric option. As you raise or lower a bar, *DecisionMap* displays a number–on a scale from one to a hundred–within the bar.

Ranking the Alternatives

When all the factors have been entered and weighted, it's time to enter the alternatives. Then you rank each alternative from best to worst for the selected factors–again by stretching and shrinking bars on a graph with the pointer (see Figure 3). The relative heights of the ranked alternatives should represent their standings, from best to worst. For the majority of decisions, you rank alternatives on each of the *detail* factors–those subfactors at the end of a branch.

In the case of the three candidates in Figure 3, Wonder Foods assessed the managerial candidates with situational tests and found that Jack Flynn works well with others to research new product ideas but doesn't always plan well enough to meet manufacturing schedules. As a result he was ranked lowest on that factor. Jill Mitchell avoided the planning problem but was occasionally unwilling to invite knowledgeable subordinates to participate in developing plans. She fell between the other candidates. Phil Marino demonstrated the best blend of planning acumen and ability to delegate tasks; he obtained the highest ranking on that detail factor. You can rank your alternatives solely on summary factors for a quick take on a decision. However, the summary rankings you enter will override any lower-level rankings you have specified.

Viewing the Results

Finally, after the alternatives have been ranked for each detail factor, *DecisionMap* automatically calculates the cumulative rankings. Selecting the root decision and choosing the Results command display an overall comparison based on the weighted factors and ranked alternatives. You can compare the alternatives' rankings for Level 1 factors to see how the candidates stack up overall on administrative skills, interpersonal skills, and experience (see Figure 4). A comparison of the candidates' rankings on specific factors reveals the relationships between factors and alternatives. To perform "what-if" analyses, simply add or remove factors or change weights and rankings.

To edit the data, format the results of a decision as Text, instead of Graphic or Numeric, and transfer them to a word pro-

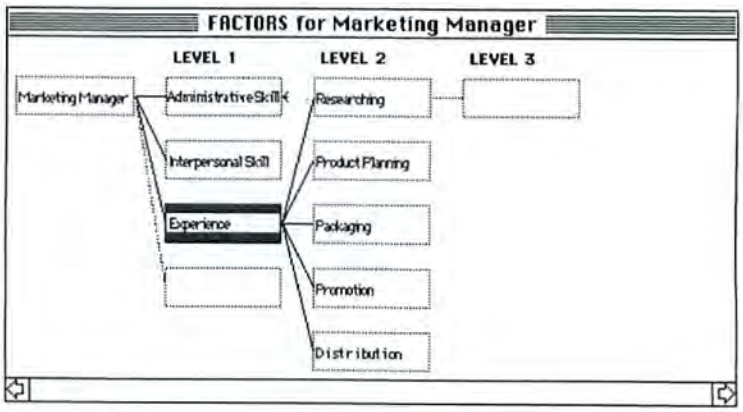

Figure 1
In this DecisionMap *model for selecting a marketing manager, the Experience factor in Level 1 breaks down into five subfactors.*

Decision: Hire a Marketing Manager

Level 1	Administrative Skill
Level 2	Flexibility
Level 2	Principles
Level 2	Delegation
Level 2	Planning
Level 1	Interpersonal Skill
Level 2	Consultative
Level 2	Persuasive
Level 2	Open to Criticism
Level 1	Experience
Level 2	Researching (consumer tastes)
Level 2	Product Planning
Level 2	Packaging
Level 2	Promotion
Level 2	Distribution

Table 1
The specific factors that influence a decision are broken up into different levels, much like an outline. This table shows the entire decision-making model, whereas DecisionMap *displays only the subfactors for the selected summary factor.*

cessing document. Text reports also include a complete numeric summary of the results. Additional reports are available that compare the influence of each detail factor on the decision. You can print and save complete decision models, or you can save just the factors and their weights as a template that you tailor to similar decisions in the future.

The Final Decision

DecisionMap worked quickly and showed no bugs when I constructed two different models. The program's warning messages and deletion verification procedures adequately protect against accidental data loss. A status thermometer in the Special menu shows the percentage of space used in memory at any point in the model-building process. It also estimates the number of factors you can add, based on the existing number of alternatives, or the number of alternatives you can add, up to five, based on the existing number of factors. The program lacks some desirable features: the ability to compare two versions of a model, yes/no rankings, and the ability to initiate actions based on criteria set up in the program. Nevertheless, the combination of the Macintosh user interface and the explicit, weighted-factors approach makes *DecisionMap* an easy program to use.

After stepping through this example, most people will need only occasional help from the manual or the on-line help facility. Overall, *DecisionMap* is a practical blend of simplicity, flexibility, and competent performance. It is a worthwhile choice for anyone in the business of making decisions. □

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DecisionMap
SoftStyle Inc.
7192 Kalanianaole Hwy. #205
Honolulu, HI 96825
800/367-5600
List price: $145

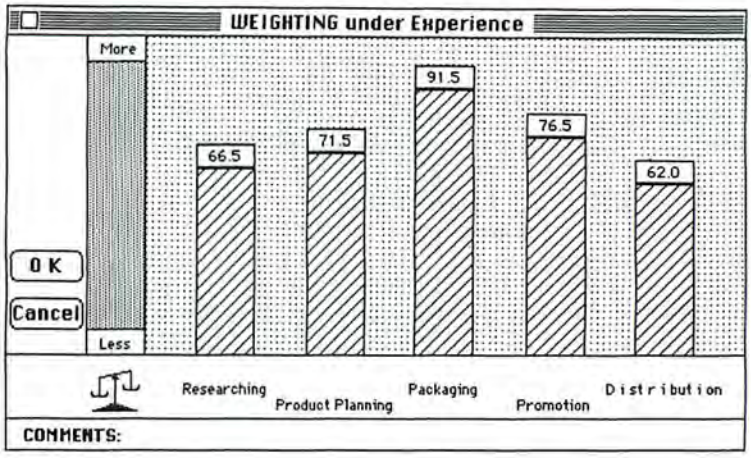


Figure 2
The five subfactors of Experience have been weighted. Packaging is weighted most heavily and therefore will have the most influence on the candidates' overall Experience ranking.

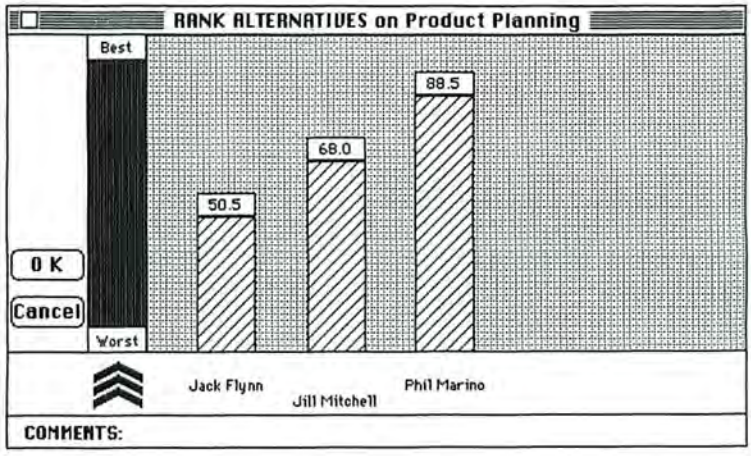


Figure 3
For the majority of decisions, you rank alternatives on each of the detail factors—those subfactors at the end of a branch. The three candidates were evaluated and ranked on their product planning abilities.

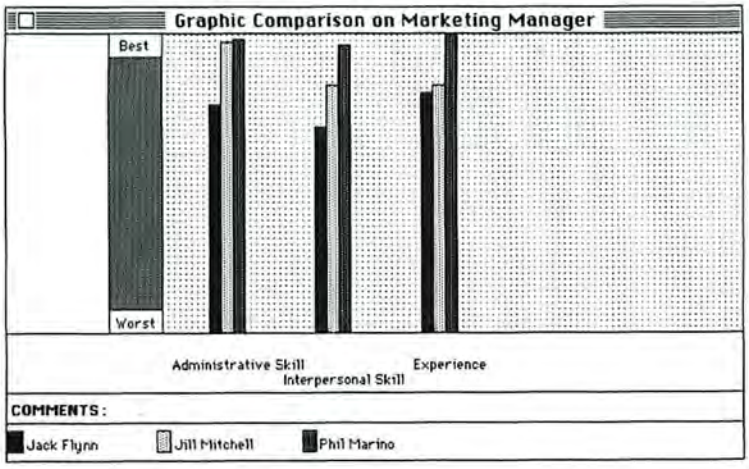


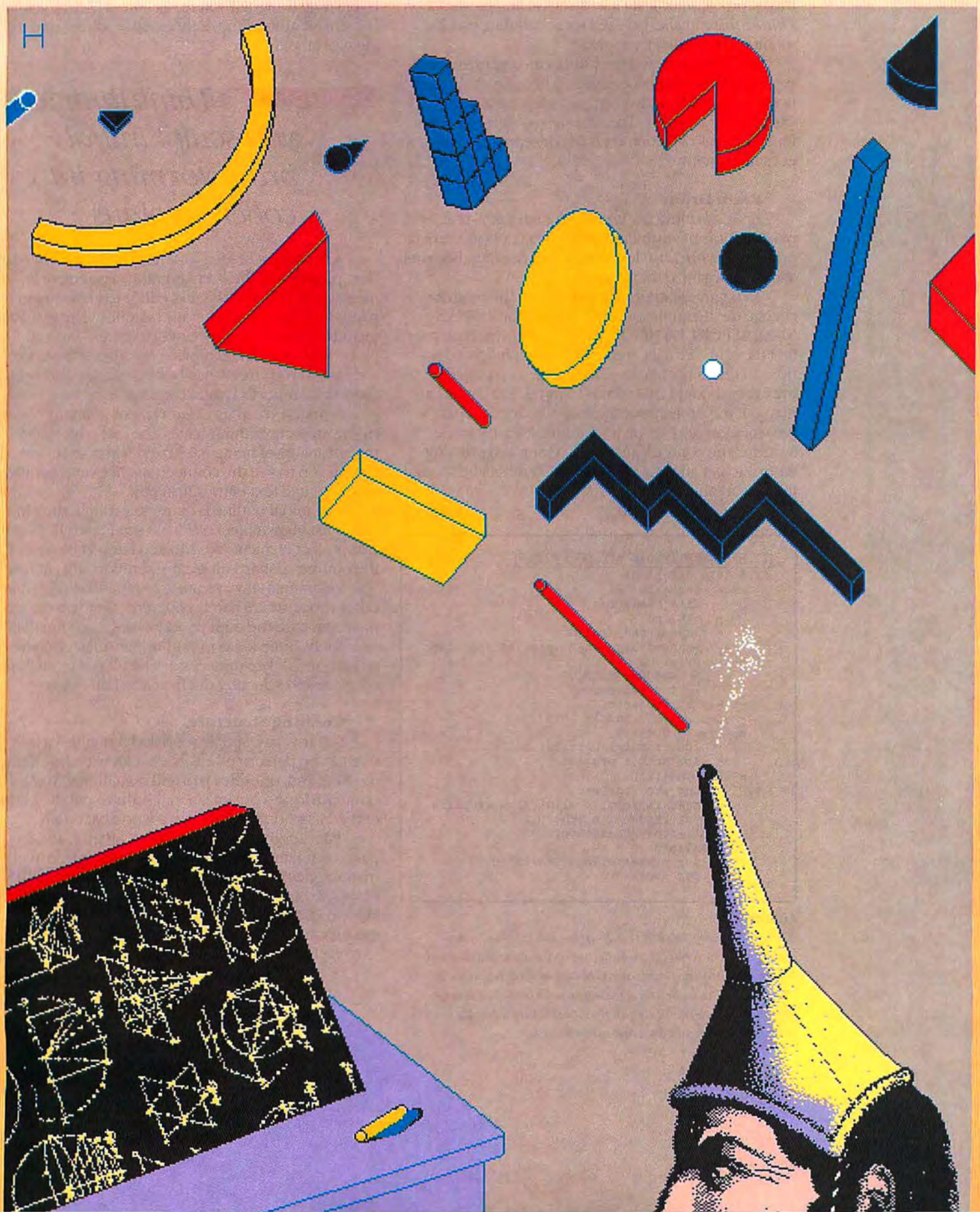
Figure 4
This display visually represents a comparison of alternatives on various factors. Such a comparison reveals the relationships between specific factors and alternatives.

Projecting Your Thoughts

Reed McManus

Oddly enough, a project management program isn't always the best tool for managing a project. Project management software is too elaborate for small jobs that don't involve coordinating numerous employees and vast amounts of resources. And the structured approach of project management software makes it unsuitable for initial conceptualizing. *ThinkTank 512*, from Living Videotext, is a good organizational alternative for small jobs. You can also brainstorm elaborate projects and transfer the results to a dedicated project management program to track dates and resources. An "outline processor," *ThinkTank* combines the flexibility of a word processor with some of the structure of a project management program.

Although *ThinkTank 512* can't match a project management program's ability to dynamically link tasks, dates, and costs, in most cases it works


H

well for creating schedules and project records. *ThinkTank* lets you focus on a project's initial planning stages and sculpt ideas into coherent project plans. Once you've worked out a detailed plan, *ThinkTank* helps you communicate it in a convincing presentation *ThinkTank* can also be used for scheduling and for monitoring a project's stages.

To illustrate how *ThinkTank* can organize a project, imagine you run a consulting firm, SmallCo, and hope to land a lucrative contract preparing MegaCorp's annual report. The first step in your campaign for the MegaCorp contract is to conceptualize the project's many steps.

Brain Drain

Brainstorming is *ThinkTank*'s strength—and its most significant advantage over a project management program. *ThinkTank* lets you record fleeting thoughts and then organize them later.

To begin creating your plan, open the program, change the heading "untitled" to "MEGACORP ANNUAL REPORT PROJECT," and press Return. Type your first thought: "Project Steps." Let your mind wander over all the implications of the MegaCorp project, typing every thought that comes to mind. You'll need to map out the project steps, create a budget, prepare a presentation, and set up a schedule in case you are awarded the contract. Just keep typing and pressing Return to get all your ideas down. They can be shaped into a workable order later.

```
+ MEGACORP ANNUAL REPORT PROJECT
   + Project steps
      - research
      - data analysis
      - writing
      + layout and design
         - need high-tech, professional look
      + printing
         - use DesignTech?
         - too expensive?
   - Report Contents
   - Can SmallCo handle this??
   ● Create Budgets
      - for proposal & research
      - for actual project
   ● Presentation
      - one man, one mac
      o need impressive slide show graphics
   - Set up Production Schedule
   - Contractors/Freelancers
   + Deadlines
      - for presentation: 6/4/86 10:00
      - for report?
```

Figure 1

A brainstorming session results in an initial list of unorganized ideas. A plus sign indicates that a headline has subheads; a minus sign indicates a headline with no subheads. The solid bullet indicates a headline with attached text or graphics as well as subheads, the open bullet a headline with attached text or graphics but no subhead.

If you've already thought through an idea or two, put them in hierarchical order from the beginning. The headline "Project Steps," for instance, spawns subordinate thoughts on research, data analysis, writing, layout, and design. If you're not sure where a headline fits, drag it around the outline until you've found its ideal position.

ThinkTank lets you sculpt initial brainstorming into coherent plans.

A simple list of ideas often isn't enough. If a headline inspires text, be it a paragraph, a poem, or a memo, use *ThinkTank*'s text editor to create up to 16 pages (32K) of text under any headline. The text editor includes basic word processing features—cut and paste, tabs, search and replace—and is adequate for, say, a memo to your free-lance book designer discussing the annual report's layout. For more extensive word processing, you can use *MacWrite* or *Microsoft Word*. In the project planning stages, the text editor offers the advantage of being integrated with the outline, allowing you to see the connections between outline headings and text entries instantly.

The initial outline is extremely rough, showing only a list of spontaneous ideas (see Figure 1). Disparate project elements are situated back-to-back, and the outline contains illogical and redundant subheads. Some elements show promise of organization, while other thoughts are barely coherent. Now you can expand and pare the outline, addressing each headline separately. Hone ideas by adding subsidiary headlines or text, and delete unnecessary headlines by clicking on them and selecting Cut from the Edit menu.

Creating Structure

So far you've simply recorded thoughts—a task that can be performed easily enough with *MacWrite*, the Note Pad, or even a pad and pencil. Now you call on *ThinkTank*'s organizational skills to put the pieces of the MegaCorp project into a workable order.

Take advantage of the Scroll, Collapse, and Expand commands to scrutinize the outline from as many angles as possible and make the hierarchical levels of the outline consistent. For example, use the Collapse command to focus on the relationships among the headlines under the entry "Project Steps"; make sure each discrete project step is at its proper outline

level. Use the Expand command to zoom in on the "printing" entry and its subprojects. Return to the big picture and evaluate the results by clicking on the topmost headline and selecting Expand All.

Now divide headlines into logical groups. Some categories seem obvious from the beginning: the MegaCorp project separates into the annual report itself, the presentation, the schedule, and the administrative concerns. The quickest way to move groups of headlines into their proper order is by dragging them, although keyboard commands are also useful.

Find related headlines in the outline with *ThinkTank*'s Search command. Keep in mind that headlines must be labeled with consistent terminology to search successfully. For instance, presentation-related entries scattered throughout the outline can be found if you enter them with a common word such as *slides* or a code such as *sl*.

Most people like to organize projects by the dates different tasks must be completed. To help you manage the project in an orderly fashion, organize headings within each topic group chronologically. Under each heading, organize and then number tasks as they should be performed. Use conventional outline organization if it helps you create structure. Drag headlines into proper position and promote or demote them using the mouse. Keep in mind that moving a headline also moves any of that headline's subheads or text.

The program's Sort command comes in handy for compiling telephone numbers of free-lance writers or for putting thoughts in order. Alphabetize entries under any headline by clicking on the headline whose subheads you want sorted and selecting Sort from the Reorganize menu.

After you gather headlines into main topics, some thoughts still refuse to be pigeonholed. Keep a headline for unassigned thoughts; call it, for example, The Bone Pile. As you refine the outline, move bone pile items into the outline or delete them.

```
+ MEGACORP ANNUAL REPORT PROJECT
    + ADMINISTRATION
        + Budgets
            + Up-front cost for proposal
                + estimate: $800-900
                    - freelance art fee: $450.00
                - cash on hand: $354.00
                - bank loan?
            + Annual Report Cost
                - estimate $12,000 pre-production?
                - keep printer's cost separate
        o Contractors/Freelancers
        - artists: leave to Leslie's discretion
        - writers/researchers: no more than two
    + PRESENTATION: June 4, 1986, 10:00
        - Howard B. Tuttle IV, Director of Corporate Communications
        + slide show
            - title slide
            - agenda for presentation
            + mock-ups
                - cover design
                - inside page w/ text and graphics
            + project schedule
                - MacProject?
        + ANNUAL REPORT ELEMENTS
            + company background
                - Howard B. Tuttle Jr. profile
                - domestic operations
                - international operations
            + financial analyses
                - need good, solid graphics
            + executive/employee profiles?
                - many photographs: "Life at MegaCorp"
        + PRODUCTION DEADLINES
            - research:              August 16
            - data analysis:         September 30
            - writing:               November 11
            - layout and design:     November 30
            + printing:              January 15
                - use DesignTech?
                - too expensive?
        + THE BONE PILE
            + Can we take on other contracts?
```

Figure 2

Initial ideas can be organized into a working plan with ThinkTank*'s specialized editing and formatting capabilities. The plan shows the different facets of the project as well as working deadlines.*

Organization to Presentation

The complex MegaCorp outline began with a jumble of rough ideas and unanswered questions. After some entering, dragging, and deleting, a structure for the project emerged (see Figure 2). But the outline's job is not complete. It is also a tool for presenting the project proposal and for carrying out the project.

The next order of business is to lay out the presentation. The quality of a presentation often determines whether you win or lose a contract. The best way to describe a visual project like an annual report is with a visual demonstration. *ThinkTank 512*'s Slide Show feature lets you present a running display of graphic images that tie in with your outline headings. You don't have to leave the outline to use it. Scan the outline and note which headline tasks would benefit from a display. Copy and paste each headline you want to illustrate through the Clipboard to a new section in the same outline, and label the section "MEGACORP ANNUAL REPORT PRESENTATION." Now organize the presentation headings to reflect the order in which you want to show the slides. Any picture, diagram, spreadsheet, or digitized image that can be loaded into the Macintosh Scrapbook can appear in the slide show. Simply click on the headline under which you want to place an image from the Scrapbook and then go to the Edit menu and choose Paste from Scrapbook. Once you transfer the items to the outline, give them appropriate titles.

The MegaCorp presentation starts with a title slide created in *MacPaint* and an outline of presentation topics culled from the larger project outline. It proceeds to mock-ups of the annual report created in *MacPaint* and a proposed project schedule created with *MacProject* (see Figure 3).

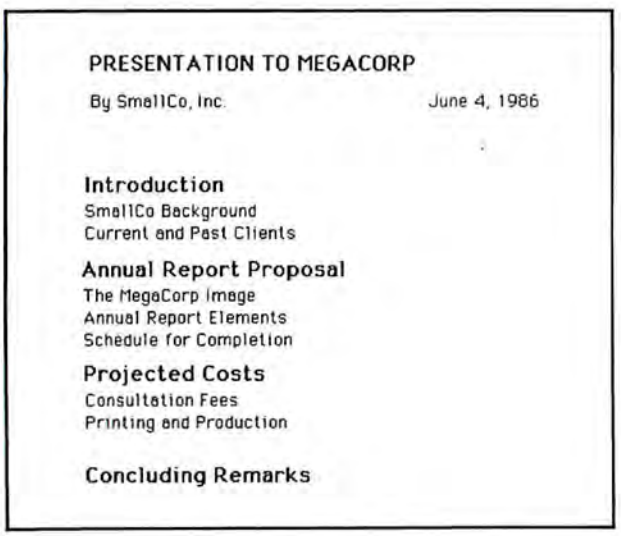
To see the slide show, select Slide Show from the Presentation menu and customize your presentation using dialog box options. You can display slides with or without their outline headings, and you can set the show to run automatically or manually. In automatic mode you set the delay between slides in sixtieths of a second. In manual mode the program pauses at each slide until you click the mouse button to move on. With *ThinkTank* version 1.1 you can move through the slides backwards or forwards by clicking on left- or right-facing arrows at the bottom of the screen.

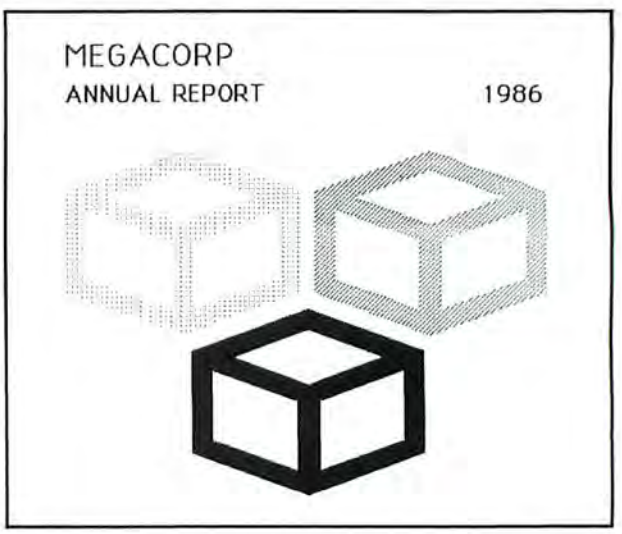
Having assembled your presentation, it is best to copy it into a new file via the Clipboard. When presentation time rolls around, you can call up that specific file without having to wade through unrelated topics in the larger project outline. Because SmallCo's presentation will be shown to only one person, the Mac's small screen is adequate. For presentations to larger audiences, it is fine to preview the slide show on the Mac, but it is best to present the show using a large-screen projection system such as LimeLight.

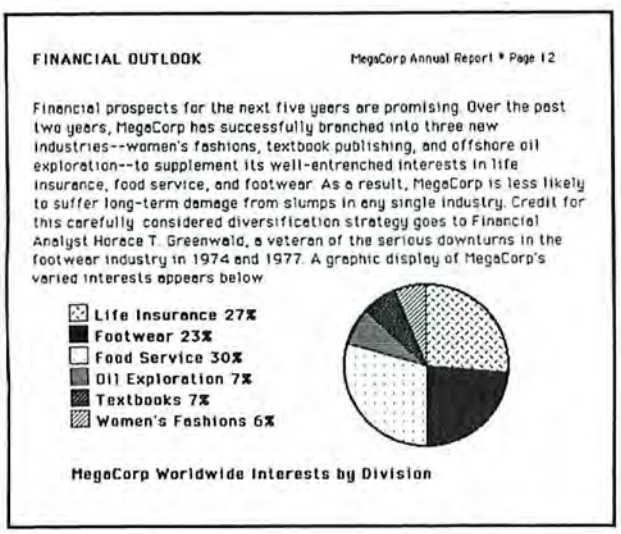
Tracking the Project

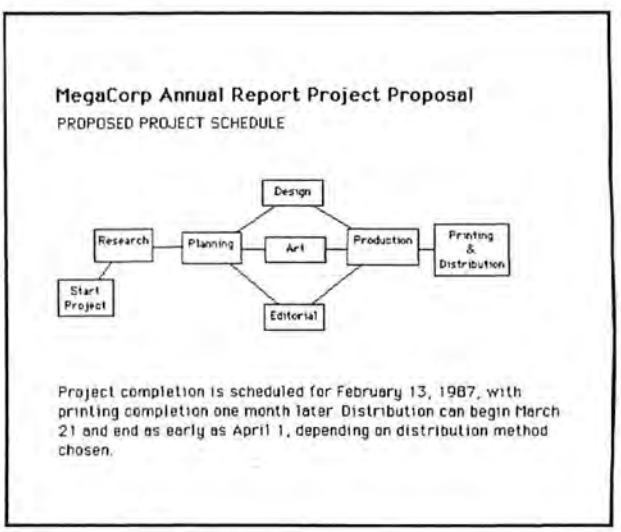
With the success of your presentation, it's time to manage the project itself. The management phase involves keeping a record of tasks completed and decisions made. Before continuing, however, it's important to decide whether you would be better off with the advanced features of a separate project management program. If the project is relatively complex, involving the organization of many subprojects, contractors, dates, and potential adjustments, use a program like *MacProject* that can instantly reflect the impact of changes made to tasks, dates, or costs on the other variables in your plans. Although you cannot transfer *ThinkTank* outline headings directly into a project management

Figure 3
ThinkTank's *Slide Show feature lets you create an impressive presentation by including graphic screens within an outline. The MegaCorp presentation includes mock-ups of pages from the annual report that help the potential client visualize the end result.*









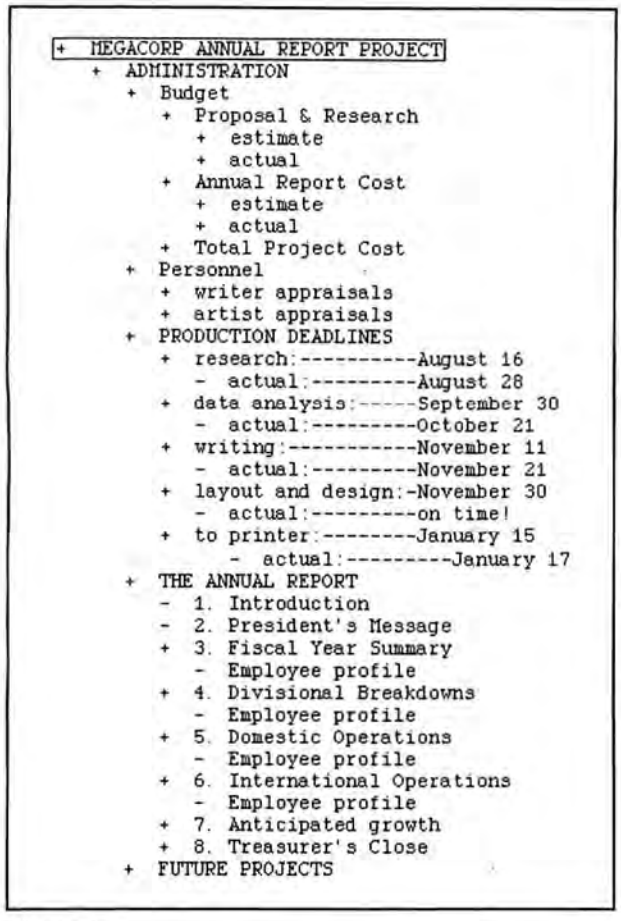


Figure 4

Originally used for planning the project, the outline is easily transformed into a project tracking tool by appending deadlines. As the project develops, the outline becomes a record of project progress.

program, the dedicated project management file will benefit from the planning you accomplished with your *ThinkTank* outline.

If you don't require the dynamic links of a full-scale project manager, you can let the *ThinkTank* outline evolve into a record of project statistics by changing and adding outline headings to reflect actions taken (see Figure 4). At the same time, you can continue to take advantage of *ThinkTank*'s flexibility by changing headings, revising the schedule, and writing memos without leaving the outline.

The easiest way to show the progress of the project's various tasks is to rename headings so they reflect a task's completion. For example, change a heading like "Contract out to Design Tech?" to "Design Tech Contract Signed 5/8/86." A more sophisticated method of recording the project's progress is to create an audit trail of actions considered and actions completed. For instance, after each subhead under "Production Deadlines," add the heading "Actual Date Completed," and you can monitor the success of your planning. Take advantage of the Mac's Key Caps symbols to instantly update records as tasks are completed. For example, as each chapter of the annual report is completed and sent to the printer, a simple check mark (use the square root symbol) next to each heading lets you know where the project stands.

Outside Help

Certain project tasks are best accomplished by developing an outline within *ThinkTank* and transferring the outline to a full-fledged word processor via the Clipboard. One step in the MegaCorp project is the creation of an outline for the annual report itself. The report text will be too large to be handled well by *ThinkTank*'s text editor. Developing the annual report outline within the overall project outline before you move to a word processor, however, enables you to easily toss in relevant ideas that emerge in other parts of the outline.

Note that when an outline is copied into a word processor it retains its plus and minus signs but loses its indentations. For a BASIC program that converts outlines into text files with indentations and no extraneous characters, look in *Open Window* in the February 1986 issue of *Macworld*. For help restoring outline indentation with *Microsoft Word*'s search and replace function, see *Get Info* in the *Macworld* for February 1986.

Thoughts on ThinkTanking

If you decide to approach a project through *ThinkTank 512*, at first you may miss the structure associated with project management programs. *ThinkTank* won't prompt you for dates, times, and numbers. Neither will it print out Gantt charts or calculate work loads and budgets.

What *ThinkTank* can do is incubate your thoughts and shape them into workable order and professional presentations. Even if you move to more specialized programs to complete the project, you can use your *ThinkTank* outline as a starting point. *ThinkTank*'s flexibility allows you to plan projects from scratch, building a conceptual prototype that you can use to orchestrate the project or from which you can build a working model in a dedicated project manager. □

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ThinkTank 512
Living VideoText, Inc.
2432 Charleston Rd.
Mountain View, CA 94043
415/964-6300
List price: $245

Take It from the Top

○ Landscape ☒ Smoothing?

Laurence Kirsh

The best ways to unlock Microsoft Word's rich but confusing treasure of formatting features

Word processing on the Macintosh rarely involves the processing of only words. Whether you're preparing a business report, an academic paper, or a quick memo, your "word processing" document often includes figures, graphs, or tables. Text such as titles, headlines, or captions also works as visual elements that are carefully sized and positioned on the page. Determining the look of a document through the manipulation of text and other elements is called formatting, and in Word *it is best approached starting from the big picture and narrowing down to the specific—otherwise, confusion reigns.*

Anyone who uses *Microsoft Word* on the Macintosh can easily be confused and frustrated when formatting documents for LaserWriter printing. Try as you might, the margins set in the ruler don't come out right on paper, text is mysteriously sliced off at the right margin, or the last line of a paragraph is spaced differently from the rest of the paragraph. Most of these problems result from a misunderstanding of how *Word* works and a reliance on habits acquired from using *MacWrite*.

Word offers more formatting possibilities than *MacWrite*, and you need a top-down approach to take advantage of *Word*'s options. A quick look at the menu bar reveals that *Word* organizes formatting in three levels: Character, Paragraph, and Document. Each level controls a distinct set of features.

At the document level, you govern the look of the printout as a whole, making specifications such as paper size, margin widths, placement of running heads and footnotes, and number and spacing of columns in tables.

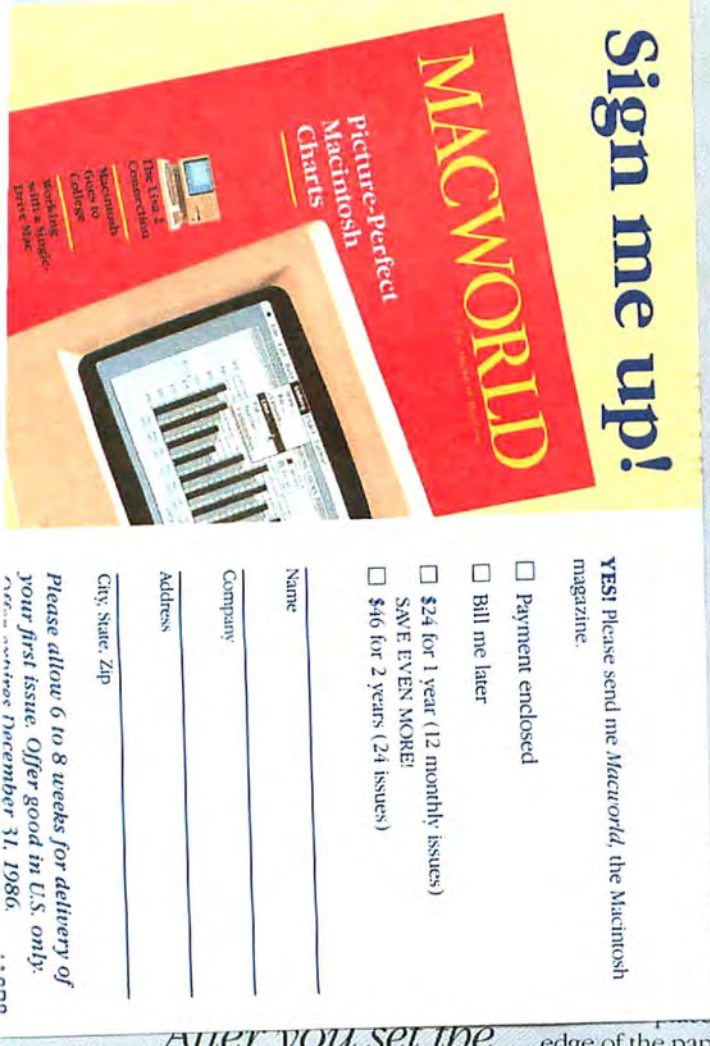
At the next level you control the appearance of individual paragraphs. In *Word*, a paragraph consists of all the characters from one return character up to and including the next return character; thus a paragraph can be anything from a blank line to the entire text of a multipage document. The markers in the ruler at the top of the screen display paragraph-level features, such as the indents and the tab stops of the currently selected paragraph or paragraphs. Dragging these markers in the ruler only changes the format at the paragraph level.

The font, size, and style of individual letters and words are determined at the character level.

Any confusion among these formatting levels can have strange, undesirable effects, so format systematically from the document level, through the paragraph level, to the character level. It's not always necessary, or even possible, to do all formatting in this order, but envisioning *Word*'s structure this way helps to avoid problems.

Sales Report as Document

To illustrate the top-down approach, I've formatted a monthly sales report for the fictitious firm Tri-State Chemical. This report, like many documents from memos to marketing studies, presents several formatting problems: a tabbed table, a pie



Font Substitution?

After you set the margins in the Page Setup box, Word adjusts the text area size automatically.

solve them. Format as you go or do all your formatting last, as you prefer. For this example, type the text in 12-point Times Roman and leave all other formatting for last (see Figure 1).

Begin formatting the typed document by deciding on a consistent overall look for each page of the report. A page is divided into two parts: the text area and the white space surrounding it. The white space is the margins, and in *Word* a document's margins are set not through the Document menu but in the Page Setup dialog box on the File menu because page specifications depend on the available printer, not on *Word* itself (see Figure 2). After you set the margin widths here, *Word* automatically size of the text area and adjust the display accordingly.

e top margin to 1.25 inch to the running heads. To give e room, open the Division ox on the Document menu running head position , .75 inch from the top, to .5 s the title closer to the top edge of the paper but still within the LaserWriter's print area. Zero on the running heads' ruler marks the physical edge of the paper, while zero marks the inside of the margin (defined in Page Setup) and the beginning of the text area for all other paragraphs. You can, therefore, place running heads in the left and right margins.

Position the insertion point at the beginning of the document and type the three-line title; end the first two lines with Shift-Return and the last line with Return. Using Shift-Return keeps the three lines in a single paragraph, which you center by choosing Centered from the Paragraph menu. With the insertion point still in the title, choose Running Head from the Document menu. The dialog box that appears allows you to decide where the title will appear as a running head. Leave Top selected as its position and check only First Page. Click OK and an opening guillemet («) appears along the left edge of the window next to the title, indicating that the paragraph is a running head. Following the same steps, center a running foot with TriState's motto at the bottom of each page and add a two-line running head with the title and page number at the top of all pages but the first.

The Look of Paragraphs

Define the look of each paragraph through the Paragraph menu. Put the insertion point anywhere in the first paragraph and open the Formats dialog box. Line spacing is set by default to "auto," which automatically adjusts line spacing—*leading* in typographical terms—in a paragraph to accommodate the largest point-size text in each line. You can specify line spacing in lines (li), such as 2 for double space, or in inches (in) or points (pt). Extra space between lines helps the reader's eyes, so add an extra point of leading to the 12-point type in the paragraph by typing **13 pt** in the line spacing box. Next, choose Justified to justify the right and left margins and click OK.

Bullets are an effective way to set off items on a list. Most Macintosh fonts and all LaserWriter fonts have a bullet character (•), which you type with an Option-8 (except in Symbol font, where it is Option-W). Create the hanging, or "outdented," bullets of the report's next three paragraphs by setting up the Paragraph Formats box as it appears in Figure 3 and putting a tab stop on the left indent marker. A positive number for the left indent moves the first line to the right; a negative number moves it to the left. The first line indent is measured in relation to the left indent. *Word* does not allow any text in the left margin, but it does

allow text to spill into the right margin. Consequently, right indents should be zero (to match the right margin) or a positive number, which moves text to the left. A negative number for the right indent moves text into the right margin—possibly beyond the LaserWriter's printing area—which risks slicing text off on the right.

When you have one paragraph the way you want it, you can copy its format to any other paragraph. Select the paragraph or paragraphs you want to format, hold down the Option and ⌘ keys, position the pointer at the left edge of the document window pointing to the paragraph whose format you are copying, and click the mouse button. The selected paragraph will assume the format of the paragraph you clicked. The technique sounds more complicated than it is. You'll find it's a quick way to make paragraph formats consistent.

Pictures and Tables

Tabs are another paragraph-level feature. It is advantageous to enter a table, like the one in the sales report, as a single paragraph by ending each line with Shift-Return. Within a single paragraph, tab stops and paragraph indents can be adjusted for the entire table simply by placing the insertion point anywhere in the table and dragging the tab and indent markers in the ruler. Also, check the box to Keep Lines Together in the Paragraph Formats dialog box so that *Word* won't put a page break in the middle of the table.

Tab leaders, such as periods or hyphens, help the reader's eyes follow the table from column to column. To produce leader characters, open the Tabs dialog box on the Paragraph menu, specify a new or existing tab stop (either by clicking on it in the ruler or by typing its position into the dialog box), and select one of the four leader characters. Be forewarned that tab leaders significantly reduce printing speed; also, underline leaders do not line up with underlined characters when printed, although they do on screen.

Pictures are paragraphs, too. After pasting in any graphic created in another application, such as *MacPaint* or *MacDraw*, you position the graphic with the paragraph-level formatting features. The Tri-State National Sales pie chart was created with *Microsoft Chart*, then copied to the Clipboard and pasted into the report. Open the Paragraph Formats dialog box and center the chart, put one line of space before it, and check Keep with Next ¶ to keep *Word* from putting a page break between the figure and its caption.

When you have a paragraph the way you want it, you can copy its format to any other paragraph.

A Judge of Characters

Thoughtful variation of fonts helps the reader distinguish among the various parts of a report. Use the Formats dialog box on the Character menu to make the title 18-point bold and to put the column headings in small caps. Changing the font of the table to 10-point Helvetica sets the table off from the main text, although using a different font pushes the limits of typographical good taste. Compare the fully formatted first page of the sales report as shown in Figure 4 with the initial text entry displayed in Figure 1.

One character that deserves attention though it never prints is the paragraph mark. This invisible character, entered every time you use the Return key, holds the format information for the paragraph. View the paragraph marks (as well as marks for tabs and spaces) by choosing Show ¶ on the Edit menu. *Word* takes paragraph marks into account in almost every printing calculation it makes. If a paragraph mark is in a different font or point

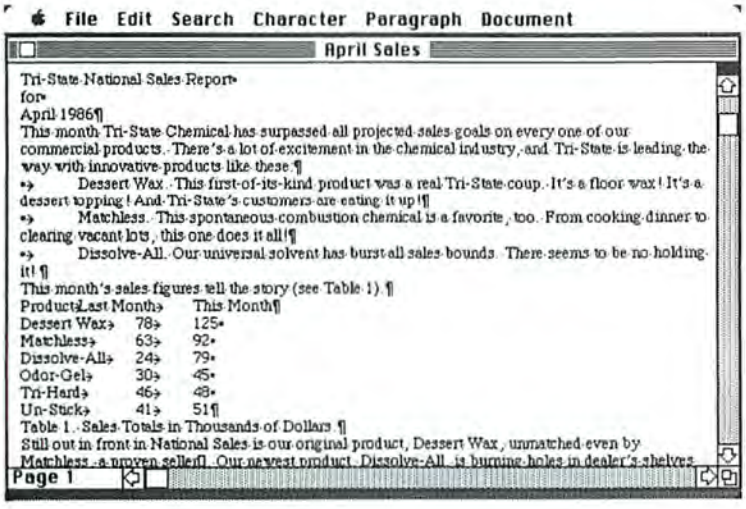


Figure 1
The unformatted, and unattractive, sales report entered in Word. *The Show ¶ command on the Edit menu helps you anticipate formatting problems by displaying returns, tabs, and spaces on screen. A small black square marks each Shift-Return, which keeps a line in the same paragraph as the next line.*

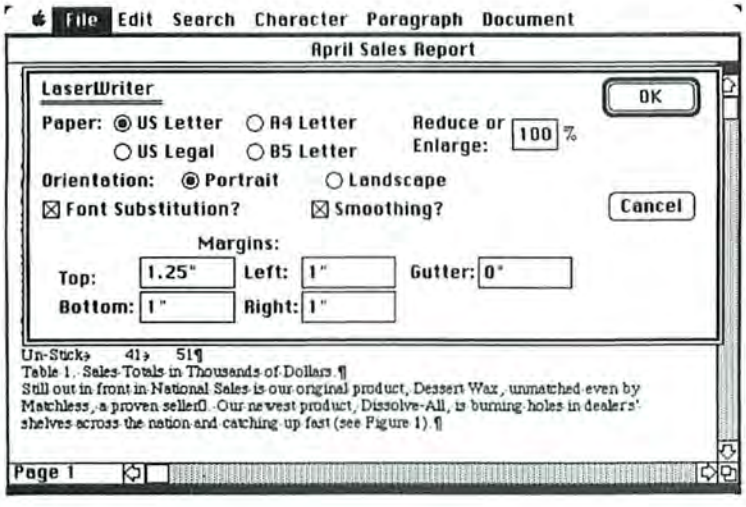


Figure 2
In the LaserWriter Page Setup box, Portrait and Landscape are equivalent to the ImageWriter's Tall Adjusted and Wide. If the report were to be double-sided and bound, Gutter could be specified to allow room for the binding.

size than the rest of the paragraph, for instance, it alters the paragraph's line spacing—so make sure that the marks are the right font and point size.

The paragraph mark can also throw off the centering of a heading in large, bold type, in which case you should use the Formats dialog box on the Character menu to make the mark as small as possible (4-point Plain text). If blank lines are created with returns, paragraph marks can add unwanted space to the top margin. To avoid this quirk, use the Space Before option in the Paragraph Formats box to create extra space between paragraphs. *Word* ignores the extra space when printing if the paragraph is the first on a page, but adds the space if the paragraph is further down the page.

Before printing, choose Repaginate on the Document menu. *Word* then calculates the page breaks, taking footnotes into account and automatically eliminating orphans (single-line stragglers of a paragraph at the top or bottom of a page). The program displays an equal sign (=) at the left edge of the window beside the first line of each page. If you have properly selected such options as Keep with Next ¶ and Keep Lines Together in the Paragraph Formats dialog box, there should be a minimum of unpleasant surprises.

The right approach to *Word* makes all the difference. Organize your formatting tasks to spare yourself frustration and to come up with an attractive document every time. Experiment with *Word* and have fun while you work. After all, you can always Undo. □

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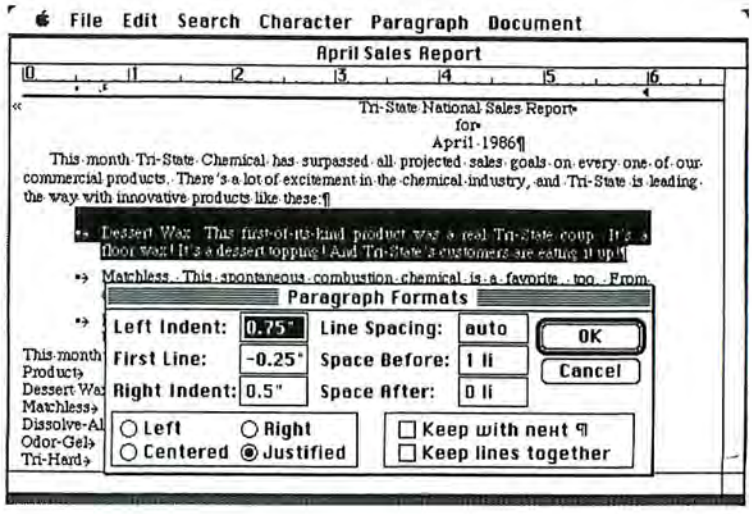
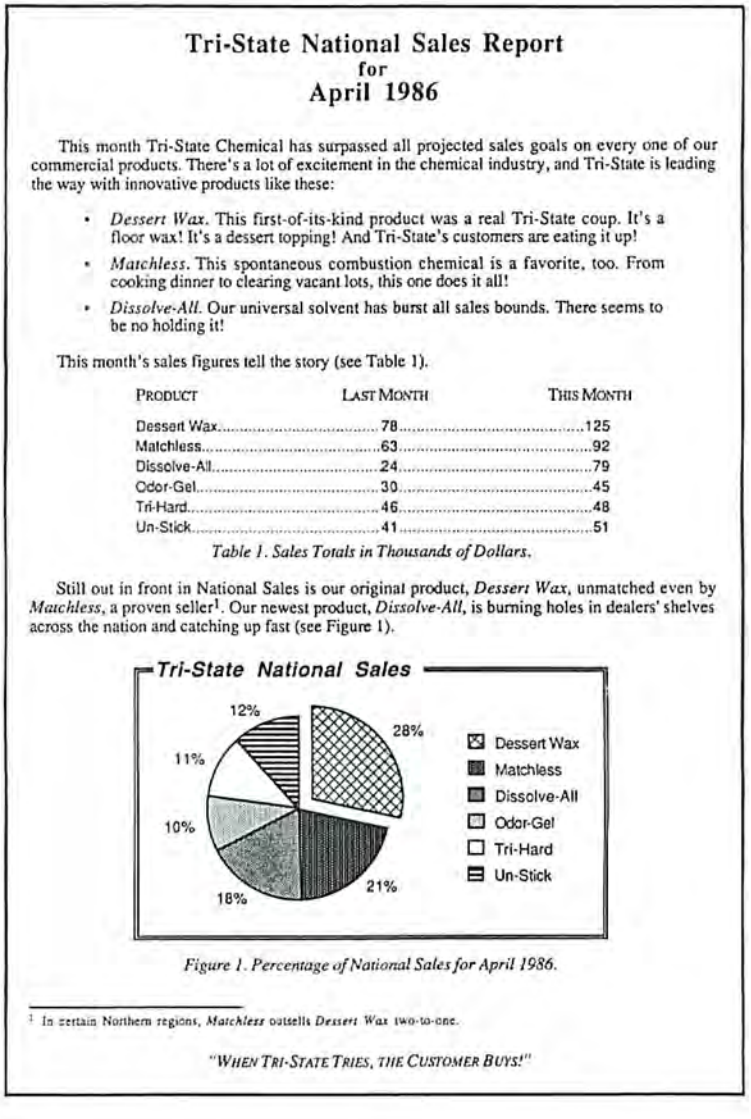


Figure 3
To create hanging bullets, this paragraph has a positive Left Indent and a negative First Line indent. To further set off the items, the paragraph has a positive Right Indent.



Tri-State National Sales Report
for
April 1986

This month Tri-State Chemical has surpassed all projected sales goals on every one of our commercial products. There's a lot of excitement in the chemical industry, and Tri-State is leading the way with innovative products like these:

- *Dessert Wax.* This first-of-its-kind product was a real Tri-State coup. It's a floor wax! It's a dessert topping! And Tri-State's customers are eating it up!
- *Matchless.* This spontaneous combustion chemical is a favorite, too. From cooking dinner to clearing vacant lots, this one does it all!
- *Dissolve-All.* Our universal solvent has burst all sales bounds. There seems to be no holding it!

This month's sales figures tell the story (see Table 1).

PRODUCT	LAST MONTH	THIS MONTH
Dessert Wax	78	125
Matchless	63	92
Dissolve-All	24	79
Odor-Gel	30	45
Tri-Hard	46	48
Un-Stick	41	51

Table 1. Sales Totals in Thousands of Dollars.

Still out in front in National Sales is our original product, *Dessert Wax*, unmatched even by *Matchless*, a proven seller[1]. Our newest product, *Dissolve-All*, is burning holes in dealers' shelves across the nation and catching up fast (see Figure 1).

Figure 1. Percentage of National Sales for April 1986.

[1] In certain Northern regions, *Matchless* outsells *Dessert Wax* two-to-one.

"When Tri-State Tries, the Customer Buys!"

Figure 4
The first page of the finished report has visual appeal and makes good use of the page. The footnote was reduced to a smaller size to make it less obtrusive.

Making Waves on Silicon Beach

Nicholas Lavroff

When the Macintosh was first introduced, game developers groaned in unison as they realized they would have to perform their magic without the dimension of color. It was as if a gathering of bakers had been asked to bake a birthday cake without sugar. But while some developers continued complaining about the Mac's lack of color, others looked more closely at the machine to see what positive features it had to offer.

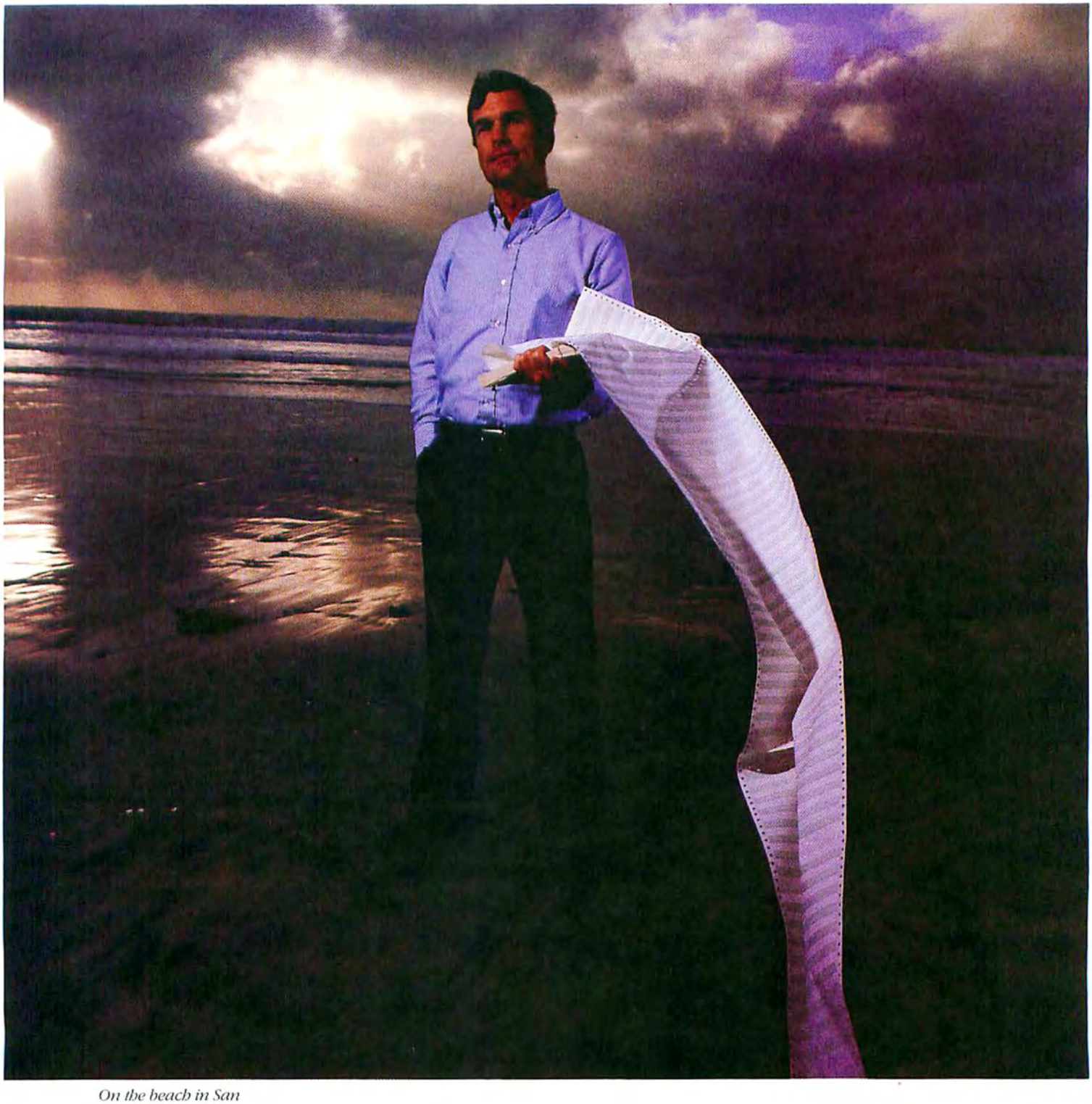
One such developer was Charlie Jackson, who, after seeing the potential in the Mac's bit-mapped graphics and sound capability, decided with his wife Hallie to form their own software company. The result was Silicon Beach Software, the San Diego-based software publishing company that has enriched the Macintosh community with programs such as *Airborne!, Accessory Pak 1,* and *Enchanted Scepters.* The programs demonstrate that imagination does not go bankrupt in a black-and-white world and that it is possible to add new texture and appeal to software even in the absence of color. Silicon Beach does so with innovative techniques such as digitized sound and animated bit-mapped graphics.

Jackson's first act as a Mac pioneer was to found the San Diego Macintosh User's Group, a group of Mac enthusiasts who met regularly at Jackson's house to discuss Apple's new personal computer. The lack of software for the Mac did not bother them; the participants swapped ideas and rumors about the new machine, confident that it represented the wave of the future in personal computing.

One visitor to Jackson's house in the summer of 1984 was computer science major and math wiz Eric Zocher. Unlike most people currently involved in personal computing, Zocher is steeped in computer science, with particular emphasis on mainframes and minicomputers. Nonetheless, one look at Jackson's Mac convinced Zocher that it could hold its own and do things that no other personal computer could. Within a few months Zocher had bought his own Mac—his first personal computer—and had joined Silicon Beach as its research and development expert.

The Sound Man

A large, jovial man, Zocher has carved a significant niche for himself in the field of digitized sound for the Macintosh, with the result that Silicon Beach is now considered a major innovator in that field. Like most great ideas, however, digitized sound began as an attempt to solve another problem: how to synthesize sound effects without knowing the shape of the original waveform. Zocher's solution was first to digitize the sound so he could examine its waveform, and then synthesize the sound, an admittedly roundabout technique. Then Zocher realized that the Macintosh could just as readily handle digitized sound. "The Mac is the



On the beach in San Diego, Charlie Jackson tests the winds for new software under development by Silicon Beach.

first mass-produced computer with a digital-to-analog converter for sound. Once I discovered this, I thought we might eliminate synthesized sound altogether."

Jackson, who holds a master's degree in linguistics, followed up on this observation by visiting his linguistics professor at the University of California at San Diego and borrowing some digitized sounds. Zocher wrote a simple routine to play the sounds back on the Mac. When Jackson and Zocher first heard the professor say, "This is a test," through the Mac, they felt as Alexander Graham Bell must have when he transmitted the first telephone signal to his assistant. Zocher and Jackson both knew that this was the start of something big.

Silicon Beach's first product, *Airborne!,* was also the first Macintosh product to use digitized sound. The game, written by Jonathan Gay, includes Zocher's digitized sound techniques. *Airborne!* is a fast-paced shoot-'em-up that has the player fending off wave after wave of enemy paratroopers dropped from helicopters and transport jets. The game's chief interest lies in the digitized sounds that accompany the helicopters and transport jets and the player's barrage of shells. When amplified through external speakers, these sounds are startling in their realism and add a whole new dimension to the game. Although digitizing eliminates the middleman of sound synthesis, it creates its own set of demands. As Zocher puts it: "It's strange to be waiting outside a marine base for a CH-53 helicopter to fly by so you can record a few moments of its sounds. Nevertheless, it beats spending hours guessing the sound's waveform so you can synthesize it."

When Eric Zocher decided to major in computer science, he had no idea it would lead him to recording the sounds of military jets, but that's exactly the result of his ground-breaking work in digitized sound.

Zocher prepares sounds for the Mac with a digitizer made by Fractal Software of Berkeley, California. The Fractal digitizer is a black box that converts a sound's waveform into a stream of bits, which can then be stored on a disk. Once the digitized sound is stored, it can be modified with looping, reverberation, or other methods. For example, the speed can be slowed or quickened and the pitch raised or lowered. Although Fractal supplies some software with their digitizer, Zocher modifies and embellishes the software to achieve the versatility he needs. In fact, each new Silicon Beach product that uses digitized sound requires some modification of the software to produce the desired range of sound effects.

Zocher and Jackson both realize that digitized sounds can have more serious applications than arcade games such as *Airborne!.* One example of the more serious side of digitized sound is *Look, Listen, and Learn,* a spelling and speaking program that pronounces words keyed in by the user. Unlike similar programs from other companies, Silicon Beach's product uses phonemes recorded from human speech rather than synthesized speech. The digitized sound removes one more boundary between computers and people by taking the edge off electronic sound effects. Children are more likely to relate to a realistic human voice than to one that seems to have a speech impediment.

Real-Time Adventures

While continuing to explore the frontiers of digitized sound, Silicon Beach is also journeying to the far reaches of the world of animated bit-mapped graphics in its development of *Dark Castle,* a two-disk, 512K-only game with startling animation. Described as a cross between the Apple II games *Aztec* and *Sammy Lightfoot, Dark Castle* contains 13 chambers, each with its own set of obstacles and antagonists. The player advances through each chamber, battling demons until he or she reaches the final chamber and the ultimate prize.

The combination of full-screen animated graphics and digitized sound on the Mac's high-resolution screen results in arcade-type and adventure games that have a real-time feel, a sense of ongoing interaction with the game environment. Programmed by Jonathan Gay, *Dark Castle* features digitized sound by Zocher and animated graphics by *VideoWorks* artist Mark Pierce. When Jackson approached Pierce to illustrate a game combining fully animated graphics with digitized sound, Pierce was impressed by Jackson's commitment to creating an epic game. Pierce comments, "Due to marketing considerations, most companies

would be afraid to produce a game that runs on only a 512K Macintosh and requires two disks. But the people at Silicon Beach Software have a visionary appreciation of the Mac's creative possibilities and are willing to devote the necessary hardware and software resources to let ideas come into full bloom."

While bit-mapped graphics are nothing new to the Mac, *Dark Castle*'s represent the most ambitious use of the technique to date. By storyboarding the entire game with *VideoWorks,* Pierce created the animations in a fraction of the time it would have taken to program a working version. In this sense, designing game graphics takes on the quality of making a movie. The artist can view animation sequences rather than merely drawing a series of stills. The ability to watch one image transform fluidly into the next allows the artist to refine the way images interact. The end result: full-screen images come to life, producing a beguiling illusion for the game player.

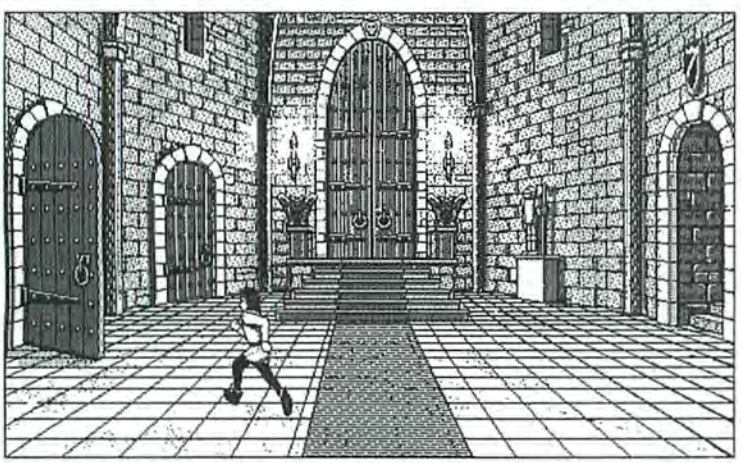
Welcome to My World

While most game developers continue to create adventure games one at a time, Bill Appleton, one of Silicon Beach's independent programmers, has built a tool for creating graphics-and-text adventure games. Tentatively known as *World Builder,* Appleton's as yet unreleased program is the answer to a question he asked himself: "How do you build the world's best adventure game? Either you get a staff of thousands or design a system that would encourage thousands of adventure game enthusiasts to collaborate and take advantage of the different sound, graphics, and text possibilities of the Mac."

World Builder consists of a graphics module and a number of editors that let game developers specify character attributes, game probabilities, and other adventure game characteristics. The graphics editor is actually two editors: one is similar to *MacDraw* (and so lets you create images that have a minimum of detail and take up little memory), while the other uses bit-mapped graphics like *MacPaint* or *VideoWorks* (but without animation), so you can include detail where needed. In addition, *World Builder* has a sound editor and a library of digitized sounds, so you can supply your own sound effects. *World Builder* requires little programming knowledge; you can create most adventure-game features with dialog boxes and pull-down menus.

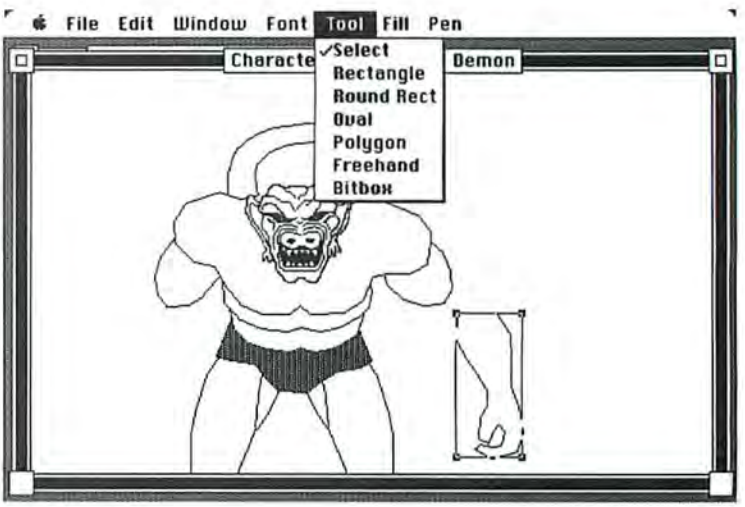
Although Silicon Beach plans to release a commercial version of *World Builder,* no release date has been determined. Whenever it might reach dealers' shelves, no doubt adventure enthusiasts will be eager for it. Game editors such as *World Builder* represent the next generation of game software, and for good reason: why settle for one game when you can create and explore unlimited worlds? Instead of exploring someone else's fantasy world, adventure gamists will be able to graduate from passive observers to active creators.

Beyond individual fantasies, perhaps the most fascinating aspect of *World Builder* is the way it may encourage the spontaneous creation of collective fantasies. Here is a program that will make it easy for game enthusiasts to create multidimensional characters and then put them into working models of their fantasy worlds. Thus Dungeons and Dragons players and other adventure game enthusiasts can create armies of characters—the possibilities for character development are almost limitless—and trade them among themselves, possibly through on-line services such as



Dark Castle

In this scene the figure moves fluidly across the screen; torches flicker in the background. As the figure moves, it changes size to indicate perspective.



World Builder

World Builder's graphics editor lets you work with objects as well as bit maps. The Earth Demon's head is a bit map designed with the editor's zoom bits feature.

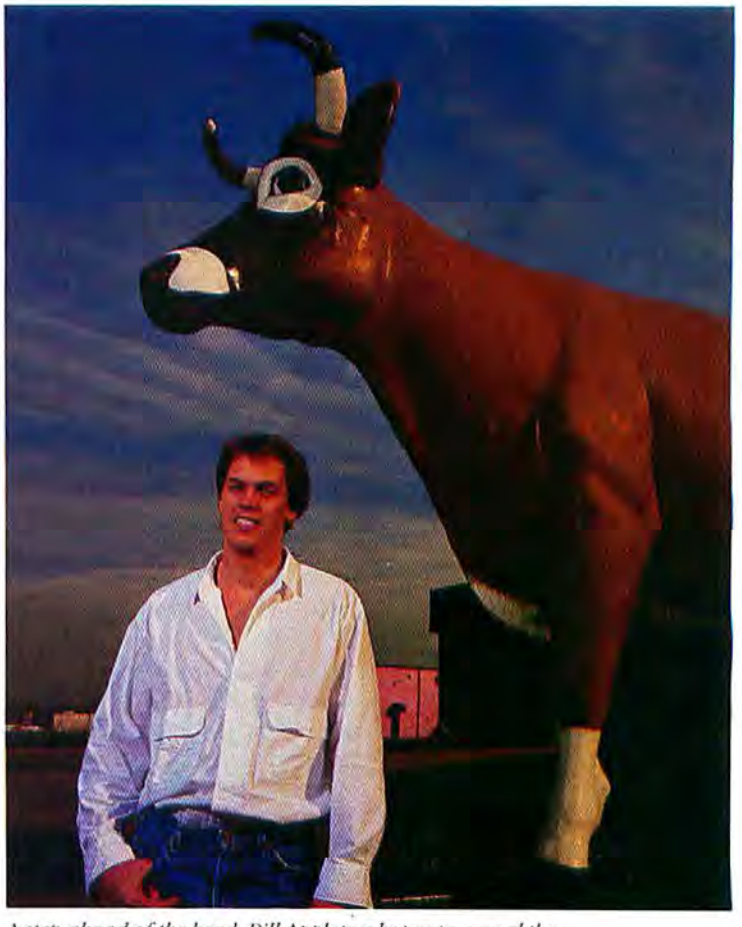
The Source or CompuServe. Indeed, it was this potentially catalyzing effect on the gaming community that prompted Appleton to create *World Builder* in the first place: "I can't wait to see what's going to happen when the artists start drawing scenes and characters, and the sound aficionados start building a library of sounds, and the writers start weaving plots."

The First World

The first game to be developed using *World Builder* is Appleton's *Enchanted Scepters,* an adventure game with more than 200 graphic images and over 30 digitized sounds. The ability to put so much information on one 400K disk is a tribute to the programming ability of 24-year-old Appleton. In the spirit of a true collaborator, Appleton readily credits the people who helped him with the game, including Bill Atkinson of *MacPaint* fame, who gave Appleton a couple of useful programming tips after seeing a prototype of the game. And this collaboration itself is a tribute to the open-minded cooperation and camaraderie that still prevails among software developers in the Macintosh community. Nonetheless, Appleton's achievement can be truly appreciated only when you realize that he taught himself assembly language in nine months and almost single-handedly developed the tools that made *World Builder* possible.

Just as digitized sound has applications beyond games, *World Builder* could also have more serious moments. For example, it could be used in business to develop flowcharts with both text and graphics or to create storyboards showing different manufacturing processes. Thus a manager could develop flowcharts of a company's organizational structure or its distribution channels and continually update them as changes occur. *World Builder* could also be used to plot sociograms (diagrams that show the interpersonal relations among a group of people) or to explore fantasy worlds in a clinical setting. Psychologists already know the value of play as a therapeutic tool, and with *World Builder* a clinician could have a patient create a fantasy world that the two could then explore together. According to Jackson, "We have been surprised at the variety of nongame applications that have been suggested to us for this product. For example, the head of a nuclear power plant called to tell us he wanted to use it for programmed instruction to teach new employees about the plant."

The Silicon Beach designers have learned that it is often necessary to create new tools to develop innovative computer games. The foremost examples of such tools are Zocher's digitizing software and Appleton's *World Builder.* While some software developers were busy complaining about the Macintosh's lack of color or joystick input, Silicon Beach looked beyond the Mac's limitations to find ways to optimize its potential. Digitized sound and bit-mapped graphics are two Macintosh features that can help make up for the lack of color, and Silicon Beach makes excellent use of these features.



A step ahead of the herd, Bill Appleton hopes to corral the imagination of gamesters with his World Builder.

As Charlie Jackson puts it: "The best thing the Mac had going for it when it first became available was its ability to stimulate the imaginations of software developers. Without that, developers would still be churning out endless variations of *Defender* or *Pac-Man.*" □

Nicholas Lavroff is a Contributing Editor of Macworld.

Silicon Beach Software, Inc.
P.O. Box 261430
San Diego, CA 92126
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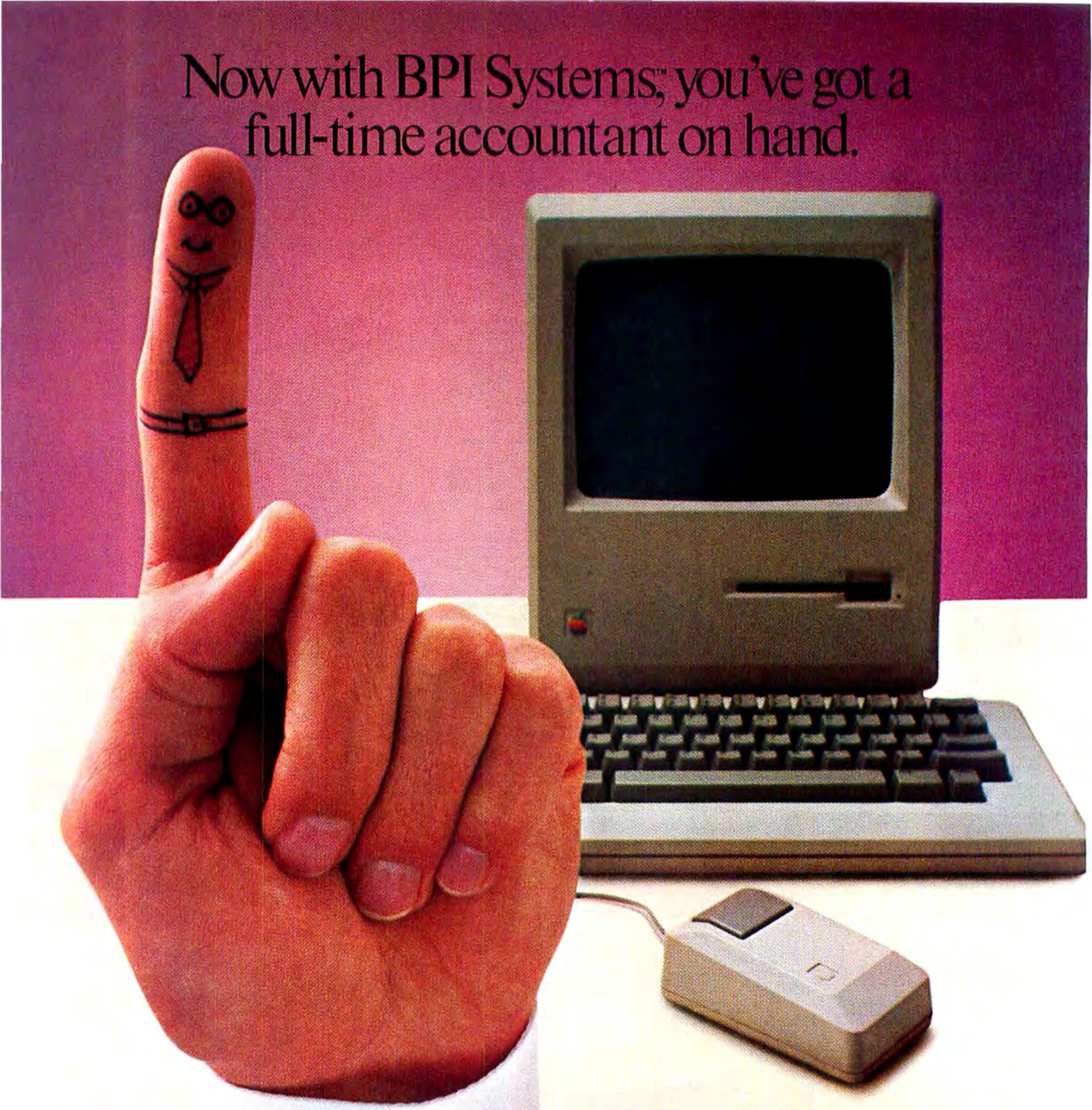

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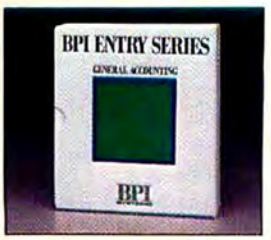

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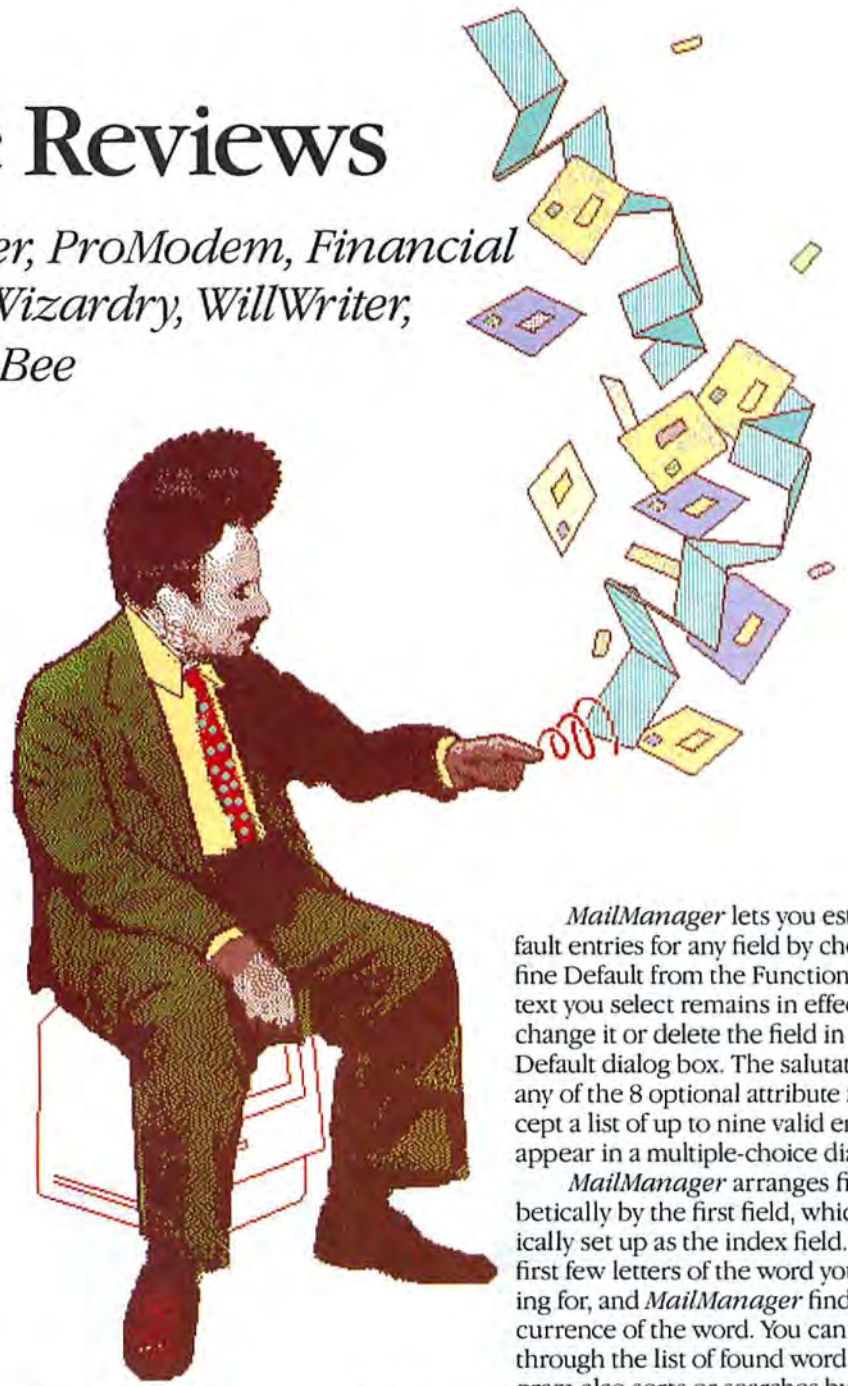
Macware Reviews

MailManager, ProModem, Financial Cookbook, Wizardry, WillWriter, and Speller Bee



Edited by Erfert Nielson

Lists, Letters, and Labels

Although the Macintosh excels in areas like desktop publishing and presentation graphics, in many offices it's called upon to perform more mundane tasks, such as printing form letters and mailing labels. ***The MacAdvantage: MailManager,*** from Pecan Software Systems, is a mailing list, label, and form letter generator that should suit the needs of most offices.

MailManager lets you select among three predefined mailing list formats and print 1-inch or 1½-inch mailing labels. You can also generate form letters in conjunction with *MacWrite* or *Microsoft Word*. Version 1.1, the edition we reviewed, doesn't support the LaserWriter, but the program works fine with the Imagewriter and with some letter-quality printers (according to the program's distributor, a new version will support the LaserWriter). We encountered no problems when we tested the program on Apple's 20-megabyte hard disk, under the hierarchical file system (HFS) and Finder 5.0, using the *Switcher* loaded with *MailManager* and *Microsoft Word*.

Entering Information

MailManager's predefined entry screen provides 14 data fields for information such as name, address, phone number, and salutation. Any of the field names can be changed, but the names must fit in the nine-character display space provided. You can add up to 8 other fields, called attributes, to the form (see "Name That Field"). Field sizes are preset, with the largest allowing 30 characters. The length and location of the boxes for the data can't be changed on the screen or in the printed output.

Instead of typing information in *MailManager*'s displayed field boxes, you enter information at the top of the form—an entry scheme similar to that of a spreadsheet. While we were initially uncomfortable with this system, we adjusted to it almost immediately.

MailManager lets you establish default entries for any field by choosing Define Default from the Function menu. The text you select remains in effect until you change it or delete the field in the Define Default dialog box. The salutation field and any of the 8 optional attribute fields also accept a list of up to nine valid entries that appear in a multiple-choice dialog box.

MailManager arranges files alphabetically by the first field, which is automatically set up as the index field. Enter the first few letters of the word you're searching for, and *MailManager* finds the first occurrence of the word. You can then scroll through the list of found words. The program also sorts or searches by zip code.

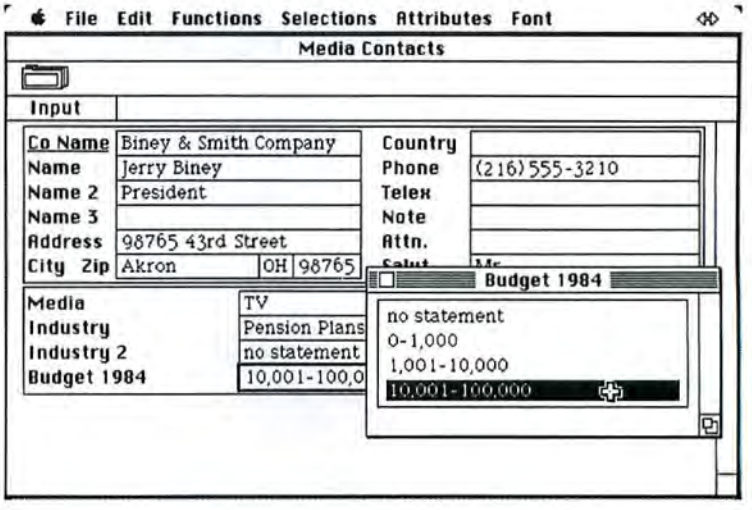
Printing Selections

One of *MailManager*'s most powerful features is its ability to define criteria by which a group of records can be selected for printing. Suppose, for example, you want to mail letters to all the companies that buy widgets, but not gadgets, from your company. To select those particular companies, choose Define New Selection from the Selections menu. The program displays a blank form, and you enter the range you want to select: all the companies

that purchased over $10,000 worth of widgets, for instance. You can create a variety of selection criteria and save them under different names. You can then view or print the selected records using a particular selection definition.

MailManager makes printing easy. Choose Print from the File menu, and a dialog box presents several printing formats, including address book listings, mailing labels, and phone lists. The Font menu offers the full selection of typefaces available in a disk's System file, but only three point sizes: 9, 10, and 12. The font selection you make applies to all fields (you can't use a larger font for just the addressee's name, for instance), and there are no style options such as bold or italic.

To print in a variety of fonts or in a format not offered by *MailManager,* or to print a series of form letters, you can merge a list of names with *MacWrite* or *Word* text files. Simply create a letter in either program, surrounding the field names with ampersands (&) in *MacWrite* or with the merge codes G and H in *Word.* The text file can then be printed using *MailManager*'s Print options.



Name That Field
MailManager *provides 14 preset fields, to which 8 fields can be added if needed. Fields can be renamed, but factors such as the length of a field name or the maximum size of a field can't be altered.*

A Competent Manager

We found *MailManager* to be an easy-to-use yet relatively versatile program. The program does have some limitations: it accommodates only two sizes of mailing labels, field size and position can't be changed, and the 30-character field size is not adequate for some foreign addresses. Despite these limitations, *MailManager* is a reliable worker. If you're looking for a simple mail manager, this is a good one.—*Diane Burns and S. Venit*

The MacAdvantage: MailManager
Pecan Software Systems
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Brooklyn, NY 11218
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List price: $79.95

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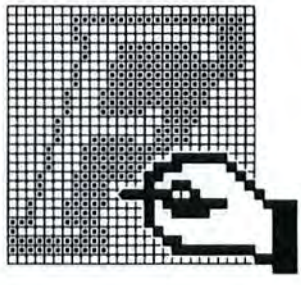

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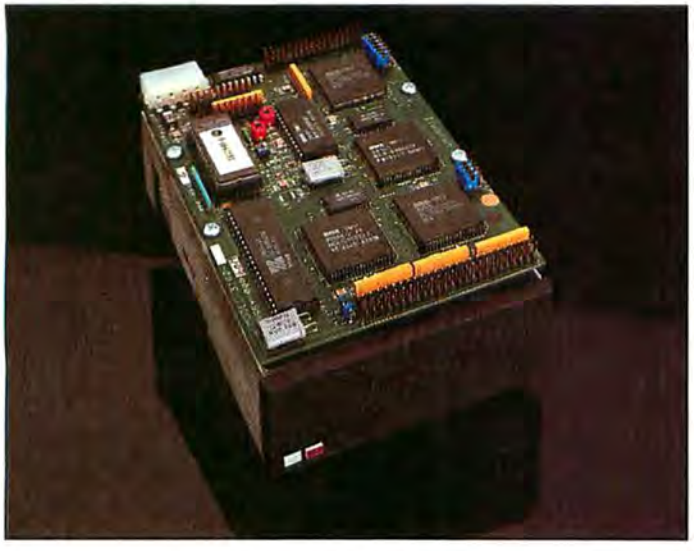

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We Give Great Software

MacServe™ from Infosphere™ is included with every MagNet 20x™... free. A $250.00 value. MacServe includes great single user features but also allows multiuser access to your Mac. Imagine the value of sharing data and peripherals with other Macs in the office. Don't spend money on unnecessary printers and hard drives. The MagNet 20x™ will make the most of the equipment you already own.

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More than a Modem

The ProModem 1200 features a 512K buffer that handles communications and printing tasks, freeing up the Mac for other work.

If you've seen one modem, you've seen them all. It's the communications program that makes the real difference, right? Generally, yes. But while there are fewer differences between modems than between communications programs, the ***ProModem 1200,*** from Prometheus Products, offers some appealing options that set it apart from the pack. Fortunately, not too far apart; the ProModem responds to industry-standard Hayes's modem commands for dialing and disconnecting. I used it successfully with two programs that send Hayes commands, Apple's *MacTerminal* and Hayes's *Smartcom II.* And the ProModem comes with its own communications software, *ProCom-M,* which handles most communications chores, despite some rough edges and a confusing manual.

The Modem

The ProModem sports front-panel indicator lights that show when the phone is off the hook, when a connection has been established, and when data is being sent or received. Indicators aren't required equipment, but they can help you spot problems during a troublesome file transfer session because you can tell at a glance whether data is being received or transmitted.

If this were a review of any other modem-and-software package, I'd be describing the software by now. But the ProModem's options are what make the product unique. Most impressive is the communications buffer, a plug-in board that houses up to 512K of memory. The buffer serves two purposes. It contains built-in software that can communicate while the Mac is turned off or occupied with other activities. The buffer also acts as an intermediary between the Mac and a printer, accepting data as fast as the Mac can send it and then returning control of the computer to you while the buffer feeds the data to the printer.

When used for communications, the buffer essentially turns the ProModem into a communications terminal without a screen. You store phone numbers and logon commands for electronic mail and information services in the buffer's battery-protected memory, along with messages that you create with the Mac and transmit to the modem. You can have the modem wait until a certain time (such as after phone rates drop) before sending messages. You can also specify Group Code Dialing, which tells the ProModem to deliver the message to several locations. The modem keeps track of which locations received the message, and when.

When receiving messages, the ProModem's buffer offers two security approaches. Password security gives callers three chances to type the correct password. Callback security is even tighter: each authorized password has a corresponding phone number, and when a caller types the correct password, the ProModem hangs up and dials the caller's number to reestablish the connection, thus eliminating the chance of an intruder gaining access by guessing the password.

The ProModem's buffer and memory board options make it unique.

The ProModem's other unique option is a 12-character calculator-like display located in the modem's front panel. When you aren't communicating, the display turns the ProModem into a digital clock. When you're on line, the display shows messages such as "Connected" or "Busy." If the communications buffer is installed, the display indicates when a message has been received.

The Software Side

ProCom-M isn't as easy to use as Hayes's icon-oriented *Smartcom II* or as feature-laden as FreeSoft's *Red Ryder* or Palantir's *inTouch,* but it is adequate for most communications tasks. (For a review of communications programs, see "No Static At All," *Macworld,* December 1985.) *ProCom-M*'s macro facility lets you store a series of commands and send them with a few mouse clicks. Unlike macros created in *Red Ryder* and Mainstay's *Telescape,* a *ProCom-M* macro can't be transmitted using a ⌘-key sequence; you must choose a command and then choose the macro's name from a file selection box.

ProCom-M's macro feature doubles as an autopilot that can dial a number, wait for specific text such as "User ID," and then send the required response identification number (see "ProCom Autopilot"). Autopilot lets you sign on to information services without having to dial and go through the sign-on routine by hand. *ProCom-M*'s autopilot is less capable than those of *Smartcom II* or *Red Ryder.* You can't, for example, transfer a file using the Xmodem protocol within an autopilot sequence, nor can you activate the printer. For simple communications tasks, however, *ProCom-M*'s autopilot is adequate.

For file transfers, *ProCom-M* can use the Xmodem error-checking protocol as well as the MacBinary format, which allows easy downloading of programs and other nontext files from bulletin board systems

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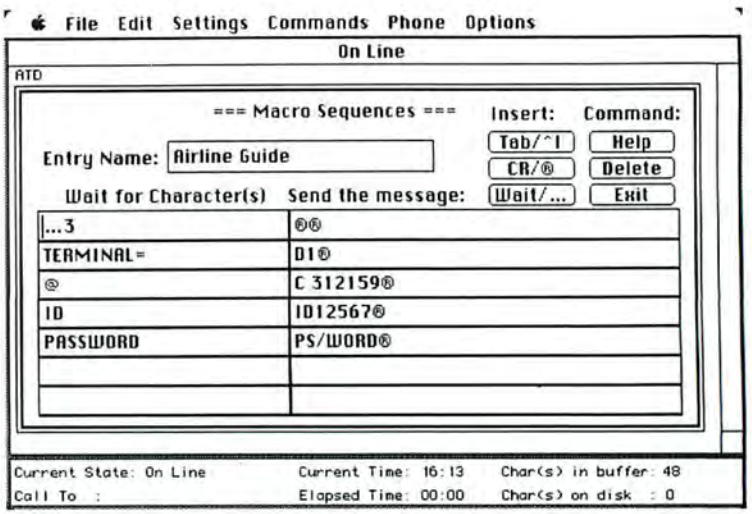
(including one operated by Prometheus Products, from which you can download the most recent version of *ProCom-M* at no charge). *ProCom-M* also sends and receives text files, and it allows you to edit and create text files without resorting to a separate word processor. I wish more communications programs had this time-saving feature.

On the negative side, *ProCom-M* lacks terminal emulation features that allow the Mac to imitate Digital Equipment Corporation VT-100s and other popular mainframe and minicomputer terminals. The program also has a few minor bugs, such as the Edit menu remaining highlighted when you use its ⌘-key equivalents. Finally, many of the program's help screens and dialog boxes contain typographical errors that don't affect the program's operation but give it a less-than-polished appearance.

ProCom-M is a serviceable communicator, but you'll enjoy communications more if you replace it with *Smartcom II* or *Red Ryder*. The ProModem is the star of this hardware-software duo. Its Hayes compatibility makes it versatile, and its unique communications buffer frees the Mac for other jobs while handling printing or communications tasks. If you routinely print large documents and are tired of drumming your fingers on the desk while waiting for the printer, or if you use electronic mail extensively and don't want it to monopolize the Macintosh, this modem is worth considering. –*Jim Heid*



ProCom Autopilot
This autopilot sequence signs on to the Official Airlines Guide database. The column labeled "Wait for Character(s)" shows which characters ProCom-M *waits to receive before sending the text in the second column.*

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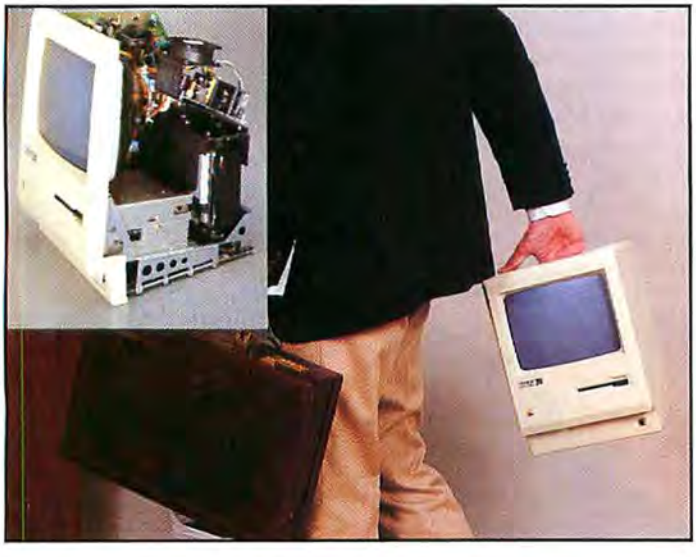

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Financial Stew

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But times have changed. Home buying is complex enough to make you want to live in a tent, and a "creative" car loan is as easy to decipher as a Jackson Pollack canvas. How do you make sense of this financial stew? One way to try is with Electronic Arts' ***Financial Cookbook.***

Financial Cookbook contains 32 financial planning "recipes" that calculate the potential returns from savings deposits, treasury bills, IRAs, and life insurance, as well as the costs of home or car buying and renting. You simply select a recipe from the program's index file, plug in values where requested, and click on Compute. *Financial Cookbook*'s calculations take into account inflation, interest, tax rates, and other particulars. Tables of supporting data accompany the results.

To calculate monthly home mortgage payments, for example, you select Mortgage Schedule, Yearly. *Financial Cookbook* requests figures for the mortgage amount, interest rate, and term. It calculates your monthly payment and displays an amortization table showing the interest and principal paid each year. Change the input variables, and you can generate stacks of "what-if" comparisons (see "The High Cost of Living").

(continues on page 134)

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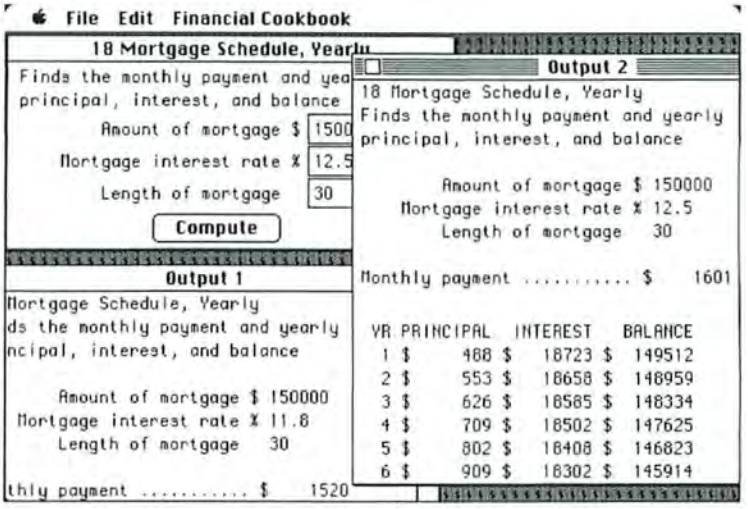
(continued from page 132)

Financial Cookbook's simplicity has its cost. Because it relies on tax information from past 1040 forms and on your estimates of key figures, you can't expect its results to be 100 percent accurate. The program is designed for armchair financial planning, not for accounting. For reliable calculations, you must turn to a financial professional or a more sophisticated personal accounting program.

Manual Labor

Although *Financial Cookbook* bills itself as "the calculator that does all the work," there are times when you must do some legwork. A key factor in many calculations is your marginal tax rate. You must manually extract data from old tax forms and plug it into *Financial Cookbook*. Once the rate has been calculated, however, it can be saved and automatically called up by the program as needed.

Marginal tax rates must be manually calculated in a number of hypothetical situations. For example, to see how long your IRA will sustain you after retirement, you must estimate your postretirement income and find its corresponding tax rate in government tax tables. To compute the taxes you will save by purchasing a house, you must manually research your potential marginal tax rate by adding up estimated homeowner deductions and looking up rates in IRS tax tables. There is no provision for sharing spreadsheet data with the program.



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In seconds, Financial Cookbook *calculates the cost of buying a house. To determine your payment at a different interest rate, open the Recipe window, change the variable, and click on Compute.*

Recipe 33: Cutting Production Costs

Financial Cookbook appears to have been hastily adapted for the Macintosh. While the outside of its package shows Mac screens, the inside is all Apple II. Users are instructed to ignore the first three pages of the manual and are directed instead to a small brochure describing Mac-specific

(continues on page 138)

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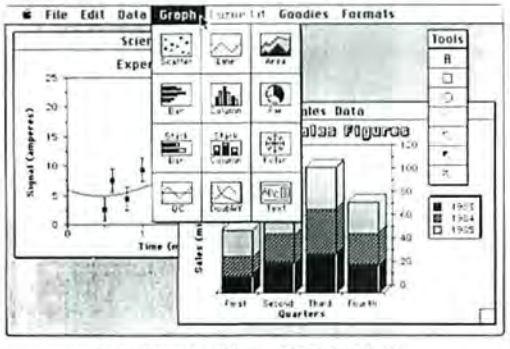

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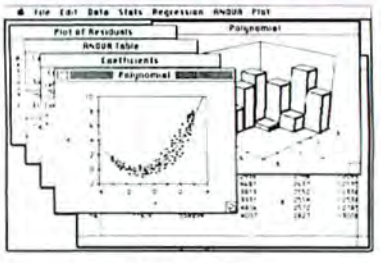

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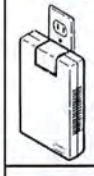

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(continued from page 134)

commands. Fortunately, the bulk of the manual refers to generic program functions. The program fails to take advantage of the Mac's display capabilities, instead presenting all text in a plain 12-point Monaco font. Simple boldface headings would have made data entry and output windows more readable. To dress up the program's solutions, you must copy them through the Clipboard to *MacWrite* or *Microsoft Word.*

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Magic in the Maze

Ask IBM PC or Apple II owners to name the most famous adventure game, and chances are they'll say *Wizardry.* Until recently Macintosh owners have had to be content with less legendary stuff. But no longer. Now that ***Wizardry: Proving Grounds of the Mad Overlord*** is available on the Mac, you can see for yourself why the game has earned such an enviable reputation.

Simply starting the program is enough to demonstrate that this is not the usual text adventure game: on the screen appear three empty windows and a row of five icons. No "You are standing by a cabin in the woods. . . . " greets you. There is no place to enter written commands or queries, and no predetermined role to assume.

Join the Party

To begin the game, you must create and arm a party of characters who will perform heroic deeds. Conjuring a band of characters involves myriad rules that might prove bewildering to the uninitiated. Beginners will frequently refer to the manual for guidance—and just as frequently will come up short on needed information. The omissions seem to be intentional; although the manual is indispensable (and rather funny), book learning is only one way of acquiring knowledge in *Wizardry.*

Of the 20 characters available in the Roster, only 6 may make up the party that searches for the evil Werdna in *Wizardry*'s ten-level maze. To form a party, drag characters into the Party window (no one ever seems to volunteer). After the party is fully equipped and in proper marching order, the heroes enter the maze when you click on the maze icon (see "Windows on Wizardry").

As in other adventure games, mapping the maze is crucial to success. The program represents the maze in another window by means of graphics that are far from state of the art—doors are blackened archways, stairs are a patch of stripes, and so forth. Fortunately, other aspects of the maze are left to the player's imagination: the bejeweled idols, noxious clouds of gas, important clues, and such are described in information boxes rather than illustrated. Simple but effective sound effects compensate for the lack of visual sophistication.

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Instructions were excellent– as good as I've ever read. Jim Ackil

Much better than I had expected (and I expected it to be very good). Mark Cochran

Light years ahead of any other upgrades for the VIDEO, book, materials, and tools. Martin Wixted

Directions were specific. Your video prepared me well—practice made it easy. S. Hindes

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Enter the Monsters

Various monsters, from bubbly slimes to undead kobolds, show up in the maze. When monsters are encountered, a combat screen appears. The screen shows crucial facts about your party's condition, pictures of and information about the monsters, and an instruction window where you indicate whether the party will run or stand and which characters will fight, cast spells, or duck. If you elect to fight, a blow-by-blow report flashes on the screen.

If vanquished monsters leave a treasure chest behind, the party is given the opportunity, in another window, to try its luck at opening it. Booby traps, however, make this hazardous. Indeed, trips through the maze can result in injury, paralysis, poisoning, and even death. A trip to the Hotel restores the injured, but a visit to the Temple is required for those who are paralyzed or dead; in *Wizardry* almost anyone can be healed, for a price.

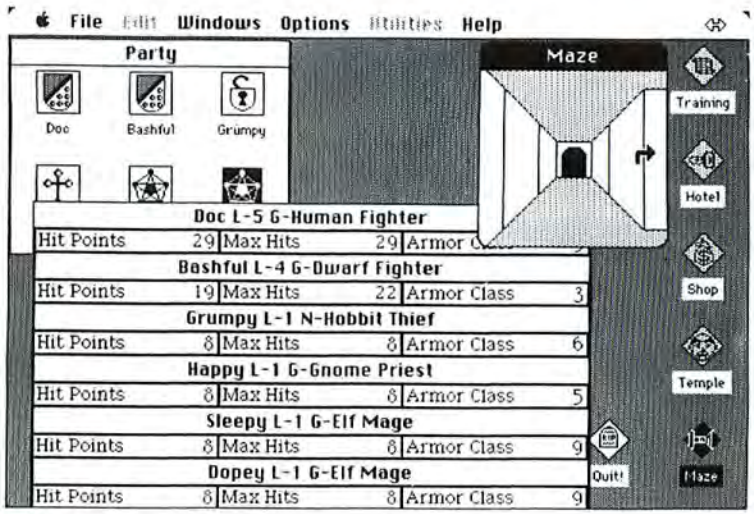
Attention to Detail

Part of what makes *Wizardry* special is its almost boundless variety of characters, places, and events. In the Macintosh version, the game's charm is enhanced by its conscious and careful use of Mac conventions. Everything that happens in the game is mediated through such familiar Macintosh devices as windows, alert boxes, icons, scrolling lists, and so on. Keyboard equivalents, for those so inclined, are abundant, logical, and easy to remember. This is no quick and dirty conversion.

Attention to detail results in a number of useful special features. You can, for example, mark your party's location for reference as you move about the maze, print the party members' vital statistics to keep at hand, transfer characters to another disk, and create backup characters (a sneaky and cheap way to resurrect the dead).

Good as it is, *Wizardry* is not perfect. The game works on a hard disk, but the key-disk copy-protection scheme requires that the floppy be available at startup. It re-

(continues on page 140)



Windows on Wizardry

By choosing the small maze window shown highlighted here, you can display your party's vital statistics while exploring Wizardry's *maze. Either the keyboard or the mouse moves the party through the maze.*

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(continued from page 139)

fers to all characters, male and female, as "he" and suffers occasional bouts of bad grammar. And once in a while the standard Macintosh interface is not followed as carefully as one might like.

But these are quibbles. Unlike many of its competitors, the game never bored me by going only N, E, S, and W or by giving "I don't know the word _____" responses to questions. *Wizardry*'s ingeniously controlled environment prevents such tiresome exchanges without diminishing the drama and excitement of the game. Also, the lack of hard-and-fast rules about aspects such as how or when to create new characters adds a significant strategic element that many other adventure games lack. *Wizardry* is not the last word in adventure games, especially in regard to graphics, but it is nonetheless an impressive and highly entertaining addition to the Macintosh game library.—*Robert C. Eckhardt*

Wizardry: Proving Grounds of the Mad Overlord
Sir-Tech Software, Inc.
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315/393-6633
List price: $59.95

Software to Die For

When François Rabelais sat down to write his will, he had no need for legal niceties or fine points: "I have nothing, I owe a great deal, and the rest I leave to the poor." If your estate is equally straightforward, you probably don't need ***WillWriter,*** a program that asks a series of questions about your estate and prints out a valid will.

WillWriter, from Legisoft/Nolo Press, is designed for the small (under $1 million) estate without conditional bequests (such as "I leave the sum of $20,000 to my daughter Amy on the condition that she remain single until she finishes college, unless she marries George Bigbucks, in which case . . . "). By prompting you for answers every step of the way, *WillWriter* makes it easy to provide for your survivors, appoint an executor and/or guardian, and generally dispose of your estate without giving a large part of it to an attorney. More importantly, *WillWriter* is more than a mere statutory form with blank spaces; it not only helps you prepare a will painlessly and economically, but it also provides solid background information on wills, trusts, and estate planning.

Legalese Deobfuscated

WillWriter's emphasis on education rather than execution is evidenced by its 170-page manual, less than a third of which deals with the program. The rest of the manual provides information about the law of wills and trusts and explains the reasons for a lot of the formalities—and mystique—usually associated with creating and executing a will. The manual describes straightforwardly the steps involved in writing a will and provides numerous examples

(continues on page 142)

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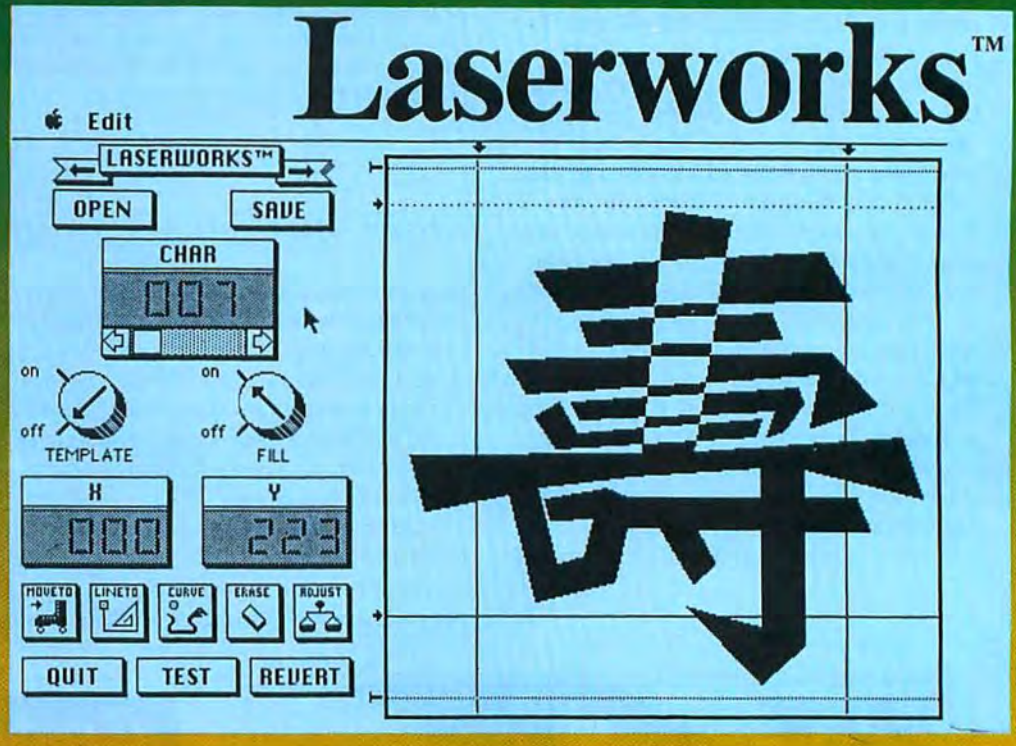

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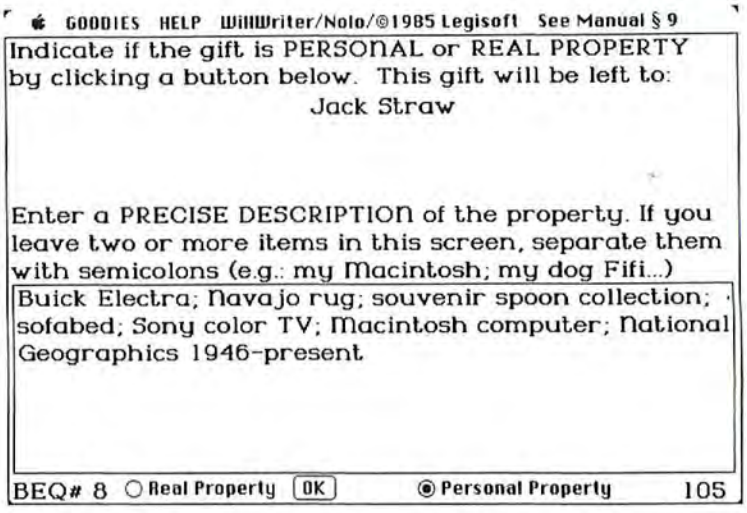
of situations that might arise ("Bill and Annie both execute wills naming each other as executor in case the other dies first. In the event they die simultaneously, Bill and Annie name Annie's father as an alternate executor, after obtaining his permission"). *WillWriter*'s educational emphasis does not stop with the manual; the software's Help menu includes items such as "What do I do now?" as well as on-screen definitions of fundamentals such as "bequest," "personal property," and "real estate."

Once you have read the manual, the process of making a will is actually very simple, since it involves nothing more than answering a series of questions. For example, *WillWriter* asks what state you reside in (different states have different requirements for preparing and executing wills), whether you are married, and whether you have children. The program then asks you to list each bequest of personal property and the person or charity to receive the bequest (see "Property Lineup"). You can leave property to up to 16 beneficiaries. For each bequest of personal property, the program asks you to name an alternative beneficiary in the event that the original beneficiary does not survive you by 45 days. The program also asks you to name the beneficiaries of your real property. Finally, *WillWriter* asks you to name guardians for your surviving children, and executors of your estate.



Property Lineup
WillWriter *guides you through the process of making a will, using plain English rather than legalese. Here, you enter the name of a beneficiary and list the property you wish that person or charity to receive.*

After all the information has been entered and confirmed, you can save the will on disk or print it immediately. The printout includes a cover page with instructions about the will-signing ceremony, the will itself, and the signature page, with room for three witnesses to sign (one more than the statutory requirement, just to be on the safe side). And if you save the will on disk, you can revise it at any time and print a fresh one, without the expense and inconvenience of visiting an attorney.

(continues on page 148)

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(continued from page 142)

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- You can't set up a plan to dispose of your remains.

These limitations exist by design: if you need to draw up a complicated will with any of the above provisions, you should consult a specialist.

Bugs and Bunnies

Although the IBM PC version of this program has generally been well received by reviewers, the Macintosh version I reviewed—version 1.0—suffers from a lack of polish. First, the software had a tendency to do some unpredictable things. On several occasions the disk crashed while I was performing perfectly normal operations such as quitting the application or attempting to display a will. Save your document frequently to avoid reentering information if such a mishap occurs.

WillWriter also has several aesthetic problems. Foremost of these is the proliferation of pictographs from the Cairo font—as if the developers saw the font as a cheap source of graphics and then didn't know when to stop. In addition, the manual is overrun with illustrations of a family of bunnies; while the drawings add a touch of whimsy to the lengthy manual, they seem a little silly considering the subject at hand. Perhaps the developers will provide us with a revised version that is more in tune with its intended audience: people who are over 18 and of sound mind. I hope so, because this excellent program could provide a valuable service to the millions of people with small, uncomplicated estates.
—Nicholas Lavroff

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To Bee or Not to Bee

English is a speller's nightmare. Words don't always sound the way they're spelled. What's worse, the rules are inconsistent (try *through, rough, dough,* and *cough*). Teaching children to spell is complicated by the fact that different children remember words in different ways. Visual learners need to see words; auditory learners retain words best when they hear them spelled; kinesthetic learners memorize

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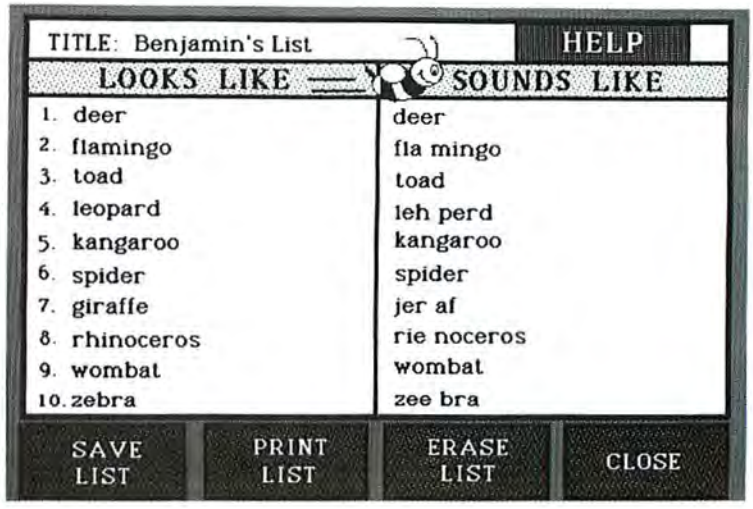
words best when they write them. To be effective, a spelling tutorial should allow for all three types of learning. Computerized spelling teachers have, of necessity, focused on visual cues; there simply hasn't been a practical way to provide auditory and kinesthetic feedback. But First Byte's ***Speller Bee,*** using the *SmoothTalker* speech synthesizer (see *Macware Reviews,* August 1985), provides the auditory cues that many children need.

Listmaker, Listmaker . . .

Like most spelling teachers, *Speller Bee* bases its lessons on spelling lists. The program comes with 15 built-in lists of ten words each, ranging from easy lists for preschoolers to challenging lists for junior high school students. But 150 words doesn't make for a very impressive vocabulary, so *Speller Bee* allows you to build up to 32 additional lists, using words from the manual's appendix, vocabulary words from textbooks, or other words.

Building a list involves more than just typing in words, though, because *SmoothTalker* doesn't always pronounce words correctly. Each time you type a new word into a list, *Speller Bee* pronounces the word according to *SmoothTalker*'s built-in rules. When it mispronounces a word—like "lee-brary" for *library*—you can correct the pronunciation by typing in syllables that sound right: "lie-brary." The program then associates that pronunciation with the correctly spelled word (see "Checking It Twice").



Checking It Twice
Speller Bee *allows you to create up to 32 personalized spelling lists. If the program's speech synthesizer doesn't say a word correctly, you can fine-tune the pronunciation by spelling the word phonetically in the right-hand column.*

Spell Power

Whether you use a built-in word list or a custom list, the Spell Power menu offers several choices for working with words. Bee Prepared is the basic drill-and-practice section of the program. *Speller Bee* shows, says, and spells a word and then asks the

(continues on page 150)

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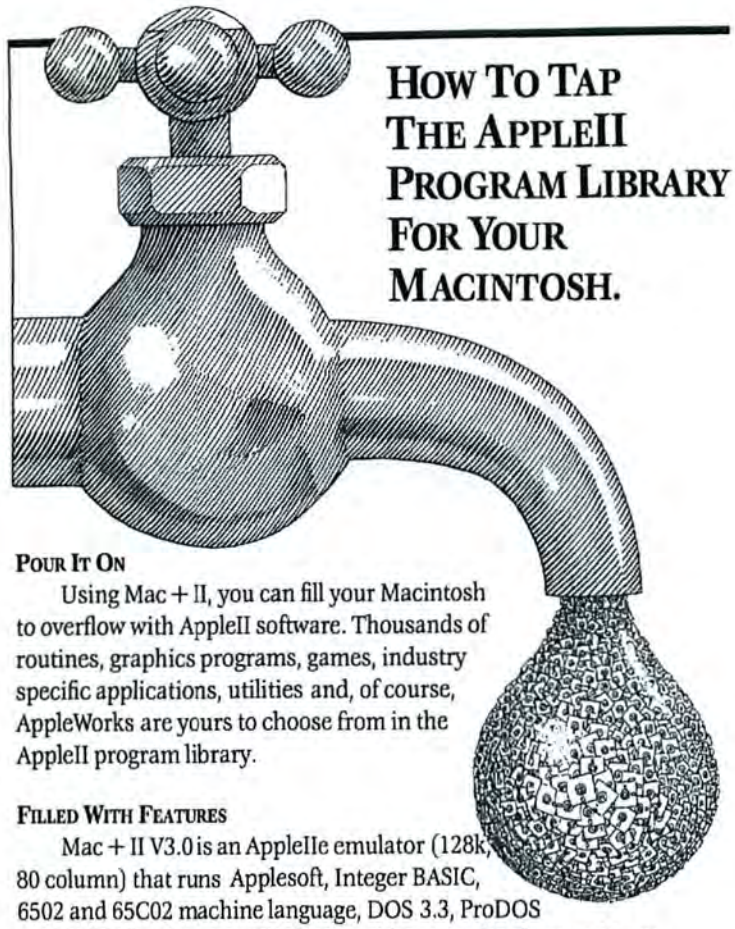

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(continued from page 149)

student to type the word. If necessary, the learner is given a second, third, and fourth chance. When the spelling is correct, Speller Bee himself flies across the top of the screen, and a new word appears.

Bee Prepared is a tireless drillmaster but may be a little dry for some kids. Fortunately, the program offers three games for practicing the words in the spelling lists. Scramble presents a word with scrambled letters and awards points for correctly typing the word. Students who don't type may be more comfortable with Detective, a fill-in-the-blanks game that displays words with missing letters, or Search, which displays a crossword grid containing hidden words. The player uses the mouse to play both of these games.

The final Spell Power option is Spelling Bee, an old-fashioned spelling test. All of the options are described in the manual, but the on-screen documentation is all that most kids will need. In addition to the animated guided tour that explains (aloud) the menu options, there's usually a help button that can be used to conjure up simple animated instructions for a particular screen.

Breaking the Spell

Speller Bee should be a great program; it's a fresh approach to an important educational problem. But *Speller Bee* has problems of its own, many of which are related to the program's limited capacity. The maximum of ten words per list, for example, limits the program's effectiveness when presenting specialized lists like the months of the year. With such short lists, more than 15 built-in lists are required to keep a motivated youngster interested for more than a few hours. But the most imposing wall is *Speller Bee*'s absolute limit of 32 custom lists. Any serious spelling program should allow the teacher, parent, or student to build a library of words spanning several disks.

While they're working on expanding *Speller Bee*'s capacity, the programmers should smooth out some rough edges in the user interface, too. On the surface, the pleasant graphics and simple picture menus have lots of appeal for kids. But beneath those cute menus lies the personality of an impatient drill sergeant. Many of the games and drills in *Speller Bee* have

(continues on page 152)

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(continued from page 150)

built-in timers that, without warning, take the student back to the main menu if he or she takes longer than about 15 seconds to respond to a question. That's a serious punishment for slow reflexes; it can take a frustrating minute or two just to negotiate the many levels of menus back to the playing level. The only thing a child learns from this arbitrary cutoff is that it doesn't pay to think things through.

The *SmoothTalker* synthesizer at the heart of *Speller Bee* is the source of other problems. Many people find it difficult to understand the monotonic, mechanical dialect of this program. Like any accent, however, *SmoothTalker*'s speech becomes easier to understand after you've spent some time listening to it. The phonetic spelling option helps overcome some of the program's pronunciation problems, although you may find yourself trying several spellings before *Speller Bee* pronounces a word correctly. Even when phonetically spelled, some words still take some effort to understand.

Surprisingly, there are a couple of errors in the manual—spelling errors. These mistakes serve a useful function, though; they point to the inherent limitations of a spelling drill program like this one. The first error, "This menu let's you ..." (instead of "lets you"), illustrates the significance of context in spelling. The second, "its'" with a trailing apostrophe, shows the importance of understanding the rules of the language. While *Speller Bee* may help students memorize individual words, it doesn't teach context or rules.

Finally, First Byte's marketing strategy creates some problems. *Speller Bee* is expensive. Even for a flawless educational game, $79.95 is a lot of money. *Speller Bee* is a good first effort but needs to be substantially improved to be worth the price.—*George Beekman and Susan Beekman*

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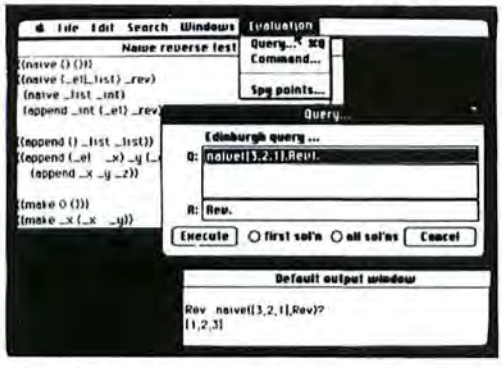

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RATES: Listings are accepted for a three-time consecutive insertion at a rate of $726. We offer a six-time insertion at $1230 that reflects a 15% frequency discount. Listings must be prepaid (except for established display advertisers) upon submission of ad copy. Checks, money orders, Visa, and MasterCard are accepted.

DEADLINE: For copy deadlines and further information please contact Niki Stranz, your Macworld Directory Account Manager, at 415/861-3861 or 800/872-7800 (800/872-7808 in California). Please send copy and prepayment to the Macworld Directory, 555 De Haro St., San Francisco, CA 94107.

■ *Accessories*

○ *Index*

Quarterly Macworld Index
Now you can find any article, column, or product review that runs in *Macworld*. A complete quarterly index ends searching thru back issues for the info you need on Mac products, applications, software. Our index covers every *Macworld* ever published. Makes *Macworld* a Mac Library. Only $3.95/ea., $12.95/yr.
Indexmasters, P.O. Box 520337, Salt Lake City, UT 84152

○ *Cables*

Mac Products
MacLock secures Mac, keyboard, mouse, second drive, modem, & printer. Attractive red vinyl covered steel ⅛-inch cables. Lock included $40. Any length MacCables custom-connect any modem, printer to your Mac. Most $29. *Tax Master* prepares U.S. taxes w/ *Multiplan*. 25 forms. Some states. $99. *MacPlot* $130. $5 s/h. CA tax 6.5%
Mac Products, 20231 San Gabriel Valley Dr., Walnut, CA 91789, 714/595-4838

ImageWriter II/Mac Plus
Interface your Mac Plus, Macintosh, or IIe to the ImageWriter II printer or Apple Personal Modem with our Apple-equivalent custom *molded* cables, all at $32.95! Also available are Mac Plus-to-SCSI drive cables and Mac Plus-to-Macintosh adapter cables. Custom designs for OEM applications. Full line of all Apple printer/modem cables.
N² Products, Inc., 2401 Qume Dr., San Jose, CA 95131, 408/435-0227, 619/243-3632

○ *Supplies*

Free Mouse Pad
Try one *free sample* of EZ Mouse™ die-cut, self-adhesive, antifriction pad on the bottom of your mouse.
- Dramatically improves the feel on any surface.
- Eliminates wear on the bottom pins.
- Keeps mouse cleaner.
- Reduces wear on desk surface, too.

For free sample and details, write or call:
Hi-Tech Products, 8331 Artesia Blvd., Buena Park, CA 90621 714/670-2150

○ *Switches*

Mac A/B Switch
Switch conveniently between your letter-quality and Imagewriter printers with only a flip of a switch. Occupies only one port and provides instant access to either printer. Compatible with all LQ printers.

Complete with one cable	$99
Add'l cable for LQ printer (Std.)	$25
Add'l cable for LQ printer (API)	$39

Visa/MC welcome. See display ad in this issue.
Creighton Development, Inc., 714/472-0488

■ *Artificial Intelligence*

○ *Expert System Tools*

ExperOPS5: The Expert Maker™
Develop your own expert system with *Exper-OPS5*. Developed by Carnegie-Mellon University and implemented for ExperTelligence by SAIC, the program uses Macintosh-style menus and editing features. OPS5 has been widely used by major corporations for applications ranging from computer configurations to stock market analysis.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperFacts™
A flexible expert systems-building tool. Written in ExperLisp by MC-Systems™, *ExperFacts* features backward and forward chaining, meta-level control, partitioning of the knowledge base, and a software hook that runs any LISP function, including graphics!
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

○ *Languages*

ExperLogo
The ideal tool to experience AI concepts & transform your Mac into a fantastic image generator! 3-D & spheric coordinates; automatic conversion; Mac toolbox; control of menus, windows, etc. Because ExperLogo is compiled, it is fast & powerful. Used by professionals for 3-D animation & development of small expert systems. More than 5000 users! A new technology that you cannot afford to ignore. Call or write today. Visa/MC. Corporate, user groups, & education welcome.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperLogo–Talk/Prologo

A special implementation of ExperLogo that brings speech to your programs. Control pitch and speed; create incredible effects! On the same disk an interpreter version of Prolog, the newest AI language. Implemented in ExperLogo. Includes source codes & numerous examples. A serious & fun professional product. Updates from ExperLogo avail. Call or write today. Visa/MC. Corporate, user groups, & education welcome.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperLisp: The AI Master

LISP is the most widely used AI language. It has been used to develop hundreds of expert systems all over the world. ExperLisp is the first compiled version available on the Mac. Includes all the Mac-style menus and editing features. Package includes *A Gentle Introduction to Symbolic Computation*, written by David S. Touretzky of Carnegie-Mellon University. A must for anybody interested in AI, from beginners to developers! Call or write today!
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

ExperLisp-Talk

Create state-of-the-art talking expert systems: allows the integration of real-time text with speech synthesis in ExperLisp programs. Control speed, pitch, & rate. Includes sources for a talking version of the famous *Animal* program, detailed documentation, and examples. Call or write today. Visa/MC. Corporate, user groups, & education welcome.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

○ *Utilities*

ExperLisp-3600

A unique version of ExperLisp designed to optimally integrate ExperLisp with a Symbolics. A special feature, ExperLink™, supports remote procedure invocation and file transfer, plus the creation of a Mac-based Symbolics Listener window. The window allows programs from the ExperLisp editor to be remotely compiled on the Symbolics.
ExperTelligence, Inc., 559 San Ysidro Rd., Santa Barbara, CA 93108, 805/969-7871

■ *Business Opportunities*

Looking for a Publisher

for your Mac application? CSI, the publisher of many microcomputer software products would like to talk with you about publishing your innovative product ideas. Complete publishing services–documentation thru distribution. In-depth technical knowledge of the Mac. Flexible royalty %'s.
Creative Solutions, Inc., 4701 Randolph Rd. #12, Rockville, MD 20852, 301/984-0262

■ *Expert Systems*

MacKIT™–512K Mac Req.

The Knowledge Integration Toolkit for building Expert Systems. Since 7/85, MacKIT™ users across the U.S. and Europe to Nairobi, Kenya, are developing their skills in Knowledge Engineering and exploring new technologies in building Expert Systems. Be part of the next computer revolution. $149 MC/Visa.
Knowledge System Environments Inc., P.O. Box 261, Dept. M2, Grantham, PA 17027, 717/766-4496

■ *Hardware*

○ *Bar Code*

Bar Code/MagCard Readers

The PC-380 Bar Code & PC-580 Magnetic Stripe (credit card) Readers have been designed to interface with the Apple Macintosh, are easily connected between the keyboard and the CPU, and require neither additional software nor an RS-232 port. A powerful but simple program for printing Code 39 bar codes is also available.
TPS Electronics, 4047 Transport St., Palo Alto, CA 94303, 415/856-6833

○ *Data Acquisition*

"Real World" Access

Add measurement and control capabilities to your Mac with the ADC-1. This easy-to-use RS-232 peripheral includes 16 analog inputs (13 bit), 4 digital inputs, 6 outputs, and a BSR controller. Used for laboratory, industrial, and home monitoring. $449. ADControl software $45. Sensors available.
Remote Measurement Systems, 2633 Eastlake Ave. E/206, Seattle, WA 98102, 206/328-2255

○ *Monitors*

MacMonitor $1295

23-inch hi-res monochrome monitor with antiglare makes viewing your Mac easy in classrooms, trade shows, seminars, offices. Horizontal scan rate is switch selectable: 15-25 kHz. Guess what else? MacMonitor works with Apple IIe, IBM PC, Amiga, etc. MacMonitor does it all. Ask about our Mac Projectors for $3995.
National Data Systems, 2419 Rutland Dr., Austin, TX 78758, 512/837-1760, 800/531-5143 (U.S.), 800/252-8286 (TX)

○ *Video Adaptors*

The Mentauris CVA

Provides any Mac with a high-quality video output port. Ideal for all large-screen viewing applications. Easily installs internally, no soldering, splicing, or mounting hardware required. Housing disassembly tools also available. Call for competitive pricing, product brochures, and technical assistance.
Mentauris Technologies, P.O. Box 1467, San Marcos, TX 78667-1467, 512/396-1565

■ *Insurance*

Safeware

If your computer is important to you, insure it! SAFEWARE provides full replacement of hardware, media, & purchased software. As little as $39 a year covers fire, theft, power surges, earthquake, water damage, auto accident. Call 8 a.m. to 8 p.m. Mon. thru Fri.; Sat. 9 a.m. to 5 p.m.
Safeware, The Insurance Agency Inc., 2929 N. High St., P.O. Box 02211, Columbus, OH 43202, 800/848-3469 (Natl), 614/262-0559 (OH)

■ *Publications*

Microcomputer Books

Current selections include *Jazz on the Macintosh* ($20.95), *Mac Revealed* Vol. 1 ($22.95), *Basic Microsoft BASIC* ($16.95), *Macintosh Multiplan* ($15.95), *Serious Business with Microsoft Excel* ($21.95). Ship/handling extra. MC/Visa/AmEx. Send for free directory of titles available.
Micro Books, P.O. Box 60203, Grand Junction, CO 81506, 800/874-5280, 800/874-3426 in Colorado

Mac Artists Unite!

Do you miss *Macworld Gallery?* Wouldn't you like to see other artists' work? Do you have patterns or drawing tips to share? Send a B&W paper copy of your masterpiece (up to 8 by 10½ inches) with a description of how it was done & $20. Each entry will receive a copy of *Mac Artist* with his or her work in it! For a copy send $5.
Mac Artist, *12 Calvin Ct., Walnut Creek, CA 94595, 415/935-2270*

■ *Services*

○ *Data Conversion*

Electronic Data Conversion

Conveniently translate data files from dedicated word processors, phototypesetters, PC software (word processing, databases, spreadsheets including formulas) to your Macintosh or other system. Experience compatibility. Call or write, then send a sample disk or tape for a complimentary translation.
CompuData Translators, Inc., 6565 Sunset Blvd. #301, Hollywood, CA 90028, 213/462-6222

○ *Graphics/Printing*

SAVE $$

Professional typesetting, printing (offset or laser), publishing, and graphics design done from your Mac or IBM disks, via modem or by Fax machine. We use a high-quality Linotype™ laser typesetter or an Apple LaserWriter. Complete printing services including business forms, letterheads, business cards at Low, Low prices.
Laser Printing Services, 26058 W. 12 Mile Rd., Southfield, MI 48034, 313/356-1004

Laser Typesetting

Use your Mac for desktop publishing! Newsletters, brochures, and other graphics output at professional quality using your Mac and our Linotype™ typesetter or Apple LaserWriter. Great savings and 24-hour turnaround via disk or modem.

Graphic design also available from our staff artists. Write or call:
Spectrum Arts, Ltd., 1823 Eutaw Pl., Baltimore, MD 21217, 301/225-7372

○ *Typesetting*

MacTypeNet
Professional typesetting services for the Macintosh. Text and/or graphics output at 300 to 2450 lines per inch resolution from Apple LaserWriter™ or Allied Linotype™ L300 laser typesetter. Disk and modem service. 24-hour turnaround. Full printing and bindery services. Write or call for user info.
MacTypeNet™, Box 52188, Livonia, MI 48152-0188, 313/477-2733

■ *Software*

○ *Accounting*

Shopkeeper
For retailers and service firms, Integrated Accounts Receivable, Billing, Inventory, Point of Sale, & Invoicing program. Use all or any parts. (880 customers, no limit inventory.) Written just for the Macintosh. Works with any general ledger system. For the 512K Macintosh with external or hard disk drive. Introductory offer $149.95.
Woodtec, 320 W. Maple, P.O. Box 445, Arkansas City, KS 67005, 316/441-0187

○ *Apple Emulator*

II in a Mac™
NOW!... Run Apple II™ software on your MAC, without hardware! *II in a Mac* simulates a 64K Apple II+ with 80-col full screen, including monitor and soft switch locations. *II in a Mac* comes COMPLETE with DOS 3.3, ProDOS, Integer/Applesoft BASIC, an Apple II transfer disk, and features like HiRes/LoRes graphics. Joystick and Desk Acc./SWITCHER support! Available NOW ... $69.95.
COMPUTERapplications, Inc., 12813 Lindley Dr., Raleigh, NC 27614, 919/846-1411

○ *Architecture*

MacPerspective™
Allows architects, draftspeople, and artists to rapidly construct perspective drawings of houses, buildings, or other objects. Viewpoint can easily be changed. Drawings can be printed in any size up to 100 inches. Easy to learn and use. Fast, professional program with many features, thorough manual. $189.
B. Knick Drafting, 313 Marlin Pl., Melbourne Beach, FL 32951, 305/727-8071

○ *Backup Restore*

COPY II MAC
COPY II MAC backs up nearly all protected software easily! Allows running some direct from your hard disk–so put that original 3½" safely away! Repairs damaged disks and undeleted files, too! For 128-512K Mac, 1-2 drives. $39.95 + $3 s/h ($8 overseas). Visa/MC/chk/c.o.d. (We also have backup programs for IBM, Apple, Comm 64!)
Central Point Software, Inc., 9700 S.W. Capitol Hwy. #100, Portland, OR 97219, 503/244-5782

○ *Compilers*

MacLanguages Series Pascal
A complete native code Pascal compiler and development system for the Macintosh. Provides full access to all ROM routines and other Apple software like *MacinTalk* and *Three D Quickdraw*. Creates stand-alone double-clickable applications and desk accessories, and it's compatible with Apple's MDS. $99.95 +5 s/h.
TML Systems, P.O. Box 361626, Melbourne, FL 32936, 305/242-1873

DeSmet C Compiler
Full K & R native code C compiler, 68000 assembler, object file linker and librarian, machine level debugger, editor (See™), RAM disk emulator. SANE (IEEE) floating-point support, program development shell, 120+ standard library routines, and 450+ ROM library interfaces. $150.
C Ware, 505 W. Olive #767, Sunnyvale, CA 94086, 408/720-9696

○ *Data Management*

DATAFAST
A powerful yet SUPER-EASY-to-use professional database management program. Create mailing lists, directories of customers, inventories, etc. Use predefined formats or create your own. Easy entering, sorting, and updating of data. "Copy" and "Paste" records into your *MacWrite* documents. $49. Req. 128K, 1dd.
Statsoft, 2832 E. 10th St. #4, Tulsa, OK 74104, 918/583-4149

db_VISTA DBMS for C
Programmer's database. B-tree indexing, multiple-key records, royalty free, optional source, application portability to MS-DOS/UNIX. db_VISTA is a network model DBMS. C programs manipulate and access the database. Requires 512K/2 drives, $195/30-day guarantee.
Tom Condon, Product Manager, Raima Corporation, 12201 S.E. Tenth St., Bellevue, WA 98005, 206/747-5570

○ *Educational*

Test Generation/Grade Book
MICROTEST II–Create, update, generate, & store exam materials. Easy question entry, large database; print multiple versions. *MICROGRADE*–Research-based, includes most-wanted features! Flexible course & grading structure, complete statistical pkg.; create variety of reports. Free brochures, demo pkgs. $5 each.
Chariot Software Group, 3659 India St. #MD-1, San Diego, CA 92103, 619/298-0202

○ *Engineering*

Digital Logic Design Aid
LogiMac is an interactive digital logic drawing and simulation package for the Macintosh. It is intended for use by engineers, students, teachers, and hobbyists interested is designing, documenting, and experimenting with digital logic hardware. It supports most common gates, flip-flops, etc. $79.95 (U.S.).
Capilano Computing, 554 Beatty St., Vancouver, B.C. V6B 2L3 Canada, 604/669-6343

Structural and Civil
Frame & beam analysis & design pgms, others. Any # of nodes, elements, loads. Section data read from disk. Structure load, tension, shear, moment & deflection diagrams, in & out text, section table, more. Full Mac interface. Frame in Feb; BEAMAC II (continuous beam) $295. BEAMAC (simple) $95. Any demo $10. $back guarantee. Info, support: free.
Erez Anzel, 5800 Arlington Ave. #5T, Riverdale, NY 10471, 212/884-5798

Tolculator
Automates Geometric Tolerancing Design and Inspection. Positional fit & other formulas; picks drill, c'bore, etc.; math (trig., least squares, etc.); tolerance circuits; probability studies. Auto in process sampling & coordinate measuring mach. output analysis; metric conv., & much more. Req. *Microsoft Excel*. No computereeze. Not protected. $125.
Samuel J. Levy Engineering, 2943 Cortina Dr., San Jose, CA 95132, 408/251-7058

○ *Fonts*

Indiawrite Fonts
Fonts for writing Hindi, Bengali, Tamil, Sinhala, Gujerati, Punjabi each $99; Sanskrit $149. Diacritic alone $29. Several fonts in several sizes, plus roman with diacritic with each. All conjuncts available. Tested by Paris University. Specify U.S. or U.K. keyboard. Checks only.
Indiawrite, 735 W. 183rd St. #2A, New York, NY 10033 or 24 rue Macarez, Valenciennes 59300 France

○ *Games*

Dungeon Masters
Gamemaster #1 provides four utilities for the FRP game master. Save hours on repetitive tasks with NPC Generator, Experience Point & Attack Priority Calculators, and Multiple Random Roller. Requires MBASIC 2.0 or later. $25 includes s/h. Check or money order to:
Hack & Slash Software, 1525E S. Broadway, P.O. Box 6066, Santa Maria, CA 93456

MacGolf™
The ultimate graphic golf simulation game. So much like real golf you'll be amazed. Digitized golfing figure, real-life digitized sounds. Two unique 18-hole courses. View trees, sand traps, fairways, lakes, and flags in true perspective. Check wind speed, choose from 14 clubs, set your stance for hook or slice, and swing. Only $59.95 + s/h. 100% satisfaction guaranteed.
Practical Computer Applications, Inc., 1305 Jefferson Hwy., Champlin, MN 55316, 612/427-4789

○ *Graphics*

Mac-Art Library
Mac-Art Library is 11 full disks of professional quality *MacPaint* art files. At $29.95/disk, choose from *Animals, Plants, Transportation, Sports, The Farm, Tools, The Kitchen, Buildings, Signs/Symbols, Greeting Card Art,*

Geography. Or get all for $200. Also available: a Library Sampler for $39.95.
CompuCRAFT, P.O. Box 3155, Englewood, CO 80155, 303/850-7472

Magic Slate–Version 2.0
A dynamic graphics program that brings to the Mac environment an exciting art medium stimulating untapped artistic talent. Slate provides features typically found in expensive systems. Since you have a state-of-the-art computer, it makes sense to support it with similar software that opens the door to a fulfilling new personal experience.
Devionics, P.O. Box 2126, Covina, CA 91722, 714/779-7193

○ *Languages*

NEON™
An object-oriented programming language, NEON™ offers a Smalltalk-like environment implemented as an efficient threaded language to provide new power, flexibility and speed for developing for the Mac–on the Mac. $195 + $5 s/h.
Kriya Systems, Inc., 6 Export Dr., Sterling, VA 22170 1-800-34-KRIYA or 703/430-8800

MacFORTH™
The Language of Innovation. Create windows, menus, graphics, mouse events quickly & easily using this interactive & fast language.

Level 1 - Explorer's Systems	$149
Level 2 - Professional System	$249
Level 3 - Developer's Kit	$499

Royalty Free License for commercial development.
Creative Solutions, Inc., 4701 Randolph Rd. #12, Rockville, MD 20852, 301/984-0262

Multitasking for the Mac
Mach1™ is Forth-83 with:
- True multitasking
- Twice the speed of other FORTHS
- Hi-level access to Toolbox, floating-point, & speech routines
- A *standard* MC68000 assembler
- *Normal* text source files
- Turnkey applications
- $49.95 Visa/MC
- No licensing fees

The Palo Alto Shipping Company, P.O. Box 7430, Menlo Park, CA 94026, 415/854-7994, 800/443-6784

MacScheme™–A Mac LISP
A LISP environment that makes a 512K Mac feel like a LISP machine. MacScheme™ features a fast, reliable byte code interpreter with debugger, trace facility, and helpful error reporting. Its Smalltalk-like interface offers multiple windows and an editor that understands LISP syntax. $125.
Semantic Microsystems, 4470 S.W. Hall St. #340, Beaverton, OR 97005, 503/643-4539

○ *Marketing*

macINTERVIEW
macINTERVIEW is a variable market or opinion survey program to quickly analyze all kinds of inquiries. macINTERVIEW presents the results in tabular form as bar, column, or polarity charts on the screen or in print. macINTERVIEW enables the user to edit, enter, classify, concentrate, cross-tabulate, and compare data. Macintosh 512K. $950 for English version.
Erich Breitschwerdt + Partner, Paulsmueblenstr. 41,4000 Dusseldorf 13, West Germany

○ *Medical*

Medical & Dental Mgmt.
Solo or multipractitioner office includes patient (responsible party) billing, recall, paper/electronic claims, aging, collection, SuperBill, labels, diagnostic history, *Word/MacWrite,* audit & productivity reports. 24-hr. support. 512 + hard disk or XL. Mac Office. Demo from $100. AMEX/MC/Visa. 2400+ dealers.
CMA Micro Computer, 55722 Santa Fe Trail, Yucca Valley, CA 92284, 619/365-9718

○ *Music*

StudioMac Music Kit
No experience required! StudioMac™ comes complete with Casio CZ-101 keyboard synthesizer, MIDI adapter, and easy-to-use software. Play new creations or *MusicWorks* pieces through the synthesizer. Great family entertainment. Synthesizer Kit $595, MIDI Kit $214, software only $125.
Creative Solutions, Inc., 4701 Randolph Rd. #12, Rockville, MD 20852, 301/984-0262

○ *Presentation Graphics*

Overeasy™
Spend less time shuffling pictures, organizing slides, and reworking diagrams for your next presentation. *Overeasy* is a powerful solution to the mgmt. of pictures on a 512K Mac w/ easy manipulation such as merging, insertion, or deletion. Pictures & text can be created or imported from other documents. Special lines, symbols, & shapes are provided as well as an outlining facility. $149
Overeasy, 2540 California St. #2, Mountain View, CA 94040, 415/941-4715

○ *Printer Drivers*

The Print-Link™
A printer driver program, complete with cable, allowing choice of dot matrix, daisy wheel, and ink jet printers for the Macintosh. Mfrs. supported are Epson, Okidata, Panasonic, Citizen, Olympia, Brother, Juki, Dynex, C. Itoh, Diablo, Siemens, and still adding. $84.95.
GDT Softworks Inc., P.O. Box 1865, Point Roberts, WA 98281-1865, 604/291-9121 or 800/663-MACC

○ *Public Domain*

Mac Public Domain
Mac Public Domain Software–Hundreds available, $10 per disk. Choose from applications, *Multiplan* templates, games, art, utilities, backup programs, disk editors, music, templates for business, desk accessories. Carefully organized with documentation. Send $1 for a catalog.
Educomp, 2139 Newcastle Ave., Cardiff, CA 92007, 619/942-3838

Public-Domain Disks $9
Have access to 1000 public-domain programs by mail! Members pay $9 per disk plus $1 postage & handling. Send $20 for 1-year subscription. Includes intro disk with ten neat programs, plus listing of all disks in library, plus quarterly newsletter describing latest public-domain software.
PD Mac, Dept. M, P.O. Box 5626, Sherman Oaks, CA 91423

1000 Programs/55 Disks
Up-to-date software on 55 disks!
3 MBASIC utility disks–incl. ReEd, ResEd, Switcher–$27
24 fonts (create own)–$9
12 games (Megaroids)–$9
20 desk accessories (HP-12calc)–$9
Rolodex/Screen Maker–$9
Latest terminal emulators–MacTEP & Red Ryder–$9
$4 s/h per order. 50-pg. catalog–$3 Visa/MC/chk.
The Public Domain Exchange, 673 Hermitage Place #1A, San Jose, CA 95134, 408/942-0309

○ *Real Estate*

REMS Investor 2000
Perform powerful investment analysis on your Macintosh. Over ten different loan types, latest depreciation, variable assumptions, industry standard reports. Stand-alone program uses all the Mac features. Easy to learn. For more information ask your dealer or call REMS direct.
REMS Software, 526 N.W. Second St., Corvallis, OR 97330, 503/757-8887

Property Management
Comprehensive program for managing residential and commercial properties. Many management reports including: operating statement, delinquent rent, lease expiration, and transaction register. Provides check writing, check reconciliation, posting late fees, recurring expenses–$395. Investment analysis–$245.
Yardi Systems, 3324 State St. Ste. O, Santa Barbara, CA 93105, 805/687-4245

Investment Analysis
From RealData, the leader in real estate software. Latest tax rules included in this powerful sensitivity analysis for income property. Ten-year pro forma of cash flows, financing, resale, tax consequences, IRR/FMRR, and more. Flexible and easy to use. Requires *Multiplan™, Jazz™,* or *Excel™.* $195.
RealData, Inc., 78 N. Main St., South Norwalk, CT 06854. 203/255-2732

Property Management
From RealData, the leader in real estate software. Manage up to 70 residential or commercial units. Receipts/disbursements ledgers, extensive property profile, receivables and billing, check-writing, financial statement, and many more features. Completely macro driven for easy use. Requires *Excel™.* $250.
RealData, Inc., 78 N. Main St., South Norwalk, CT 06854, 203/255-2732

More Real Estate Tools . . .
From RealData, the leader in real estate software. Products for investors, commercial and residential developers, syndicators, mortgage lenders, brokers, and closing attorneys. Programs for the Macintosh and the

IBM PC available for immediate delivery. AMEX, Visa, MasterCard welcome.
RealData, Inc., 78 N. Main St., South Norwalk, CT 06854, 203/255-2732

○ *Science*

Tools for Scientists

Two low-priced products that will enhance the usefulness of your Mac. Our *Scientific Symbols Fonts* disk contains all the characters in IBM's Selectric™ symbols ball and more for $20. The *Spectral Analysis* package provides four basic functions: forward and inverse transform, power spectrum, and autocorrelation. $65.
Renaissance Software Systems, P.O. Box 329, New York, NY 10028-0006, 212/794-2273

○ *Security*

Advanced Copy Protection

The leading software manufacturers depend on Softguard copy protection. Introducing the *MACLOK Kit™*, a complete copy protection system that runs on the Macintosh.
- Stops all copybusters
- FULL HARD DISK support
- No source code changes
- Compatible with all Macintosh systems.

Free demo disk.
Softguard Systems, Inc., 2840 San Tomas Expwy. #201, Santa Clara, CA 95051, 408/970-9240

○ *Spec Writing*

MacSpec

A professional's word processor for writing specs, proposals, and technical papers. With automatic:
- Section numbering
- Indentation
- Table of contents
- New table of contents and numbers when paragraphs are changed
- All you worry about is input of text.

Compatible with existing word processors. $199.95.
LM Software, P.O. Box 93, Belmont, CA 94002, 415/594-0627

○ *Speech Synthesis*

MacinTalk from MS-BASIC™

CLR speechLib allows you to produce high-quality speech from BASIC. English and phonemic input can be used. Speech rate, pitch, and volume can be easily controlled. BASIC 2.0 or 2.1 required. No additional hardware needed. $35 + $3 postage and handling. 24 hrs. 7 days. MC/Visa.
Clear Lake Research, 5353 Dora St. #7, Houston, TX 77005, 800/835-2246 ext. 199, 800/362-2421 ext. 199 in Kansas

○ *Spelling Checker*

Spellswell™

A better spelling fixer for *MacWrite™*, *Word™* and text documents.
- Catches mistakes the others don't, like "insufficient funs"
- Checks homophones, e.g., there/their
- Handles hyphens/abbreviations
- Maintains capitalization
- Add/remove words from dictionary
- Separate document dictionaries
- $49.95

Greene, Johnson, Inc., 15 Via Chualar, Monterey, CA 93940, 408/375-2828

○ *Statistics*

Number Cruncher Stat Sys

Integrated, menu-driven, Mac statistical system including: Multiple and stepwise regression, t-tests, correlation, scatter plots, up to 4-way ANOVA, principal components, cross tabulation, transformation, nonparametrics and much more. Complete Mac interface. Transfer data to/from clipboard. $79. Requires 2dd.
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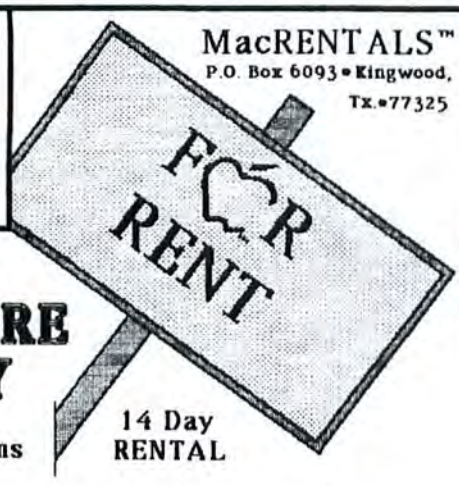

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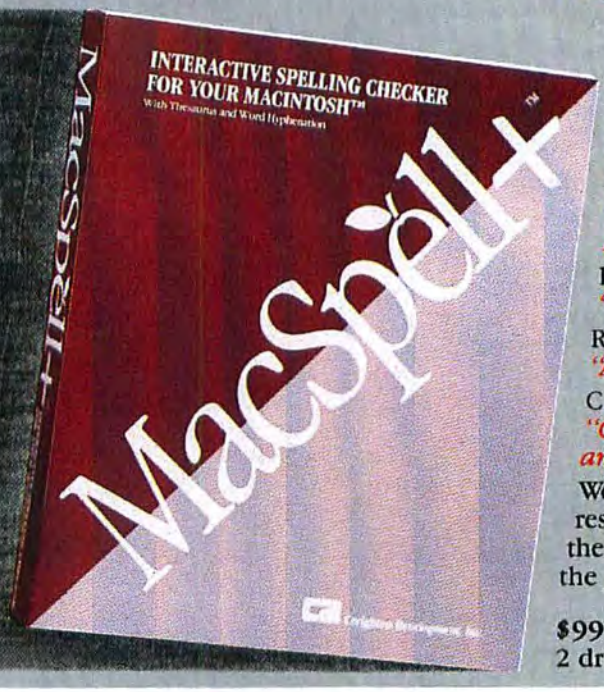

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Circle 437 on reader service card

Open Window

Database file conversions through Word, scriptwriting with MacDraw, a desk accessory to watch your windows, and more useful tips

Edited by Jim Heid

If you need to convert a database from pfs:file *to* Microsoft File, *a reader shows you how* Microsoft Word *prepares the file for transfer. Other tips on tap are a foolproof reminder for saving* MacWrite *boilerplate documents, and news about a handy desk accessory that keeps track of the windows you have open. Also, some new angles on printing sideways using a Microsoft BASIC subroutine and on setting up a* MacDraw *document for writing television scripts.*

Fighting Forgetfulness

I've created boilerplate *MacWrite* documents with margins, tabs, headers, and so on, set up for each format I commonly use. The problem is that I usually forget to use the Save As command to save the boilerplate when starting a new document, and I end up saving the document over the boilerplate.

If you have the memory-based *MacWrite* version 2.2, which keeps the open document entirely in RAM, as well as the current disk-based version 4.5, the solution is easy. Create your boilerplate documents in version 2.2. When you open a boilerplate with *MacWrite* 4.5, a dialog box states, "This document is being converted and will open as Untitled." Press Return, and you have an untitled document containing the boilerplate formatting.

J. Douglas Rabb
Thunder Bay, Ontario
Canada

From One File to Another

The procedure for transferring a *pfs:file* database to *Microsoft File* isn't covered in either product's manual, though the *File* manual says you can import records if a tab character separates fields and a carriage return separates records. Although *pfs:file* can save records in text form on disk, the program does not include a tab character between fields. *pfs:file* prints either two spaces or a return between fields, depending on what you specify. After some experimentation, I found a way to transfer the records using *Microsoft Word* as an intermediary.

- Start *pfs:file* and open the database you want to transfer. Choose Print Forms from the Functions menu and specify the forms you want to convert. If you're converting the entire database, don't specify any forms and click the Print Forms button.
- In the dialog box that appears, click the Print to Disk File button, make sure the Print Item Names box is unchecked, and type zero in the Lines Per Page box. Click OK and then type a name for the disk file when prompted.
- In the next dialog box, *pfs:file* asks which fields to print. Put a plus sign (+) after each field name (indicating two spaces) except the last, which you mark with an *X* (indicating a return).
- Click the Start Printing button, to save the records to the disk file you specified.

Your database is now a text file with two spaces separating fields and a carriage return separating records. Use *Word* to open the file and to replace the two spaces between fields with a tab character.

With the file open in *Word,* choose Change on the Search menu. In the Find What box, type two spaces, and in the Change To box, type ^T, which is *Word's* code for the tab character. You can choose Change All at this point to make the conversion throughout the file. However, if the database has two consecutive spaces *within* a field, they will convert to a tab character and cause that record to load improperly when moved to *File.* Using the Change, Then Find button allows you to bypass any pairs of spaces you want to remain within a field.

Check your work by choosing Show ¶ from the Edit menu. A small arrow pointing to the right represents each tab character. Make any necessary corrections, save your changes, and quit *Word.* You are now ready to transfer the text file into *Microsoft File.*

- Start *File,* type a new file name, and click the New button. When the Form window appears, create the same number of fields as are in the database to be converted. You can name the fields whatever you like, but make sure the number and order match the original database.
- Activate the Datafile window, choose Open Datafile from the File menu, and open the text file. The program copies the contents of the file into the new database, with each field in its proper place.

This technique should work with any database manager that can import files with tab-delimited fields.

Lynn Yaeger
Menlo Park, California

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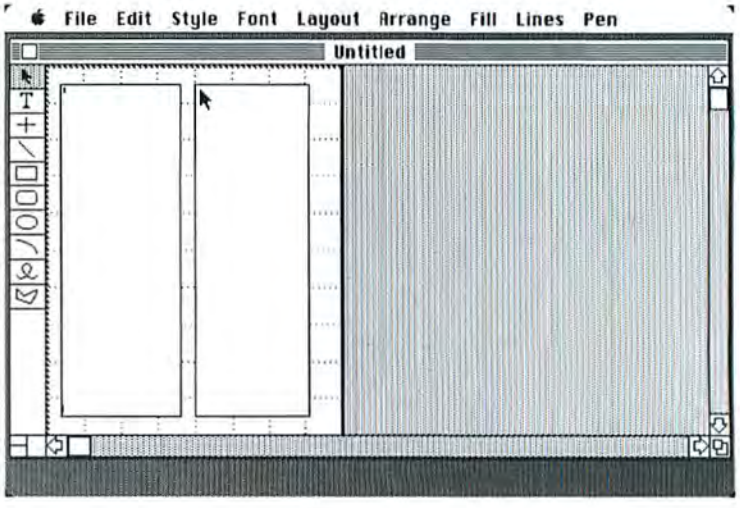
Word Processing with MacDraw

Television scripts impose unusual text-formatting demands. The left half of the page describes the video action and must be single-spaced, while the right half describes the audio and must be double-spaced. I was disappointed to discover that neither *MacWrite* nor *Microsoft Word* can handle columns with different line spacing on the same page. While a desktop publishing program would do the job, I found that Apple's *MacDraw* also works well.

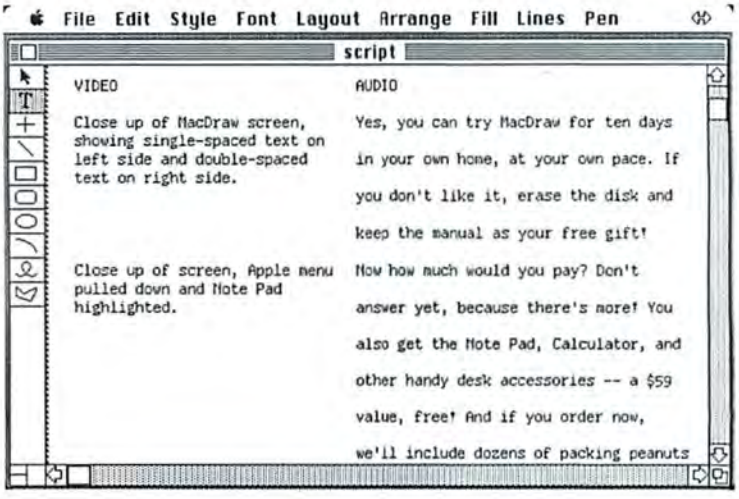
- Start *MacDraw* and open a new document, then choose Reduce to Fit from the Layout menu.
- Divide the page into two columns by drawing two rectangles using the box tool (see "MacDraw Scripts I").
- To establish a text area, click the arrow pointer (not the text icon) in the upper-left corner of one rectangle, type any character, then press the Return key until the insertion point reaches the bottom of the rectangle. Repeat this procedure with the other rectangle. Clicking the arrow pointer and typing a character instead of simply clicking the text icon specifies *MacDraw*'s paragraph function, which allows word wraparound within the rectangles.
- Choose Normal Size from the Layout menu and scroll to the top of the document. Select the rectangles and press Backspace to clear them. Click the text icon, select the single character you typed, delete it, and begin typing the script. Use the Style menu to change the line spacing and other formatting for each column. If adjoining text doesn't align properly across the column divide, choose Turn Grid Off from the Layout menu and adjust the columns (see "MacDraw Scripts II"). Add more pages using the Layout menu's Drawing Size command.

Furman S. Baldwin
Cornwall-on-Hudson, New York

(continues on page 166)



MacDraw Scripts I
To set up MacDraw *for writing television scripts, first choose Reduce to Fit from the Layout menu and then divide the page into two columns by drawing two rectangles that you establish as text areas.*



MacDraw Scripts II
The two-column television script, after removing the rectangles and hiding the rulers. If the blocks of text don't align, choose Turn Grid Off from the Layout menu and align them against the ruler lines.

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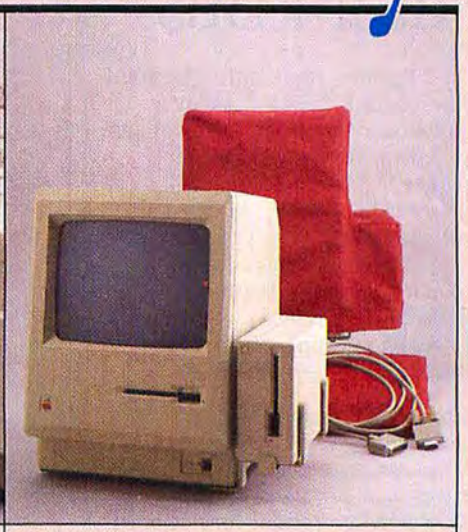

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(continued from page 164)

Banner Maker: The Odyssey Continues

Using the sideways-printing technique from Gerald Keep's Banner Maker BASIC program (see *Macworld*, November 1985, page 166), I've developed a subroutine that can print text on the screen sideways, diagonally, and in other orientations (see "Various Ways"). The routine works by printing the contents of the string variable TEXT$ horizontally in an unused area of the screen. The program reads the *x* and *y* coordinates of each pixel with a GET statement and redraws them in other orientations using PSET statements.

This subroutine is an interesting application of the GET and PSET statements and has other practical uses, too. For example, engineers and scientists often write BASIC programs for plotting complex statistical analyses that programs like *Microsoft Chart* can't handle. You could include the routine in such a program to print the *y* axis labels parallel to the *y* axis, which *Chart* can't do. You could also modify the routine to reorient pictures or larger sections of text by changing the limits of the FOR . . . NEXT loop.

Bill Wilson
Bellaire, Texas

(continues on page 168)

Various Ways

This BASIC 2.0 subroutine can print text on the screen sideways, diagonally, and in other orientations. To use it in programs, include the routine labeled PRINT.TEXT.SIDEWAYS and store the text to be printed in the string variable TEXT$ before calling the subroutine.

```
REM Microsoft BASIC subroutine to print text in various orientations.
REM This is a modification of Gerald Keep's "Banner Maker" program.
REM Type "WATCH THIS!" to see demo of other text orientations.
DEFINT J-P
DIM PEN(1), PIX(2)
XCOORDINATE = 200 : YCOORDINATE = 170 'Coordinates for sideways printing.
LINE INPUT "Enter text to be printed sideways: ", TEXT$
CLS
GOSUB PRINT.TEXT.SIDEWAYS
WHILE LEN(INKEY$) = 0     ' Press any key to quit.
WEND
END

PRINT.TEXT.SIDEWAYS:
  MOVETO 0,30          ' Or move to any other unused part of the screen.
  PRINT TEXT$;
  GETPEN(VARPTR(PEN(0)))
  FOR J = 0 TO PEN(1)
    FOR K = 20 TO 32  ' Use 23 to 31 for 9-point text with MOVETO 0,30.
                      ' For uppercase 9-point, interval can be 23 to 29.
    GET(J, K)-(J, K), PIX
    IF PIX(2) <> 0 THEN PSET (XCOORDINATE + K, YCOORDINATE - J)
    IF PIX(2) <> 0 AND TEXT$ = "WATCH THIS!" THEN GOSUB DEMO
    NEXT K
  NEXT J
  MOVETO 0,30 : PRINT STRING$(LEN(TEXT$) + 5, 32)    'Clear work space.
RETURN

DEMO:                'Demonstrates other orientations of printing.
  PSET (200 + J, 35 + K)
  PSET (200 + J, 100 - K)
  PSET (150 + J + K, 150 + 2 * K)
  PSET (270 + J -K, 70 + J + K)
  PSET (290 - J, 220 + K)
  PSET (290 - J, 285 - K)
  PSET (300 - K, 150 + J )
  PSET (120 - K, 100 + J)
RETURN
```

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"Hackers" was produced by Fabrice Florin in association with KQED-TV. The Hackers Conference was coordinated in part by the staff of *Whole Earth Review*.

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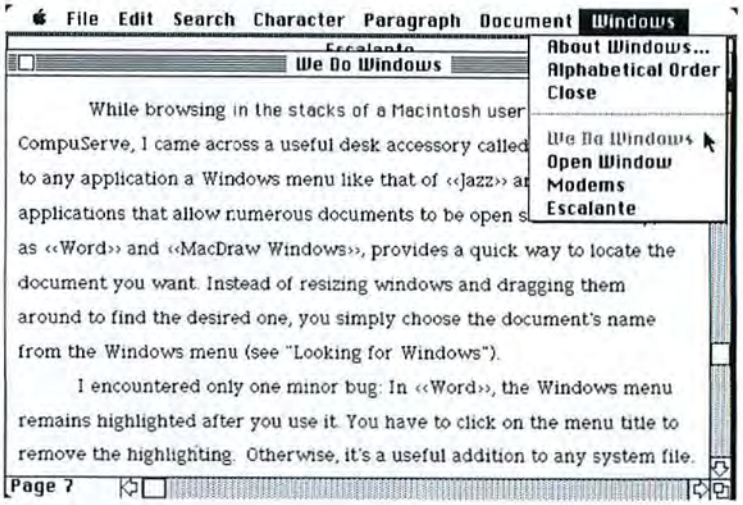
(continued from page 166)

A Handy Desk Accessory

While browsing in the stacks of a Macintosh user data library on CompuServe, I came across a useful desk accessory called *Windows* that adds to any application a Windows menu like those of *Jazz* and *Excel*. With applications that allow numerous documents to be open simultaneously, such as *Word* and *MacDraw, Windows* provides a quick way to locate the document you want. Instead of resizing windows and dragging them around to find the desired one, you simply choose the document's name from the Windows menu (see "Looking for Windows").

I encountered only one minor bug: in *Word*, the Windows menu remains highlighted after you use it. You have to click on the menu title to remove the highlighting. Otherwise, it's a useful addition to any system file. *Windows* is a $5 shareware desk accessory written by Marsh Gosnell of Montclair, New Jersey. You'll find it in MACUS data library 1, stored as WINDOW.BIN.—*Jim Heid*



Looking for Windows

Marsh Gosnell's Windows *desk accessory adds a Windows menu to any application. With applications that allow numerous documents to be open simultaneously, such as* Word *and* MacDraw, Windows *lets you access the window you want quickly.*

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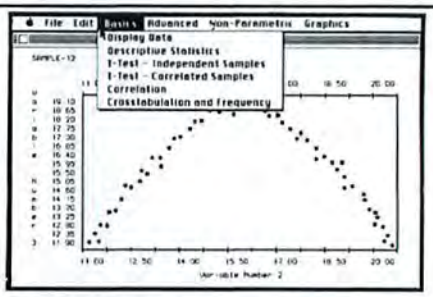

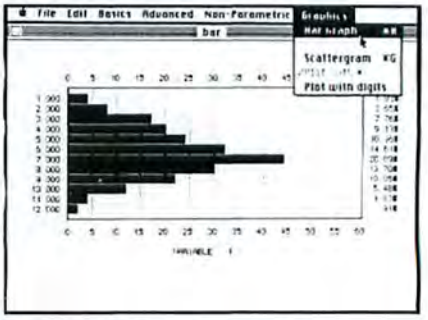

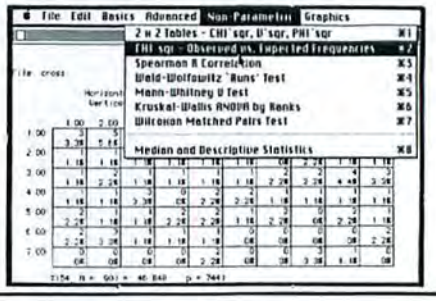

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