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The Macintosh™ Magazine

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Learn to Program in Mac Pascal

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MACWORLD

April 1985 — *The Macintosh™ Magazine*

Getting Started

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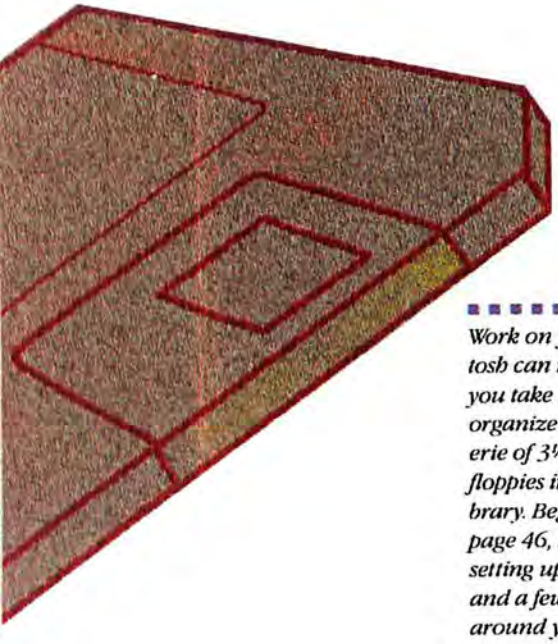

Work on your Macintosh can really fly if you take the time to organize that menagerie of 3½-inch microfloppies into a disk library. Beginning on page 46, learn how setting up a system and a few routines around your computer can save you time and trouble.

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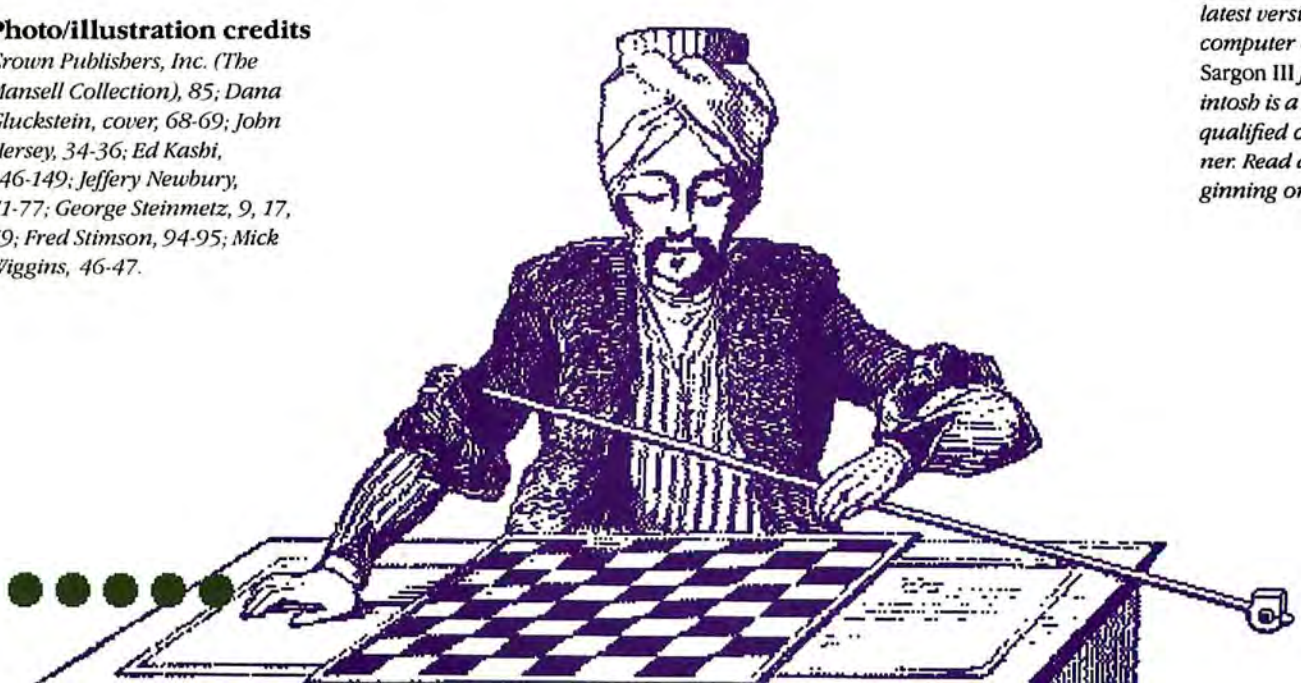

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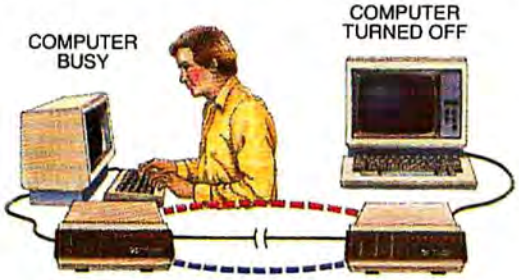

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You can also add other printers besides LaserWriter to The Macintosh Office. Including our stand-alone ImageWriter printer you see here, as well as letter-quality daisywheel printers you don't see here.

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The idea that people, not mainframes, are the most important information centers in an office. And that most things in business are really accomplished by teams of 5 to 25 people who need to share information with each other. What we call the *workgroup.*

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David Bunnell

Apple Wins It!

Notes on Apple's entertainment event of the year—its stockholders meeting

I recently attended two events in the same week at which President Ronald Reagan appeared on a giant video screen during the opening ceremony. The first was the Super Bowl at Stanford Stadium, and the second was the 1985 Apple stockholders meeting.

Since approximately 90 percent of you saw the first event on television (if you weren't lucky enough to be at the stadium), I'll focus on the second, which in some ways surpassed the first.

Reagan told the stockholders, "When I was a boy, I thought an apple was something you brought to the teacher. Today you learn on an Apple or a Macintosh."

Unlike at the football game, where the president spoke live, at the Apple meeting he was a mere clip of film—part of a multimedia presentation designed to make the world enthusiastic about Apple Computer. Nonetheless, it gave me goose bumps to think that in only ten years the personal computer industry has left the garage and driven all the way to the White House.

Dressed in a stylish double-breasted suit and sporting a bow tie, Steve Jobs came bouncing onto the stage. The resulting thrill that rippled through the audience of several thousand and the confidence that Steve exudes reminded me of Joe Montana abandoning the pocket and taking off on yet another successful dead run. Steve is like a great quarterback who can take matters into his own hands when the defense breaks down and turn imminent disaster into a 15-yard gain—if not a touchdown.

Early Retirement

In 1984 Apple's revenues reached nearly $2 billion, enough to make Steve Jobs secure enough to declare that $1 billion companies can't make it in personal computing. But he is known for outlandish statements, such as the remark in his *Playboy* interview that creativity stops at age 40.

I wonder if they tell people at Apple to plan on early retirement. That gives Steve ten years to go. Ten years can go fast, Steve.

The Apple stockholders meeting has traditionally set the stage for major product announcements. In 1982 the Apple III was released; 1983 marked the introduction of the Apple IIe and the Lisa; the Lisa 2 and the Macintosh were both unveiled during the 1984 meeting, at which *Macworld* was first offered to the public eye. Naturally, Apple planned something exciting for 1985. But its first disclosure was more amusing than electrifying. When Steve announced that stock certificates were redesigned to reflect the 1985 corporate look, *Macworld* Contributing Editor Danny Goodman remarked, "I wonder what their upgrade policy will be."

Jobs proceeded to introduce another member of the Apple family as "my boss and my friend," John Sculley. Recapping Apple's successes in 1984, Sculley declared that Apple is the "unquestionable challenger" to IBM. He proudly noted that Apple has more brand-name recognition than his former company, Pepsi, and that Apple's net sales per employee has risen from $260,000 to $300,000—the highest in the industry.

Sculley defended Apple's event marketing. By "using media in bold ways," he claimed, the company raises issues that must be brought up. For Jobs and Sculley the main issue is clearly IBM.

- Is there an alternative to the IBM PC standard in the office?
- Are we all going to be under one giant umbrella?
- Or are we going to be under two giant umbrellas?

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Plus all winners will receive the entire Microsoft family of Macintosh software.

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Macworld will judge the winners in four categories: Productivity, Recreation, Education, and Utilities.

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1) The eligible categories for this contest are:
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   D. UTILITIES: Applications that make it easier to develop or maintain systems.
2) Your program must be written in Microsoft BASIC for the Macintosh. You may use any version of Microsoft BASIC you wish.
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4) Programs may not have been previously published anywhere. *Macworld* magazine will publish the winning programs. Authors may submit programs to other publications after the conclusion of the contest.
5) All entries must be submitted on disk. Entries must include documentation (when necessary) and must indicate which contest category you are entering (education, recreation, productivity or utility).
6) Your entry must include the following materials:
   1) Disk containing the program you wish to enter,
   2) Your name, address, and phone number,
   3) The documentation for the program (if needed),
   4) An indication of which category you wish to enter. Please include this *both* on the outside of your envelope and inside with your name and address.

   Send these materials to: MICROSOFT BASIC PROGRAMMING CONTEST, P.O. Box 82243, St. Paul, MN 55182. Entries must be postmarked no later than June 30, 1985 and received no later than July 7, 1985.
7) Entries will be judged by an independent group of judges selected by *Macworld* and Microsoft. Entries will be judged on the following criteria:
   70 percent for creativity, i.e. definition originality, implementation originality and use of Mac features.
   30 percent for implementation, i.e. programming elegance and bug free.
   Limit one prize per person or household per category. All prizes will be awarded.
8) There will be a First, Second and Third prize awarded in each category, along with a Grand Prize for the best overall program submitted. The prizes for each category are:
   First—512K RAM upgrade and 4 Microsoft packages.
   Second—Your choice of one of the following: external disk drive *or* a printer *or* a modem *and* 4 Microsoft packages.
   Third—Mac carrying case and 4 Microsoft packages.
   The Grand Prize is—Corvus 11MB hard disk drive.
9) A list of the major prize winners is available by sending a stamped, self-addressed envelope to:
   MICROSOFT BASIC PROGRAMMING CONTEST WINNERS LIST, P.O. Box 82217, St. Paul, MN 55182
   Requests must be received by July 7, 1985. Do not send entries to this address.
10) All entries become the property of Microsoft and none will be returned. Winners will be notified by mail on or about August 30, 1985. There will be no substitution of prizes. Any taxes on prizes shall be the sole responsibility of the winners. Microsoft reserves the right to secure a certificate of eligibility from winning entrants.
11) Miscellaneous: No special form needed to enter. Enter as often as you wish, but each entry must be mailed separately. Disks will not be returned. Decision of the judges is final. Contest open to all residents of the USA except employees and their families of Microsoft and *Macworld*, their affiliated companies and agencies and Carlson Marketing Group. Contest void wherever prohibited or restricted by law.

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David Bunnell

Jobs rejects the notion of more than two umbrellas. I don't like his idea much because in a world with only two computers, there can be only two computer magazines. Ho hum.

It's the United States versus the Russians, the 49ers versus the Dolphins, and Apple versus IBM. But now that it's 1985, Apple is trying to be less like the 49ers and more like the United States by talking of peaceful coexistence.

Flash. On the big screen appears a mock issue of the *Wall Street Journal* featuring the headline "Apple and IBM Detente!" Below the headline is a photo of a grinning Steve Jobs alongside a glum IBM chairman John Opel.

What a Performance!

After all the pomp and circumstance, the serious announcement of the Macintosh Office, including AppleTalk and the new laser printer, seemed destined to be overshadowed. However, Jobs and Sculley managed to maintain the level of interest and excitement by demonstrating the Macintosh Office on two giant video screens. Working on two Macs connected by a bright, fluorescent green cable, they created a joint letter to the stockholders, then printed it out on the laser printer. The audience loved it.

Unlike the Super Bowl, which got boring in the fourth quarter, Apple's stockholders meeting managed to keep its fans on edge until the final whistle. No one left early.

Although its technology and upgrade policies may sometimes be questionable, Apple Computer—under the guidance of Jobs and Sculley—is undoubtedly the entertainment leader in personal computing and possibly the entire business world.

The final score: Apple 38, Super Bowl 16. □

Amazing what goes into Macintosh these days.

IBM PC software, for instance.

Macintosh and IBM PC software. Compatible at last, thanks to MacCharlie, a rather innovative coprocessing system.

And imagine the consequences.

Nearly 10,000 IBM PC software programs designed for general business and specific applications in real estate, insurance, law, medicine, banking, etcetera, can now join forces with Macintosh's own popular programs.

And, the myriad of IBM PC-compatible software adopts Macintosh's many beloved features, including desktop utilities such as the clipboard and the calculator.

In addition, MacCharlie allows IBM PC and Macintosh data files to be exchanged. Talk about flexibility.

But the good news gets better.

You see, MacCharlie delivers hardware compatibility, as well. For example, IBM letter-quality printers can be easily used with Macintosh.

Furthermore, MacCharlie now allows Macintosh to perform virtually any networking an IBM PC can perform. Even to the extent of tying in with IBM mainframes.

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MacCharlie offers 256K RAM, with optional upgrade to 640K RAM; 360KB disk drive, and optional second disk drive.

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Adrian Mello

The Inconvenience of Convenience

The Mac's easy-to-use design can be its biggest drawback

Since the introduction of the Macintosh, people have enthusiastically discussed how easy it is to use. The Mac has been described as intuitive, natural, friendly, and "the most personal of personal computers." A consensus has developed that the Macintosh is the first computer to bring the power of computing to those who have no interest in computers.

For the most part these observations are accurate. In practical terms the Macintosh can be described as convenient, in the way that a telephone is convenient. The more a computer's design simplifies complicated tasks, the more convenient it becomes.

The Mac is convenient because it minimizes the amount of new information you need in order to operate the computer. Icons and other graphic elements take advantage of pictorial symbols that are readily understood, such as symbols of file folders. Pull-down menus eliminate the need to remember cryptic commands. The mouse lets you point to objects on screen just as you would real objects. And because software developers are encouraged to design programs that share the Mac's user interface, you can use diverse application programs without learning new commands and procedures for common tasks, such as saving files or copying portions of a document to another document.

Technically, the reason the Mac is so convenient is the design of its system software. The very same system software, however, is the Mac's biggest drawback. When you're a beginner, using a single application like *MacWrite* or *MacPaint* with a few documents allows the Mac's design deficiencies to go unnoticed. But when you begin to put a Mac to more demanding work, its system software, combined with some inescapable hardware restrictions, creates difficulty. If you've ever tried to manage a large number of files, change application programs, or take full advantage of a hard disk or a RAM disk, then you've encountered the Mac's alter ego—inconvenience.

Carrying Extra Baggage

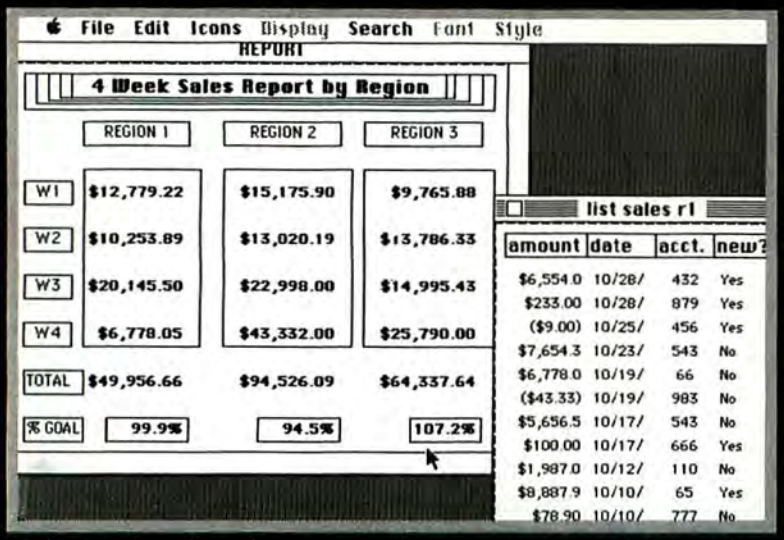
The Mac's system software is like the entourage of a celebrity or political figure. The opulent provisions and complicated planning required to make the passenger as comfortable and secure as possible often turn a simple trip into a major expedition. Similarly, when you use an application program, the Mac carries around a lot of baggage, such as fonts, desk accessories, icons, and windows, that make the Mac so convenient to use.

When you work on a term paper or a business report, you may not need ten fonts or a puzzle on your startup disk. A fully loaded System Folder can easily weigh in at 200K, which doesn't leave much room for application programs and documents on disk. To get your work done, you'll have to suffer the inconvenience of juggling disks. One way to increase disk space is to invest in a second disk drive, which doubles available disk space (see "Double-Disk Strategies," *Macworld,* November 1984). However, you'll still be carrying around some excess baggage on your disks.

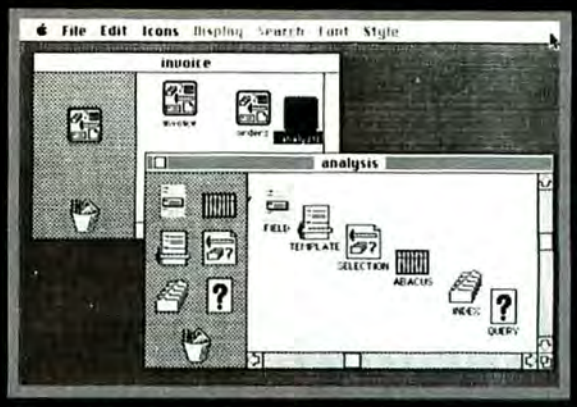
It is ironic that, for the time being, making the Mac an efficient computing tool means eliminating portions of the system that add convenience and appeal. To get extra storage space on your disk, you need to learn how to use specialized utilities such as the Font Mover and the *Desk Accessory Mover* (see "The Compleat Disk Juggler," *Macworld,* May/June 1984 and "Decking Out the Mac's Desktop," *Macworld,* March 1985).

In effect, when you begin to demand that the Mac pull its own weight as a powerful personal computer, you have to develop a new level of computer expertise. Using utilities like

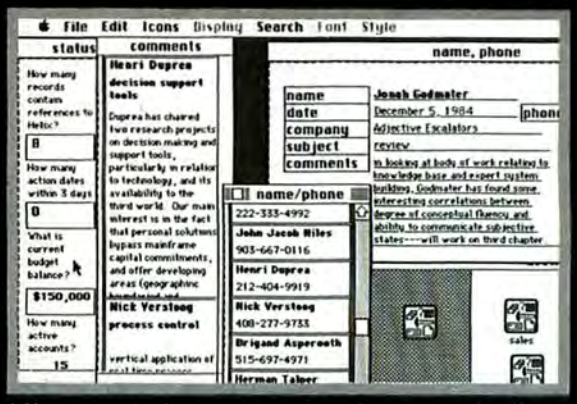
You have wanted to do something, but the door has been closed . . .



Helix is a data-based system, so that once you enter information you can use it for anything – reports, lists, analyses, mail merge printouts, or even relational look-ups to other data-bases within Helix.



The full functionality of Helix lies within its six basic icons. You can "learn by doing" with Helix, since it does not get in your way with imposed structure or restrictions. You don't have to worry about parameters, command codes, or "modes".



All open windows are updated automatically. Used here to simultaneously enter project notes, see synopses, get phone numbers, and display important "global" statistics.

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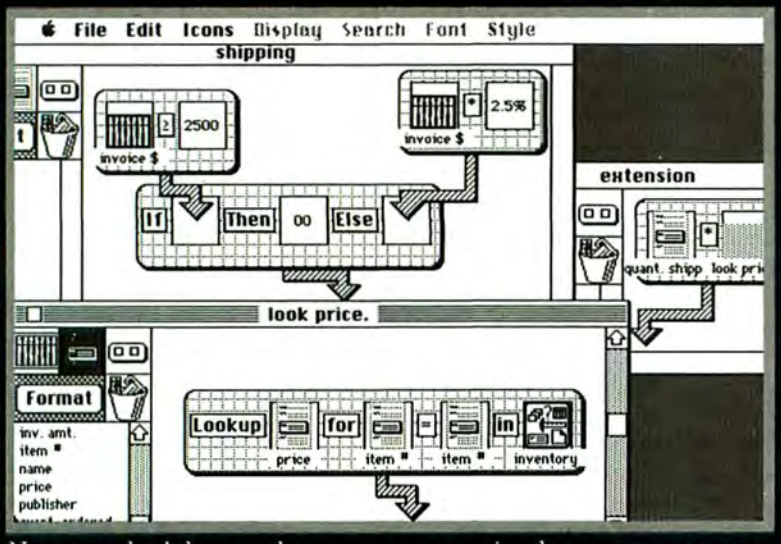
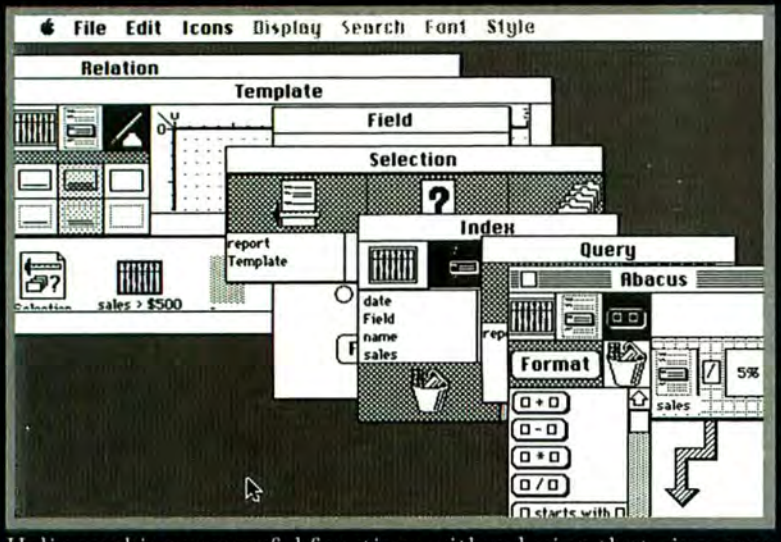
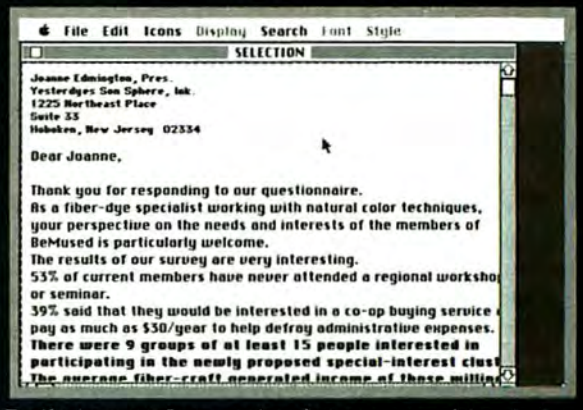
Odesta Helix opens the door.



Now, you don't have to learn a programming language or worry about "relational algebra". Except for the three numbers you see, no typing was used to create these calculations: "If invoice amount is equal to or greater than $2500, then don't charge for shipping, otherwise charge 2.5% of the invoice amount" . . . "Look up the price for the item in the inventory data-base" . . . "Multiply the item's price by how many were shipped" . . .



Helix combines powerful functions with a design that gives you direct control.



Built-in text formatting lets you combine information in a new way for mail merge letters, memo's, reports or free-form comments.

Helix provides a unique place to work because it takes a different approach.

It is based on the idea that we discover the important questions, relationships, and connections between things by working with them.

(So we need to be able to work with words and numbers in many different forms).

That our own experience, perception, and understanding are the basis of true "knowledge work".

And that this process can be both productive and playful, intently serious and intensely enjoyable.

(So we need a technology that is flexible, accommodating, and directly responsive to our actions and style of dialogue).

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the Font Mover requires that you look underneath the Mac's friendly interface and deal with the complexities of its system software.

Waiting for the Finder

One of the greatest Macintosh inconveniences is the time the computer takes to perform simple operations such as opening and quitting an application from the desktop. Anyone who has used the Mac a while has spent a fair amount of time looking at the wristwatch icon. The reason for the wait is that the computer needs time to construct the convenient graphics interface. The Mac's desktop, for instance, requires extra resources and a special application program—the Finder. Every time you quit a document or application, the Mac must open the Finder and create the desktop using resources for icons, windows, menus, scroll bars, and other graphic and text elements.

You can bypass the Finder with the Set Startup command on the Special menu. It automatically opens a selected application at startup without the intermediate step of building the desktop. But this feature isn't helpful when you change application programs. The inconvenience of waiting for a program to open or quit is aggravated when your work requires that you switch among several application programs.

The Mac's scheme for changing applications is good for beginners, who have to remember only to double-click on an icon. Long after you become familiar with the computer's operation, however, you must still perform certain tasks as a beginner does because the system software can't accommodate your improved ability. Before long your patience wears thin, and you begin to wonder why you can't switch directly from one application to another without returning to the desktop each time. Having to return to the desktop between programs is grossly inefficient—like having to drive home from the produce store before going to the delicatessen, when the store and the deli are next door to each other. A true mini-Finder, like the one used to switch between documents within an application, but which allows you to change applications without forcing a return to the desktop each time, would make better sense.

Besides opening and quitting programs, the Mac takes extra time to shuttle its luxurious resources between disk and memory. Because the resources cannot all be available at once in the 128K Mac's memory, they must be installed and removed as needed. The 512K Macintosh has enough memory to contain the resources, but you still need to wait the first time they are transferred from disk to memory.

Short on Memory

Additional memory could solve most of the Mac's sluggishness. The extra memory could be used with a RAM disk program, which simulates a disk drive in memory, to avoid waiting for mechanical disk drives to store or retrieve information. A RAM disk could greatly accelerate opening and quitting application programs and loading all system resources at once (see "The Invisible Disk," *Macworld,* March 1985).

You can get a RAM disk for the 512K Mac, but once again, the size of the system software inhibits a RAM disk's effectiveness. To receive a RAM disk's speed benefits, the System Folder must be loaded into the RAM disk, leaving room for only a moderately sized program, such as *MacPaint.*

If the Mac had more than 512K of memory, the RAM disk could be large enough to eliminate this problem. Another solution to the speed and storage problems would be to place the Finder and system resources in ROM—the logical way for Apple to revise the Mac's system.

Missing Conveniences

If the bulk of the Mac's system software often interferes with efficient operation, it also seems to be responsible for the lack of some conveniences that speed up operations on other computers. In this regard the Macintosh is like a gourmet who has such a predilection for fine cheeses that the refrigerator has little room for other delicacies.

The Macintosh system, for all its ease of use, lacks a convenience enjoyed by more common operating systems like Microsoft's MS-DOS (disk operating system), which, in various forms, runs on many computers including the IBM Personal Computer and the Tandy 2000. Other operating systems allow you to set up batch files so that you can avoid repetitive work. A batch file contains one or more commands that the operating system executes one at a time. You create a batch file once to automatically execute a series of commands that open a specific document or application, give specialized commands to external hardware, or automate any other operation performed outside of application programs.

Hard Disks Hardly Supported

People who work with large amounts of information demand the storage capacity and speed of a hard disk drive. Unfortunately, the Finder prevents you from storing large numbers of documents on a hard disk because the file directory's size is limited by the Mac's available memory (see "Shifting into Overdrive," *Macworld,* December 1984). As a result of this limitation, the directory can track only 90 to 150 files, depending on the number of folders used.

The 512K Macintosh has enough memory to track hundreds of files, but the Finder can't efficiently manage large numbers of files anyway. It takes around 20 seconds to search and load a file from among 200 files in a directory because the Finder must look for another file that holds folder information. Furthermore, the present mini-Finder doesn't show the hierarchical file structures that desktop folders suggest; any time you want to change documents with the mini-Finder, it is inconvenient to scroll through large numbers of documents to find the one document you're looking for. Until a more efficient Finder arrives, a hard disk drive isn't likely to be the answer to the Mac's storage problems.

During the last year manufacturers have released products in an attempt to solve some of the Mac's limitations. But the Mac's problems can't be solved with add-on software and hardware products, which are only Band-Aid fixes to systemic problems. Some of the Mac's inconvenience can't be overcome until it gains more than 512K of memory so that it can keep in memory both the System Folder and a RAM disk with several large programs. The Finder and the system should be built into ROM to reduce the burden on disk space and memory. Apple should also redesign the Finder and the system to handle large numbers of files and to allow extra levels of control and convenience so that the Mac can grow with people's abilities.

Most people will agree that the Macintosh has created a new standard of convenience by which other personal computers are certain to be measured. But the machine's success may wane in the coming year if it can't meet the growing requirements of the people that it has so adeptly drawn to itself. □

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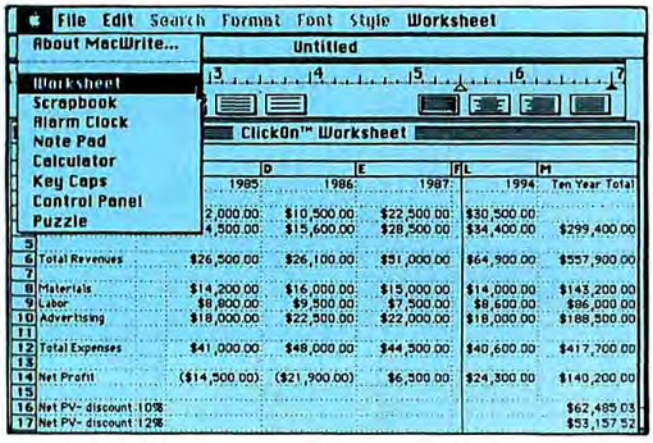

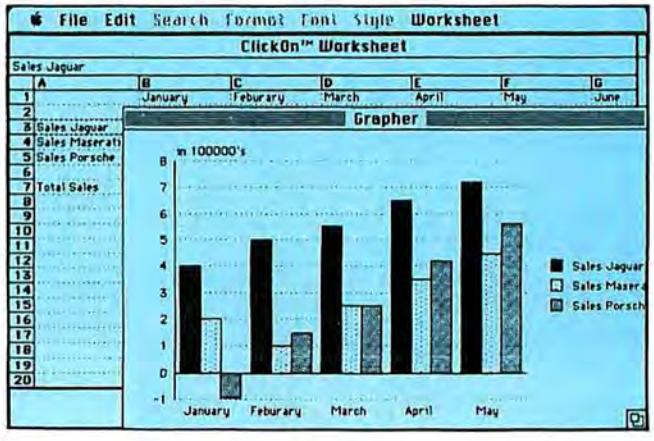

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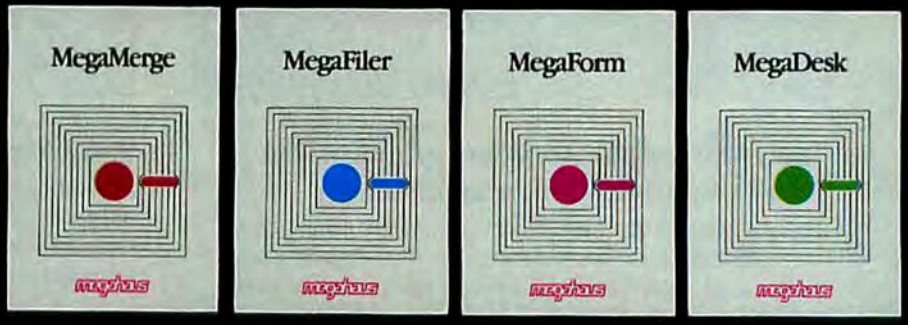

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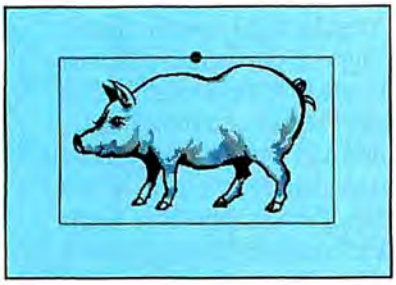

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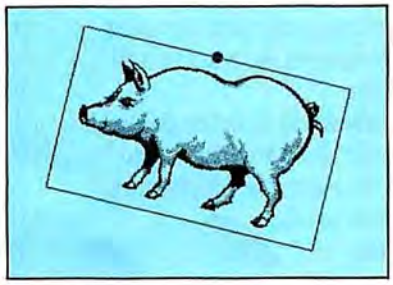

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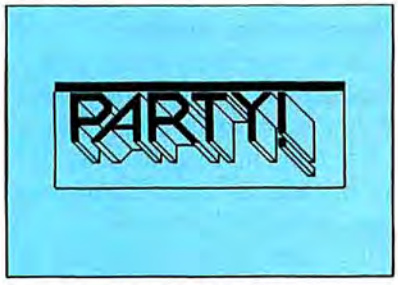

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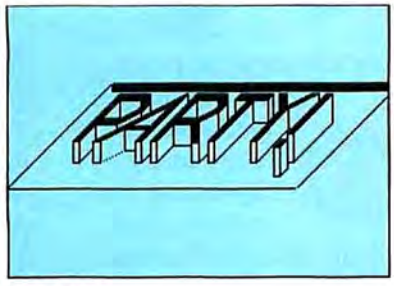

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Letters

Two-Sided Query
You did it again. I've just finished reading the December issue of *Macworld* cover to cover and can't wait until the next issue arrives. I don't own a Macintosh yet, but your magazine has made me more anxious to get one. Besides being informative, *Macworld* is fun to read.

Whether to buy a Mac was a difficult decision because I use several other computers at work. My colleagues were a little concerned about the Mac not being a Big Blue compatible, but the graphics on the Mac sold me. One colleague, who works mostly with spreadsheets, needed only one issue of *Macworld* to convince him that the Mac is the right computer for him.

I have a request for information. Is there anything new on a double-sided disk drive?

Phil Feinberg
San Diego, California

Sony, which makes the 400K single-sided disk drive for the Macintosh, already makes an 800K double-sided disk drive. Macintosh product manager Randy Battat of Apple Computer says that while Apple would like to use the new drive as soon as possible, Sony's production levels are not yet high enough to warrant doing so and won't be for the rest of the year.–Ed.

Teacher's Pet
I am a high school teacher with Apple II+ and IIe computers at my disposal. When I finally saved up enough money to buy my first personal computer, I decided to purchase a Macintosh, even though I knew that software would not be compatible between the Apple II and the Mac.

Based on my experiences with the Macintosh, I would like to share some of the things I have learned with other teachers. I hope that other educators will write to you, and a regular exchange of ideas could begin.

Multiplan makes an excellent electronic grade book. The tedium associated with adding up the grades of 140 students with up to 40 grades each in a semester made calculating quarter and semester grades a nightmare. By setting up the program to keep track of grades for the quarter and the semester, I have saved myself many hours of work. I also make updated printouts available to students on a weekly basis so they always know where they stand.

Handwritten overhead transparencies are a thing of the past. I produce transparencies on the Mac. Graphics and the numerous font styles have made my overheads a joy to take notes from. After getting a master print from the Mac, I make the transparency with a Thermofax machine. My students never know what I'll come up with next.

Similarly, all of my lab sheets, work sheets, and data sheets are now typed in different fonts and include graphics from clip art packages like *McPic!, ClickArt,* and *Mac the Knife.*

Teaching school is a difficult job, with enormous pressures from the administration, parents, and students. Teachers are always looking for ways to improve education, and I see the Macintosh as a terrific tool in this regard.

R. S. Doren
Denver, Colorado

The Score on Jazz
I read a description of *Jazz,* the integrated program from Lotus Development Corporation, in February's *Macware News.* I've been waiting to read a review of the program. When are you planning to cover it?

Michael Lynch
Marshfield, Wisconsin

We have seen a demonstration of Jazz, *and we think it will be an important program for the Macintosh. However, Lotus has not provided us with a review copy, and we believe it would be unfair to our readers to report on the program before we've made a full evaluation. We will publish a review as soon as possible. –Ed.*

Thanks and No Thanks
I would like to compliment you on an outstanding publication. I have read many computer publications. What separates *Macworld* from the rest of them is that your publication, besides being highly informative, exudes class. It is apparent that a lot of love and pride goes into the making of this magazine.

You mentioned that Apple was giving away *MacDraw* and *MacProject* to Mac owners who got the 512K upgrade. Being the proud owner of a Fat Mac, I'd like to know if Apple is doing anything special for those who purchased the 512K Mac outright.

Mario Santiago
Chicago, Illinois

Macintosh product manager Randy Battat of Apple Computer tells us that only Macintosh owners who purchased their 128K Macs before September 10, 1984 (when the 512K Mac was introduced), are given MacDraw *and* MacProject *when they have their Macs upgraded.–Ed.*

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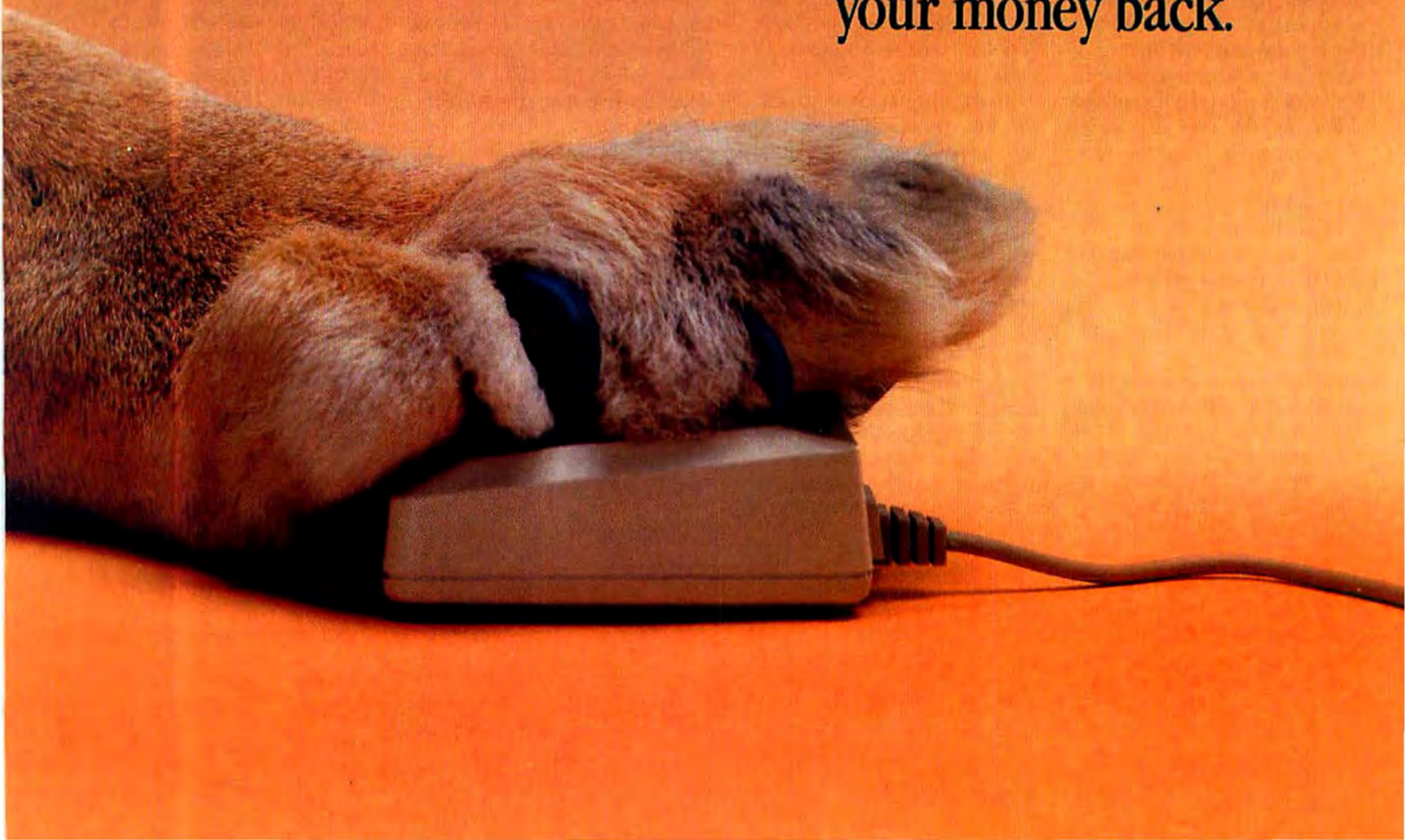

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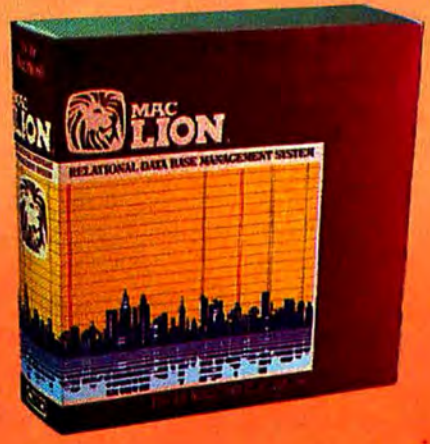

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Diacritical Remarks

I wish to comment on "The International Macintosh" [*Macworld,* May/June 1984]. I was pleased to note that Apple made a serious attempt to allow the Mac to type in many European languages. But there are problems with the result. The author points out the availability of Greek letters, but the whole Greek alphabet is not available, nor is the Cyrillic alphabet. While it is a great advantage to me to have the Danish, Swedish, and Norwegian alphabets fully covered, I miss being able to type in many other European languages that use the Latin alphabet, such as Latin itself (for which horizontal lines should be available to mark long vowels), Czech, Hungarian, Polish, and Latvian. Each of these languages uses diacritical marks–marks that go above or below certain letters–that the current Mac either does not have or does not allow users to put in the right place.

It is good to have a small circle available (°), but if I can't put it over an uppercase or a lowercase *u,* then I must add the symbol by hand in Czech documents. The cedilla is found on the Mac under the uppercase and lowercase *c,* but in Latvian it is needed under many other consonants. Even for the more common European languages there is a problem: the three standard accents (acute, grave, and circumflex) are too small relative to the letters over which they occur. Moreover, for some unfathomable reason, the Mac will not place the accents over most uppercase vowels.

It should be relatively easy to make all the diacritical marks dead keys so that you could place them above or below any letter, uppercase or lowercase. Or perhaps an overstrike fea-

ture could be introduced. I realize that software designers may be thinking of these things now as they create font editors, but it is still unfortunate that the Mac went so far with diacritical signs but no farther.

Paul Rapoport
Hamilton, Ontario
Canada

In Search of Cyrillic

For some time now I have been examining a variety of computers with a view to selecting one for my work as a translator of scientific texts from the Russian, the Polish, and the French. Unfortunately I have been unable to find the necessary software. An attempt at word processing on the Macintosh has certainly swayed me, but I still have the problem of finding software for handling my files of Russian-English and Polish-English terminology. The Polish alphabet has Latin letters with a few accents and hence poses no great problem. The Cyrillic alphabet is another matter. In "Font Fabrications" [*Macworld,* November 1984], you mention that Dreams of the Phoenix, a Florida software company, is developing Cyrillic fonts. Could you please provide the address so I could write to the company?

I shall continue to read your excellently produced journal for all the features other readers have already praised. However, I should like to add an accolade for your avoidance of the trendy jargon I have seen in other computer magazines. Evidently, contributors to those magazines forget that we lowly humans are programmed for a natural language–English in this case.

Eugene Lepa
Drummondville, Quebec
Canada

You can write to Dreams of the Phoenix, P.O. Box 10273, Jacksonville, FL 32247.–Ed.

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Letters

Righting a Lefty

Left-hander Paul Schroeder praised the movability of the Mac's numeric keypad in a letter in the December issue. In contrast, he wrote, a left-handed person using the Lisa's numeric keypad, which is fixed at the right-hand side of the keyboard, "would be crossing hands as often as a pianist performing a Chopin étude." I agree that the fixed position is thoughtless, and I applaud Mr. Schroeder's spirit. And I enjoy the image of the left hand popping back and forth over the right. But Chopin was not a hand crosser. There are no crossings in any of the 24 études or in any of the 24 preludes. I can think of a couple of instances in the mazurkas, but only where the right hand crosses over the left—and usually it doesn't pop back but lingers down there playing a melody. The luckless lefty at the Lisa would, however, be crossing hands as often as a pianist performing a Scarlatti sonata.

Leonard Gillman
Austin, Texas

Computer-Aided Empowerment

I'm in my early forties and have cerebral palsy, which affects my speech and causes some mild coordination problems; otherwise, I am normal 95 percent of the time.

I never dreamed that I could use a computer until about three years ago, when I started reading computer magazines. I bought an Apple IIe but was disappointed because running *WordStar* was a little too much to cope with. So back to the store it went.

When I saw the Macintosh, I knew right away that it was for me. When I brought it home, I was quickly overwhelmed by its ease of use. The mouse soon became a friend.

Being disabled led me to believe that everything was impossible, unreachable. I'd regretted life because every time I had an idea, I couldn't get it down on paper no matter how hard I tried. Drawing a circle with a compass or a straight line with a ruler was unreal in its difficulty. My ideas ended in total frustration.

With the Macintosh, life is a whole new ball game because every time I get an idea, I rush over to the computer and express my idea right away. I find the Mac very easy to use, especially with the mouse, which is an interesting device. With it some disabled people could overcome the problem of eye-hand coordination. There's no room for frustration because if you don't like what you see, you can undo the last command until you get it right.

With the pull-down menus, you don't have to be a computer scientist to use the Mac. With *MacWrite,* word processing becomes as easy as running your fingers through the yellow pages. There are no complex key combinations to remember or heavy manuals to read. *MacPaint* makes the impossible become possible and frees your ability to create without becoming frustrated. The manuals are easy to read and understand.

For some disabled people, the computer is the only way to express themselves. The Mac makes self-expression better by making it easier.

Larry C. Yarmo
Willowdale, Ontario
Canada

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Macworld View

News and notes for the Macintosh community

Edited by Janet McCandless

Macworld View *reports on new products and developments in Macintosh technology. We cover items of interest to Mac users and comment on industry trends. We welcome contributions from readers and pay up to $50 for each item we use. Please include your name, address, and phone number with your contributions; send them to* Macworld View, *555 De Haro St., San Francisco, CA 94107.*

Mac Video

You may not realize that you can record Macintosh images on your VCR. Connect the Mac to your television by running a communications cable from the serial port; attach the cable at the television end with an RGB connector, which is available at most electronics stores. You can tape a sequence of drawings in *MacPaint,* for example, on a videocassette and add a sound track to create your own music video. The introduction of digitizers and animation software has so expanded the Mac's graphics capabilities that artists and would-be artists should be busy for a while just eyeing the possibilities (see "Pictures to Pixels" in this issue).

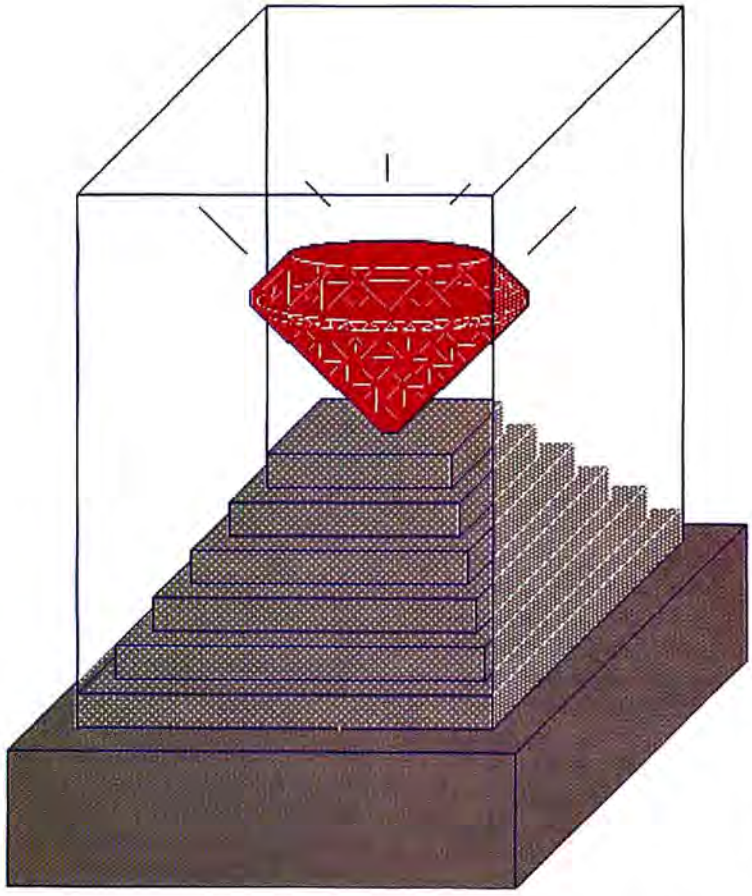
Stagehand

One of the most tedious jobs for a director of a play or a musical is *blocking*—working out where the actors move on stage. The actors, the stage manager, and lesser mortals come to the first rehearsal each armed with a copy of the play, a sharp pencil, and an eraser. Grinding through the play, the director spells out where each actor has to be from one dramatic moment to the next. By the third rehearsal the female lead doesn't remember whether she sits down before John goes to the fireplace or afterward, and the male lead wonders whether he enters on the line "For god's sake, Joan, your father will be here any minute" or on the line before.

The seasoned director always comes to rehearsal with an extra copy of the script that has been torn apart and glued into a large book. Even with this preparation, the director has to outline the actors' movements and spend hours as cast members make notes of the movements on their copies of the script.

With a Macintosh, blocking becomes an easy task that lets the actors get on with the real business of rehearsal. Using *MacDraw* or *MacPaint,* the director lays out a clearly labeled diagram of the set. The actors' relative positions and their movements in each scene can be outlined on screen. When the time arrives to determine the lighting or to decide where to place additional props, the director uses the set diagrams to show where the lights or the props should be. Mac owner John Weygandt, assistant professor of drama at Earlham College in Indiana, uses *Filevision* to record more complex information about each light, such as circuit number, focus area, and wattage.

Directors at community theaters and college drama departments now have a tool in the Macintosh that solves many knotty problems other than blocking. The Mac can be used to prepare budgets, revise dialog at the last minute, issue memos to the cast and crew, write musical scores, design posters, and print tickets.
–Anthony Betts



Put On a Friendly Face

Many computer owners believe that Apple has redefined *user friendly* with the Macintosh. While Apple didn't invent the use of icons, windows, and menus, the Mac set a standard for user interface that other companies have followed. A recent example is a user interface program from Digital Research called Graphics Environment Manager (GEM), which installs a Mac-like desktop in IBM, Tandy 2000, and other personal computers that use operating systems based on MS-DOS (Microsoft's disk operating system). The desktop features pull-down menus, icons, and overlapping windows. Icons represent disk drives and are used within windows to show folders for document files or application programs. A mouse-controlled pointer selects files and menu choices from the pull-down menus.

GEM resides between the operating system and an application program. This arrangement means that the application does not appear with GEM's menus, windows, and icons unless it has been rewritten to take advantage of GEM's features. How many software publishers will rewrite their programs for the new user interface remains to be seen.

Software Publishing

MacLibrary, Microsoft's new software publishing division, plans to select several programs developed by smaller companies for the Macintosh and take on the job of manufacturing, packaging, advertising, and distributing the programs. Alan Boyd, publisher of MacLibrary, intends to encourage product development in the following areas: business productivity software, educational and self-improvement software, recreational software, programming tools, software for the home, and a catch-all category for novel developments that don't fall under the other areas.

The first three products to be shipped this year include a tutorial on Microsoft's *Multiplan* and *Chart,* Logo from Logo Computer Systems, and a business simulator called *Entrepreneur* (see this issue's *Macware News* for further information on *Entrepreneur*). Microsoft is already working with universities to market products developed by faculty members and researchers, primarily software development tools. For more information contact MacLibrary, Microsoft, 10700 Northup Way, Box 97200, Bellevue, WA 98004.

Developer Training

Persistent requests for assistance from programmers interested in developing software for the Macintosh have encouraged Apple to seek backup support. Perennial Software Services Group, a computer consulting firm in Santa Clara, California, has undertaken the task of helping train developers and answer their questions. Perennial is offering two programs: a beginning class for programmers and a subscription technical support service. The class is conducted twice a month, once at Apple in nearby Cupertino and a second time in another region of the country. The training program is designed to take developers through the initial stages of producing software, with emphasis on the Mac's user interface.

Subscribers to the support service have access to Perennial's database and development tools for the Mac. The programs are not restricted to certified developers. For further information contact Perennial Software Services Group, 3130 De La Cruz Blvd., Santa Clara, CA 95054, 408/727-2755.

The Mac Show

The fast-growing New York Macintosh Users Group (NYMUG) is nearing completion of one of its most ambitious projects—"The Mac Show," a kind of user group meeting to be shown on cable television. Taping began in December on the series of three half-hour shows. To get the airing times of the program, contact NYMUG, P.O. Box 6686, Yorkville Station, New York, NY 10128.

The shows are devoted to special interest groups (SIGs), whose members demonstrate software and hardware relating to specific, usually advanced applications for the Mac. For instance, the first show will deal with such topics as how to pull programs out of damaged disks, how to use a digitizer and enhance a digitized picture with *MacPaint,* and how to evaluate software for letter quality printers.

Produced by NYMUG member Bruce Spector, who has his own video studio, the show will get its message across with photos, screen setups, and group interaction, in which the camera follows members as they call out questions and comments to demonstrate the uses of featured products. NYMUG copresident Steve Doochin asserts that "The show almost has a 'Hill Street Blues' look to it," referring to the documentary-style opening sequence of the popular television series.—*Robert Buderi*

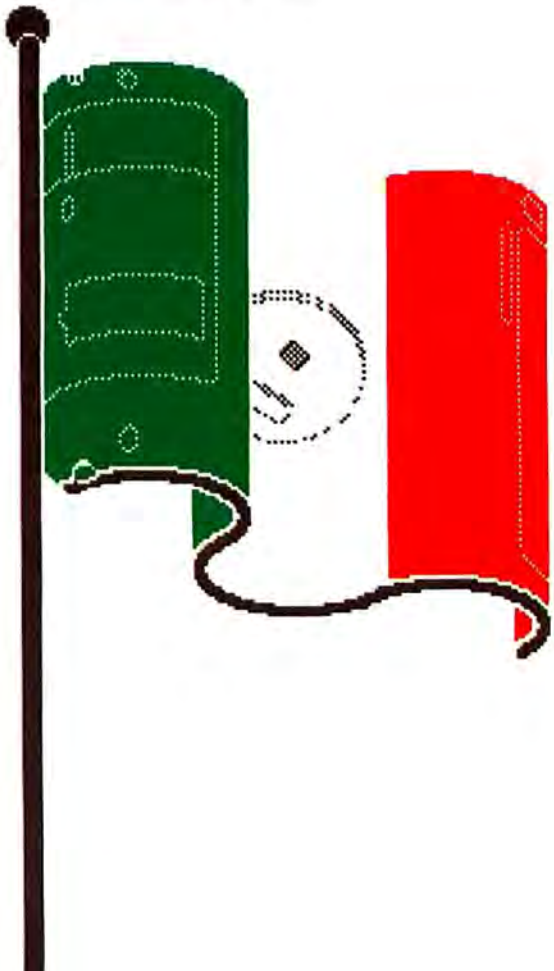
Mac's Up Down Under

In Sydney, Australia, cover type is being applied to the first issue of *Australian Macworld.* According to editor Neville Angove, the bimonthly magazine will be the first Macintosh-specific publication outside the United States. While the first few issues will feature stories familiar to *Macworld* readers, future issues will cover Macintosh products and topics more closely related to *Australian Macworld*'s market, which includes Japan, Hong Kong, New Guinea, Singapore, the Philippines, and New Zealand. The magazine is published by Computerworld Australia, which also publishes *Computerworld Australia, Australian Micro Computerworld,* and *Australian PC World.*

Meanwhile, in Italy

In 1984 the Macintosh was featured in the international exhibition of office products that is held in Milan, Italy, each year. Introduced throughout Europe in May, the Mac drew large crowds each day of the six-day show. In addition to showcasing such familiar Macintosh software as *MacPaint* and *Microsoft Multiplan,* Apple Italia introduced a few products developed by Italian companies, including a list manager called *CFS Schedario,* which is similar to *pfs:file.* While *CFS Schedario* is in Italian, most other Macintosh programs are imported from the United States and available only in English. Even so, Italian Mac owners say that the machine lends itself to international use because of the iconographic format of the screen. Luciano de Crescienzo, a prominent writer and filmmaker, uses the Mac to develop storyboards. Using *MacPaint,* Crescienzo splits each screen in half vertically. He outlines dialog on one side and sketches corresponding shots on the other.

Although some Macintosh documentation has been translated into Italian, Apple Italia has had to supplement its dealer training materials with English documentation, including copies of *Macworld.* Publications on the Mac are beginning to appear in Italian bookstores. Gruppo Editoriale Jackson, a publishing company in Milan, has published a book by Jaetano Marano entitled *Macintosh: 120 idee per il nuovo computer Apple* (120 Ideas for the New Apple Computer). Marano's ideas include the development of application programs for furniture and fashion design. Considering the Italian facility for design, we can hope to see some innovative software crossing the Atlantic.—*Janette Martin* □



WHY INVEST $150 IN MACMODULA-2™?
SO YOU CAN SOAR ABOVE COMPETITORS WHO BELIEVE THE BEST PROGRAMMING METHOD IS THE ONE THEY ALREADY KNOW.

Compared to Modula-2, whatever programming method you're now using is like doing your arithmetic in Roman Numerals.

It would take much more space than this ad to prove Modula-2 is *the best available competitive tool for the serious computer entrepreneur*. "Such matters," according to Frank Herbert (*DUNE*), "can only be tested in the crucible of survival, not in the play of symbols." Nevertheless, consider the merits of Modula-2.

Modula-2 is the latest, state-of-the-art structured programming method. It was originally designed by Niklaus Wirth to be the only *language* which would ever run on the Lilith computer (there wouldn't even be an assembler). This meant Modula-2 must be suitable for both high-level, machine-independent development, as well as for low-level control of I/O and storage management. It must be equally useful for both operating system development and application-level programming.

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Modula Corporation is now proud to offer this new technology to Macintosh owners.

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MacModula-2 is what 128KB Macintosh users have been waiting for. Over 400 of the ToolBox ROM routines are supported, including pull-down menus, multiple windows, multiple fonts, QuickDraw graphics, the ROM-based serial driver, the sound driver, mouse support, etc. The M-code interpreter reduces memory requirements for 128KB Mac systems, yet executes at up to 75% of native-mode speeds if extensive use is made of the ROM routines.

Also included with MacModula-2 is a full-screen, mouse-driven editor, a Transfer Menu facility that reduces the need for returning to the desktop between compiles, links and edits, and a Resource Maker that allows the entrepreneur to ship modifiable menus to customers, without shipping the actual MacModula-2 source code.

The comprehensive MacModula-2 users manual is over 600 pages. It includes numerous programming examples, in addition to an appendix of sample programs. The index is complete, and allows easy reference to all Macintosh ToolBox routines supported. It is a reference manual, rather than a Modula-2 tutorial. Therefore, if you are new to Modula-2, we recommend you also order Niklaus Wirth's *Programming in Modula-2*, second edition.

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Please send me the Modula-2 Compiler at $150 for the ☐ IBM PC or XT (MS™-DOS 2.0 up), or the Apple ☐ Lisa or the ☐ Macintosh.
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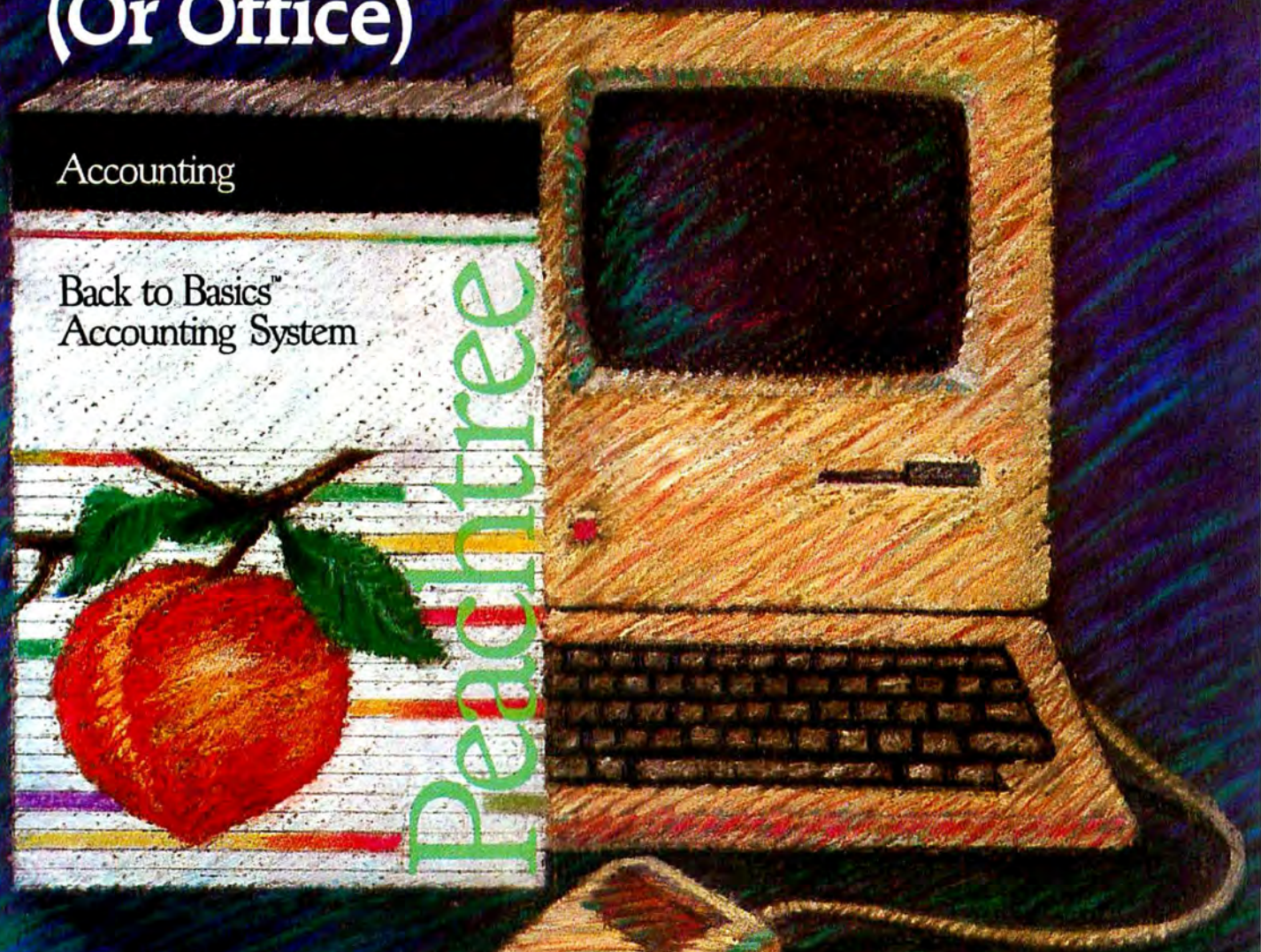

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But if you go fast enough, you can live it one-and-a-half times.

Helping you get the most out of every minute is what our WindoWare Calendar™ and WindoWare Phone Book™ are all about.

Available for the Macintosh™ or Lisa™ *they're true desktop accessories that come installed right into the Apple menu. And a simple utility program lets you install them on any application disk you like. So they're always available instantly. No disk swapping or quitting your current application required.

Call old what's-his-name.

If a lot of fast living has affected your memory, don't worry. The WindoWare Calendar and Phone Book are incredibly adept at locating fragments of names, addresses or any character string you happen to recall. If old what's-his-name's name starts with 'Q,' just enter 'Q' and click. WindoWare will display every 'Q' in the book, then automatically dial the one you want. No modem required. And your code numbers for Sprint, Savenet, MCI or other discount long distance companies are automatically dialed.

Note mortgage payments through 2010.

While there may be some things you'd rather forget, you'll find living with them is a whole lot easier with the WindoWare Calendar. Things like rescheduling your entire life to suit the whims of the client, remembering the day (forget the year) your mother-in-law was born, or planning your mortgage burning party are quick and easy with our calendar. It gives you day-at-a-glance, monthly overview and plenty of room for personal notes. It lets you schedule appointments to the minute — not the quarter-hour. And, it's perpetual. We should all be so lucky.

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*requires MacWorks operating system

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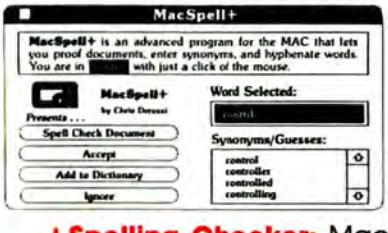
Word Power Within Your Reach

MacSpell+™ is a single program that enables you to check your spelling and correctly hyphenate words while increasing your word power. And because it's totally interactive, you can accomplish all these functions without quitting your word processing program. We're sure you'll agree MacSpell+ is a real plus for Macintosh™ users at home and in the office.



+Spelling Checker: MacSpell+ enables you to proof important documents for spelling errors throughout the ongoing word processing program. MacSpell+ contains over 40,000 words in its dictionary and allows you to add 2,500 words of your own.

+Thesaurus: MacSpell+ has a built-in thesaurus that allows you to replace one word for another. By clicking your preferred word choice from a list of synonyms that appears on screen, MacSpell+ automatically substitutes the word you select into your text.

+Word Hyphenation: MacSpell+ contains a hyphenation feature that assists you when proper word division is needed.

Gain confidence and efficiency as you streamline your word processing system with **MacSpell+ $99.00**

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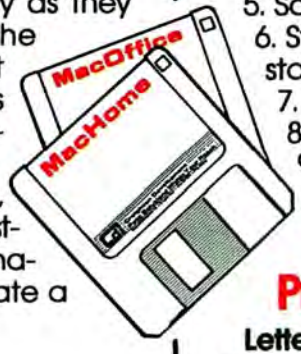
Our two new editions are quickly climbing to the top of the best-seller list. And it's no wonder why — each package contains 10 individual applications that improve your efficiency as they simplify your life. The easy-to-use format practically eliminates the need for instruction. While a user's manual is included, you can utilize our best-sellers without explanation if you can operate a Macintosh.



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ProPrint's printer driver program helps you get extra mileage from your Macintosh.™

There's nothing in today's market that compares to ProPrint's comprehensive letter quality program for your Macintosh.

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ProPrint is a must for your Macintosh. Here's why:

Its versatile format is powerful yet easy to use. And it has multitasking capabilities so the user can simultaneously print documents, monitor and control printing status, and select additional files for printing.

Full one year warranty. Available for immediate delivery.

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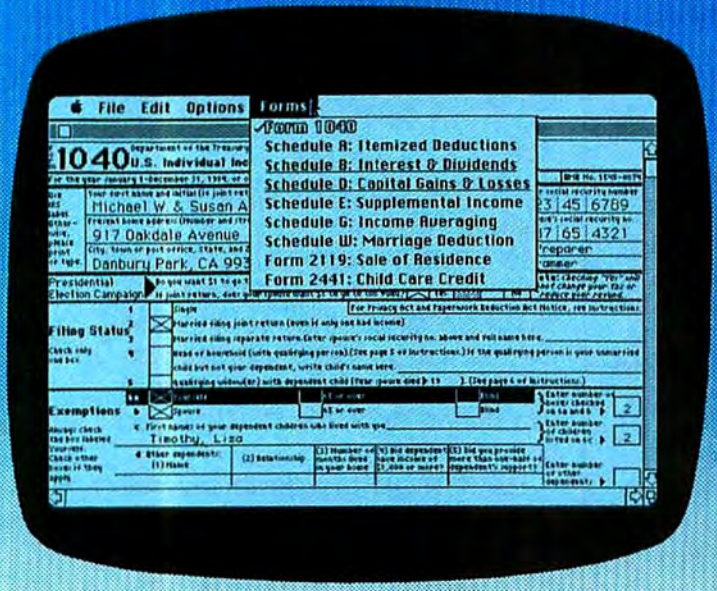
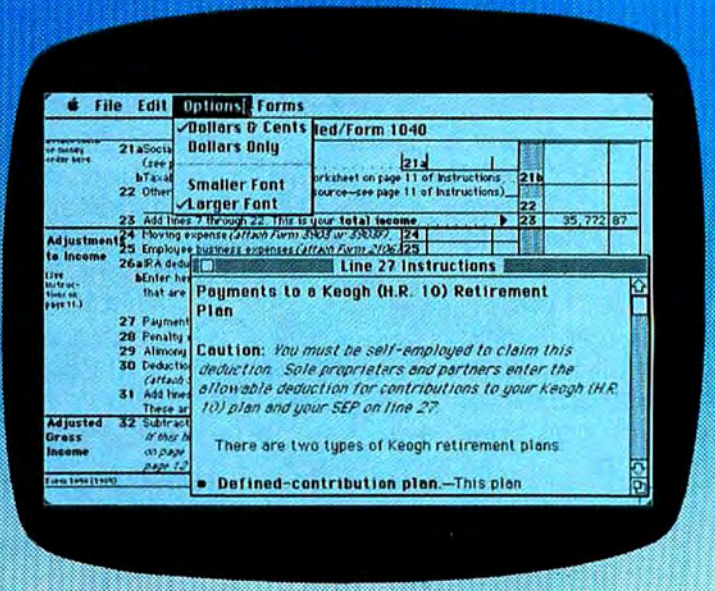
MacInTax™

The Income Tax Program For Individuals





- **TAX FORMS APPEAR ON SCREEN** — select any form from the menu, an image of the form appears. Separate windows for each form.
- **POINT AND CLICK TO ENTER AMOUNTS** — selected lines are highlighted. Amounts can be entered, changed or cut-and-pasted from the calculator.
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Corvus OmniDrive™ gives you unlimited file capacity.*

Add a Corvus OmniDrive to your Macintosh™ and unleash the full potential of this amazing new Apple computer.

More Capacity. Take file capacity for example. Put the Macintosh Finder program to work with the vastly increased storage capacity of a Corvus OmniDrive. Now you can set up many more volumes with 128 Macintosh files in each one. Need more capacity? Add another OmniDrive, then another, and another, up to a total of eight. Total capacity using 45 MB OmniDrives is 14,336 files.

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Mac Compatible. We didn't modify the Mac operating system, we work with it. You don't sacrifice any of Mac's famed user friendliness.

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Get a Demonstration. Contact your nearest Corvus or Apple dealer today. Ask for a free demonstration of the Corvus OmniDrive and find out how much better your Macintosh can be.

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*Up to 14,336 files compared to 128 on the Mac Floppy.

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Circle 206 on reader service card

Feed your Mac.

Introducing ThunderScan.™

Now you can turn any printed image into a detailed, high-resolution Macintosh graphic.

Just roll your original into your Imagewriter.

ThunderScan scans and digitizes the image.

Presto! A high-resolution MacPaint document.

No doubt about it, Macintosh is one great graphics machine. But until now, Mac graphics have been limited to what you can draw with a mouse and what someone else has put on a disk. Consequently, taking full advantage of Mac's graphics capabilities has been tough. But now there's ThunderScan. The new optical scanning device that lets you feed your Mac a steady diet of graphics that are useful to you.

ThunderScan turns Mac's Imagewriter printer into an image reader. So you can digitize any printed image and turn it into a detailed, high-resolution MacPaint document. Anything, including forms, half-tones, photos, mechanical drawings, maps, floorplans, logos, signatures and more. From black and white and color originals. ThunderScan reproduces them at over 200 dots per inch and in 32 shades of gray.

ThunderScan's application software, written by Mac-team-member, Andy Hertzfeld, makes it an extremely versatile and useful tool. You can generate full-page images or selected parts of them. Enlarge and reduce them. Manipulate them. Control the contrast and brightness. Create your own personal image disk. "Cut" and "paste" images together, creating new documents. And print them out on your Imagewriter. Or send them by modem to another Mac. The possibilities are nearly endless.

No lights, no camera, just action.

What you see here is the complete ThunderScan system. You don't have to buy an expensive video camera. Just pop out your Imagewriter's ribbon cartridge, snap in ThunderScan and you're set. It can even work in the dark (maybe you can think of an application for that).

If you bought a Mac at least partly for its graphics, only to find you couldn't take full advantage of them, now you can. With ThunderScan. At an introductory price of just $229, it's a small price to pay for a whole new graphics capability.

For more information or a ThunderScan of your own, see your dealer or call us today.

(415) 254-6581

ThunderScan

Thunderware Inc., 19 G Orinda Way, Orinda, CA 94563

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It's easy with Factfinder.™ Because Factfinder is a kind of electronic "desk-drawer" where you can just toss information without worrying about how it should be arranged or how you might want to use it. There are no fields to define, no formats to set up.

When you need to find all the clients you have who hate olives or live in Denver; when you want to collect your notes on pasta merchandising; when you need the name and number of that guy who's looking for leveraged buyouts, it's yours in a few seconds, at your index fingertip.

You just key in your notes on the Needleman Plan (or Needleman vs. Nardoff or the Needleman Noodles campaign) in any length you want, and click the mouse on a few key words—"fallout," "bail out," "roll-out," "leveraged buyout," whatever.

Then, any of those words or part of those words will bring you a stack of notes you've made that include "Needleman," or "leveraged buyouts," "national rollouts" or miracle "bail-outs." Or you can request Factfinder to get you the Factsheet that contains "Needleman" *and* "bail-out." Or you can ask for anything that mentions "bail-out" *or* "Needleman."

And Factfinder has all kinds of features like zoom and automatic wrap to help you manipulate the heck out of your data, and make it whatever size and shape you want.

Contact your Macintosh™ software dealer, or call 1 800 MACWARE to find out where you can get Factfinder.

From Forethought, Inc.

MACWARE™

How to find a Needleman in a haystack.

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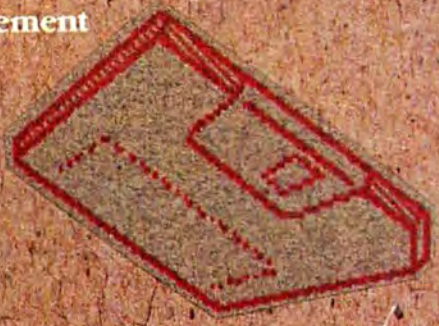
Become a Disk Librarian



Gordon McComb

Odds are that a time will come when you'll reach for a Macintosh disk you can't find. It may be gone forever, lost in the dark abyss of a binary twilight zone. It might be behind the sofa, under the car seat, or in the vest pocket of your gray suit. But who will ever know?

A time may also come when you're so laden with disks that it takes 10 to 20 minutes to locate an important document or application program. If you have to go hunting for elusive Macintosh files too often, you waste a lot of precious time.

The solution? Become a Macintosh disk librarian. It isn't hard, and it doesn't take long. Take a few minutes to set up a simple, workable disk library—a filing system for your Mac disks, documents, and applications. Then spend a few moments each time you work with the Mac to keep the disk library up to date.

Before you begin to organize your collection of Macintosh disks, you have to organize the files on the disks. Follow these three rules of thumb for classifying the contents of each Mac disk in your library.

- Whenever possible separate applications and documents onto different disks. Even if you have just one disk drive, you can transfer documents off the application disk when you finish with them. For example, a *MacPaint* disk can hold just the *MacPaint* application and all necessary system files, and the picture disk can contain *MacPaint* documents only.

Bear in mind that if you have only a handful of documents for an application and they all fit on the same disk with the program, you probably have no reason to go to the trouble of moving the documents to a separate disk. For example, you can fit a dozen or so *MacDraw* documents onto a *MacDraw* application disk (see Figure 1). Until you create more, keep them where they are.

- If all the documents from an application don't fit on one disk, separate them in a logical way, such as by subject or by date (year, month, or quarter). Let's say that you have two disks full of *Multiplan* spreadsheet documents. On one disk you might keep all the *Multiplan* spreadsheets that pertain to your company's budget. On the other disk you put all the spreadsheets with sales forecasts.

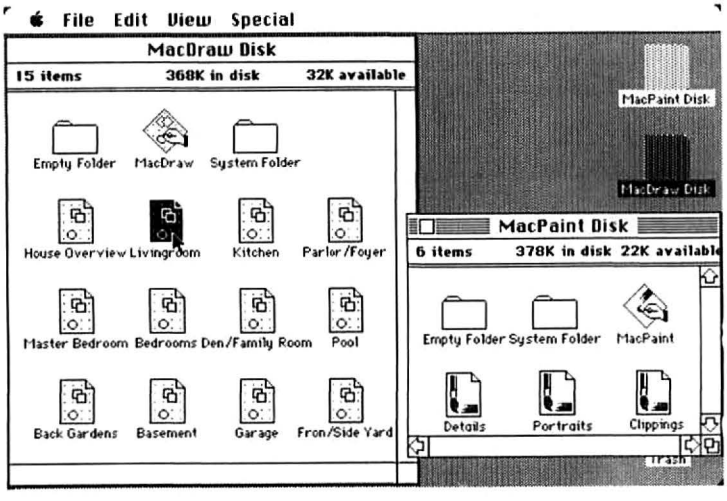


Figure 1

MacDraw *documents tend to be small–2K to 6K–so you can often fit several of them on the same disk with the* MacDraw *application.* MacPaint, *however, creates very large documents–9K to over 15K–and the program needs from 30K to 102K of extra space on the disk for proper operation. As a result, all* MacPaint *documents should be placed on a separate, "pictures" disk.*

- To make it easy to locate files on the same disk, place similar documents into folders. If one disk holds all your *MacWrite* letters, for instance, you might organize the letters by recipient. As displayed in Figure 2, one folder might contain all the letters to XYZ Plating Company. Another might contain all the letters to ABC Furnishings, and so forth.

Another tip for locating the file you want is to change the document icons to text with the View menu, which lets you indicate how you want the files sorted. For example, the By Date command sorts files by the date they were last modified, starting with the current date and working backward. This arrangement is handy when you work with files such as budgets, accounts receivable, or project management records. Keep in mind that you cannot move or delete files when they are displayed on the desktop as text; you must switch back to icons to make any changes.

Notes on Your Files

Once you've organized your files, you might want to add notes or comments about each one. For any file, you can write a three-line description using the comment box in the Get Info window. To add a comment, select a file and choose the Get Info command from the File menu. The comment stays with the file–even when it is copied to other disks–until you erase it or delete the file (see Figure 3).

If you need more space for comments about a file on a particular disk, you can write a short memo with the Note Pad. On each page of the Note Pad, you can keep a note for the important files on the disk. Remember, however, that the Note Pad is tied to the startup disk. Notes you write on one startup disk don't appear on any other because the memos are stored in a system document named Note Pad File, which usually resides in the System Folder.

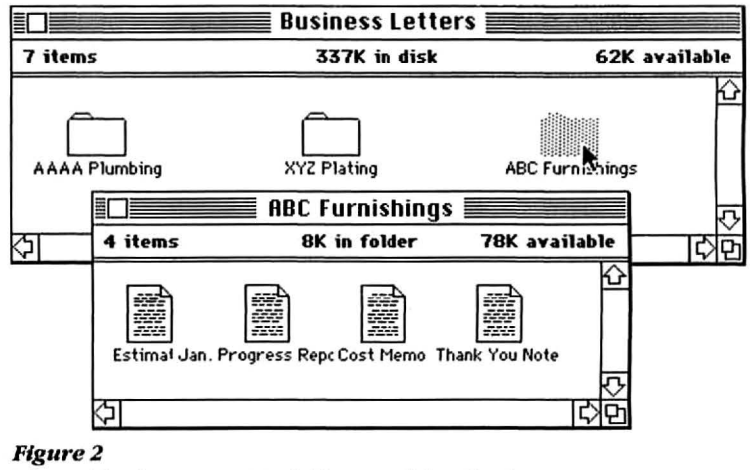


Figure 2

Cluster like documents into folders. Don't be afraid to put folders within folders. However, avoid nesting folders more than three deep, since it may be hard to uncover files later.

The Label's the Thing

When it comes to showing what information is stored on a disk, the Macintosh's electronic desktop can't be beat. But what happens when the disk is not in the disk drive? How can you tell what is stored on the disk? With a label, of course.

You can make life easy by labeling every disk immediately after putting information on it. If you put a program or a document on a disk—even one small *MacPaint* drawing—be quick to label it. Keep in mind that the label doesn't need to have the same name as the disk. The Mac imposes a limit of 27 characters for a disk name, but the descriptions on disks can be as verbose as label space permits. If you have a disk called "*MacPaint* Pictures," for instance, why not label it "*MacPaint* Pictures of My Uncle and Aunt" or some other descriptive phrase?

Most new Macintosh disks come with a set of blank labels. You can use them, but they are permanent, which makes changing labels difficult.

I suggest that you instead use removable labels, which are available from most office supply stores. Avery labels S-2448 or S-4848 are about the right size for Mac disks. Those labels adhere perfectly and peel off easily when you need a new label.

For easy disk handling you may want to color-code disk labels. You can use colored pencils, markers, or peel-off labels. Figure out how many color categories you need, then buy the proper assortment.

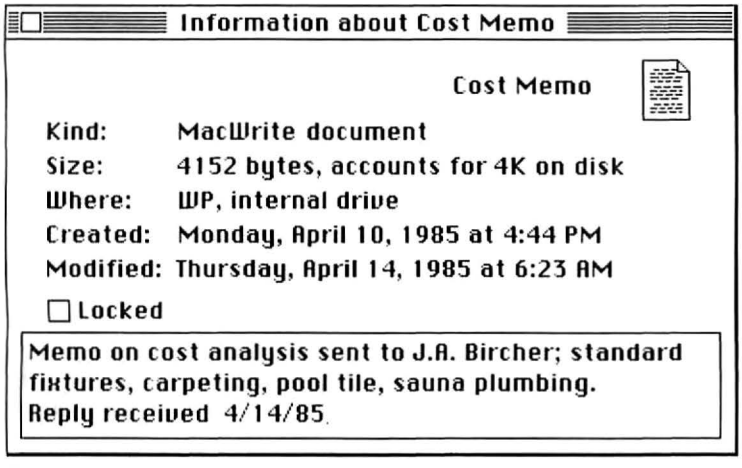


Figure 3

If you can't convey enough information about a file in its title, use the comment box in the Get Info window. Remember that you can always add to the comment later. In this way the Get Info window serves as a handy tickler file.

How you color-code is up to you, but here are some suggestions.

- Give each application a different color. For example, you might use red for *MacWrite* application and document disks and blue for *MacPaint* disks.
- Instead of choosing a different color for each application, you might want to color-code by application type. All word processing disks might be labeled in red, all graphics programs and documents in blue, all data managers in green, and so forth.
- Let's say you work in a large office where several Macintoshes are in use. You may want to code the ownership of your application and document disks to avoid mixing your data files with someone else's.

However you decide to color-code, remember to maintain consistency, particularly when you use several colors. Keep a reference key handy and refer to it while setting up and maintaining a disk filing system.

When you want professional-looking disk labels, call on the Macintosh for help. Use *MacPaint* or *MacWrite* to design labels. You can even include your own monogram or logo on your labels (see Figure 4). If you don't want to fuss with *MacWrite* or *MacPaint,* try the labeling application called *MacLabeler.* The program lets you create comprehensive disk labels in less than a minute. *MacLabeler* gives you the choice of printing the disk directory label with or without folders.

When you create labels, keep their dimensions in mind; disk labels are about 2¾ by 2¾ inches, including the flap that extends to the back of the disk. A front label is only 2¾ by 2 inches. When you create a label template, place a ruler against the Mac's screen to give you approximate dimensions. Then make a couple of sample printouts and adjust the size as needed.

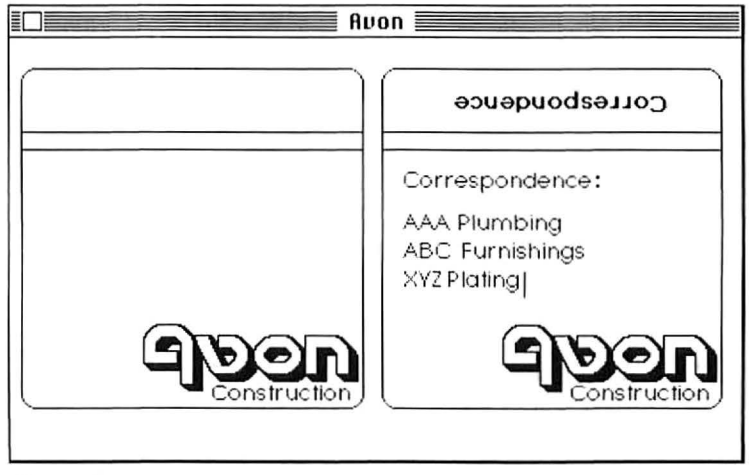


Figure 4

You can use MacPaint *to create your own disk label templates. Create one template, then copy it to make each label. To get the upside-down text shown on the top of the label (which will end up on the back flap), write the text as usual and select it with the marquee. Choose the Edit-Rotate command twice, or choose Edit-Flip Horizontal, then Edit-Flip Vertical. Finish by dragging the text into position.*

Indexing Your Files

The task of keeping track of all the files in a library may require a directory or an index. The complexity of a record-keeping system is determined by the number of disks and files the library contains.

For a library of eight or ten files, a simple list may suffice. You can jot down the file names on the disk label or use the Mac to print them. You can also make a separate list of the files and keep the list in a notebook. You could copy the names of the files by hand, but that would be a waste of time and energy. Instead, have the Mac create the list for you. With the files displayed in the disk directory window, press ⌘-Shift-4 to print an exact duplicate of the contents of the active window. If you want the entire screen instead, engage the Caps Lock key as well.

When documents are displayed as icons, you're limited to a maximum of 28 files in a window; to show all the files, you have to enlarge the window to its fullest. When you display the files as text, you're limited to a maximum of 17. If you have more files than this, or when some are tucked within their own folders, make several printouts. You can also place the open folders side by side if they fit on the desktop. When you print disk directories, be sure that the file names don't cover up one another. If the names become hard to read, reposition the icons or change the icons to text.

If you have lots of disks to track—a few hundred or more—you may consider creating a master index. The index can include such items as file names, dates of creation, disk names, and locations of disks. With an itemized index at your side, you can look up the status and whereabouts of any file in a matter of seconds.

To make constructing an index easier, use a data management program. A disk index is nothing more than a fancy Rolodex file, so creating a database template for the job should be a 15-minute proposition. Entering the information for each file is the hard part, but it shouldn't take more than a few hours. If you're willing to put up with some slight inconveniences and you don't want to spend extra for a database management application, both *Multiplan* and *MacWrite* are well suited to creating an index, too.

Fort Disk

A disk library is no different from a public library. Like books, Macintosh disks are categorized and indexed to make it easy to find the one you want. But no filing system is efficient unless the disks are stored in a way that makes access to them easy.

At the very least you should store your disks in the box in which they came to protect them and keep them together in one easy-to-handle bundle. Use the boxes like miniature file cabinets and label the outside of each box so you know what's inside. If you run out of boxes, most computer dealers sell empty plastic cases for the Mac's 3½-inch disks (a set of five cases is usually priced from $15 to $20).

A better way to go is with disk binders, most of which hold from 10 to 20 disks and cost between $5 and $8 each. Some binders have individual slots that each accept only one disk. Others have open, gaping pockets that accept numerous disks. You can often put a few extra disks into the second kind of binder without a noticeable bulge.

It's a good idea to reserve one binder for each major disk category. For instance, you might have one binder each for games, public-domain programs, clip art, *MacPaint* pictures, and *MacWrite* letters.

Because of the way disk binders are designed, they are ideal for long-term disk storage. A "disk caddy" lets you keep up to 50 disks within arm's reach. Caddies are ideal for disks that you use regularly. Most have built-in dividers to make filing easy.

If you like the idea of an easy-to-use disk caddy but can't afford to spend $20 to $75, pick up an old business-card box, the kind offset printers use. Macintosh disks fit these boxes perfectly. A 1000-card box holds up to 50 disks. Use stiff cardboard for the dividers, and label each box you use. When you've finished work for the day, you can prop the top of the box over the disks to keep dust out.

Checkout Time

No library will do you any good unless you maintain and update it regularly. Spend a few minutes every few days tidying up to be sure your disks are in their proper place. If you index your disks, keep the index up to date. Last but not least, if others use your Macintosh, let them know that you expect them to leave your Mac as they found it—neat, clean, and organized. □

■■■■■■■■■■ *Gordon McComb is a Contributing Editor of* Macworld.

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EMERALD SP-2

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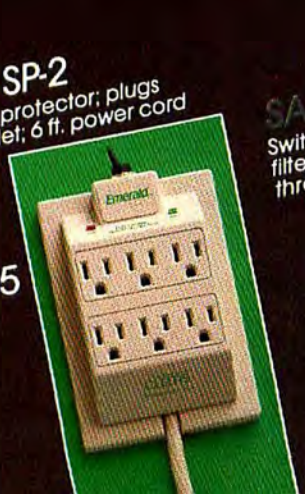

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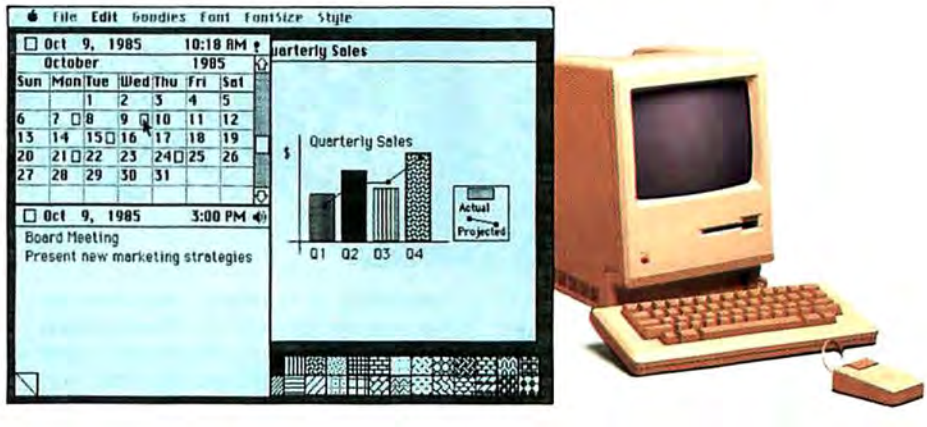

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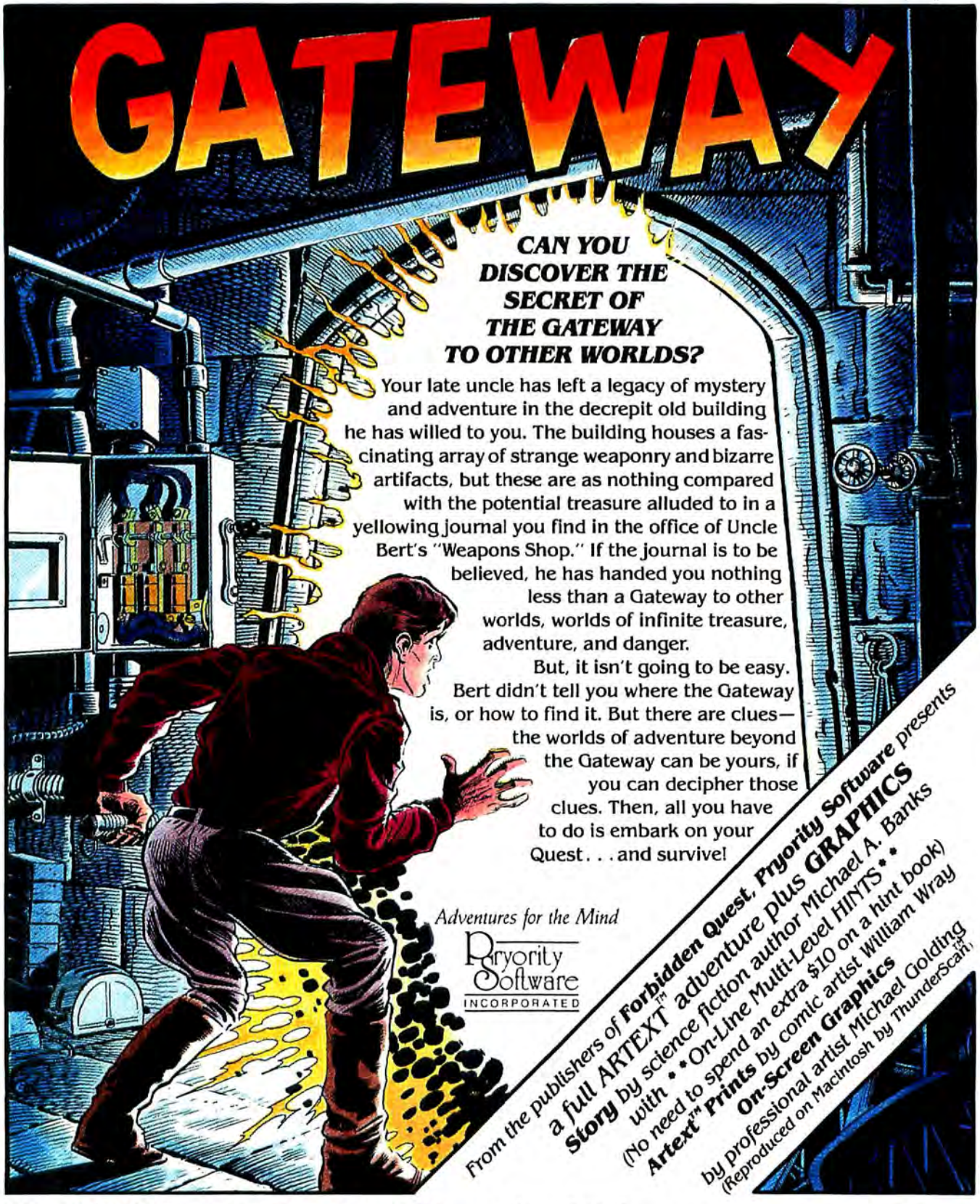

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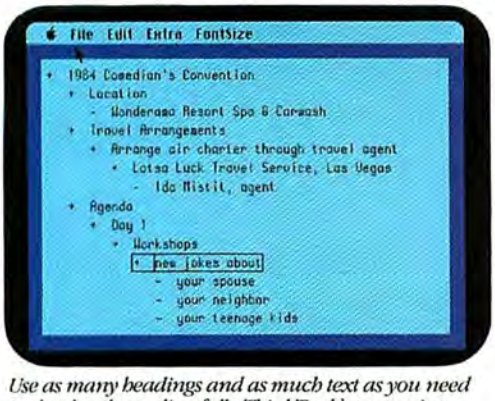
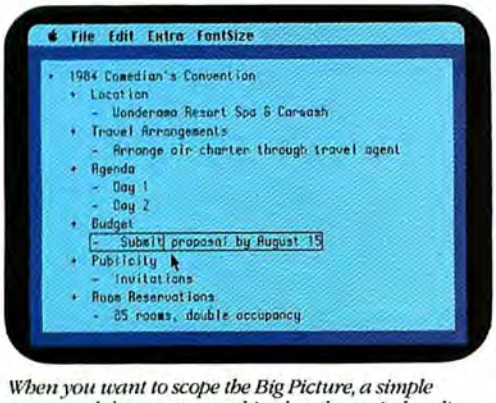


Use as many headings and as much text as you need to develop the outline fully. ThinkTank's processing power can move whole sections of text with a single keystroke—something no word processor can do.



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Always, flash cards are the method of choice to learn arithmetic. Now MathFlash makes it easy and fun.

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MathFlash duplicates the flash card experience with a 3-dimensional picture of a stack of cards that flip up, one at a time. The child keys in the answer or points to a number on the screen. Right answers send the card to a "correct" pile that the child can watch accumulate. And as the child progresses, MathFlash displays other graphic rewards that recognize accomplishment.

Unlike game-type computer drills where making mistakes and playing with the program are more fun than learning, MathFlash only rewards accomplishment. And it does so with infinite patience, but without being boring.

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PALANTIR SOFTWARE

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Get Info

Macworld's tutor answers questions about using the Mac

Lon Poole

Get Info answers questions about the Macintosh and how it works. Most inquiries deal with application programs, but no topic is too elementary or too advanced. Discussions range from setting up the Mac to programming in BASIC and Pascal. When you need advice about using the Mac, drop me a line. I cannot respond to individual letters, but I will answer the most representative questions.

This month *Get Info* explains why you can't transfer text from *MacWrite* into *MacPaint* and retain the fonts, styles, and attributes of the original text. Other questions treat the expected life span of a floppy disk, creating documents without proportional spacing, and how to ground the Macintosh when the electrical system of a building doesn't have a third, grounding wire. Before answering those questions, I'd like to share one of several alternatives that readers have offered to the method for addressing envelopes with *MacWrite* that I described in the December 1984 issue.

John Koskinen of Middleton, Wisconsin, writes to suggest that you can save time by using self-adhesive mailing labels to print addresses for several letters at once. You can purchase the labels in sheets so they can be fed through the Imagewriter's pin-feed mechanism, which you can adjust to accommodate label widths of between 3 and 10 inches. You must use a font that fits the label size you choose. After writing each letter, copy the address and paste it into another document containing addresses only. If you produce 15 letters a day, you could build a file of that day's addresses. When you're ready to mail the letters you've written, you can print address labels for all the addresses in the file in one continuous operation.

This technique can save time, but personally I prefer the appearance of an envelope with the address printed directly on it. Mailing labels are one of the early warning signals of junk mail to me and don't seem as personal as an address printed directly on an envelope.

I also suggested that using a rubber stamp is an easier way to put your return address on letter-sized envelopes than using *MacWrite*. You can use the Imagewriter to print a return address, but you can't print the address closer than ¾ inch from the side of the envelope with *MacWrite* unless you fold the envelope. I don't like the appearance of a return address printed so far from the envelope's edge. It also seems inappropriate to use the printer for work that is more quickly and easily accomplished with a simple tool like a rubber stamp.

Koskinen has also discovered a way to print closer to the edge of an envelope. By removing the Imagewriter's cover, you can insert a document another ¼ inch to the right, thereby getting a return address just a bit more than ½ inch from the left edge of an envelope. Removing the cover disables the ready switch, so the printer won't run. However, a small magnet placed near the switch's location, in the left front corner of the Imagewriter, reactivates the switch.

Removing the cover also provides room for printing on envelopes or documents 2 inches wider than those you can print with the cover on. You can feed a document between 10 and 12 inches wide through the Imagewriter lengthwise and then print the address sideways with *MacPaint* by rotating or inverting a window of text.

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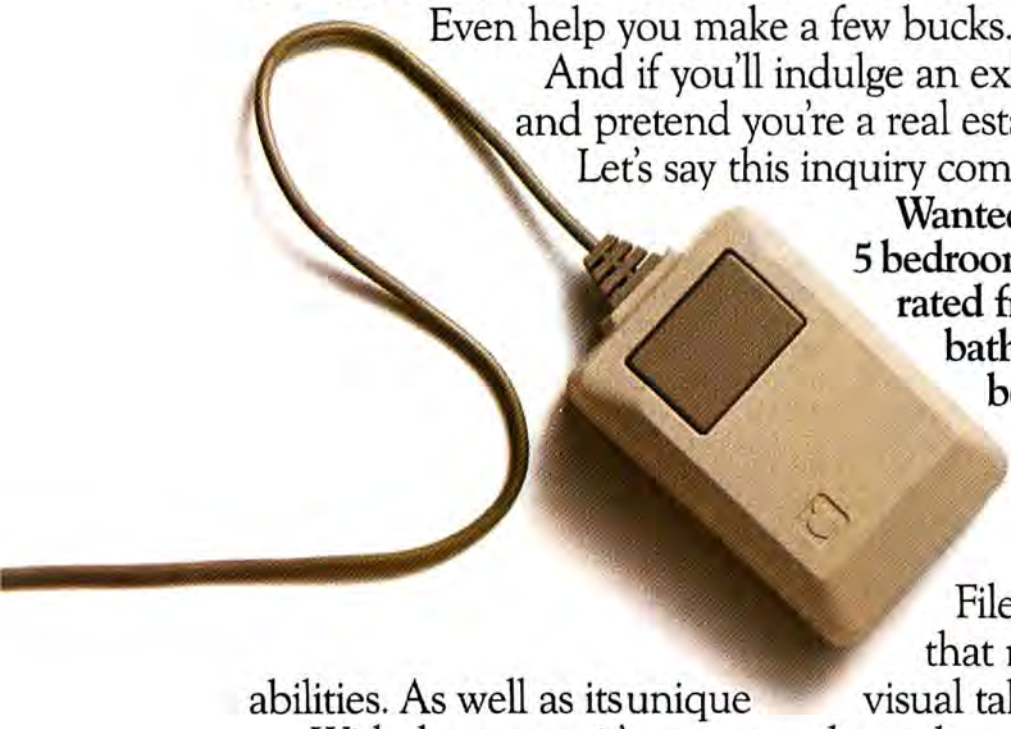
Lost names. Lost phone numbers. Lost inventory. Lost sales. Lost time. Enough to make you lose your mind.

Well, if you need to track any kind of information—from factory inventory to a little black book—Microsoft® File can sort it all out for you.

Even help you make a few bucks.



And if you'll indulge an extravagant fantasy for a second, and pretend you're a real estate agent, we'll show you just how.

Let's say this inquiry comes across your desk:

Wanted: Tudor Bauhaus Revival. Require 5 bedrooms (Master bedroom WELL separated from rest—This is Important!) 4 baths, kennel, under $500,000. Must be within ten minutes of downtown.

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With File you'd know real fast.

File is a real find.

File is the professional data manager that makes the most of Mac's mouse abilities. As well as its unique visual talents.

With the mouse it's easy to make and remake your own customized forms.

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A report function is built right into File—not a separate program.

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File also has the astounding ability to make mountains of facts actually mean something.

you can't find it.

It can calculate answers to questions like, how many dollars is this costing a square foot? Or, who earned the most commissions in August? Or, in what part of town do I make the best return on my time?

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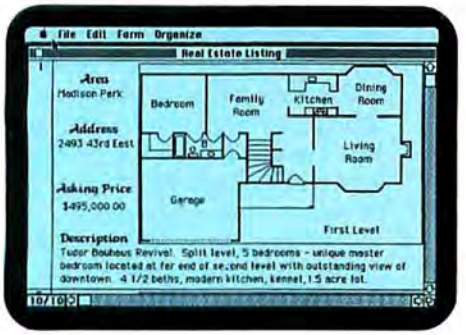
When words fail, pictures talk.

Remember the part about the master bedroom having to be separated from the rest? An ordinary database wouldn't give you a clue about that.

But because File has graphic talent, you can, for instance, paste floor plans into your records. And know the lay of the house at a glance.



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The Clipboard's Lack of Distinction

Q. When I copy a selection from *MacWrite* onto the Clipboard and paste it into *MacPaint,* it doesn't arrive in the font or the size in which I sent it. Is there any way to transfer alternate fonts intact?
Steve Newman

A. When you quit *MacWrite,* any text on the Clipboard loses its font, size, and style information, as well as the formatting instructions provided by formatting rulers. All that remains is unformatted text: letters, numbers, punctuation, and symbols, plus carriage return and tab characters. Therefore, you cannot transfer special attributes or formats of anything you copy or cut from *MacWrite* to *MacPaint* or any other application.

When you paste the unformatted text into another document, the application in control applies its own standard font and size attributes. For example, *MacPaint* version 1.3 usually uses Geneva-12 unless you've removed it.

The application in control also interprets the carriage return and tab characters by its own rules. For example, a tab character in *MacPaint* produces a single space, but in *Multiplan* it marks the end of a cell value.

You may have noticed that when you copy text from *MacPaint* to *MacWrite,* it retains its font, size, and style attributes. The reason for this exception is that *MacPaint* converts text to a picture, and the Clipboard transfers pictures intact.

Ungrounded Fears

Q. The apartment building in which I live has no electrical grounding available. What can I do to ground my Macintosh?
Andrew Caplan
New York, New York

A. You can ground your Mac by running a 14-gauge insulated wire from the screw on the wall outlet cover plate into which you plug the Mac to the nearest cold water pipe. Use a cold water pipe, not a hot water pipe or radiator, because the boiler may interrupt the ground. A hardware store or electrical supply store should have a bracket that clamps to the pipe and has a terminal to which you attach the wire. Then equip the Mac's three-prong power cord with a grounded adapter plug. Be sure to connect the small wire of the adapter to the screw on the outlet cover plate so that it makes contact with the ground wire.

Printing out of Proportion

Q. Is it possible to set up *MacWrite* documents so that they are printed nonproportionally, like most typewritten documents?
Gerd H. Eysser
Sandy, Utah

A. Simply use the Monaco font.

The Life of a Floppy Disk

Q. How long will a floppy disk last?
Lonnie Luce
San Angelo, Texas

A. I checked with two disk manufacturers, BASF and Verbatim. Both gave me the same arcane statistic: their 3½-inch disks are designed to operate without dropouts (that is, with less than 10 percent loss of signal amplitude) for 10 million passes with the drive head positioned over one track. What does that mean to you and me? Chanbran Cheriyan, microdisk product marketing manager at Verbatim, says that a 3½-inch disk should last 160 hours. That may not seem like a long time, but each time the computer retrieves or stores information, the disk is in use for only a few seconds. Depending on how heavily you use a disk, it may last one year or many. Because there is no guaranteed safe time limit, however, you should back up your valuable documents on another disk.

Actual statistics on 3½-inch disk longevity are incomplete, but Cheriyan says that for comparison 5¼-inch disks tend to last one to two years before reaching retirement age. Dick Silva, technical services manager at BASF, said history has shown that 5¼-inch disks fail generally because of physical abuse–bending, denting, folding, and so forth–before they wear out.

By the way, disks have an indefinite shelf life, as long as they're kept in pleasant surroundings. To a disk, *pleasant* means clean, dry (between 8 and 90 percent relative humidity, noncondensing), between 4°C and 53°C (39°F and 127°F), and away from magnetic fields. You don't have to worry about your disk archives fading or developing worm holes.

Send your questions to Get Info, Macworld, *555 De Haro St., San Francisco, CA 94107.*

Lon Poole is a Contributing Editor of Macworld. □

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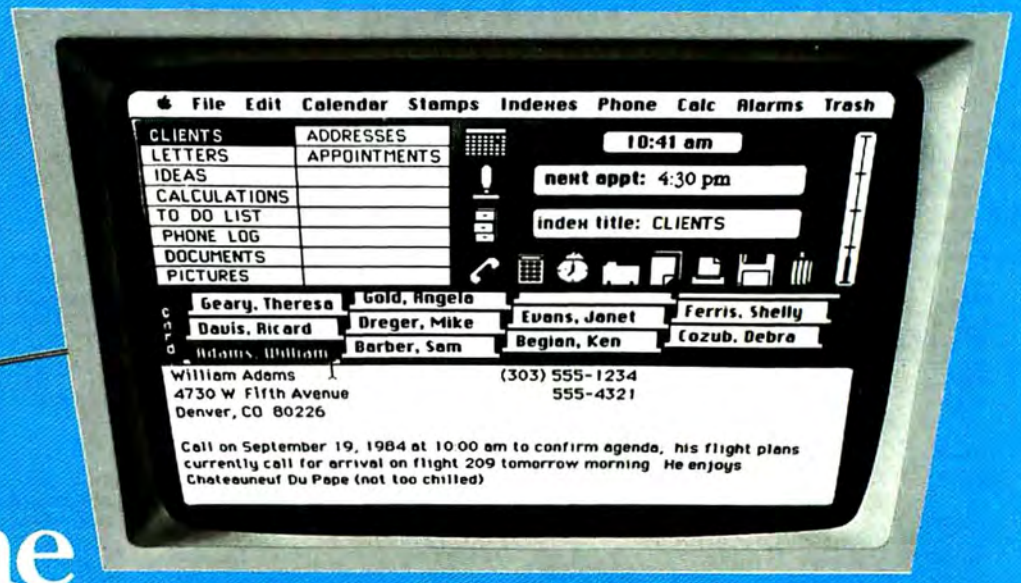

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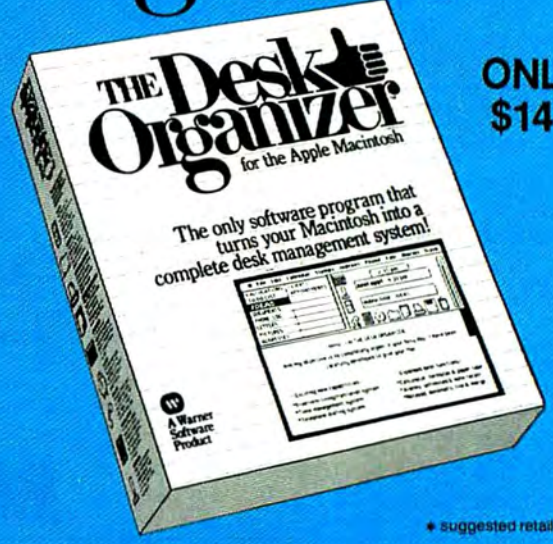

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Image Adjustments. The MICRO-*IMAGER*™ is very easy to use and the capture process is controlled using the menu bar commands. Contrast and brightness adjustments are made via front panel controls. A digitized video output allows the user to view the digitized image (in 2-Shade or Multi-Shade format) on an external video monitor (also available) in real-time prior to capture. Unlike other systems, this digitized output makes contrast, brightness, and camera focus adjustments quick and easy, avoiding having to make multiple scans before achieving desired results.

B & W/Color Sources. The MICRO-*IMAGER*™ video digitizer is designed to work with either a color or B & W source. For color sources, the MICRO-*IMAGER*™ employs a very effective color rejection filter to remove virtually all chrominance (color) information prior to conversion. The MICRO-*IMAGER*™ features a B & W/Color Switch, allowing the user to bypass the pre-conversion color filter when using a B & W source, preserving the signal's full horizontal resolution. In short, the color rejection filter used in conjunction with the B & W/Color Switch enables the MICRO-*IMAGER*™ to obtain superior results with both B & W and color sources.

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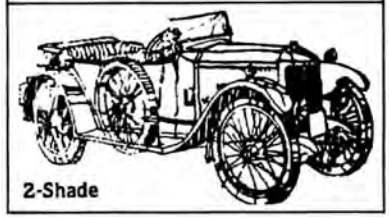

2-Shade

Edit Capability. The user can selectively **Cut, Copy,** and **Clear** parts of the digitized image using our Edit Menu functions. Since the entire image is saved in a MacPaint compatible file, the image can also be edited using all of the features of MacPaint.

Interface. The MICRO-*IMAGER*™ interfaces to the Mac via either serial port. The hardware, software interface, user's manual and a cable are provided. Software interface documentation is available for the user who is also a developer or an experienced programmer to facilitate writing one's own software interface if desired.

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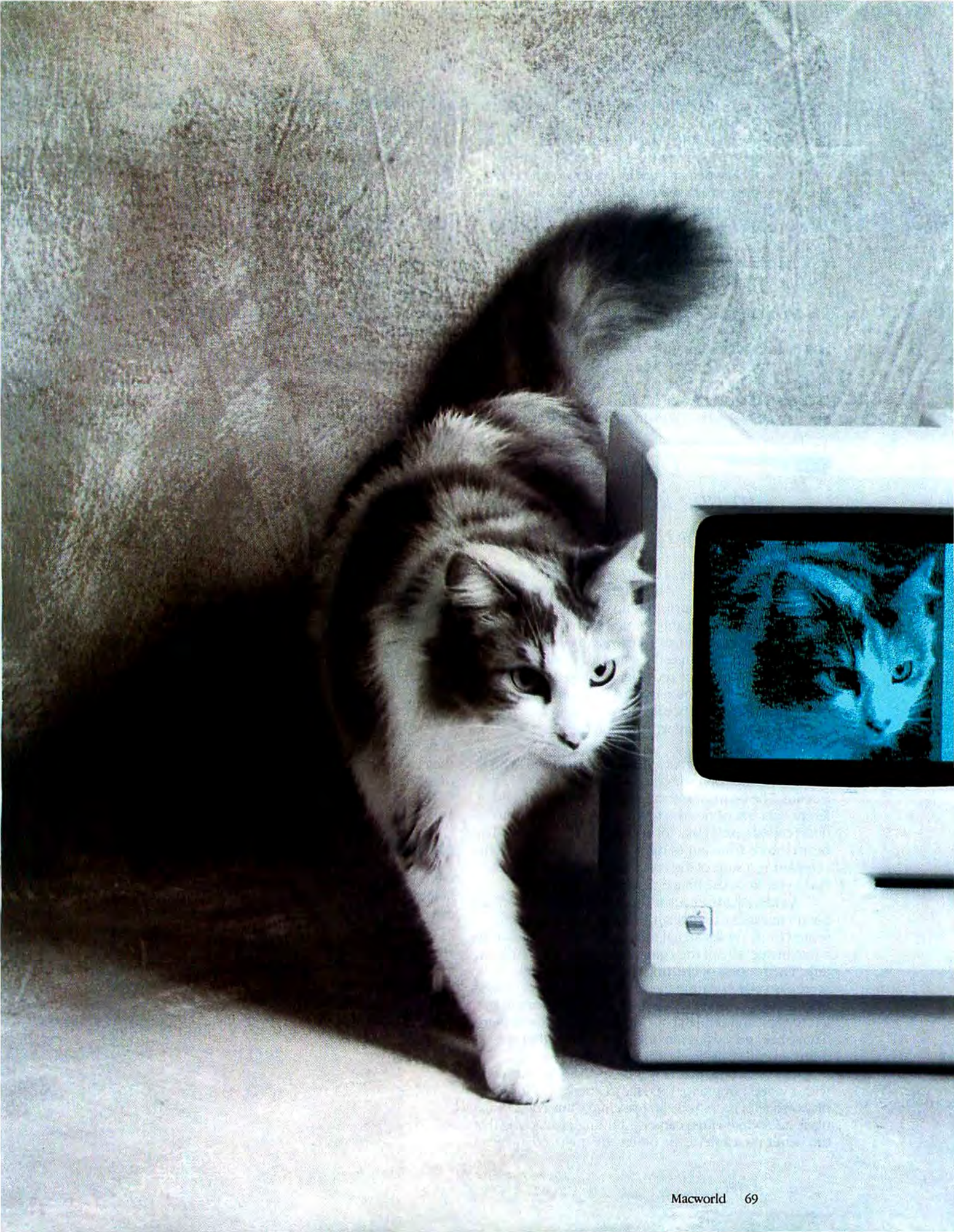
Pictures to Pixels

Gordon McComb

You had to be there to know the thrill of viewing the first nationwide television broadcast or the excitement of watching *The Great Train Robbery* during its first run at the local nickelodeon. You can now get an inkling of what those experiences were like when you see a favorite drawing or the portrait of someone standing in front of you forming on the Macintosh screen. To bring you this new experience, some of the best minds that worked on the Mac have worked on software for a new genre of products—digitizers.

Digitizers permit you to transform artwork or anything else you can shoot with a video camera into a black-and-white digital image. You can view the image on a computer screen, save it on disk, and print it out.



Though the Mac makes it relatively easy to produce artwork, not everyone has the time or the skill to put on screen what they have in mind. If you want to draw a telephone on the Mac, the results may be disappointing unless you're a fairly skilled artist. Instead, you can attach a video camera to a digitizer and the Mac, point the camera at a real telephone or an illustration of a phone, and capture a digitized image. You can enhance digitized images with *MacPaint* and collect them for your own clip art library, sizing the art to your own specifications rather than those of the commercial clip art publishers.

How Digitizers Work

Simply put, all digitizers convert visual information into digital information by breaking down an image into a mesh of fine dots and assigning a specific numerical value to the gray level found in each dot. Digitizing an image is akin to painting by numbers; like the dabbler who colors in a picture according to a carefully coded outline, a digitizer fills each dot in an image with the degree of blackness or whiteness that, in combination with surrounding dots, best approximates the appropriate gray for that part of the picture.

Digitizing an image is akin to painting by numbers.

Two kinds of digitizers are available for the Macintosh. Video digitizers use the standard video signal from a video camera or recorder to form digital information. The less common optical digitizers scan photos, illustrations, or other flat art with a tiny beam of light and base digital information on the beam's reflection.

When the signal that video digitizers use is sent to a video monitor or a television set, it is converted into a beam. The beam scans the screen, activating at different light intensities the small electroluminescent dots (called pixels) that form each video scan line. The beam travels from left to right and from top to bottom, completing a scan of the entire screen 30 times a second to produce the image you view.

A video digitizer turns the signal into a stream of binary numbers, reducing the light intensities represented by the video signal to a high-contrast black-and-white image, which the computer can represent digitally. The process of creating the digitized image on screen is called scanning; each of the digitizers I tested has its own scanning style. Some digitizers scan from left to right and others from top to bottom. Some digitizers show gray values in one scan, while others require several scans to show gray values.

With video digitizers you create original images with a video camera for the Mac as you would for replay on a television. You can use almost any color or black-and-white video camera, although I've found that the better the camera, the better the digitized image.

The video digitizers I tested also accept the composite video signal produced by other computers (such as the IBM Personal Computer or the Apple II), videocassette recorders, or videodisk players. You could, for example, play a videotape of the movie *Star Wars,* hold the image as Darth Vader cuts down Obi Wan Kenobi, and digitize the duel's climax.

Before you buy a video digitizer, make sure your video equipment can accept the digitizer's connectors. Two digitizers I tested use RCA phono connectors to connect to cameras, monitors, and other video devices. Most video cameras, however, give off a BNC signal, so you need a BNC to RCA adapter. One of the tested video digitizers accepts a direct BNC connection.

Four Digitizers

Of the four digitizers I review in this article, three are video digitizers: the Koala MacVision, the New Image Magic, and the Servidyne Micro-Imager. The fourth digitizer, the Thunderware ThunderScan, is the only optical digitizer currently on the market. Each digitizer costs under $400.

Regardless of how they convert an image into digital form, Macintosh digitizers use patterns to simulate gray scale–the range of shades from black to white–because the Mac can't recreate actual grays. The digitizer analyzes the high-contrast image it produces and, according to software instructions (which differ for each product), replaces groups of black and white dots with patterns. The patterns may or may not look good to you, since the software instructions that create them cannot always simulate the shades of gray you have in mind. Most digitizer software allows you to control the appearance of the digitized image and to edit the image by copying it into another application, such as *MacPaint.*

Mac digitizers aren't all created equal. They differ in the way they work, the complexity of the patterns they use to represent shading, and the amount of control they give you over the digitized image.

Koala MacVision

Of the digitizers I tested, MacVision from Koala Technologies is the simplest to use but has the fewest special effects. MacVision is a video digitizer that includes a cream-colored box containing processing electronics and software on disk. Written by *MacPaint* author Bill Atkinson, the software captures the digitized image produced by the hardware. Once captured, the image can be copied to Macintosh documents or saved as a *MacPaint* document.

Koala MacVision
This video digitizer has dials to control contrast and brightness. Like the other video digitizers, MacVision also comes with software for creating an image on the Mac's screen.

To set up the hardware, you attach a cable from MacVision to a Macintosh serial port. You then connect a video camera or another video source to MacVision. Since MacVision is powered through the Macintosh, you don't have to plug it in separately.

MacVision software is a desk accessory. Like other desk accessories, you can open and use MacVision from the Mac desktop or from within an application program. You install the MacVision desk accessory by copying the Install MacVision icon from the MacVision disk to another disk, such as a *MacPaint* disk, and opening the icon.

Figure 1
When you open the MacVision desk accessory, the MacVision menu appears in the menu bar. The Adjust command lets you set contrast and brightness.

Taking the Picture

To use MacVision, select MacVision from the Apple menu. A small window appears on screen, and the MacVision menu is on the menu bar. Point the camera at your subject and choose either the Scan Window or the Scan Screen command from the MacVision menu. With Scan Window the digitized image appears in a small Scrapbook-sized window, and with Scan Screen the image occupies the entire Mac screen. Either command causes the picture to appear on screen slowly from left to right. The scanning continues until you stop it by clicking the mouse button.

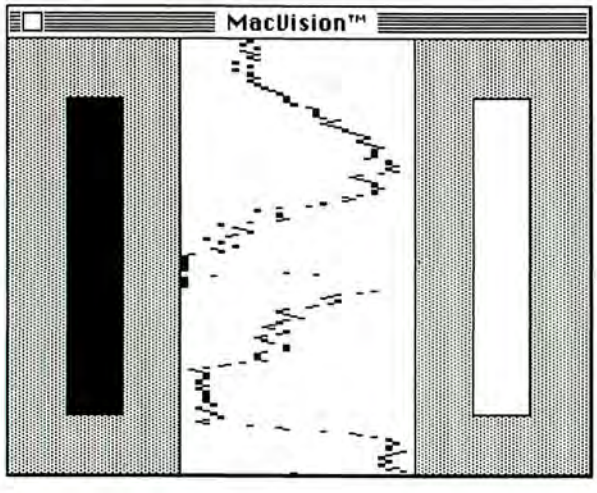


Figure 2
When you choose Adjust on the MacVision menu, a window appears that helps you fine-tune the hardware's contrast and brightness controls for the best possible balance. Turn the contrast and brightness dials until the wavy line is vertically centered and touches both sides of the window.

When you choose the Scan Window command, the image appears in a small 320- by 240-pixel MacVision window. When scanning is complete (in about 7 seconds), you can copy all or part of the window into the Clipboard from the Macintosh desktop or from within an application program. You can then paste it into the Scrapbook or an application program.

The scanning process takes 18 to 20 seconds with the Scan Screen command. Another disadvantage of this command is that by displaying the image on the full screen, you can't cut or copy a selected part of the picture. You have to save the entire image as a *MacPaint* document before you can select a part of it for editing.

Being a desk accessory, MacVision's best feature is that you can use it while you work with another application, although *MacPaint* is inactive as long as any desk accessory is open. Unfortunately, I found it nearly impossible to focus the image during scanning, since MacVision lacks a focusing aid. You have to use the camera's viewfinder or an external monitor to focus the image. MacVision's lack of a monitor jack aggravates the focusing problem because you have to unplug the camera cable from MacVision and connect it to a monitor.

You can overcome the lack of a monitor jack by purchasing an A-B switch from an electronics store. An A-B switch is designed to switch between two input devices such as a tape player and a turntable; it can help you switch more easily between MacVision and the video monitor. Plug the camera cable into the input jack of the A-B switch and connect the MacVision and monitor cables into the A and B output jacks.

You adjust dials on the hardware to control the brightness and contrast of the image MacVision sends to the Macintosh. The Adjust command on the MacVision menu gives you an indication of brightness and contrast before you begin the scanning process (see Figures 1 and 2). It's probably best not to rely on the Adjust command too much; I found that the eye is a better judge of contrast and brightness than the algorithms used by MacVision software. You can use the command to fine-tune the contrast and brightness as the digitized image appears on screen.

Special Effects

Because of its simplicity, MacVision offers you little control over the digitized image. Unlike other video digitizers, for example, MacVision doesn't let you change the patterns that create the finished picture. Nevertheless, MacVision produces a few special effects. You can alter textures and patterns to some degree with the contrast and brightness controls. You can distort or multiply an image; by moving the camera during scanning you can stretch or squash an image. Humorous applications aside, you can use this method to control perspective, proportion, and size.

New Image Magic

Of the digitizers I looked at, the New Image Magic is the hardest to use. However, Magic is packed with features. It is especially useful for fine-tuning the details of a digitized image.

You connect the hardware to one of the Macintosh's serial ports and to a video camera or other video source. If you don't already have a video camera, New Image's $150 black-and-white camera is a good way to save money; the average cost of a color home video camera is about $500. You complete the hardware connection by plugging the Magic digitizer into a wall outlet.

New Image Magic
Magic's cream-colored box contains the processing electronics necessary to transform a video signal from a camera, a video recorder, or another source into a digital image that can be shown on the Mac.

Taking the Picture

Insert the Magic software disk into the Macintosh and open the camera icon on the desktop. A complicated-looking control panel appears from which you take the picture, adjust brightness and contrast, edit patterns, and view previously digitized images. The picture window in the center of the panel is flanked on the left by a menu and on the right by a pan control window, a pattern palette, and a set of option boxes. Three horizontal bars stretch across the bottom of the screen (see Figure 3). I suggest that you get to know the control panel because the Magic system requires a thorough familiarity with its software.

Once you frame and focus your subject in the camera, you can set the control panel to produce a grayless black-and-white image by clicking the cut bar, which is the topmost of the horizontal bars below the picture window, or by clicking the pan control box in the upper-right corner of the screen. You can adjust the brightness of a grayless black-and-white image by moving the cut bar to the right.

You can also get a black-and-white image with three patterns representing intermediate gray levels by clicking the picture window in the center of the control panel. One noteworthy feature of Magic is that if you don't like the patterns the digitizer uses initially, you can change them. As in *MacPaint,* you can choose from 38 editable patterns. You choose the patterns from the pattern palette on the right and drag them onto the pattern bar at the bottom of the screen.

The pattern bar represents the entire gray scale of the digitized image from black on the left to white on the right. You adjust the width of each pattern on the bar to control the portion of the gray scale represented by that pattern.

Although you can place all 38 patterns on the bar at once, using three or four is optimum; additional patterns slow down and unnecessarily complicate the scanning process. You adjust brightness by dragging the pattern bar to the left or right.

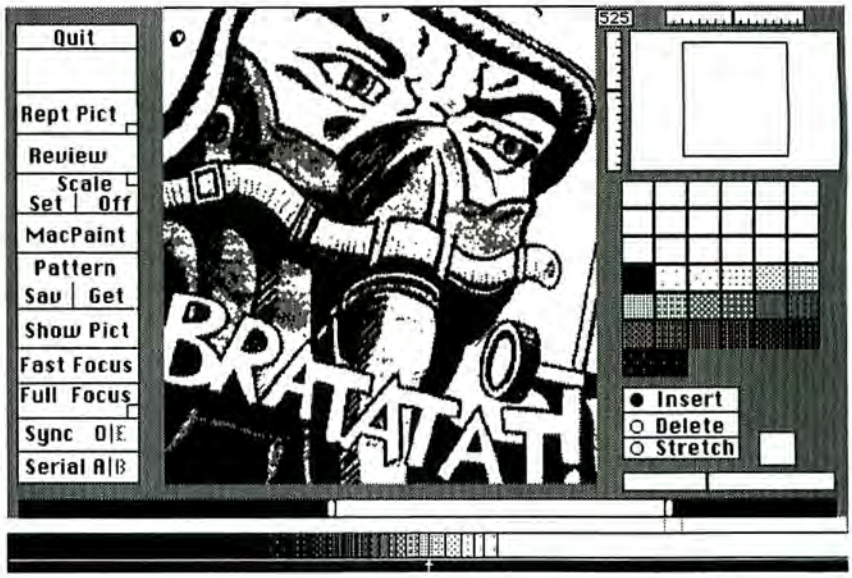


Figure 3
The Magic control panel lets you review previously digitized images, focus the image, change and edit patterns, and adjust contrast and brightness. The box and rulers in the panel's upper-right corner are the pan control. You can select patterns from the palette and place them on the pattern bar, the thickest horizontal bar at the bottom of the screen.

Contrast is more difficult to adjust than brightness. First click the Stretch button located under the pattern palette. Then adjust the width of each pattern on the bar by clicking and dragging. As the individual patterns become narrower, the contrast increases.

Special Effects

Magic is the only digitizer I tested that provides a precise way to measure the size of an image. Clicking the little square in the Scale box brings out rulers graduated in ⅛-inch increments along the edges of the main window. You can resize the image by moving the camera or zooming the lens in or out.

Magic's scanning rate is fast enough to allow you to use the digitizer to focus the camera, but once again I found that focusing with the human eye is more accurate. When you click the Fast Focus option, a high-contrast image quickly appears in the main window. The Full Focus option lets you focus on a larger image, but scanning and editing are slower than when you use the Fast Focus button.

Because digitizers use patterns to represent shades of gray, an image can often look awkward; patterns sometimes appear overstated, and the

shadings of the patterns don't always match the gray shades of the original. To compensate, Magic software lets you blend patterns. A light blend tends to emphasize contours between shades of gray, while a heavy blend obscures the contours to give a more natural appearance. Too heavy a blend, however, can create a mess that's impossible to make out.

A unique feature of the Magic system is its pan control. A standard video signal produces an image roughly 768 pixels wide and 480 pixels high on a Macintosh. The Mac's screen displays only 512 by 342 pixels, or about 66 percent of the video image, losing the remaining 34 percent around the edges. Magic's pan control allows you to select the area of the video image that you want to digitize. This feature comes in handy when you digitize images from a videocassette recorder or videodisk player. However, when you work with a camera, you can always pan or tilt the camera to frame the image that you want to digitize.

Servidyne Micro-Imager

Like the New Image Magic, the Servidyne Micro-Imager digitizes images either without gray levels or with selected patterns, which you can edit, to represent the gray scale. Micro-Imager accepts the standard video signal from cameras, videocassette recorders, and videodisk players and can be connected to a video monitor. After making those connections, you attach the hardware to one of the Macintosh's serial ports and plug it in. A switch on Micro-Imager permits you to set the digitizer for a color or black-and-white camera. When you set the switch for a color camera, Micro-Imager filters color information for maximum resolution in black and white.

Taking the Picture

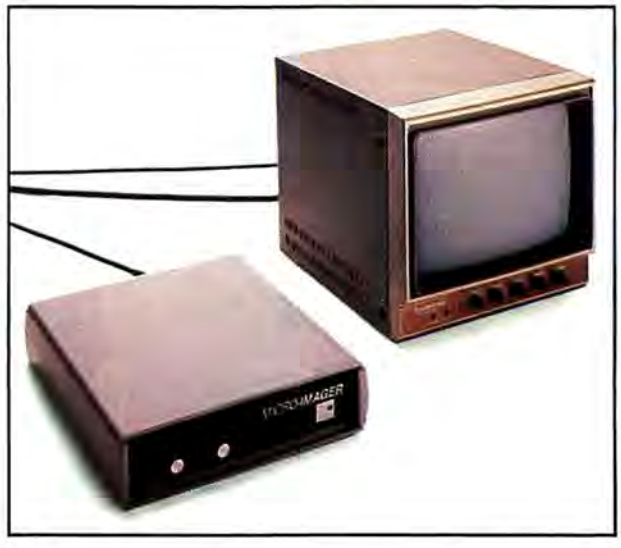
To digitize an image, open the Micro-Imager program and choose the Capture Image command on the Digitize menu. Within 5 seconds a high-contrast digitized image appears on screen. Like MacVision, Micro-Imager hardware has dials that let you adjust contrast and brightness.

Micro-Imager can produce a digitized image with six preset patterns representing the gray scale, but the scanning process takes twice as long as when it produces a grayless, high-contrast image. You create an image with patterns by choosing Multi-Shade-Pattern on the Options menu (see Figure 4).

You can select and save parts or all of the digitized image as a *MacPaint* document. After you drag the selection rectangle over the area you want to save, you can use Clear Outside Selection in the Edit menu to delete everything outside the rectangle. The Clear Inside Selection command, which deletes everything inside the selection rectangle, is next on the menu, so be careful (see Figure 5).

Special Effects

If you don't like the way an image looks with Micro-Imager's preset patterns, choose Change Patterns on the Options menu (see Figure 4). A dialog box appears in which you can edit the patterns as you do in *MacPaint;* you click a pattern and then revise it as you see fit (see Figure 6). Experimenting with combinations of patterns can create stunning effects. For



Servidyne Micro-Imager
Like the other video digitizers, Micro-Imager requires a video camera and proper lighting or uses the signal from another video source. Micro-Imager makes a direct video connection and doesn't need an RCA plug.

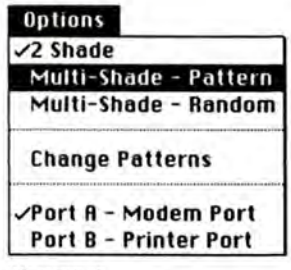


Figure 4
The Options menu lets you change patterns and blend the shading of images you create with Magic. Choosing the Multi-Shade-Pattern option produces an image with regular patterns. If you want less regular patterns, choose the Multi-Shade-Random option to create blended patterns.

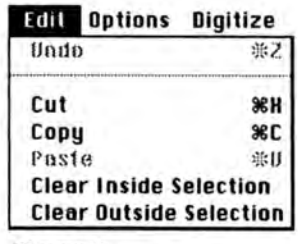


Figure 5
The Micro-Imager Edit menu lets you save selected portions of a digitized image. After selecting the portion you want to keep, you can choose the Clear Outside Selection command to save the area inside the selection rectangle. To save the area outside the rectangle, choose Clear Inside Selection from the menu.

Digitizer Gallery

Although all four Macintosh digitizers reviewed in this issue are designed to generate computerized renditions of real-world images, there are subtle differences in the amount of detail and level of resolution among the images produced. The most significant difference is in the way the digitizers represent the intermediate levels between white and black, called the *gray scale*, found in the subject. Each digitizer employs unique software formulas to choose patterns that represent gray levels in the scale.

Macworld performed a test to demonstrate the differences among the four digitizers. Each product was used to create a digitized image of a black-and-white 8- by 10-inch glossy photograph of film star Jimmy Stewart. The video digitizers (MacVision, Micro-Imager, and Magic) were tested using the same lighting and video camera with a 35mm camera close-up lens. The photograph was fed through the Imagewriter for the ThunderScan digitizer, which doesn't use a video camera.

You can see the differences in detail and in gray scale representation by examining a section of the image, such as the chin or the nose, and comparing the patterns used in each sample.

Koala MacVision
In the test, MacVision provided the smoothest transition from one gray value to another. Notice the variations of gray in the background. The digitizer doesn't give you control over the patterns with which it represents an image, but it is the easiest and fastest video digitizer to use.

New Image Magic
The sample shows excellent modeling of gray values and good detail. Magic used 20 patterns to represent the gray levels in the test image. Magic's software is complex, and it is the most difficult digitizer to learn to operate; however, it offers the greatest control over pattern selection.

Servidyne Micro-Imager
The Micro-Imager represents an image using only six patterns, which results in abrupt transitions between gray values in an image with many levels of gray. You can see the effect in the test image along the chin line, which appears less realistic than in the images produced by the other digitizers.

Thunderware ThunderScan
ThunderScan has excellent resolution and produced the most detailed image in the test. Since it's the only digitizer that doesn't use a camera, ThunderScan takes longer to digitize an image. The time lost is often offset, however, by the time saved by not having to set up lights or a camera.

The Original
This black-and-white glossy photograph of Jimmy Stewart is the basis of a test of four Macintosh digitizers.

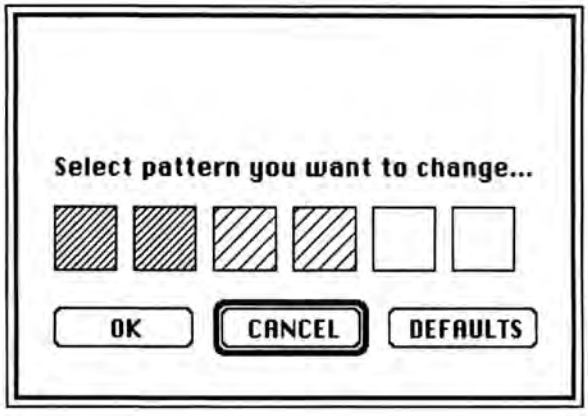


Figure 6
You can change Micro-Imager's six preset patterns by choosing the Change Patterns command on the Options menu (see Figure 4). You then edit patterns individually in the same manner as you do in MacPaint.

Figure 7
Micro-Imager gives movie stars Tony Curtis and Janet Leigh a digital look. You can experiment with patterns to create special effects. For example, the diagonal patterns selected in the Change Patterns dialog box shown in Figure 5 create an image with gray levels represented by diagonal lines only.

example, you can produce a digitized image that is composed entirely of diagonal lines (see Figure 7).

Patterns can be distracting if they're too obtrusive or too regular. The Micro-Imager system offers a random pattern mode that scrambles the dots so the patterns don't call attention to themselves. Random-pattern digitizing tends to increase contrast, but you can compensate by adjusting the image's brightness and contrast.

Thunderware ThunderScan

MacVision, Magic, and Micro-Imager represent the video approach to Macintosh digitizing. ThunderScan from Thunderware is an optical digitizer, which creates pictures without a video source. ThunderScan forms an image by scanning a photo, an illustration, or other flat art with a pinpoint stream of light. A light-sensitive detector senses the degree of lightness or darkness in each dot as the beam goes over it. To each dot, ThunderScan assigns a gray value of from 1 to 32 (from darkest black to lightest white). The gray values are encoded during scanning and stored in memory. When showing the digitized image on screen, ThunderScan software examines the gray values and determines which patterns to use to represent the gray scale.

The software was designed by Andy Hertzfeld, former Software Wizard at Apple Computer who wrote about a third of the Macintosh's system software, including the User Interface Toolbox. "I could draw circles and rectangles with *MacPaint,* but that's about the extent of my ability," Hertzfeld says, recounting how he became interested in ThunderScan. "When I first saw ThunderScan running on an Apple IIc, I realized that it could provide an inexpensive way for people like me to include drawings in their work."

The ThunderScan module contains the light emitter and detector and uses the Imagewriter printer as a scanning mechanism. The module fits onto the Imagewriter's ribbon bed, replacing the ribbon cartridge. During the digitizing process, the module sweeps back and forth across the original artwork as the Imagewriter feeds the paper through its platen a fraction of an inch at a time.

If you know how to put a ribbon into the Imagewriter, you can install the ThunderScan module. Take out the ribbon, pop the scanning module in its place, and patch ThunderScan's cable into the Mac. At the end of the cable is a small switch box that lets you select either scanning or printing mode. You replace the Imagewriter's carrier cover with a replacement included with ThunderScan.

One problem with ThunderScan is that you must replace the scanning module with a ribbon cartridge whenever you want to print with the Imagewriter. You'll probably want to print digitized images after a digitizing session. The ThunderScan system digitizes any image on paper that can fit into the Imagewriter, although the size of the image is limited not only by the Imagewriter but by the Macintosh's available mem-

Seven Tips for Better Digitizing

- If you want to digitize artwork, make sure that it is clean and crisp. Macintosh digitizers can't make a poor photograph or illustration look better. Don't try to digitize artwork that is folded, creased, or lacking in contrast.
- The video camera is usually the weakest link in a video digitizing system. A camera that produces soft, unfocused pictures isn't a good choice for a digitizer. Before using any camera, make sure that the lens is clean.
- Good lighting is essential. If you're digitizing flat art, position the camera directly in front of the art, and place two lights on either side of the camera. The lights should shine on the art at a 45-degree angle. If you get too much glare, reposition the lights or place a sheet of nonglare glass over the art.
- Whenever possible use a monitor to frame and focus the image, even if your camera has a built-in viewfinder. Camera viewfinders are too small for accurate focusing and often don't show exactly the same image that is received by the digitizer.
- After you frame and focus your subject in the camera, adjust the contrast and brightness controls for the best picture. Contrast and brightness determine the type and density of patterns used; an incorrect setting of either control can yield poor results.
- Don't expect the digitized image to be an exact replica of the original. To achieve a professional look you usually have to edit the image with *MacPaint*.
- Replacing the video camera lens with a high-quality 35mm camera lens produces a more refined image. Mounting the 35mm lens requires an adapter. The type of adapter depends on the brand of camera, but most video cameras require a C-mount adapter.

ory. At 100 percent magnification the largest page ThunderScan can process is 8 by 7¾ inches with a 128K Mac and 8 by 10 inches with a 512K Mac.

Because ThunderScan can digitize only flat art, you have to photograph a three-dimensional object whose image you want to digitize and feed the photo through the Imagewriter. One advantage to the ThunderScan method, though, is that you don't need to bother lighting your subject as you do with video digitizers. Proper lighting can be difficult and time-consuming.

Taking the Picture

After opening the ThunderScan program, focus the scanning module by selecting Choose Focus on the Scan menu. Place the artwork you want to digitize into the Imagewriter and adjust the small thumbwheel on the module until the scanner is focused. I found that this simple arrangement works nicely.

ThunderScan is slow, taking up to 20 minutes to digitize an image on an 8- by 10-inch page. ThunderScan alleviates the slowness problem somewhat by letting you define the part of the page that you want to digitize. After you select the area, click the New Scan button, and scanning commences. I recommend limiting as much as possible the area to be digitized in order to save time.

Thunderware ThunderScan
The ThunderScan cartridge fits in place of the Imagewriter's ribbon cartridge. This unique scanning technique eliminates the need for lights or a camera and offers the least expensive way to digitize.

Although scanning takes a long time, you get a full progress report along the way. The Image Pane on the ThunderScan control panel shows each line of the image as it is digitized. An indicator also shows you how many lines remain to be scanned.

One feature that distinguishes ThunderScan from other digitizers is that it lets you reduce or enlarge the image before scanning. You select the image magnification, which ranges from 25 percent to 400 percent of the original size (see Figure 8).

Special Effects

Unlike the video digitizers, which allow you to change contrast, brightness, and patterns before scanning the image but not after, ThunderScan allows you to make those adjustments after scanning. For example, if you think the contrast is too high, you don't have to spend another 5 to 20 minutes redigitizing the image. Instead you can adjust the contrast control and change the image. You can also select which areas of the image you want to alter. You might want part of the image to be lighter than the rest, for example. You drag the selection rectangle over the area you want to change and make the adjustment (see Figure 9).

The gray values of the original can be permanently stored with the digitized image. When you alter brightness and contrast, you're simply changing how the software displays the gray values picked up from the original image. Therefore, you can change the image's patterns or revert to the original without scanning each time.

If you want to edit an image later, you can save it as a ThunderScan document. You can also save it as a *MacPaint* document, but you can't return a *MacPaint* document to ThunderScan for editing. Though ThunderScan software has its own *MacPaint*-like features (including FatBits), you'll probably find it easier to use *MacPaint*. ThunderScan editing isn't as smooth as *MacPaint*'s, and ThunderScan images take up large amounts of disk space, easily reaching 80K or more.

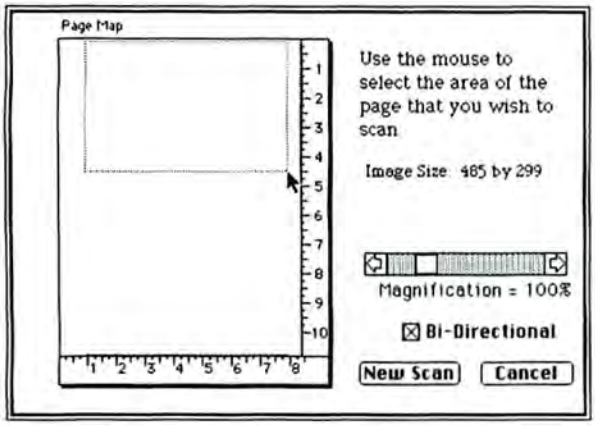


Figure 8
Before scanning, ThunderScan lets you select the portion of a document that you want digitized to save you time. Image Size shows the size of the selected area in pixels, while the rulers alongside the Page Map show the size of the selection in inches.

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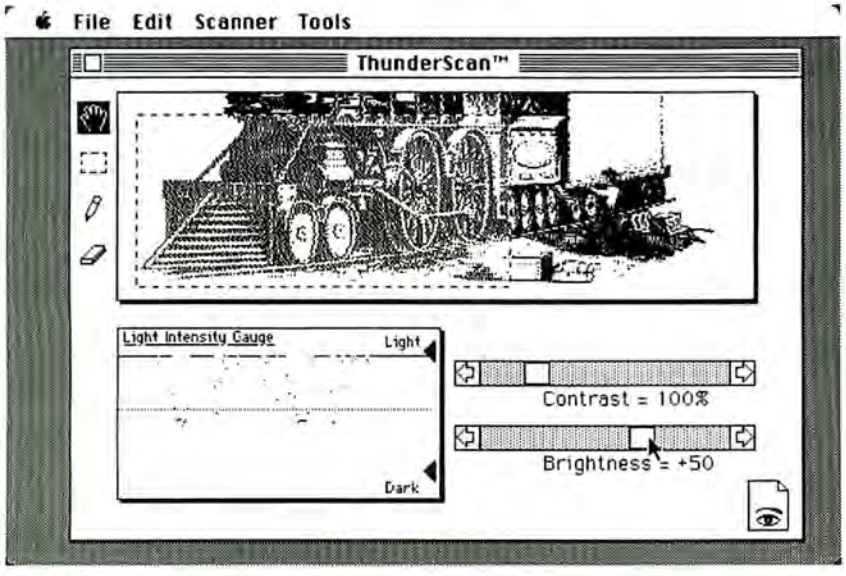

Figure 9
Once ThunderScan digitizes an image, you can alter the contrast and brightness of all or part of the image. You select the marquee icon on the left side of the screen and create a selection rectangle with the mouse. After you select the area, you adjust the contrast and brightness with the controls that look like horizontal scroll bars until you get the effect you want. The new settings affect the selected area only.

More Digitizers

Micron Technology offers its Micron Eye, which was the first Macintosh digitizer. For $399 you get a camera and a scanner that produce simple digitized images. Unfortunately Micron Eye takes only thin slices of a picture at a time, producing only narrow images. It also suffers from lower overall resolution compared to the competition.

Other digitizers were in development at press time. I/O Video has announced a high-definition digitizer and camera package that will sell for around $700.

As an alternative to digitizers that produce images primarily for you to store and edit, you might consider the Silicon Video digitizer from Epix. This $3495 unit uses the Macintosh as a digitizing controller, producing extra-high-resolution images that are not designed to be edited with *MacPaint*. Instead, software that accompanies the Silicon Video system allows digitized images to be recorded on film or tape and transmitted via phone lines or satellite for teleconferencing.

If you decide to purchase a digitizer, the one you choose presents new possibilities for including visual images in your work. You may find it difficult to resist using pictures that you couldn't draw yourself. As you watch a picture become pixels on the Mac's screen, new technological vistas open up before you. □

Gordon McComb is a Contributing Editor of Macworld.

MacVision
Koala Technologies Corp.
3100 Patrick Henry Dr.
Santa Clara, CA 95052-8100
408/986-8866
List price: $399

Magic
New Image Technology, Inc.
10300 Greenbelt Rd. #104
Seabrook, MD 20706
301/464-3100
List price: $399

Micro-Imager
Servidyne Systems, Inc.
1735 DeFoor Pl. NW
Box 93846
Atlanta, GA 30377
404/352-2050
List price: $349

Silicon Video
Epix
7223 N. Hamilton Ave.
Chicago, IL 60645
312/764-9186
List price: $3495

ThunderScan
Thunderware, Inc.
21 Orinda Way
Orinda, CA 94563
415/254-6581
List price: $229

I/O Video
222 Third St.
Cambridge, MA 02142
617/547-4141
List price: under $700

Three pages

Confidentiality not assured.

Over there on the right you'll find the first winner of our "We'd like to think you're a little strange contest." It seems that around Santa Cruz the Macs are so laid back that all they need is the sun and the wind. And a wild software aficionado like Gary Ingram to put it all together. If you've got a fascinating tale of Mac life that tops Gary's (or even comes close) let us be the first to know.

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SOFTWARE

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Interactive teaching program for using the Mac, two disks/handbook.

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MacLion ..... 249.
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Edit, compile, link, and execute C programs on a 128k Mac.

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Helps prepare strategies for all aspects of sales negotiations.

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Identifies communications strengths and weaknesses.

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The Negotiation Edge ..... 179.
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Software that reveals people's hidden thoughts.

Layered

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For organizing and scheduling your most important activities.

Linguist's Software

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Over 1000 symbols for scientific equations.

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12 + 24 point Greek font including math symbols.

MacHebrew ..... $75.
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MacKana/Basic Kanji ..... 75.
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12 + 24 point includes all extra symbols of phonetic alphabet.

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ThinkTank 128 ..... 85.

ThinkTank 512k ..... 139.
Put your ideas into ThinkTank and let your thoughts flow, the perfect idea organizer.

Magnum

McPic - Volume I ..... 35.
Create maps, logos, etc. with this collection of MacPaint drawings.

McPic - Volume II ..... 35.
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For presentations, teaching or just plain fun.

Megahaus

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Microlab

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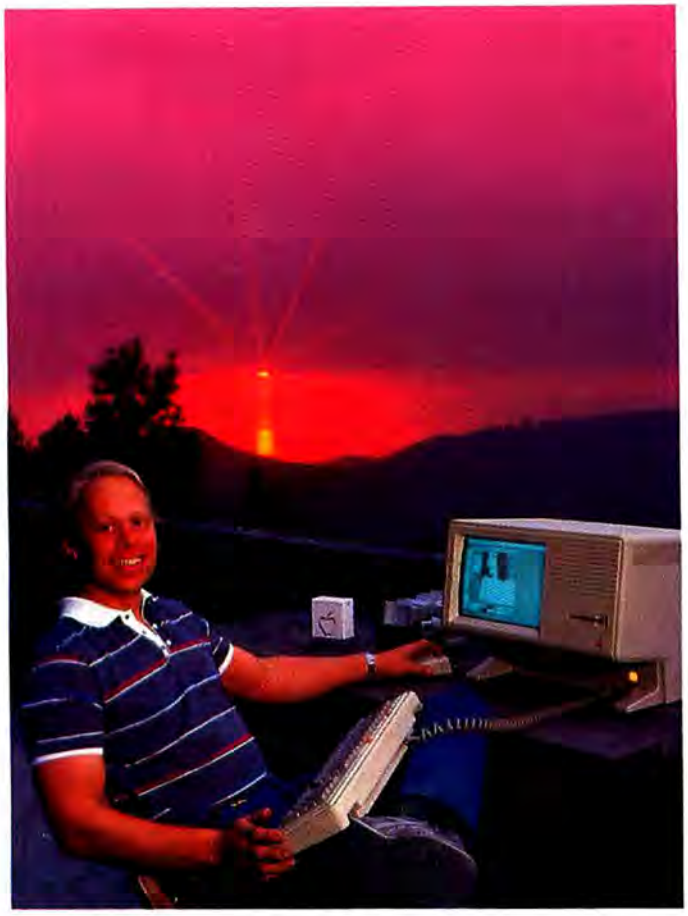
Mac, out back.



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He lives 1750 feet in the air near Santa Cruz, California. Monterey Bay on one side, redwoods on the other. Peacocks, Siberian Huskies, Pork Chop the pig, and small children run wild.

Gary Ingram sits, mouse in hand, clicking furiously. Maintaining files, building data bases, reviewing software. And troubleshooting for small computer companies—like Apple. He gets so much mail at The Source that people think he lives there.

His house clings to a precipice at the top of Last Chance Road. There isn't a power line in sight—the last one was 8 miles back.

Gary's neighbors jog barefoot, light their houses with kerosene, put eucalyptus collars on their dogs, and believe the telephone repair man is a CIA agent. The municipal road agent drives his tractor naked.

The locals naturally have a little trouble relating to a guy who spends up to twenty hours a day bent over a 10 Megabyte Lisa 2/10 with Macworks. It's not that they really mind it. Hey, whatever turns him on. The question is, what turns the Mac on?

Well, the explanation is simple. Some people only chase windmills—Gary builds them. And one of his windmills, along with some photovoltaics, are all he needs to keep his Mac breathing heavy into the wee hours of the morning.

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Computer Chess Comes of Age

Sargon III helps beginners and challenges chess masters

Nicholas Lavroff

In 1770 Baron von Kempelen, Counselor on Mechanics to the royal chamber in Vienna, introduced the Turk, the first chess-playing machine. Complete with springs, cogs, and gears housed inside a large chest and presided over by a life-size figure dressed in Turkish garb, the Turk pitted its skill against human opponents. In case the audience suspected fraud, von Kempelen opened all the doors and drawers in the chest to reveal nothing but the inner workings of his most modern machine. What the audience didn't see, of course, was the man in a secret compartment, moving the pieces around the board with the Turk's mechanical arm.

Though playing conditions were less than ideal, the hidden players (there was a succession of them over the years) managed to win a majority of their games, much to the delight of the gullible public, who were convinced that the age of automation had finally arrived. The Turk toured Europe for about 15 years, until it was purchased by Frederick the Great, who, discovering its secret, promptly banished it to the royal basement.

If Baron von Kempelen were alive today, he would be hard pressed to figure out how anyone could hide inside a Macintosh. In any case, now that Hayden Software has introduced *Sargon III* for the Mac, no doubt exists that the baron would be impressed with its playing strength.

The Twentieth-Century Turk

If you've never played chess with a computer, you will be pleased to discover the benefits of playing against a nonhuman opponent. First, some chess computers have been rated at over 2000 under the United States Chess Federation's (USCF) rating system. Considering that the average player registered with the USCF is rated at about 1500, these chess programs are no pushover wood pushers.

Second, a computer is available for chess whenever you are. It will never try to put you off until next week or feign indigestion or a toothache. It will not sigh, blow smoke in your face, or drum its fingers while you are deciding your next move. If you should beat it, it won't try to make inane excuses or point out that it was winning until you found that lucky move. Above all, while you're losing the occasional game, the computer derives absolutely no pleasure from watching you squirm.

Sargon III, the latest version of a program developed by Kathe and Dan Spracklen, represents the coming of age of computer chess. In 1978 an earlier version, *Sargon I*, took first place in the West Coast Computer Faire's Microcomputer Chess Tournament. Since then the program has undergone numerous revisions, culminating in the state-of-the-art Macintosh version. The combination of *Sargon III*'s features and the Macintosh's operating environment makes for a chess machine that surpasses even dedicated chess computers, some costing ten times as much as *Sargon III*.

The Turk, introduced in 1770, was the world's first mechanical chess player. Machine chess has come a long way since then, evidenced by the sophistication of Sargon III *for the Macintosh.*

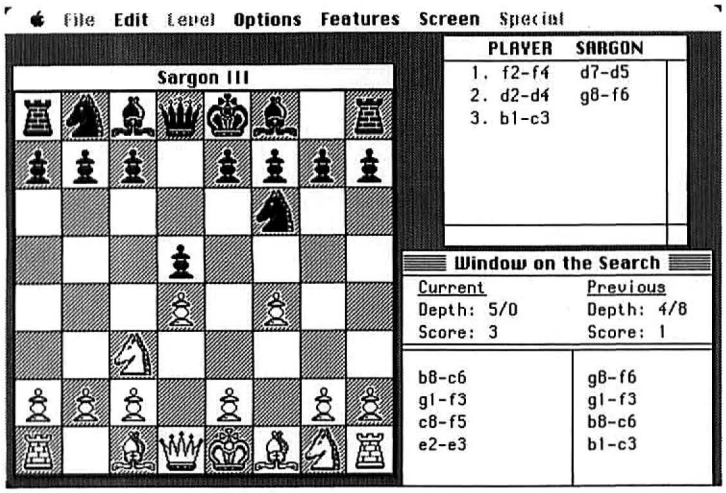

Figure 1

Sargon III's *electronic chessboard provides all the features of a real chessboard; it even lets you take back moves. The window in the upper-right portion of the screen keeps a record of the game moves. The Window on the Search displays the evaluation process as* Sargon III *considers its current position and selects its next move.*

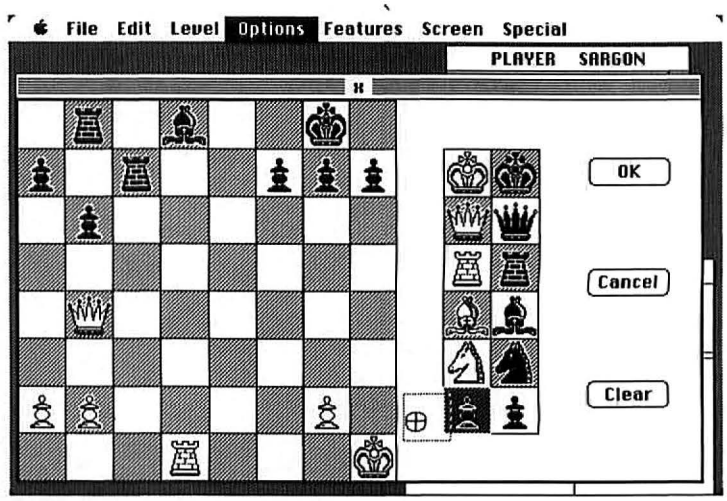

Figure 2

The Change Board option allows you to construct any chess position. This feature is most useful for setting up problems and playing them out. Saving the chess positions you construct allows you to replay a particular position using different strategies.

In the true Macintosh tradition, all the program's features are mouse controlled. You make a move by positioning the cursor on a piece and dragging it to its destination square. You cannot make an illegal move; if you try, the program automatically restores the piece to its original position when you release the mouse button.

The Electronic Chessboard

When you start *Sargon III,* three windows appear on the screen: the chessboard, the move list, and the Window on the Search (see Figure 1). All the windows can be moved around the screen. The move list and search windows can be hidden, and the move list window can be resized as well.

Sargon's electronic chessboard offers players a great deal of flexibility. One of the most useful options is Change Board, which allows you to construct any chess position (see Figure 2). This function lets you construct a myriad of variations to study and play out. Once you set up a board, you can have *Sargon III* analyze the position or play the game from that point on.

Sargon III also lets you switch sides at the beginning or at any time during a game. If you select the Change Sides feature at the outset of a game, *Sargon III* plays white. If you are playing white and find black's position interesting in the middle of a game, you can change sides and finish the game as black. Or if you find yourself on the verge of losing to *Sargon III,* you can escape defeat by choosing the Self Play option and watching the program play against itself.

Another board feature, Change Color, lets you control the next move, regardless of which color you are playing. The purpose of this feature is to specify which color should move first after you construct a chess position. You can also invert the board at any time during a game; if *Sargon III* is playing white, choosing Invert Board from the Screen menu switches the top and bottom colors. This feature is also useful for analyzing your opponent's position from his or her (or its) own perspective.

The move list window keeps a record of the moves. The contents of the move list window can be copied to the Clipboard, so you can paste the list into a word processing document and print it out. As with other Mac programs, you can print the contents of the active window by pressing ⌘-Shift-4. Enlarging the move list window to the full height of the screen displays only 17 moves, so you need to scroll another set of moves into the window and print the contents of the list window again for most games. You can also print out *Sargon III*'s game board using the same technique at any time during a game to save a paper copy of the board position. You can print the entire screen by holding down the Caps Lock key and pressing ⌘-Shift-4.

Sargon III lets you save a game at any point and resume play later. You can also store a completed game on disk, to be played back or printed out at your convenience. The *Sargon III* program disk has storage space for about 50 games (see Figure 3).

(continues on page 88)

How Computers Play Chess

Computers play chess through the interaction of three or more basic modules, or routines. The first of the modules generates a tree of possible continuations for each player. The number of possibilities increases exponentially with the depth of the search. Therefore, the search is limited by time constraints to a depth of about four or five plies, or half moves.

The second module evaluates the positions generated by the first by considering and weighing factors such as material, mobility, pawn structure, king safety, and control of the central squares. The third module considers each end position arrived at by the first module and determines whether the second module's evaluation would be drastically affected by subsequent checks or captures. If so, the program searches those particular end points to a greater depth. This procedure is known as the *quiescence* function, since the program keeps searching to greater and greater depth until it reaches a quiescent state. At this point, the program has found all the possible checks or captures resulting from a certain line of play.

The three modules contribute to a chess program's tactical strength—its ability to make a move or series of moves resulting in an immediate gain, such as winning a piece, checkmate, or avoiding an immediate loss. Because computers are able to sift through mounds of data quickly and without error, they are extremely strong tactically. In fact they have attained close to grand master strength in speed chess, where tactical ability is of foremost importance.

Strategically, however, chess programs are still relatively weak. Strategy in chess refers to the formulation of a game plan, such as the decision to embark on a kingside attack even though no immediate gain is in sight. For the most part, computer chess strategy is confined to what is known as the *minimax* strategy, which bases the selection of a move on the minimization of the opponent's maximum potential gain. In practical terms the program selects the line of play that results in the lowest possible maximum score for its opponent commensurate with the highest possible maximum score for itself.

Most experts believe that the most important barrier still to be broken in computer chess is the emulation of strategic planning as it is practiced by human chess players. A computer is capable of incredible feats of calculation, but even a computer processing a million calculations per second would require longer than the life expectancy of the universe to analyze all the moves possible in a 40-move game. Until such time as computers can emulate human thought processes, chess programs will continue to be beaten by highly skilled chess players.

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(continued from page 86)

If you resume a game that was saved on disk and subsequently finish it, you can save the completed game under a different name. That way, if you don't like the result, you can go back to the original game and try again. In fact, you can revert at any time to the point at which the game was last saved and replay the game from that point.

The Search Window

The Window on the Search allows players to take a peek into the computer's "thought processes" as it evaluates the current position and considers its next move. Although hiding the search window speeds the computer's response time slightly, you might want to keep it visible so you can watch the computer's evaluation change as it "realizes" that your queen sacrifice is a sound move after all. This reaction is about the closest you will get to an emotional response from *Sargon III.*

The left side of the search window displays current search activity. The Depth shows the number of plies (half moves) the program has looked ahead. The Score gives an indication of how *Sargon III* evaluates its own play. A positive number indicates that the program believes itself to be winning. The right column displays the results of the previous search.

The Display Tree option shows *Sargon's* capture search activity. The left column displays the best move *Sargon III* has found in its search at that point. You can stop the search activity by choosing the Halt Search command; the program then plays the best move it has found so far in the search.

Playing Sargon

Sargon III has eight levels of playing strength, as well as an analysis mode (the Infinite option on the Level menu), which analyzes any given position until instructed to stop. *Sargon's* response time varies from about 5 seconds per move at level 1 to about 10 minutes per move at level 8. At any level, *Sargon* budgets its time, making a certain number of moves in a fixed time period. In this way playing *Sargon III* closely approximates "flesh-and-blood" chess playing, since some positions require considerable analysis, while others require little or none because of fewer available options.

Usually *Sargon III* uses the time you take to decide on a move to "think" about its own next move. Choosing the Easy Play option stops the program from using that extra time to analyze the current position, so *Sargon's* game is weakened slightly.

Sargon III can play against itself, play a human opponent, or act as a chaperone when two players match wits. In its default setting, Normal Play, *Sargon III* responds to your moves at the current play level. The Verify Moves mode allows two players to play against each other, with *Sargon* acting as a referee. Serious chess players will find this feature useful, since it allows the Mac to act as a super chess set.

Sargon III makes sure all the moves are legal and automatically keeps track of them. The serious player can also play through published games and save them on disk as part of a permanent collection. A correspondence player can keep track of dozens of games in progress, with each game readily accessible.

Figure 3
You can save games in progress on disk and resume play later. You can also store a reference library of games on disk. Each game takes up only about 1K of disk space.

Special Features

Unlike *Sargon II,* which was a no-frills chess program allowing little more than the modification of playing strength, *Sargon III* abounds with special features. Those features have transformed a mere chess opponent into a multifunction chess companion. For starters, *Sargon III* has a library containing no fewer than 68,000 moves of standard opening play. Since chess openings have been analyzed for

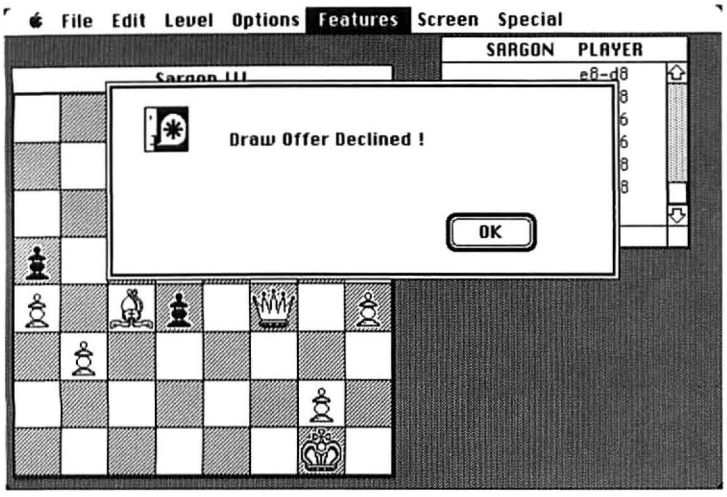

Figure 4
Sargon III *is programmed to announce draws as a result of the 50-move rule, repeating a move three times in succession, or a stalemate. You can also offer* Sargon III *a draw during a game, but don't expect the program to roll over and play dead.*

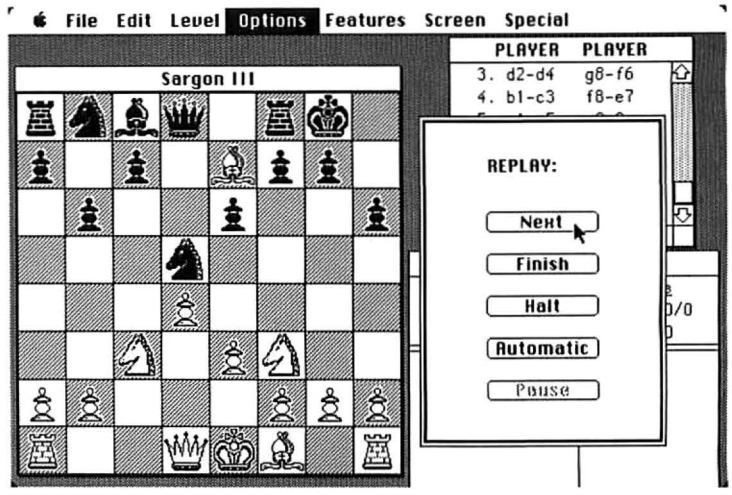

Figure 5
Sargon III *includes 107 Great Games, as well as several chess problems and endgame studies. You can review each game move by move or let it play automatically. The game in progress shown in this figure is Fischer versus Spassky during the world championships in 1972.*

centuries, certain moves are considered standard and are made automatically, without the need for further analysis.

Out of the multitude of variations possible in the first ten or so moves, *Sargon III* can handle most of the main lines, making moves generally considered the best for a particular opening. It is also possible to cancel *Sargon III*'s opening at any time during a game. This feature is useful if you wish to put *Sargon III* to work analyzing some opening innovation.

Although retracting moves is considered equivalent to cheating among serious chess players, *Sargon III* lets you take back any number of moves in the current game. Cheating aside, the feature is useful if you want to reconsider an earlier position or just to see where you went wrong in a game. If you do take back the occasional move, *Sargon III* won't complain, and no one will ever know.

When you are in a difficult position and wish that a chess mentor were on hand to advise you, *Sargon III* can give you an assist. When you choose the Hint feature, *Sargon III* suggests a move for you as long as the opening library hasn't been canceled or *Sargon III* has completed its move search. In addition, you can tempt *Sargon III* with a draw offer during the course of a game (see Figure 4).

To get you started on your chess library, the *Sargon III* disk has 107 of the greatest games ever played, as well as endgame studies and chess problems (see Figure 5). Each game can be reviewed move by move, or you can let it play automatically and freeze the action temporarily to study the board. The documentation contains a brief description of each historical game, as well as solutions to the problems.

Checkmate

Overall, *Sargon III* is an excellent personal computer chess program with useful features for beginners as well as professionals. The accompanying documentation provides a good guide to the game's features.

I would have liked to see some other features included in the program, such as a built-in time-keeping function. All tournament chess is played with clocks, so it is surprising that Hayden overlooked such an obvious feature. Since the Macintosh has an internal clock, it should have been simple to include an automatic timing function, to operate in either the Verify Moves or Normal Play mode. That way *Sargon* could keep track of each player's thinking time, stopping one player's clock upon the completion of a move while simultaneously starting the other player's clock.

Machine chess has come a long way since von Kempelen and his chess-playing automaton, and still the end is nowhere in sight. Chess and personal computers are ideally suited to each other. Computers can act as a creditable opponent even for advanced players and can help improve play. For example, a chess program can help you memorize or analyze openings. You can set the computer to work analyzing a troublesome position and then go to bed while the computer toils all night without complaint. Eventually, standard openings will be available on disk, with all the major and minor variations instantly accessible for review, analysis, or memorization.

Computer chess does not signal an endgame, as some people fear, but the opening of a new era. □

◢◢◢◢◢◢◢◢◢◢◢ *Nicholas Lavroff is a lawyer and a frequent contributor to computer magazines.*

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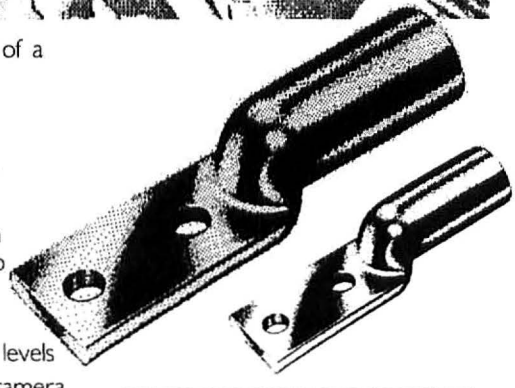

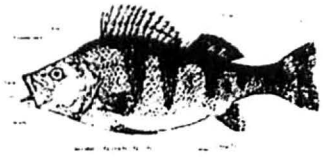

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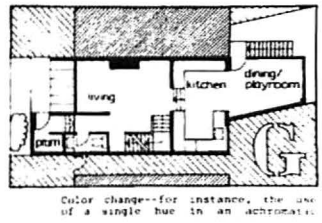

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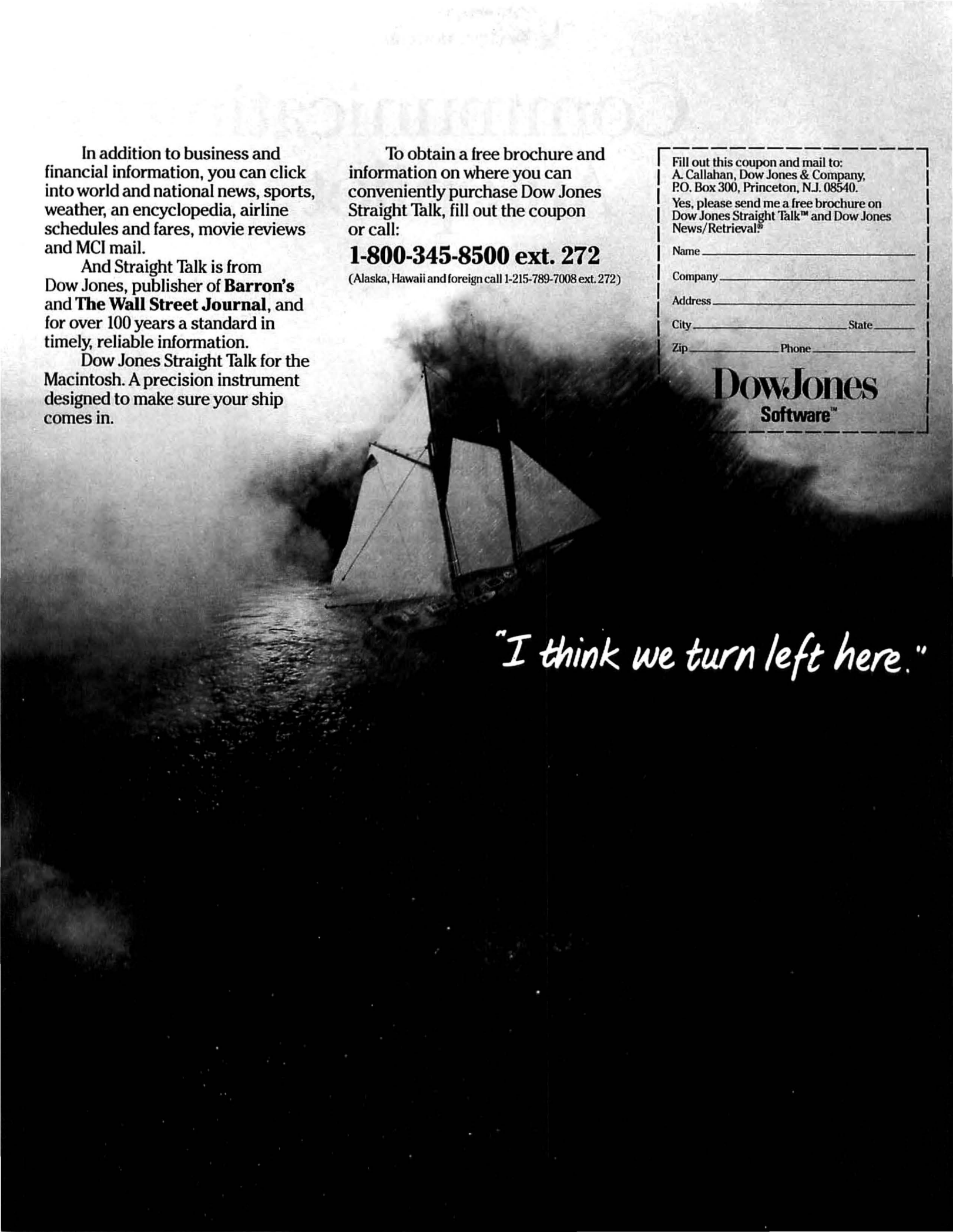


Communicating on Autopilot

Jim Heid

MacModem saves you money by automating your telecommunications

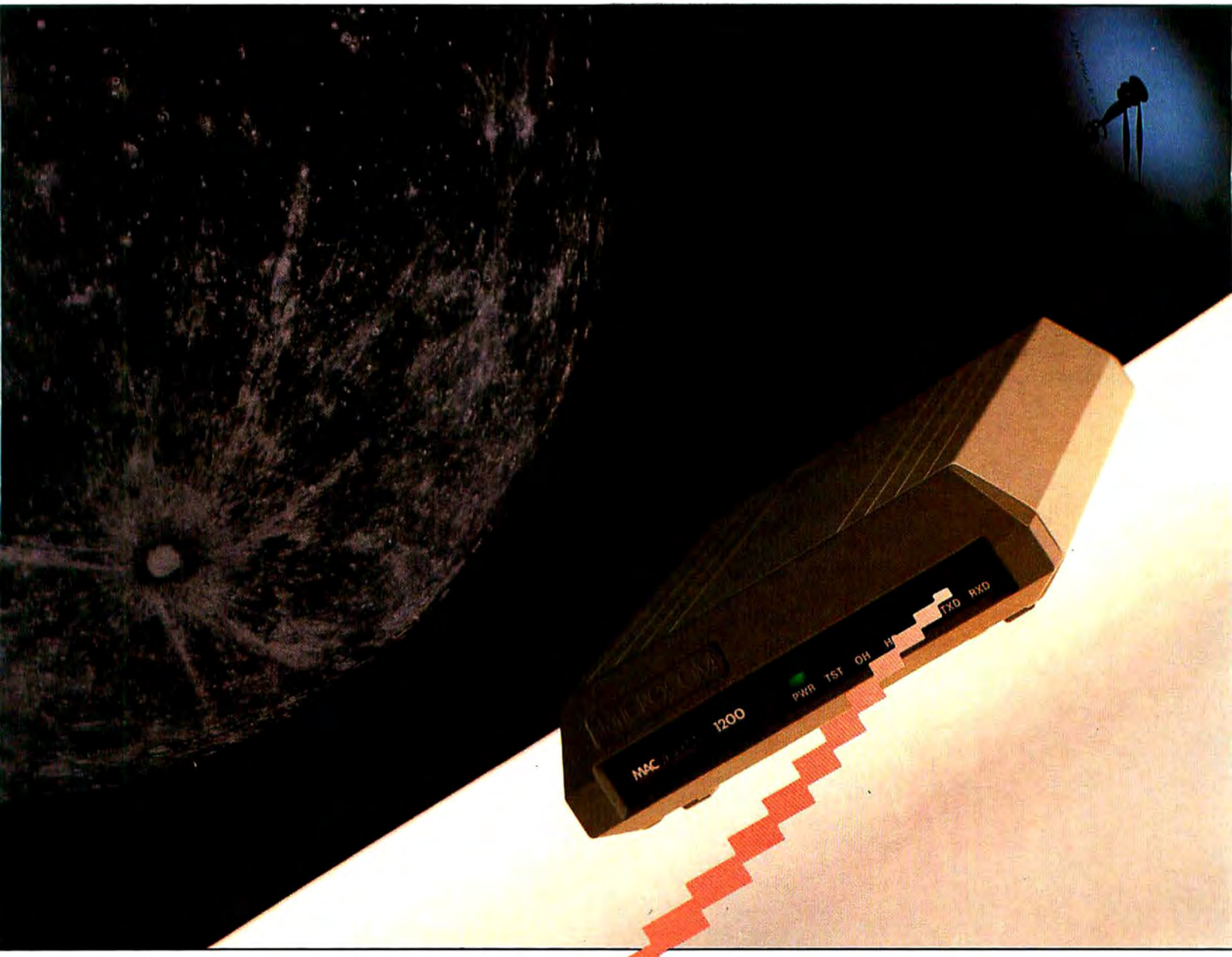
If you're absolutely, positively tired of overnight express charges and of racing to finish your work before the courier arrives, consider the following scenario: The Big Proposal is due at the client's home office tomorrow morning. While your competition fights to finish before the overnight courier arrives, you calmly make your final revisions using MacWrite. *When you finish, you save your document using* MacWrite's *Text Only option, then you quit and return to the Mac Finder. When the Mac desktop appears, you double-click an icon called Electronic Mail. A few minutes later your client is reading your proposal, while your competition's sits in the back of a van headed for the airport.*

Microcom's MacModem is a complete telecommunications system comprising a 1200-bps (bits per second) modem paired with a telecommunications program. For $599, about as much as Apple's Modem 1200 and *MacTerminal* together, MacModem has many more convenience features and even lets your Mac communicate in your absence. (For a review of *MacTerminal* and a telecommunications primer, see "The Mac Connects" and "Communications Primer," *Macworld,* July/August 1984.)

The Hardware

The steel-cased Microcom modem fits comfortably under a desk phone or a Mac external disk drive and connects to the Mac's modem port and a modular telephone jack. A rather large external AC adapter supplies power. The adapter case is so large, in fact, that it covers two outlets on my power strip. The modem lacks an on/off switch; when the unit is plugged in, it's on.

MacModem's front panel sports seven indicator lights that keep you informed about the status of a communications session. The lights indicate when power is on, when the modem is testing its internal electronics (which it does continuously until you go on-line), and when data is being transmitted and received. While the indicator lights aren't necessary for proper operation (Apple's modem doesn't have them), the feedback they provide helps when you're trying to make sure data is flowing from one computer to another. And they exemplify Microcom's attention to detail, much like a car manufacturer including gauges rather than simple idiot lights as standard equipment.


MAC
1200
PWR TST OH
TXD RXD

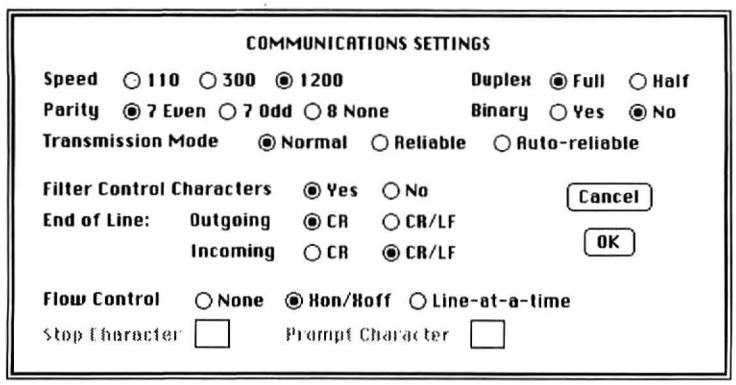


Figure 1
MacModem's Communications Settings dialog box. Selecting the Reliable and Auto-reliable options causes MacModem to communicate with the Microcom networking protocol.

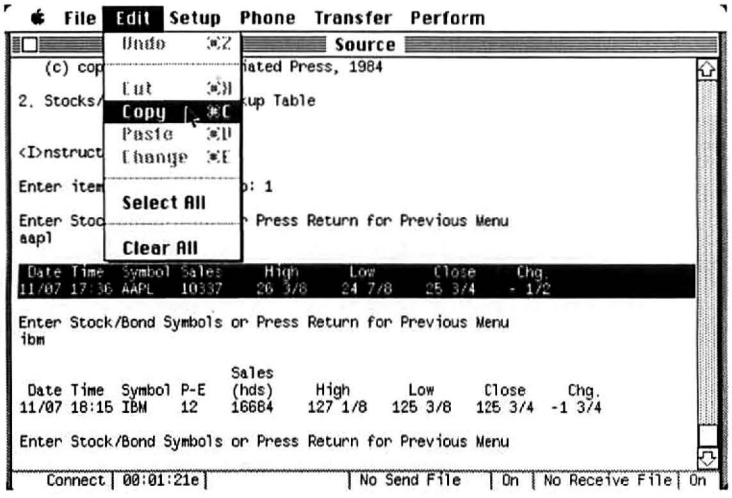


Figure 2
On-line with MacModem. Here Apple's closing stock figures are being copied to the Clipboard. The status line at the bottom of the screen tells you when a connection is made, the time elapsed since the beginning of the session, whether an automated communications procedure is being performed, and whether files are being transmitted or received. The scroll bar lets you see up to one screen of text that has already scrolled off the screen.

The Software

MacModem has all the features a communications program should have, and then some. Using the Setup menu, you can change communications settings such as bps, word length, and parity, as well as specify XON/XOFF or line-at-a-time handshaking to match the settings of the computer with which you're communicating (see Figure 1). You can choose to communicate under the Microcom networking protocol, a set of rules used by communications carriers and services such as Telenet, MCI Mail, and Uninet. The protocol ensures that data is transmitted without errors over phone lines that aren't always reliable due to poor connections or static on the line.

The Transfer menu lets you receive and send ASCII files such as those produced by *MacWrite*'s Text Only option, as well as binary files, which include non-copyrighted Mac application programs and *MacPaint* files. You can save incoming text in an ASCII disk file and review and edit it with *MacWrite* later, when you aren't paying minute-by-minute connect charges. Similarly, you can prepare electronic mail with *MacWrite,* then go on-line for only the time required to transmit the messages to their destinations. When you transmit binary files, in which lost or erroneous data can cause a program to fail or a *MacPaint* picture to become garbled, you can use the Send File Using MNP command to transfer the files with the Microcom networking protocol (assuming that the computer at the other end uses the protocol also).

You can also use the Clipboard to transfer short pieces of text you receive to other Macintosh applications. Select the text you want to transfer by dragging across it, then copy it (see Figure 2). You can put the copied text into the Scrapbook or the Note Pad. Or you can quit MacModem, start another application, and paste the text into it. You could use this technique to transfer stock quotes into *Multiplan,* electronic mail into *MacWrite,* or even short BASIC or Pascal programs and routines into their respective languages.

To keep a record of your communications sessions, you choose Printer On from the File menu. This operation lets you print all the text that appears on the screen as you communicate, both the commands you

type and the messages and files you receive. Although transmitted data comes in faster than it can be printed, MacModem makes sure no information is lost by storing the incoming information in a buffer and sending it to the printer when the printer is ready.

Automating Your Communication

What really sets the MacModem software apart from other communications programs is what Microcom program designers call *user functions.* I like to think of these functions as automated communications procedures. You can string together and store up to 25 MacModem commands–such as dialing the phone, transmitting sign-on messages, or receiving a file–in a procedure to which you assign a name. You then perform the procedure as often as you need by choosing its name from the Perform menu.

If 25 commands aren't enough, you can chain procedures together. To chain procedures you make the last command in a procedure a GoTo command, which causes the program to perform another procedure. Since the program lets you create up to ten automated procedures, you could use the GoTo command to create one huge procedure that would perform 250 commands at the click of a mouse.

You create and edit a communications procedure by choosing the procedure's name (up to 10 characters) from the Setup menu. You then use the program's menus to specify the commands you want to include. Some commands present dialog boxes that prompt you to enter information, such as your identification number for an information service. To ensure that you have time to type the information or that you input the correct information before the next command in the procedure goes into action, you can insert a command called Wait, which causes MacModem to wait until a specified time or until certain text is entered before letting the procedure continue (see Figure 3).

You can place any MacModem command (except the ones that adjust communications parameters) into a communications procedure. Figure 4 contains two procedures that tell MacModem to wait until 1:00 a.m., then to dial The Source, sign on, retrieve Apple Computer's closing stock quotes, save the data in a disk file, and finally sign off and hang up. At 1200 bps the entire process takes about a minute and is a great way to minimize connect charges.

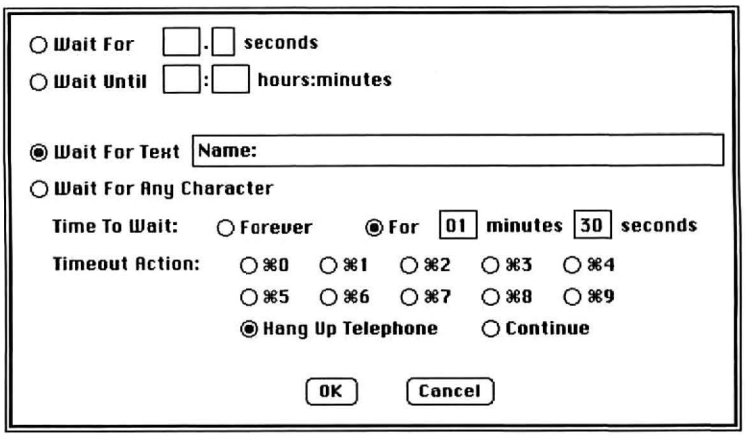
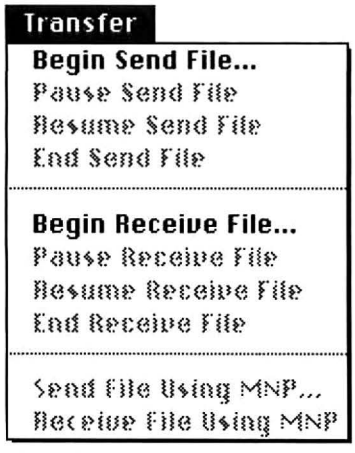


Figure 3
Here the communications procedure is set to wait until "Name:" is received before continuing. If the text is not received within a minute and a half, MacModem performs the timeout action you specify, in this case hanging up.



Transfer Menu
You use the Transfer menu to send and receive files. To send or receive ASCII files, such as those created with MacWrite's *Text Only option, select the Begin Send File and Begin Receive File commands. To transfer binary files, such as applications and* MacPaint *documents, use the Send File Using MNP and Receive File Using MNP commands.*

Phone Menu
The Phone menu lets you activate MacModem's automatic answering feature, which causes the program to answer your phone and send a carrier tone. The other commands let you dial and hang up the telephone and establish a reliable link with the Microcom networking protocol to ensure error-free communications.

File Edit Phone Transfer Perform Other Exit

⌘0 -- Sign On

```
Clear All
Wait Until 01:00 hours:minutes
Dial [1-224-1024]  Until Connected
Hide Messages
Wait For 02.0 seconds
Send [^M]
Wait For 00.5 seconds
Send [^M]
Wait For [=]  For 00 min 20 sec  Or Else Hang Up
Send [D1^M]
Wait For [@]  For 00 min 20 sec  Or Else Hang Up
Send [C 30124^M]
Wait For [>]  For 00 min 45 sec  Or Else Hang Up
Send [ID STxxxx PASSWORD^M]
Wait For [HELP ]  For 01 min 00 sec  Or Else Hang Up
Send [6^M]
GoTo ⌘2
```

File Edit Phone Transfer Perform Other Exit

⌘2 -- Appl stock

```
Wait For [-> ]  For 01 min 30 sec  Or Else Hang Up
Send [stockcheck^M]
Wait For [<H>elp: ]  For 02 min 00 sec  Or Else Hang Up
Send [1^M]
Wait For [Menu]  For 01 min 30 sec  Or Else Hang Up
Receive File [Microcom:apple stock closing]
Send [aapl^M]
Wait For [Menu]  For 01 min 30 sec  Or Else Hang Up
Send [quit^M]
Wait For [<H>elp: ]  For 02 min 00 sec  Or Else Hang Up
Send [quit^M]
Wait For [-> ]  For 03 min 00 sec  Or Else Hang Up
Send [off^M]
Wait For [@]  For 02 min 00 sec  Or Else Hang Up
End Receive File
Hang Up Telephone
```

Figure 4
Communicating on autopilot. These two procedures wait until 1:00 a.m., then dial The Source, sign on, retrieve Apple Computer's closing stock figures and save them in a disk file, then sign off and hang up. Two procedures are required to incorporate the more than 25 commands. The GoTo command at the end of the Sign On procedure causes MacModem to perform the Apple Stock procedure. If you're leery of placing your password in a file that others might see, use the Prompt For Text command, which displays a dialog box that lets you type your password then transmits what you typed.

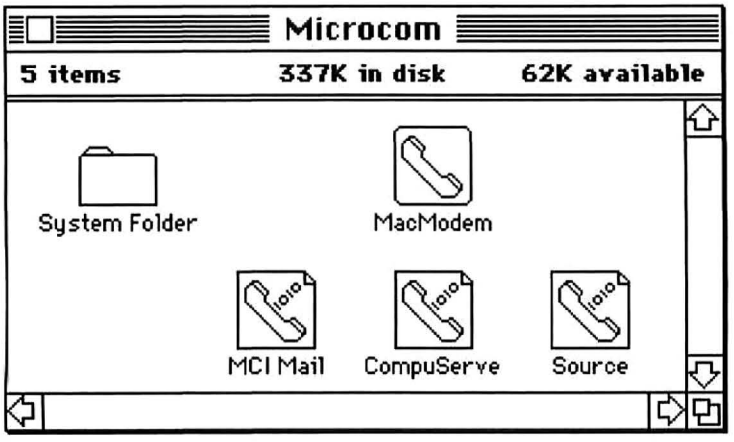


Figure 5
MacModem's setup documents (the three icons at the bottom of the window) let you choose the proper communications settings and procedures for a specific service by double-clicking from the Finder.

The automated communications procedures can also simplify the maze of menus you have to work through when you link up with an information service such as CompuServe's MicroNet Apple User's Group (MAUG). Rather than typing GO PCS-51, XA4, and other cryptic commands, you can place them in a procedure and gain access to the MAUG by either choosing the procedure's name from the Perform menu or typing its keyboard equivalent.

MacModem also creates a setup document that stores the procedures and communications settings for a specific information service such as The Source or CompuServe. You can use a setup document to start the program and load the appropriate procedures and settings by double-clicking the document's icon from the Finder (see Figure 5). You can even create a procedure that automatically starts the Mac communicating with another computer or an information service as soon as you open the setup document.

The MacModem software exploits the Macintosh user interface well. However, the program doesn't use the Key Caps desk accessory. You can't create text containing optional characters, such as mathematical symbols or accent marks, from within the MacModem application because it uses the Option key as a way to send communications control codes. This design means that if you want to transmit a document that contains special characters created with the Option key, you must prepare the document off-line with an application that uses the Option key normally (such as *MacWrite*). Then you transmit the text with the Begin Send File command.

The MacModem software has one feature that is inconsistent with most Macintosh applications. When you choose Quit from the File menu before you save the changes made in a document, most applications ask, "Save changes before quitting?" and save the changes when you press Return. With MacModem, however, when you choose Quit from the File menu before you save the changes made to a setup document, a different dialog box appears. The box contains a message that states, "Setup document changes will be lost," and shows two buttons, one labeled Quit and the other, Don't Quit. If you press either the Return or the Enter key, the program quits, and all your changes are lost. To avoid getting caught by this inconsistency, be sure to choose Save before you quit.

The Road Ahead

At this writing, MacModem works with only the Microcom software. You can't use the modem with Apple's *MacTerminal* or Dow Jones's *Straight Talk* (which simplifies connection to the Dow Jones News/Retrieval service). These programs send modem commands in the Hayes command language, while Microcom's modem has its own command set. Since the MacModem software is powerful, however, most people won't need any other communications software. For those who do want other software, Microcom plans to offer a Hayes-compatibility upgrade free of charge.

Microcom product designers also say they are working on a 2400-bps MacModem system that will sell for about $899. A 2400-bps modem can cut your communications costs even more than a 1200-bps unit, since data is sent and received twice as fast. The designers say 2400-bps capability can be added to Microcom's current 1200-bps modem for approximately $400.

These improvements will make an already excellent product even better. With MacModem, Microcom has raised the standard set by Apple's *MacTerminal* and has boosted Macintosh communications to a new level of ease and sophistication. □

▲▲▲▲▲▲▲▲▲▲▲ *Jim Heid is a freelance writer based in Peterborough, New Hampshire. He is the author of a book on Macintosh BASIC programming and coauthor of a book on Tandy's Model 1000, both forthcoming from Ashton-Tate.*

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Norwood, MA 02062
617/762-9310
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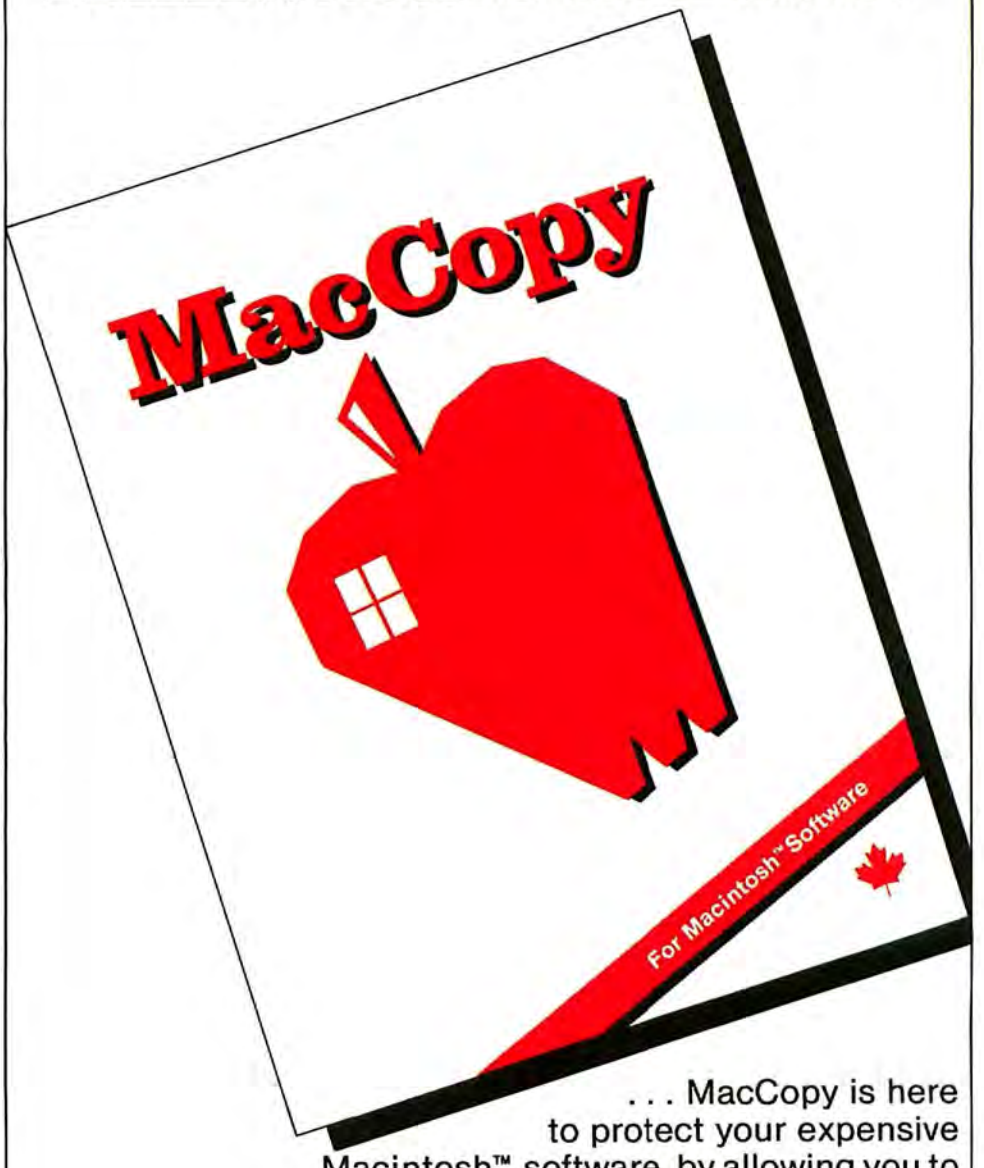

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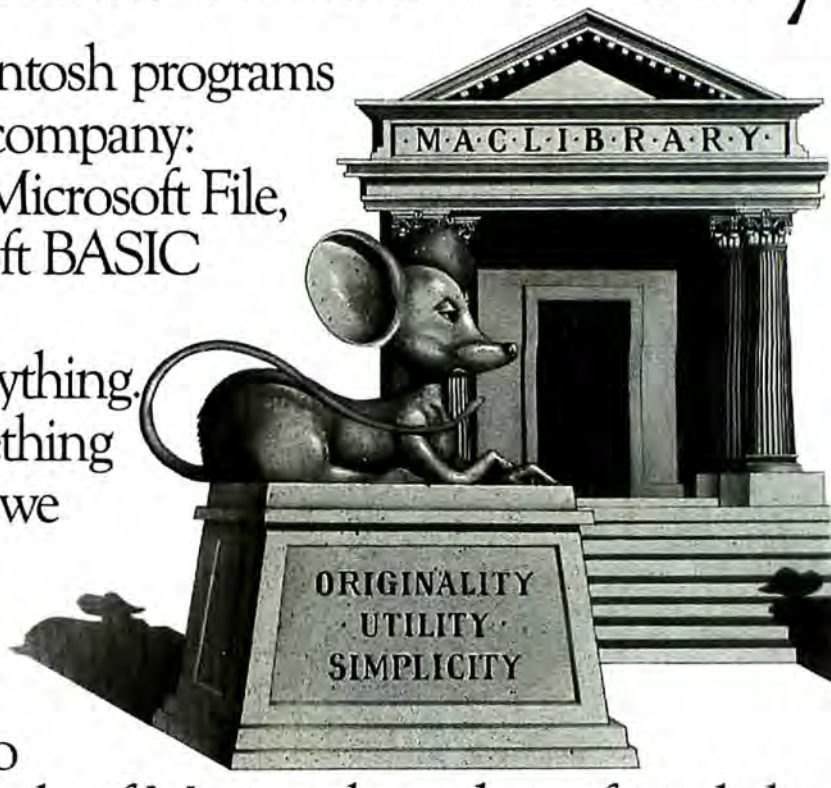

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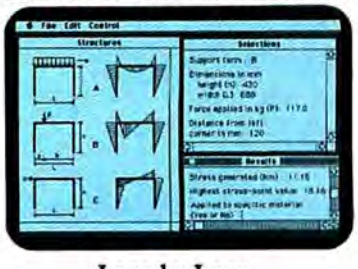

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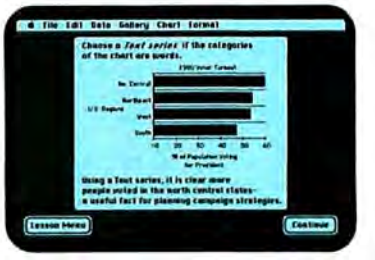

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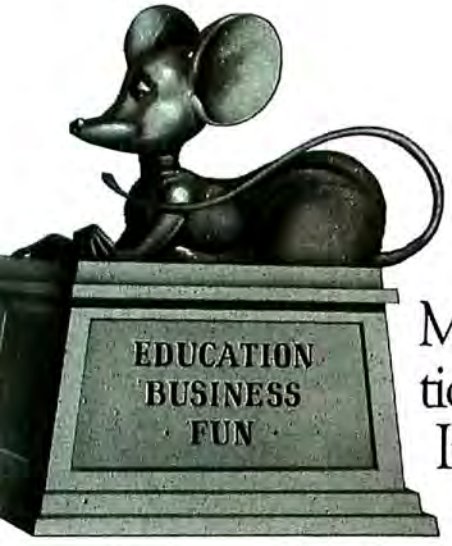

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MAIL TO: 12060 S.W. Garden Place, Portland, OR 97223——Include your telephone number; double check your figures for Shipping, Insurance and Handling (SIH). All items usually in stock. NO C.O.D. Cashiers checks, money orders, Fortune 1000 checks and government checks honored immediately. Personal and other company checks—allow 20 days to clear. Prices reflect 3% discount for cash and Conroy-LaPointe Credit Card purchases, so ADD 3% to above prices for VISA, MasterCard or American Express. Add **SIH CHARGES:** U.S. Mainland, 3% ($5 minimum) for standard UPS ground; UPS Blue, 6% ($10 minimum); for U.S. Postal, APO or FPO, 12% ($15 minimum). Hawaii—UPS Blue. For Alaska or Canada—UPS in some areas only, all others Postal—call or write, or specify Postal. Foreign orders except Canada, 18% ($25 minimum). Monitors by Postal or to foreign countries, 30% ($50 minimum). Orders received with insufficient SIH charges will be refunded. All prices, availability and specifications subject to errors or change without notice, so call to verify. All goods are new, include warranty and are guaranteed to work. Due to our low prices and our assurance that you will get new, unused products—**ALL SALES ARE FINAL.** Call before returning goods for repair or replacement. **ORDER DESK HOURS—8AM to 6PM PST, Monday through Friday, Saturday 10 to 4.** (8AM here is 9AM in New York.)

OUR REFERENCES

We have been in computers and electronics since 1958, a computer dealer since 1978 and in computer mail order since 1980. Banks: 1st Interstate Bank, (503) 643-4678. We belong to the Chamber of Commerce (503) 2289411, and Direct Marketing Association, or call Dunn and Bradstreet if you are a subscriber.

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Retail Sales only. Call stores for local hours.

SAN FRANCISCO — 550 Washington Street (at Montgomery, opposite the Pyramid). Interstate 80, to Highway 480; take Washington Street Exit. **CALL (415) 982-6212.**

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The more the critics look, the more they see in Filevision.™

"It is Filevision's unique integration of object-oriented drawing and database functions that gives it the edge over other stand alone graphics or database applications."

MacLine,™ September 1984

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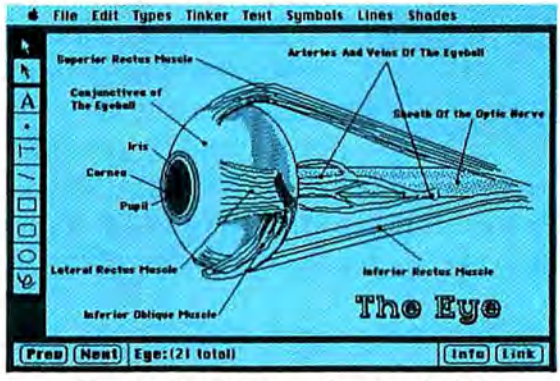
The MACazine, December 1984

"Filevision is elegantly designed and fun to use. Features such as linking files in one drawing with other drawing files—with the ability to quickly jump between the two—are handy."

Whole Earth Review, January 1985



Here's what they saw when they looked into technical drawings. Data forms connected to each object in the picture.

"Filevision is everything Macintosh software should be... (it) stretches the definition of data management in an exciting and novel direction..."

InfoWorld, December 1984

For business, they saw how to map sales regions and track volume. And print out sale reports, in the click of a mouse.

"Filevision is a revolutionary program..."

Macworld, January 1985

"Perhaps the most important conceptual advance in software since VisiCalc is a new Macintosh™ product called Filevision."

Publishers Weekly, November 1984

"...an honorable mention for Software Product of the Year... the best example of a product using the full capacity of (The Macintosh) environment..."

InfoWorld, January 1985

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Circle 54 on reader service card

THE MOST USEFUL IDEAS ARE OFTEN REMARKABLY SIMPLE.

The first filing system was a remarkably simple way to do incredibly useful things. Like organize a business and make it work.

PFS®:FILE and PFS:REPORT are remarkably simple software programs that can help you organize your business faster and more effectively.

And both programs are amazingly easy to learn.

FILE and REPORT were designed for people without computer experience. So all instructions are easy to understand. And you can be productive quickly.

FILE lets you record, retrieve and review information like personnel records and purchase orders. Instantly. You can even cross reference by department or job or however you want.

And you can arrange information in "forms" you design yourself. Or you can take advantage of PFS SOLUTIONS which are pre-designed forms for popular applications like inventory, invoices and ledgers. Either way, you can quickly and easily create the filing system that fits your needs. Not your computer's.

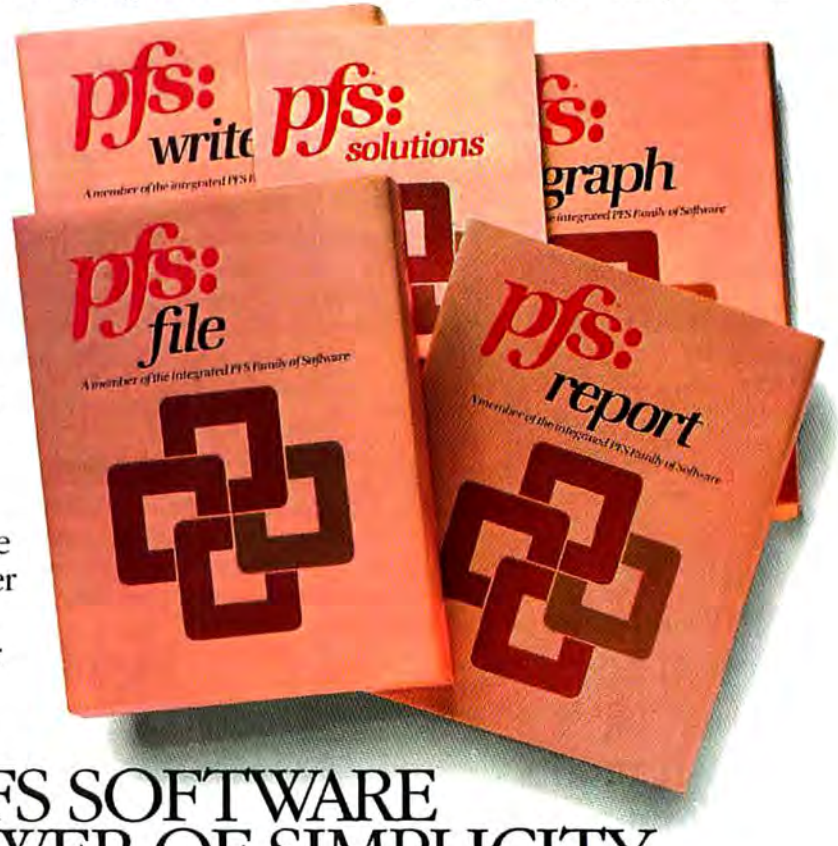
REPORT is the perfect companion program to FILE. Because it gives you the power to summarize and perform calculations on information you've stored with FILE.

With REPORT, you can create presentation quality summaries in table form in just minutes. Automatically sorted, calculated, formatted and printed!

FILE, REPORT and SOLUTIONS are fully integrated with the PFS Family of Software. Which means your computing capabilities can always expand to meet your needs.

PFS: It's the powerful software that's simple to learn. It's the power of simplicity.

See your computer dealer for more details.



PFS SOFTWARE
THE POWER OF SIMPLICITY

PFS:FILE and PFS:REPORT currently work on Apple, IBM, Macintosh,* Tandy,* Commodore,* DEC, Gavilan,* Hewlett Packard,* NEC,* Panasonic, Polo,* Texas Instruments, Compaq, Chameleon, Columbia, Corona, Eagle and Hyperion personal computers.
*Does not work with PFS SOLUTIONS

Macware News

The latest developments in Macintosh software, hardware, and accessories

Edited by Erfert Nielson

Macware News *announces new Macintosh products. Those listed here are available now or will be in the near future. We will keep you informed of developments as the number of products for the Mac increases.*

A note to product developers: because of limited editorial space and a dramatic increase in the number of press releases and product announcements received at Macworld, *we will not be able to list every product description that is submitted to* Macware News. *We will list as many new products as space permits and attempt to represent a variety of categories. Also, please keep in mind that submissions usually take at least three months to appear in print.*

Software

■ *American Softwerkz*

P.O. Box 678
Brandon, FL 34299
813/626-0755

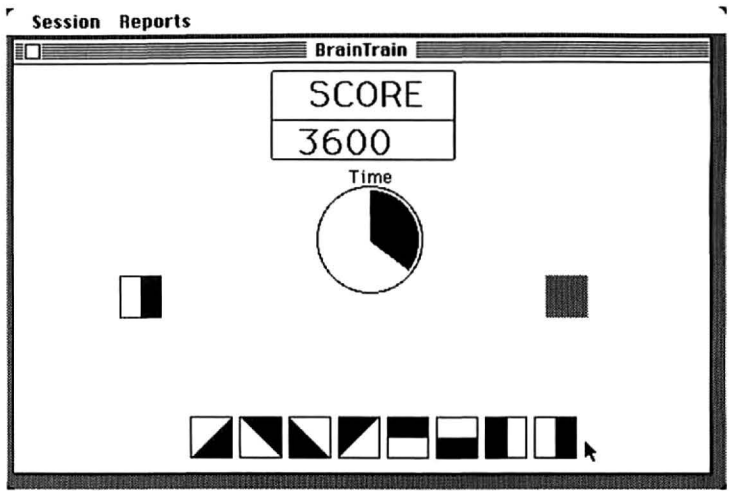
Headline Graphics
A set of 72-point and larger characters that you can paste into *MacPaint* documents and use in signs, posters, or other projects that require large lettering. Among *Headline Graphics'* 18 character sets are carved stone, wood grain, plumbing pipes, train cars, and hoops. List price: $24.95.

■ *Boston Software Publishers Inc.*

19 Ledge Hill Rd.
Boston, MA 02132
617/327-5775

MacPublisher
An application that enables you to write, edit, and lay out articles in a multicolumn format. You use the mouse to arrange text and *MacPaint* graphics on a miniature version of an 8½- by 11-inch page. *MacPublisher* keeps track of the total number of lines and characters in each section of text in your layout. You can format text in one-third-, one-half-, or two-thirds-page columns or set your own column widths. *MacPublisher* allows you to mix column formats on a page and "crop" *MacPaint* pictures to fit across any number of columns. Text can be centered or left, right, or full justified and can be typed in a variety of fonts, including commercially available fonts that you can load with the Font Mover.

MacPublisher's editing techniques are similar to those of *MacWrite,* but *MacPublisher* also includes a vertical ruler with measurements in inches, centimeters, pixels, or lines of text; a scissors pointer that lets you clip a column of text into fragments; condensed or wide-pitch text; and variable leading. Unlike *MacWrite, MacPublisher* lets you place text and graphics on the same line. List price: $99.95.



BrainTrain, Brainworks

■ *Brainworks, Inc.*

24009 Ventura Blvd.
Calabasas, CA 91302
818/884-6911

BrainTrain
An educational program designed to strengthen the cognitive skills attributed to the left and right hemispheres of the brain. The program provides performance feedback and scores in response to a variety of stimuli, helping you retain verbal and numeric information (a left-brain skill) and abstract visual information (a right-brain skill). The left-brain exercise begins with comparisons of nonsense syllables and progresses to complete words. You then compare sets of digits and type them from memory. The right-brain exercise requires you to recreate patterns from sets of displayed "building blocks." The left- and right-brain exercises are then combined to create more complex problems. List price: $39.95.

■ *Devionics*

P.O. Box 2126
Covina, CA 91722
818/332-3131

Magic Slate
A program that provides a variety of tools for producing graphics on the Macintosh. *Magic Slate* includes a number of pen sizes, pen modes (black, white, and reverse), and patterns. Other options include the ability to reverse black and white, modify patterns, and customize the pens. Documents created with *Magic Slate* can be transferred to *MacPaint* and edited. List price: $99.

■ *EnterSet*

410 Townsend #408
San Francisco, CA 94107
415/543-7644

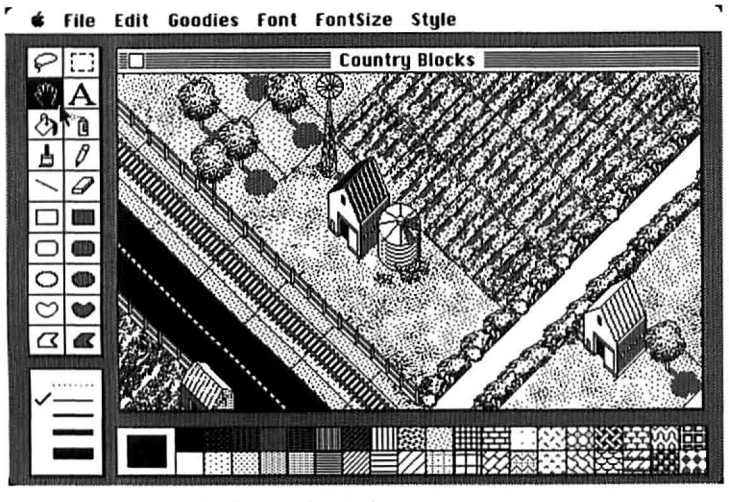
DeskMate
A program that helps you organize and plan your activities. DeskMate, which is installed as a desk accessory under the Apple menu, includes a notepad with a filing system and full editing capabilities, a phone directory, a calendar and appointment book, and a financial calculator with several built-in functions including rate of return, discounted cash flow, depreciation calculations, and amortization and interest problems. The program also provides password protection for files. List price: $99.95.

■ *Hayden Software Co.*

600 Suffolk St.
Lowell, MA 01854
617/937-0200

da Vinci Building Blocks
A graphics package that lets you create three-dimensional views of architectural structures. You use the mouse to combine any of *Building Blocks'* more than 400 predrawn architectural elements into buildings and landscapes. The images are used in conjunction with *MacPaint,* so you can use *MacPaint's* drawing and editing features to modify designs. *Building Blocks* provides stylistic elements from a number of historical periods. List price: $79.95.

da Vinci Commercial Interiors
A disk containing more than 450 scaled images that you can use to construct layouts of offices or other commercial space. *Commercial Interiors* images include desks, chairs, tables, computer and office equipment, theater seats, exercise equipment, and modular walls and partitions. You install the images in *MacPaint's* Font menu and enter them from the keyboard; to change an image's scale you change the font size. You can use *MacPaint's* tools to move or modify the images. List price: $199.95.



da Vinci Building Blocks, Hayden Software

■ *Mainstay*

28611B Canwood St.
Agoura Hills, CA 91301
818/991-6540

MacASM
An integrated assembly language development system for the Macintosh. MacASM offers an integrated editor, macroassembler, and resource compiler. The flexible assembler assembles source code from memory or disk to memory or disk and offers full macro capability. Numerous directives, full expressions, and Macsbug debuggers simplify program development. Source files can be edited in *MacWrite.* MacASM is not copy-protected and can be used with multiple drives, including hard disks. It comes with six source code samples. List price: $125.

■ *McCarron-Dial Systems*

P.O. Box 45628
Dallas, TX 75245
214/247-5945

McFlip
A game based on the classic game of reversi, in which you trap an opponent's playing pieces with your pieces; the player who has the most pieces on the board when all spaces are filled wins. You can play against the Mac or another player, select the level of difficulty, and ask the program for hints. Within each of its four skill levels, *McFlip* improves as you do, maintaining a constant challenge. List price: $34.

■ *MicroLab*

2699 Skokie Valley Rd.
Highland Park, IL 60035
312/433-7550

Tax Manager
A tax preparation program that calculates, prepares, reviews, and prints federal income tax forms. The program uses your responses to questions to determine which forms to file along with the 1040 and which deductions to claim. If you change a figure on the return, *Tax Manager* automatically changes all related figures; this feature allows you to evaluate different tax strategies. List price: $180.

■ *Microsoft Corp.*

10700 Northup Way
Bellevue, WA 98004
206/828-8080

Entrepreneur
A competitive simulation of the software industry. You compete with your opponents to develop a business plan that will make the profits of your company the largest in the industry. You make monthly decisions in five areas: pricing, production level, and expenditures for marketing, production facilities and equipment, and research and development. You keep track of your opponents' progress by reading *Bitt* magazine, a monthly journal that covers the software industry. *Entrepreneur* also provides graphs and reports to help you review your company's financial status and plan a business strategy. Two to nine companies, controlled either by other players or by the Macintosh, compete for up to 36 rounds, or three simulated years. List price: $49.95.

MUSICWORKS™ BRINGS OUT THE MUSIC IN YOU.

WRITE THAT TOP 40 HIT YOU'VE ALWAYS DREAMED OF.

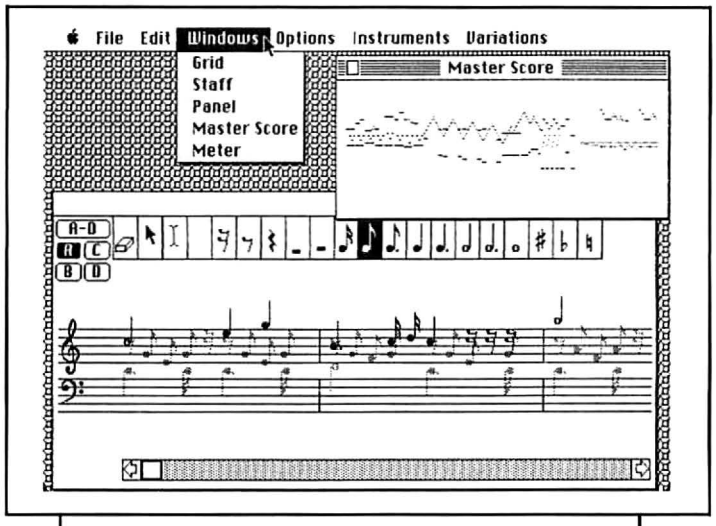
With MusicWorks you can compose music directly on your Macintosh™ and hear the results instantly.

Even if you can't read a note, you can easily use MusicWorks to produce professional musical scores. You compose on a seven-and-a-half octave grid that corresponds to the keys of a piano. Use your mouse to place "notes" on the grid. As you place them, you hear them. When you've got your song the way you want it, MusicWorks can transform your grid into a musical staff, insert the proper musical notation, and print it out in a professional format which any musician can follow.

If you already know musical notation, you can compose directly on a staff. Use the mouse to place your notes, to select the meter and key signatures, and to listen to your music instantly.

Either way, grid or staff, if you make a mistake or want to change something, simply erase and edit.

You can play back your whole composition or any part of it whenever you want.



ORCHESTRATE 4 PARTS SIMULTANEOUSLY.

Choose any 4 instruments from out of a selection of 10. You've got piano, chimes, flute, trumpet, organ, even a synthesizer for that contemporary electronic sound.

You can hear all four instruments at once, or turn them off selectively so you can alter individual parts.

A LITTLE BACH IN EVERY BOX.

MusicWorks comes with templates which guide you through the instructional process by playing classical and popular selections.

MusicWorks is part of the Hayden HeadStart Program which allows schools to accumulate points toward free computers, peripherals, and software. Buy MusicWorks, and your school will receive 50 HeadStart Points.

MusicWorks. Only $79.95. Contact your local computer software dealer or Hayden Software, 600 Suffolk Street, Lowell, MA 01854, phone toll-free 800-343-1218.

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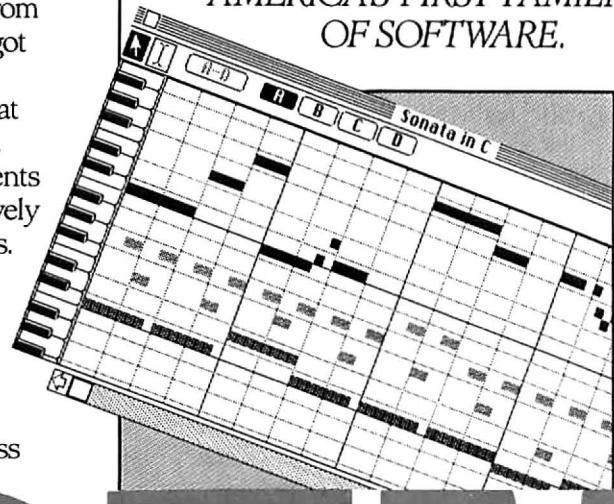

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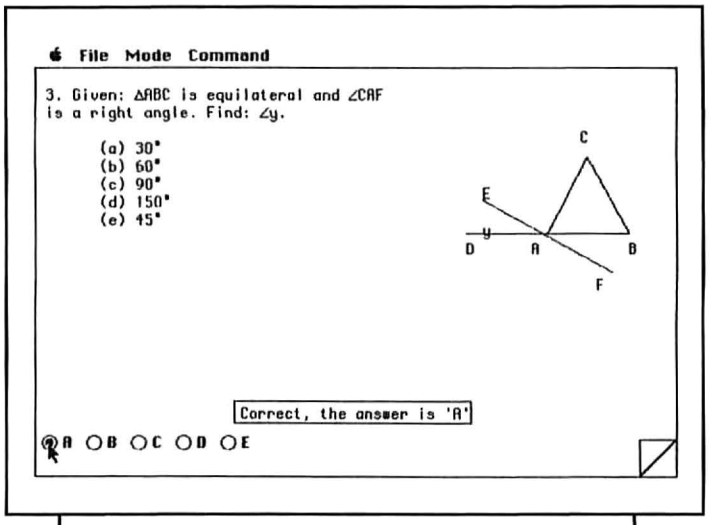
THE BEST SCORE IMPROVEMENT SYSTEM FOR THE SATs*. NOW AVAILABLE ON THE MACINTOSH.™

HAS HELPED THOUSANDS OF STUDENTS ALREADY. NOW IT'S YOUR TURN.

Hayden's Macintosh-based Score Improvement System for the SAT includes simulated SAT exams and complete reviews of the Verbal and Math topics typically found on the SAT.

The program takes complete advantage of all Macintosh ease-of-use features. All material necessary to complete examples or answer test questions, including diagrams, appears on your screen. A click of your mouse moves you quickly from one part of the program to another. To answer a question, either use your mouse or type in the answer directly from your keyboard.



CONTAINS EVERYTHING YOU NEED TO SUCCEED.

The system's first module, Practice Tests, contains 3 sections. The Analysis of the SAT section shows you the workings of the actual exam and its organization and scoring. Plus it gives you test-taking strategies and tips for raising your scores. The Pre-Test section determines your strengths and weaknesses in Math and Verbal sections representative of the SATs. The Practice Test section shows you exactly what you'll be facing when the real time comes. It includes simulated exams timed and formatted according to the latest SATs. These exams are scored for you on the SAT "800" scale.

The Verbal Module covers vocabulary and reading comprehension. The Vocabulary section reviews antonyms, analogies and sentence completions. It includes an extensive on-screen dictionary. The Reading Comprehension section offers strategies and practice in reading passages and in responding to questions about those passages.

The Math Module's Algebra section covers linear and literal equations, systems of linear equations, quadratic and radical equations, and reducing fractions. The Geometry section covers angle sums, equality of angles and sides of triangles, parallel lines, angles of a circle, the Pythagorean Theorem, special triangles, perimeters, areas and volumes. The Quantitative Comparisons and Word Problems section covers all the Math Module's remaining subjects.

Hayden's Score Improvement System for the SAT is part of the Hayden HeadStart Program which allows schools to accumulate points toward free computers, peripherals, and software. Buy Hayden's Score Improvement System for the SAT and your school will receive 50 *HeadStart Points.*

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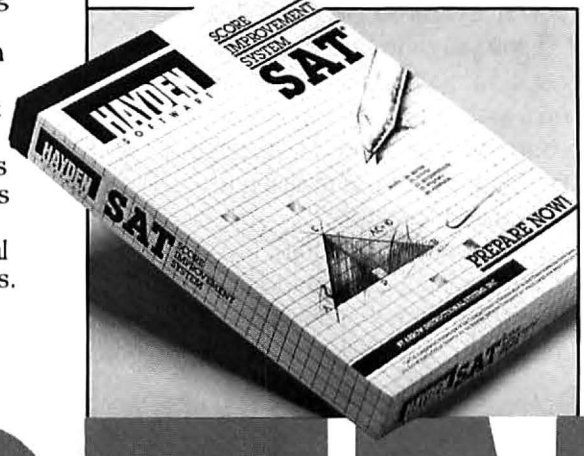


HAYDEN

PIT YOUR PLUCK AND WIT AGAINST THE FORCES OF EVIL IN THE MYSTICAL GAME OF THE HOLY GRAIL.

IT GETS BETTER WITH TIME.

For centuries, valiant knights have pursued in vain the fabled Holy Grail.

Thank the fates, oh brave adventurer, that you come better equipped in your search than the many who went before you. They had naught but the brute force of sword and lance. You have something far, far mightier, the awesome power of your Macintosh™ and the wondrous game of The Holy Grail. With those two at your beckoning, you can journey through the medieval countryside; do battle with bold knights and foul dragons; converse with kings, thieves, and clerics; rescue a fair princess; and pursue a treasure which has eluded mankind for ages.

ACT QUICKLY. THIS GAME WILL NOT BE THE SAME AFTER YOU TURN THE PAGE.

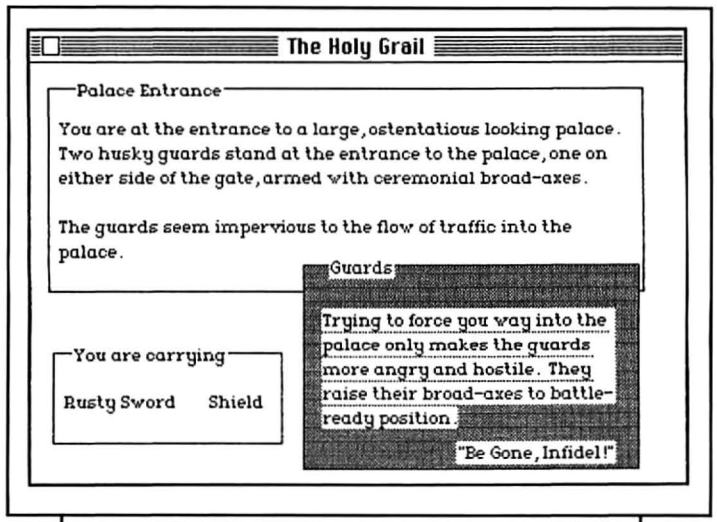
The Holy Grail is one of Hayden's innovative new TimeQuest™ Adventure games. In these games of interactive fiction, the passage of time plays an active and crucial role. The whole nature of the game changes instantly, before your very eyes. If you aren't wise enough or swift enough to take advantage of circumstances, you may forever alter the course of your future.

So come! Through the ages, countless others have tried and failed. Now it's your turn. Take up the quest. Succeed, and you catch a glimpse of immortality.

But be wary! Myriad pitfalls lurk. You will need extreme cunning if you are to evade the treacherously clever villainy you will encounter along the way.

If you be the least bit faint of heart, try some other game instead. For dangerous adventures aplenty await you in your bold attempt to unravel the age-old secret of The Holy Grail.

The Holy Grail. Only $49.95. See your local software dealer, or contact Hayden Software, 600 Suffolk Street, Lowell, MA 01854, phone toll-free 800-343-1218.



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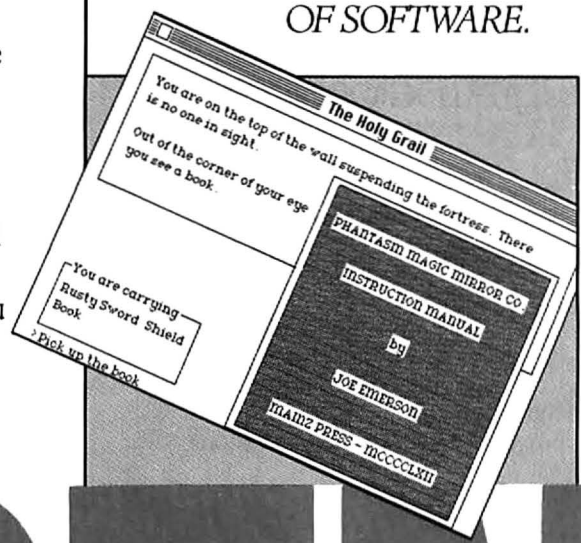
AMERICA'S FIRST FAMILY OF SOFTWARE.



HAYDEN

I KNOW IT'S HERE SOMEWHERE.™ THE COMPUTER PROGRAM THAT GETS YOUR FACTS STRAIGHT.

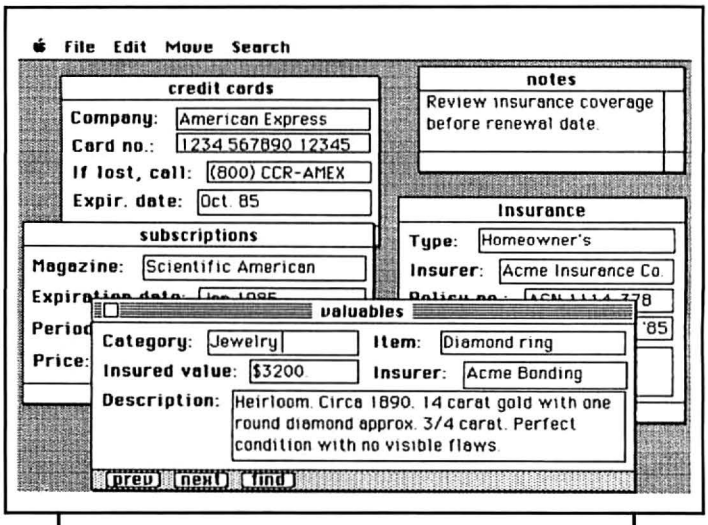
FOR ANYONE WHO WANTS TO BE ORGANIZED BUT CAN'T SEEM TO MAKE IT HAPPEN.

"Why can't I ever find anything when I want it?" Does that sound familiar? If so, you need I Know It's Here Somewhere. I Know It's Here Somewhere is a simple, foolproof filing system for home, business, or school. It gives you a perfect way to catalog and store all that important information you know you have but can never seem to find when you need it most.

Users of large computer systems have been using similar programs for years. They call such programs database management systems. I Know It's Here Somewhere takes that basic, proven concept and simplifies it for everyday use.

ANYTHING YOU CAN CATALOG OR LIST, YOU CAN STORE AWAY ON I KNOW IT'S HERE SOMEWHERE.

To create a format, simply use your mouse to position your basic headings, or fields as they're called, where you want them. That's all there is to it. I Know It's Here Somewhere takes it from there. You supply the information, and the program provides the organization.



The program comes with several standard formats ready for immediate use. There are formats for filing stamps, books, slides, coins, correspondence, recipes, membership lists, names and addresses, credit card numbers, warranty information for household appliances, investments, insurance policies, financial data, capital assets, even the wine in your cellar.

But the program does much more than simply store your information away. It also lets you rearrange it or look at it in different ways.

You can do a sort. Find all the British stamps in your collection, for instance. Then you can do a second sort. Of all those British stamps, find the ones bearing a queen's picture. Or suppose you're doing a mailing, and you want it to go only to single people living within a certain ZIP code. No problem with I Know It's Here Somewhere. Two sorts, and the information is ready for printout.

The program will find any piece of information for you even if you have nothing more to go on than a single letter within its name.

If you do a lot of bibliographies, I Know It's Here Somewhere gives you a special block at the bottom of your screen that you can use to store footnotes. You can then use the program as a word processor to correct, add, or delete your footnotes as you need.

When you see how easy it can be, isn't it time you got organized?

I Know It's Here Somewhere. Only $59.95. Contact your local computer software dealer or Hayden Software, 600 Suffolk Street, Lowell, MA 01854, phone toll-free 800-343-1218.

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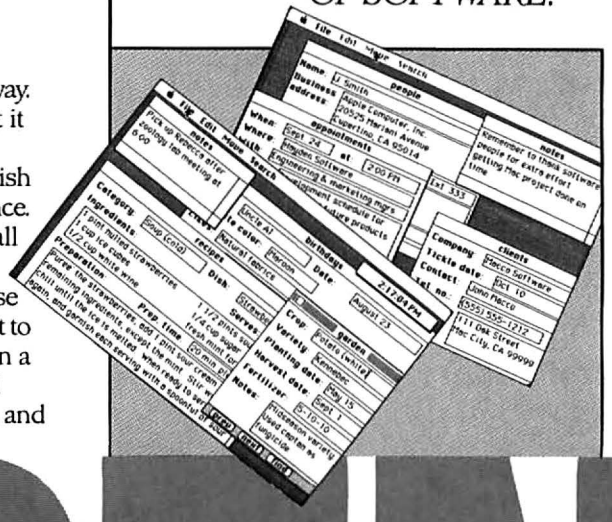


HAYDEN

■ *Mycroft Labs, Inc.*

P.O. Box 6045
Tallahassee, FL 32314
904/385-1141

Mite/Mac
A communications program that handles multiple protocols, automatic log-on, help menus, automatic dialing and answering, and direct file transfer from the Mac to another computer. *Mite/Mac* gives you access to information services such as CompuServe, The Source, and the Dow Jones News/Retrieval service and enables you to transfer text or binary files between the Mac and other personal computers. *Mite/Mac* is compatible with most other communications packages such as *MacTerminal, CLink-Crosstalk,* and Hayes *Smartcom*. The program also allows you to change and store communications parameters. List price: $145.

■ *NewSoft*

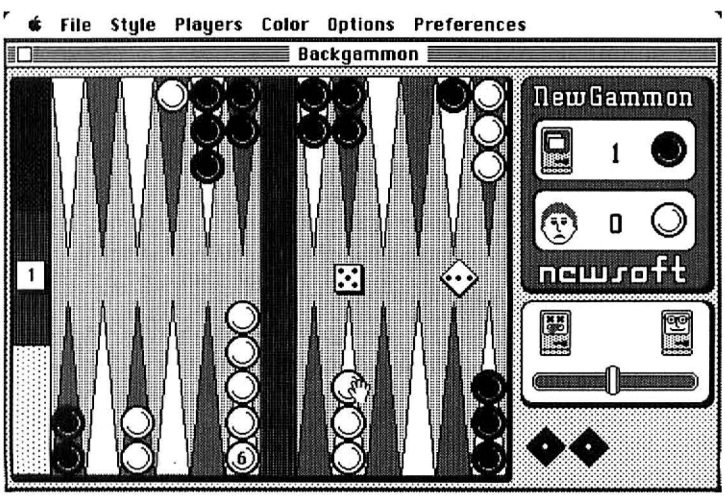
P.O. Box 4035
Newport Beach, CA 92661
714/646-0948

NewGammon
An animated backgammon game that lets you play against the Macintosh or another player. *NewGammon* includes tournament scoring, adjustable skill levels, and a doubling cube. The program also includes an arcade-style game based on backgammon. Players can save games, withdraw moves, set up any position on the board, change sides at any time, and ask for hints. The disk provides backgammon rules and strategy tips for beginners. List price: $39.95.

■ *Organizational Software Corp.*

2655 Campus Dr. #150
San Mateo, CA 94403
415/571-0222

Omnis 3
A hierarchical and relational database management system that allows you to create custom turnkey systems. *Omnis 3* can handle 24 files, 12 at a time; since the program is disk-based, the number of records is not limited by memory. The program lets you design a custom database that includes commands, messages, and pull-down menus. *Omnis 3* includes report generation capabilities, password protection, range and error checking, calculations, global changes, searching on up to 50 fields at a time, the ability to simultaneously present information from different records in multiple files, and the ability to exchange information with other Macintosh programs. The program requires a 512K Macintosh with an external drive. List price: $495.



NewGammon, NewSoft

■ *Public Domain Exchange*

673 Hermitage Ln. #1
San Jose, CA 95134
408/942-0309

Public Domain Software
Disks containing public-domain programs, including utilities, games, fonts, graphics, communications, speech synthesis, and others. List price: $10 per disk plus $4 shipping and handling, $1 for a list of available programs.

■ *RealData, Inc.*

P.O. Box 691
Southport, CT 06490
203/255-2732

Real Estate and Financial Software
A series of programs to use with Microsoft's *Multiplan*. *Financial Overlay Applications* includes Critical Ratio Analysis, Personal Financial Statement, Lease vs. Buy Analysis, Yield on a Wraparound Mortgage, Modified Internal Rate of Return, and Modified Financial Management Rate of Return. *Commercial/Industrial/Development Applications* includes Project Cost Analysis, Lease Tracking, and Annual Income-and-Expense Statement. *Residential Real Estate Models* includes Mortgage Qualifier, Residential Rent vs. Buy Analysis, Comparative Market Analysis, and Mortgage Payment Chart. *Real Estate Overlays* provides Cash Flow/Sensitivity Analysis, Annual Operating Statement, Loan Amortization Schedule, and Internal Rate of Return Calculator. Also available are *Tax Shelter Syndication Analysis,* a package for both conventional and HUD-financed real estate syndications, and *On Schedule,* designed to help developers of condominiums and subdivisions schedule the use of construction funds. List price: *Financial Overlay, Commercial/Industrial/Development, Residential Real Estate Models, Real Estate Overlays* $100 each; *Tax Shelter Syndication Analysis* $295; *On Schedule* $195.

■ *The Reference Corp.*

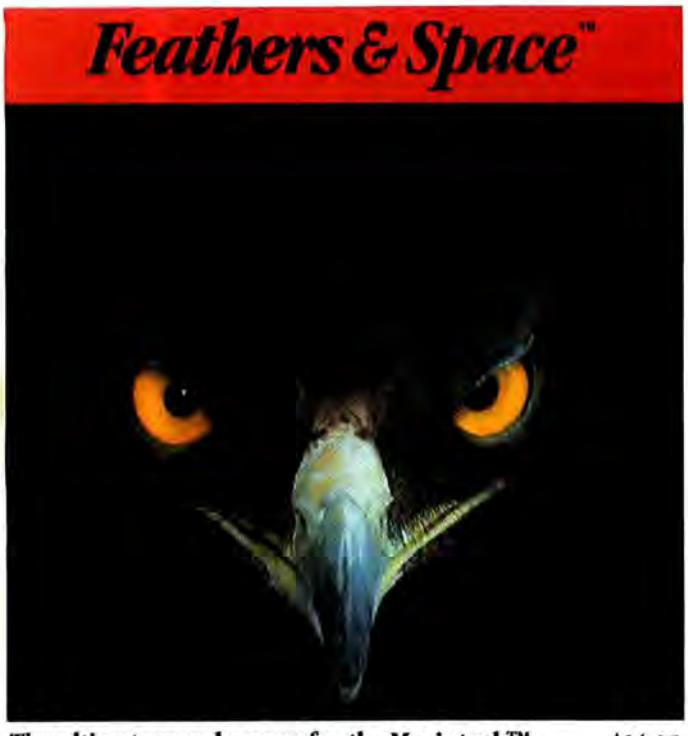
212 Fifth Ave. #1312
New York, NY 10010
212/685-4809

HumanForms
A disk containing approximately 1000 drawings of individual parts of the human body. You assemble the parts in *MacPaint* to create illustrations of figures in a wide range of poses. The disk includes front, back, left, and right views of male and female figures, including a range of motion in 15-degree increments for legs, arms, head, and torso. List price: $59.95.

■ *Scarborough Systems, Inc.*

25 N. Broadway
Tarrytown, NY 10591
914/332-4545

MasterType
An arcade-style typing instruction game in which enemy words and letters hurl missiles at your command ship. The game features satellites, rocket ships, animated explosions with sound, and a "pointing wizard" cursor. *MasterType* provides 18 typing lessons in a range of skill levels and lets you add your own lessons. Your score, average speed in words per minute, number of words typed, and number of mistakes are displayed after each game. List price: $49.95.



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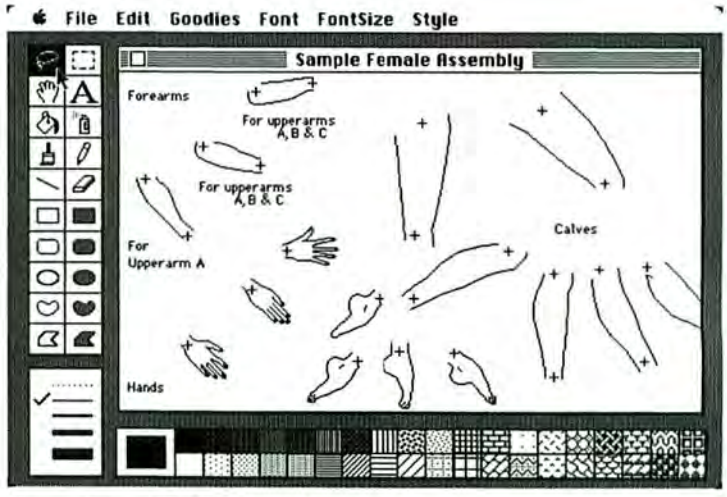

HumanForms, The Reference Corporation

■ *ShapeChanger Software, Inc.*

P.O. Box 1936
Athens, TX 75751
214/677-3509

Webster's Revenge
A word game that challenges you to find words in an array of letters on a 4 by 4 grid. A game consists of a series of rounds, which continue until either the player or the game's built-in dictionary accumulate enough points to win. Words are constructed by connecting letters vertically, horizontally, or diagonally with the mouse. As words are selected, they appear in a window to the right of the grid; the game awards you points for correct words and subtracts points from your score for invalid words. A displayed hourglass times each round. The game allows you to rotate the grid, remove a word from your list if you make an error, and temporarily halt the timer. List price: $34.95.

■ *Silicon Beach Software*

11212 Dalby Pl. #201
San Diego, CA 92126
619/695-6956

Airborne!
An animated game in which you use an antiaircraft gun and a mortar to stave off waves of enemy paratroopers, tanks, and jets. Sound effects, such as helicopter rotors, explosions, and jet engines, were recorded, digitized, and incorporated into the game. List price: $34.95.

■ *Software Applecations*

11510 Alejandro
Boise, ID 83709
208/322-8910

Superfonts
A disk containing 16 text and decorative fonts. Each font comes in at least two sizes, and several are available in five or more sizes. *Presentations*, a disk of borders, textures, and symbols, is also available. List price: $29.95, *Presentations* $29.95.

■ *Softsync, Inc.*

162 Madison Ave.
New York, NY 10016
212/685-2080

The Personal Accountant
A financial management system that makes use of double-entry bookkeeping. You can open as many accounts as you need; when a disk becomes full, you can forward all balances to another disk. *The Personal Ac-*

countant enables you to balance a checkbook; keep track of loans, mortgage payments, expenses, tax deductions, and the like; and generate reports such as Trial Balance, Profit/Loss, Expense vs. Income, and Assets vs. Liabilities. *The Personal Accountant*'s amortization program calculates payments and changing rates and generates amortization and growth tables. A built-in database stores names, addresses, and other account information, which you can print on labels. List price: $89.95.

■ *Tech2000 Software, Inc.*

263 Lugonia St.
Newport Beach, CA 92663
714/650-7240

MacMuscle
A program designed to help you get into good physical condition. You view the program's anatomical diagrams and select the muscles you want to develop. *MacMuscle* then provides a list of appropriate exercises for the muscles you selected. Animated figures also perform a variety of exercises, accompanied by descriptive text. The program will generate a customized workout schedule for you and suggest the training pulse rate that is best for you. List price: $89.95.

Hardware

■ *Haba Systems*

15154 Stagg St.
Van Nuys, CA 91405-1025
800/468-4222, 800/367-4222 in California

HabaDisk
An external disk drive that comes with two programs. *Habadex,* a desktop management program, includes a monthly calendar, a daily appointment book, a Rolodex file, a database, communications capabilities, and report and mailing label generation; *QuickFinder,* a desk accessory, speeds up the process of moving between programs and files. HabaDisk currently uses 400K, single-sided disks but can be upgraded to use 800K, double-sided disks. A double-sided HabaDisk drive will also be available. Contact Haba Systems for more information. List price: $449.

■ *I/O Video*

222 Third St.
Cambridge, MA 02142
617/547-4141

Mac Private Eye
A video digitizer that creates a 512- by 512-dot image (you can view the entire image by scrolling the window) using any standard NTSC (RS-170) video source—a television camera, a television monitor, or a video cassette recorder. The digitized image is displayed on the Mac's screen, allowing you to adjust the picture. Mac Private Eye "grabs" an image in 1/30 second, enabling you to capture one frame from moving television input. Once an image is captured with Mac Private Eye, you can transfer the picture to *MacPaint* and modify it. Mac Private Eye's software includes a "spray paint" random-dot-pattern generator capable of creating numerous shades of gray. The Mac Private Eye system includes hardware, software, cables, and manuals. List price: $595, with camera $799.

Mac Private Eye, I/O Video

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■ *Servidyne Systems, Inc.*

1735 DeFoor Pl. NW
P.O. Box 93846
Atlanta, GA 30377
404/352-2050

Micro-Imager
A video digitizer that lets you capture an image using an NTSC standard (EIA RS-170) black-and-white or color video source such as a television camera, a video cassette recorder, or a laser disk player. The 512- by 322-dot image can be transferred to *MacPaint* and edited. The Micro-Imager provides two capture modes: Two-Shade (best for line drawings) and Multi-Shade (best for photos or other shaded pictures). You can apply fixed or random patterns to a digitized image; a "pattern palette" allows you to modify patterns. The Micro-Imager's controls allow you to adjust brightness and contrast by viewing an external video monitor (not included) or by scanning an image and displaying it on the Mac's screen. The Micro-Imager includes hardware, software, a cable, and a manual. List price: $349.95 (camera not included).

Accessories

■ *American Tourister, Inc.*

Special Products Division
91 Main St.
Warren, RI 02885
401/245-2100

Macintosh Carrying Case, American Tourister

Macintosh Carrying Case
A Cordura nylon case containing movable foam partitions that you can rearrange to accommodate the Macintosh and various accessories. The case features a hard floor, an adjustable padded shoulder strap, a zippered accessory pocket, and a magazine pouch. List price: $89.

■ *The Mouse MATe Co.*

P.O. Box 623
Derby, KS 67037
316/777-4926

Mouse MATe-2, Mouse MATe Company

Mouse MATe-2
A desktop mat on which to move the Macintosh mouse. The high-density foam mat measures 10 by 12 inches and helps prevent wear on the mouse's moving parts. List price: $9.95.

■ *New Technology Associates, Inc.*

578 Lynnwood Ln.
Lancaster, OH 43130
614/687-0129

Colored Ribbons
Nylon ribbon cartridges for the Imagewriter printer. The ribbons are available in red, blue, green, purple, brown, yellow, and black. List price: $10 each (minimum order of two).

Iron-On Transfer Ribbon
A black ribbon that enables you to transfer Macintosh artwork onto T-shirts or other clothing. You insert the ribbon in the Imagewriter, print your document on a piece of paper, and apply a hot iron to the back of the paper to transfer the image. List price: $18.

■ *South Bay Software*

P.O. Box 969
Millbrae, CA 94030
415/579-5455

Mouse Pad
A plastic working surface on which to move the Macintosh mouse. The 9¼- by 9¼-inch Mouse Pad is surrounded by a protective ridge that keeps the mouse from sliding off the pad. List price: $12.95.

■ *Starcor*

6300 La Calma #100
Austin, TX 78752
512/495-6726

Screen Coordinator
A grid that helps programmers design and lay out windows, dialog boxes, and other graphics for Macintosh programs. The Screen Coordinator grid, which is printed on a sheet of clear acrylic, is made up of horizontal and vertical lines spaced 10½ inch apart. Since the Imagewriter and many other dot matrix printers print 72 dots per inch, the space between two grid lines is equal to 10 printed dots. You can draw a graphic image in *MacPaint,* print it out, and place it under the Screen Coordinator to determine the pixel coordinates of items on the printout. List price: $39.95.

Notes

CP/M for the Mac
I.Q. Software of Fort Worth, Texas, is distributing Digital Research's CP/M 68K, an operating system that will enable programmers to convert CP/M programs to run on the Macintosh. I.Q.'s package, which sells for $395, includes four volumes of documentation and six disks of programs: CP/M, a C compiler, a Modem 7-compatible program for program transfer and communications, a macroassembler, a terminal emulation program, and a standard printer driver. To transfer a program from another computer to the Macintosh, a developer must use the communications program with either a modem or a direct connection to the Mac's serial port. I.Q. Software recommends that programmers use a 512K Macintosh for program development. The *CP/M for the Macintosh Catalog* describes available programs, including public-domain software. For further information contact I.Q. Software, 2229 E. Loop 820 North, Fort Worth, TX 76118, 817/589-2000.

Macware News *uses information provided by manufacturers; it does not evaluate or corroborate manufacturers' claims. Send a description of your product and a black-and-white photo or a demo disk to* Macware News, *555 De Haro St., San Francisco, CA 94107, 415/861-3861.* □

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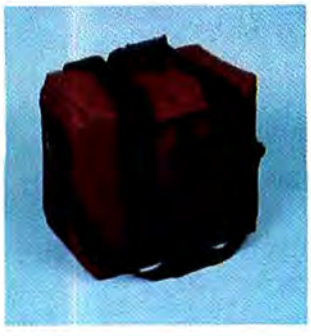

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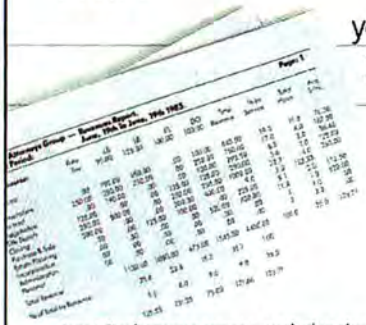

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This lets you see where your profits are coming from. Where your time is going. You can spot trends. Nip unprofitable ventures in the bud. And decide who gets bigger Christmas bonuses. In short, you'll get more done. In less time.

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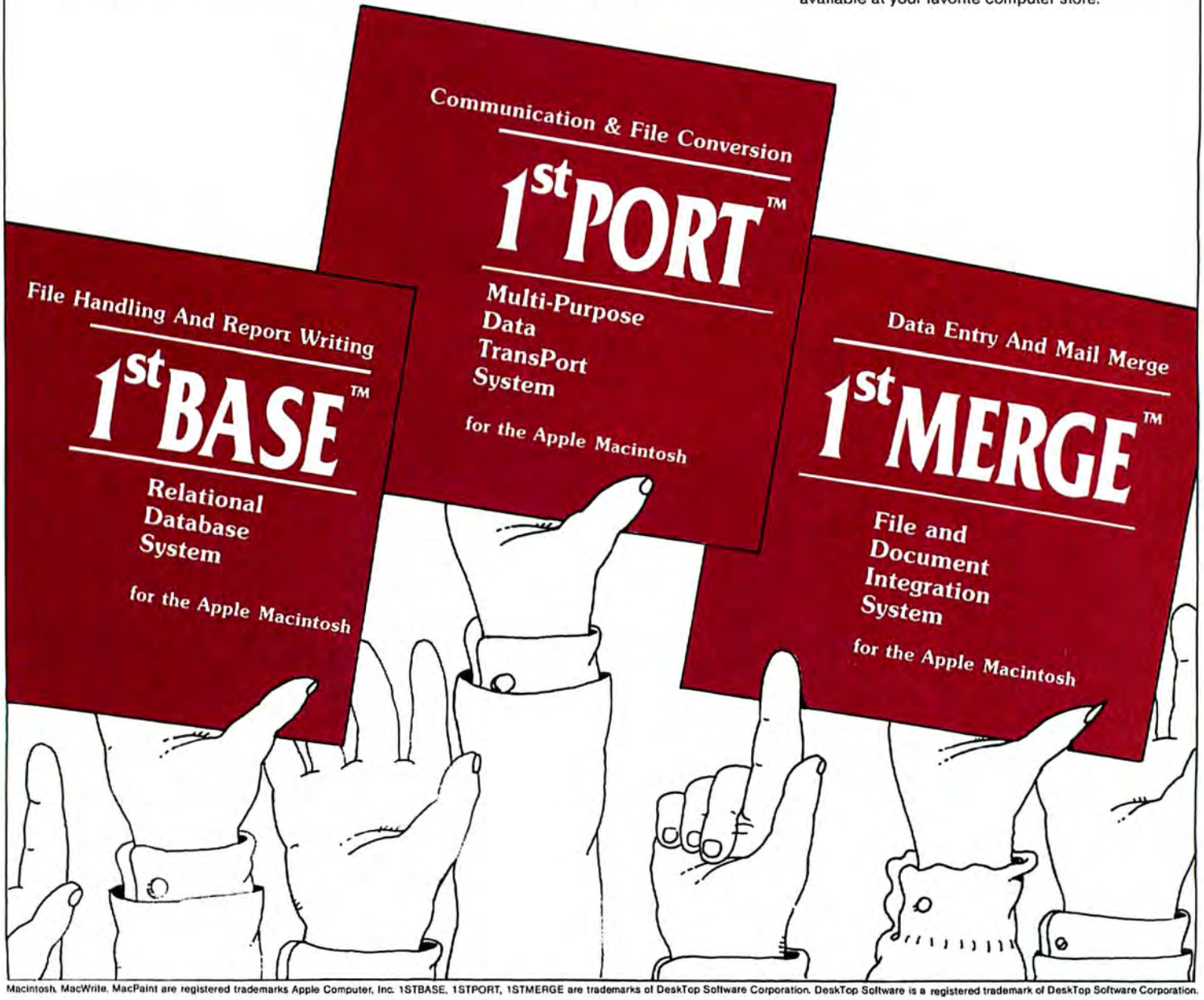
1stMERGE™ is a data-entry and mail merge package that allows for letters, memos and documents created in MacWrite® to be merged with your own data. All of MacWrites's special type fonts and sizes are available. In addition, graphics including graphs and MacPaint® pictures may be pasted into MacWrite documents and merged. Other features include creating up to five across labels and printing directly onto envelopes.

1stPORT, 1stMERGE and 1stBASE all run on both the 128k and 512k Macintosh and are available at your favorite computer store.



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IT WAS HER EYES...

. . . that tipped me off. They looked out through the fancy fur and perfume and told me something was wrong, dead wrong. I'd seen those eyes somewhere, in some long forgotten place, some dingy nightclub on the south side of Chicago. But here she was, strictly East Side Manhattan, if you catch my drift.

She was askin' me to stick my neck out for the long green, but a nasty feeling made me think twice before I made my move. I had to put those eyes to a face, and fast. The solution was on my desk: MAC PRIVATE EYE.™ One quick call to my inside man at headquarters was all it took. Within seconds he copied the mug shot with his MAC PRIVATE EYE video digitizer, modemed it straight to my Macintosh,™ and put the I.D. on this dame. The $595.00 I spent on that MAC PRIVATE EYE probably saved this flatfoot from some serious trouble. One thing WAS clear, my MAC PRIVATE EYE would never leave me short for important information like maps, graphs, blueprints, photos, security I.D.'s, and a thousand other things I hadn't thought of yet. There was only one question; how did I ever get along without it?

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RFI Can Play Havoc With Your Image

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Circle 177 on reader service card

Step by Step with Mac Pascal

Tim Field and Jim Heid

Combine 16 random letters, a time limit, and instructions to find as many words as possible before time runs out. What do you have? Well, if you're Parker Brothers, you have Boggle, a popular word game. If you know Macintosh Pascal, however, you have Word Fun, a game that offers all the fun of Boggle with the added advantage that you'll never lose a letter cube.

The Word Fun game comprises 16 electronic dice with a letter printed on each of the six sides of each die. When the game begins, the cubes are randomly placed in a four-by-four grid with only the top letter of each cube showing (see Figure 1). The cubes are continuously shuffled about in the grid until you click the mouse button to start the game.

Now the heat is on. You have 3 minutes to study the board, looking for letters that can be strung together into words, which you write down on your own sheet of paper. Each letter in a word must be adjacent to the next and previous letters in the word. No die may be used more than once in a single word, and proper names, foreign words, hyphenated words, and slang terms are strictly no-no's. Each word you find can be used only once, even if you can form the same word using different letters. Plural words are allowed and, though often overlooked, provide easy points. Finally, only words containing three or more letters are valid. Figure 2 sums up the rules by illustrating several valid words from the game board in Figure 1.

When the clock runs out, Word Fun sounds several beeps. All players should put down their pencils. Next, each player calls out his or her words to the other players. Any word found by two or more players is crossed out. If someone contests one of your words, it's up to you to show where the word is found on the board and in the dictionary. After all the players have called out their words and crossed out duplicates, they count the words that no one else found. A three- or four-letter word is worth one point, five-letter words are worth two points, six-letter words earn three points, and words longer than six letters bring four points.

You Have to Type to Play

To type Word Fun, start Macintosh Pascal by selecting its icon and choosing the Open command from the Finder's File menu. After several seconds, the screen looks like Figure 3. The window called Untitled is where you type the Word Fun program listing. The Text window is where text produced by the Pascal statements ReadLn, Write, and WriteLn appears. Word Fun doesn't use the Text window; if you don't want the window cluttering up the screen, close it by clicking the close box. Any graphics that a program produces appear in the window titled Drawing. The Word Fun game board appears here and is produced with Macintosh Pascal's DrawLine procedure. You can also display text in the Drawing window in any of the Mac's fonts, sizes, and styles by using the WriteDraw and DrawString procedures. Word Fun uses DrawString to display each letter in the grid, while WriteDraw displays the game's timer.

Type the Word Fun program listing in the Untitled window (see the listing "Word Fun Code"). As soon as you type a character in the Untitled window, the highlighted text within it disappears. Don't worry; you didn't do anything wrong. The text that initially appears in the window is simply Macintosh Pascal's way of reminding you how a Pascal program is set up. And don't worry about typing words in bold or indenting certain lines the way they appear in the listing. Macintosh Pascal does all that for you as you type. If, however, some characters appear in an outline font style, you've made a typing error (see Figure 4). Compare the line where the outline characters appear to its counterpart in the printed listing, and you should be able to locate the error.

You can change the size of the type in the listing window by choosing Type Size from the Windows menu. The Small option displays a program's listing in 9-point type, which is handy when you want to see a lot of the listing at once. The Medium option gives 12-point type, the default font size. The Large option provides 18-point type, which is great for 3 a.m. debugging sessions, when all keywords look alike. Save your work occasionally to spare yourself the agony of losing everything to a power failure. To save the untitled listing, choose the Save As command from the File menu, type **Word Fun**, then click the Save button. The listing window's title bar changes from Untitled to Word Fun. For subsequent saves, use the File menu's Save command.

Running the Program

Once you type the entire Word Fun listing, you can run the program and correct any errors that you may have made. To run Word Fun, choose the Go command from the Run menu. Macintosh Pascal scans the program, looking for errors. If Pascal finds an error, it displays a thumbs-down icon next to the erroneous line and a dialog box with a message describing the problem (see Figure 5). Any errors you encounter can be traced to missed characters or lines. Proofread the erroneous line carefully. If the line is correct, check the lines above and below it.

Once the program is running properly, save it on disk. When you run the program, the Word Fun game board appears, the cubes begin to scramble themselves, and a new game is under way. Pascal's menus dim, and a new menu, Pause, appears. You can stop running the program at any time by choosing the Halt command from the Pause menu. To continue the program from where it stopped, choose the Go command again. To run the program from the beginning, choose Reset from the Run menu, then choose Go.

One Step at a Time

Macintosh Pascal also lets you run a program one statement at a time, as a pointing-finger icon indicates the next statement to be performed. Stepping through a program makes locating errors easy because you have time to study the result of each statement. Stepping through also shows visually how a running program operates, making it an excellent tutor for beginning programmers.

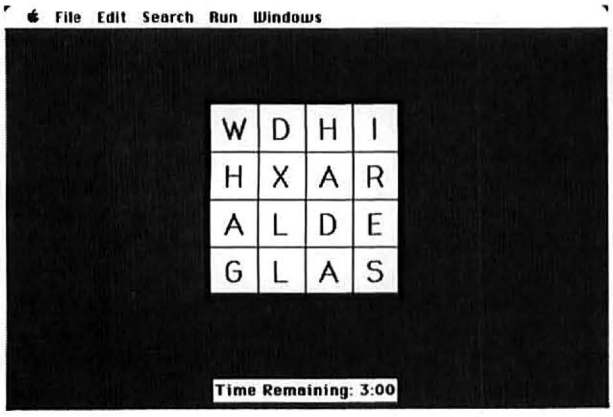

Figure 1
The Word Fun game board. When you start the game, the letter "cubes" shuffle randomly until you click the mouse button. The timer then begins counting down, and the beat is on

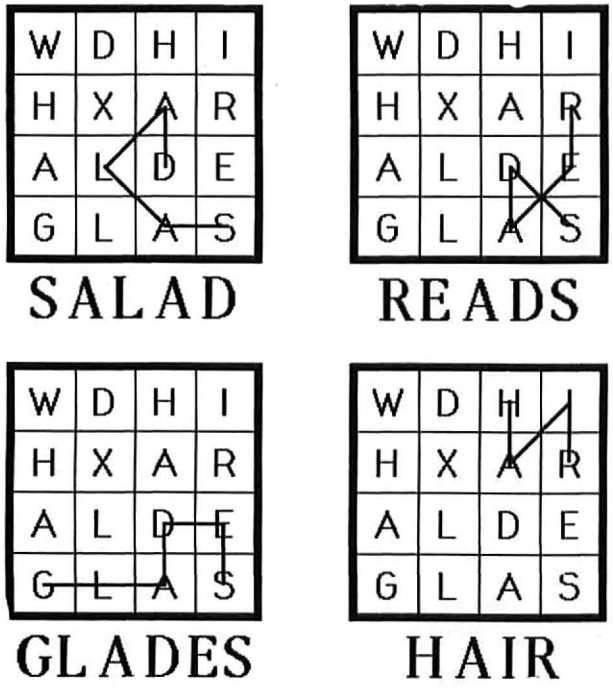

Figure 2
Several valid words from the game board shown in Figure 1. Each letter in a word must be adjacent to the next and previous letters in the word. Three- and four-letter words are worth one point, five-letter words earn two points, and six-letter words bring three points. Words with more than six letters are worth four points.

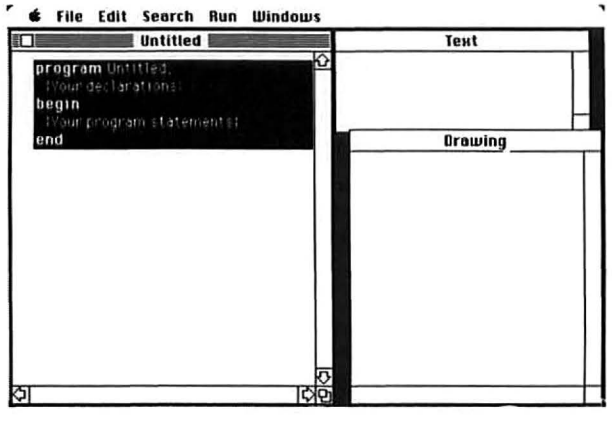

Figure 3
When you start Macintosh Pascal, its three main windows appear, with an example in the listing window to remind you of how a Pascal program is set up. As soon as you type any character, the sample "program" disappears. Here, the text window is inactive, so the close box doesn't show. Click on the window to make the box appear.

To step through Word Fun, follow these steps:

- Choose Reset from the Run menu. This command ensures that Word Fun runs from the beginning in case a previous Halt command stopped it in midstream. Next, make sure the Word Fun listing window is visible. If it isn't, choose the Word Fun command from the Windows menu. The command name is different if you save the program under a different name. Whatever its name, the first command on the Windows menu displays your listing.
- Choose the Step command from the Run menu or, better still, type ⌘-S, the keyboard shortcut for Step. The finger appears adjacent to the Begin keyword that represents the beginning of the main program. Type ⌘-S again, and the finger moves down one line, to the procedure name Init. Type ⌘-S once more, and the listing scrolls to the Begin keyword that represents the beginning of the Init procedure. You can continue stepping through the program using ⌘-S, or you can begin full-speed execution by choosing Go. You can also choose Step-Step from the Run menu to step through the program without having to type ⌘-S repeatedly. Similar to the Step command, Step-Step takes you through one step after another until you halt the program or until the program ends.

A Window into Your Program

Macintosh Pascal's Observe window lets you monitor the program's variables while the program runs. This "software spy" lets you determine whether complex calculations are being performed accurately. If your checkbook program seems to lose track of every deposit you make, you can use the Observe window to make sure that the portion of code that credits your account is written correctly. Another Macintosh Pascal debugging tool, the stop sign, is designed to work with the Observe window. The stop sign lets you specify breakpoints–temporary roadblocks that halt a program wherever you specify, allowing you to monitor what the program is doing and to alter the variables.

You can use the Observe window and the stop sign feature to spy on the method Word Fun uses to determine which letters to draw on the game grid and where to draw them. The procedure involves monitoring three variables: hpos, vpos, and ch. Word Fun uses hpos and vpos to determine where to draw the next letter. The variable ch contains the character itself. Follow these steps:

- Choose Reset from the Run menu to reset Pascal's execution pointer.
- Choose Stops In from the Run menu. A small stop sign appears in the lower-left corner of the listing window. Notice also that the pointer turns into a stop sign when you move it into the area directly above the stop sign.

• Use the Search menu or the scroll bars to locate the comment that reads, { Add a stop below when instructed }. When you locate the line, move the pointer into the stop sign area and click next to the line that reads **FillRect(DrawingRect, Gray);** (see Figure 6).

• Using the Search menu or the scroll bars again, locate the second occurrence of the comment { Add a stop below when instructed }. The second occurrence appears above a line that reads **if (ch = 'Q') then**. Add a stop sign next to this line, too.

• Choose the Go command. Pascal's menus dim briefly, the screen turns white, and the Word Fun listing window disappears.

Those instructions cause Pascal to run Word Fun just up to the first breakpoint. The screen turns white and the listing window disappears because the program statements before the first breakpoint close all the windows and open the Drawing window over the entire screen.

Follow these steps to continue running the program:

• Choose the Observe command from the Windows menu. When the Observe window appears, drag it to the upper-left corner of the screen.

Study the Observe window for a moment. Notice the blinking insertion point in the box after the phrase "Enter an expression." The boxes on the window's right-hand side may contain any Pascal expressions, from a simple variable name to a complex expression that uses Macintosh Pascal procedures and functions. Each time you pause or halt a running program, the result of each expression is displayed in the box to its left. Since you have added a breakpoint to the Word Fun procedure that displays the letters, the values in the Observe window are updated every time the running program reaches that breakpoint. With this in mind perform the following steps:

• Type **hpos**, then press Return. The phrase "Enter an expression" moves down to the next line.

• Type **vpos**, then press the Return key. Again, "Enter an expression" moves down one line.

• Type **ch**; press Return. The Observe window scrolls, pushing the **hpos** and **vpos** lines out of view. Since you want to monitor the three variables at once, scroll to the top of the Observe window and enlarge it using its size box. Make sure the window looks like Figure 7 before you continue.

(continues on page 128)

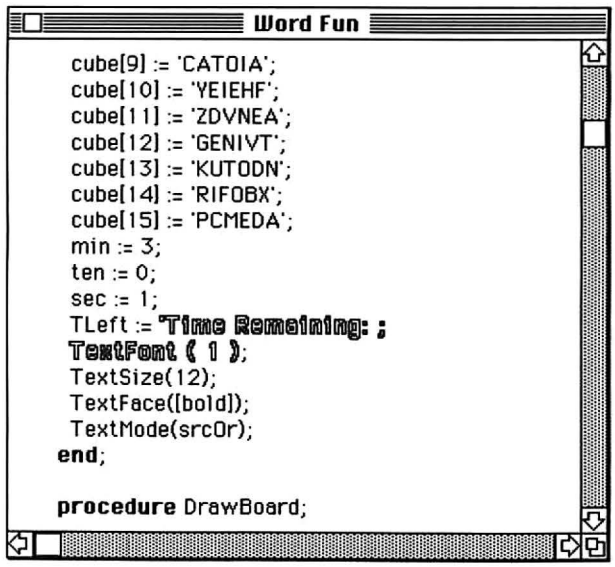

Figure 4
Macintosh Pascal indicates a typing error by outlining characters near the error. Here, a closing single quote has been omitted from the Time Remaining: string.

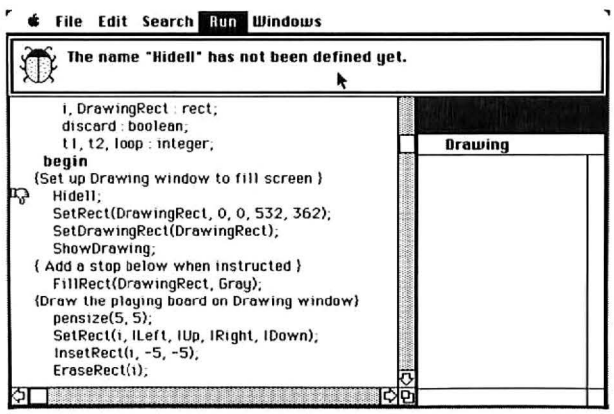

Figure 5
A Macintosh Pascal error message. Notice the thumbs-down icon next to the erroneous line. Here, Pascal is telling you that the name Hidell has not been defined yet. The problem is that an A *has been left out of the name, which should read HideAll.*

Word Fun Procedures

The major procedures in Word Fun use Pascal procedures such as DrawLine, DrawString, and WriteDraw for the game's graphics display.

```
program WordFun;
 const
  lUp = 84;
  lLeft = 174;
  lDown = 243;
  lRight = 333;
 var
  min, ten, sec : integer;
  cube : array[0..15] of string[6];
  time : rect;
  TLeft : string[17];
  SW, SP, TP : integer;


 procedure init;
 begin
  cube[0] := 'UGEYKL';
  cube[1] := 'UGIRLW';
  cube[2] := 'SEDNWO';
  cube[3] := 'SPTLUE';
  cube[4] := 'EALRCS';
  cube[5] := 'PNIEHS';
  cube[6] := 'MOSHRA';
  cube[7] := 'IBALYT';
  cube[8] := 'OBAJMQ';
  cube[9] := 'CATOIA';
  cube[10] := 'YEIEHF';
  cube[11] := 'ZDVNEA';
  cube[12] := 'GENIVT';
  cube[13] := 'KUTODN';
  cube[14] := 'RIFOBX';
  cube[15] := 'PCMEDA';
  min := 3;
  ten := 0;
  sec := 1;
  TLeft := 'Time Remaining: ';
  TextFont(1);
  TextSize(12);
  TextFace([bold]);
  TextMode(srcOr);
 end;

 procedure DrawBoard;
  var
   i, DrawingRect : rect;
   discard : boolean;
   t1, t2, loop : integer;
 begin
{Set up Drawing window to fill screen }
  HideAll;
  SetRect(DrawingRect, 0, 0, 532, 362);
  SetDrawingRect(DrawingRect);
  ShowDrawing;
{ Add a stop below when instructed }
  FillRect(DrawingRect, Gray);
{Draw the playing board on Drawing window}
  pensize(5, 5);
  SetRect(i, lLeft, lUp, lRight, lDown);
  InsetRect(i, -5, -5);
  EraseRect(i);
  FrameRect(i);
  pensize(1, 1);
  t1 := lLeft;
  t2 := lUp;
  for loop := 1 to 3 do
   begin
    t1 := t1 + 40;
    DrawLine(t1, lUp, t1, lDown);
    t2 := t2 + 40;
    DrawLine(lLeft, t2, lRight, t2);
   end;
{Set up TIME REMAINING text on window}
  SW := StringWidth(TLeft);
  SP := (512 - (SW + 36)) div 2;
  TP := SP + SW;
  pensize(1, 1);
  SetRect(time, lLeft, 315, lRight, 337);
  EraseRect(time);
  FrameRect(time);
  InsetRect(time, 1, 1);
  time.left := TP;
  MoveTo(SP, 330);
  DrawString(TLeft);
  DrawString('3:00');
 end;

 procedure DoLetters;
  var
   i, val, cnt, index : integer;
   NextCh : char;
   bool : array[0..15] of boolean;
   store : array[0..15] of integer;

  procedure WriteCh (ch : char;
            sq : integer);
   var
    r : rect;
    horiz, rw, cl, cwQ, cwU, Off : integer;
    hpos, vpos : integer;
  begin
   TextSize(24);
   rw := sq div 4;
   cl := sq mod 4;
   vpos := lUp + cl * 40;
   hpos := lLeft + rw * 40;
   SetRect(r, 0, 0, 40, 40);
   OffsetRect(r, hpos, vpos);
   InsetRect(r, 1, 1);
   EraseRect(r);
```

```
{ Add a stop below when instructed }
    if (ch = 'Q') then
     begin
      cwQ := CharWidth('Q');
      cwU := CharWidth('u');
      Off := (40 - (cwQ + cwU)) div 2;
      MoveTo(hpos + Off + cwQ, vpos + 30);
      DrawString('u');
     end
    else
     Off := (40 - CharWidth(ch)) div 2;
    MoveTo(hpos + Off, vpos + 30);
    DrawString(ch);
  end;

 begin
{Get good approximation of randomness}
  repeat
   i := Random;
  until ((TickCount mod 30) = 0);
{Set up cubes}
  for i := 0 to 15 do
   bool[i] := TRUE;
  for i := 15 downto 0 do
   begin
    val := (Random mod (i + 1)) + 1;
    cnt := 0;
    index := 0;
    repeat
     if (bool[index]) then
      cnt := cnt + 1;
     index := index + 1;
    until (val = cnt);
    index := index - 1;
    bool[index] := FALSE;
    NextCh := cube[i, ((Random mod 6) + 1)];
    WriteCh(NextCh, index);
    store[i] := index;
   end;
{Randomly change letters until mouse click}
  while not button do
   begin
    i := Random mod 16;
    NextCh := cube[i, ((Random mod 6) + 1)];
    WriteCh(NextCh, store[i]);
   end;
 end;

 procedure TimeGame;
  var
   tcnt : longint;

 function TimeTick : boolean;
 begin
  TextSize(12);
  EraseRect(time);
  if (sec + ten + min = 0) then
   TimeTick := TRUE
  else
   begin
    sec := sec - 1;
    if (sec < 0) then
     begin
      sec := 9;
      ten := ten - 1;
      if (ten < 0) then
       begin
        ten := 5;
        min := min - 1;
       end;
     end;
   end;
  MoveTo(TP, 330);
  writeDraw(min : 1, ':', ten : 1, sec : 1);
 end;

begin
 tcnt := TickCount;
 repeat
  tcnt := tcnt + 60;
  while (TickCount < tcnt) do
   ;
 until (TimeTick);
end;

 procedure GameOver;
  var
   loop : integer;
 begin
  SysBeep(40);
  for loop := 1 to 500 do
   ;
  SysBeep(7);
  for loop := 1 to 50 do
   ;
  SysBeep(7);
 end;

{Start MAIN}
begin
 Init;
 DrawBoard;
 DoLetters;
 TimeGame;
 GameOver;
end.
```

(continued from page 125)

Start Observing

You've added breakpoints at the right places, and you've entered the variables you want to observe in the Observe window. Now you're ready to do some observing. Choose Go and watch the Mac screen. The Word Fun game board appears, and values appear in the Observe window (see Figure 8). The values next to hpos and vpos indicate the box in the grid where the next letter is to appear. The letter next to ch is the letter that will appear. Choose Go again or type ⌘-G; you see the letter appear on the Word Fun grid, and then you'll see new values for hpos, vpos, and ch.

Now choose Go-Go from the Run menu. Go-Go lets you run a program nonstop while using the Observe window. When Pascal encounters a breakpoint, it pauses just long enough to update the Observe window, then continues.

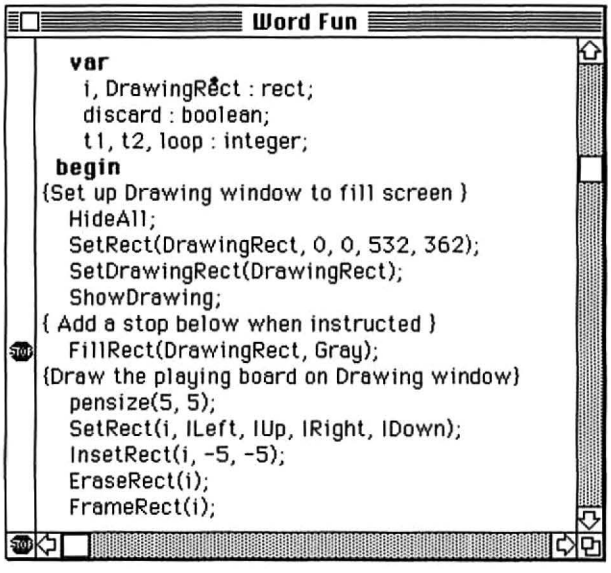

Figure 6
Macintosh Pascal lets you specify breakpoints—temporary roadblocks that halt a program's execution—anywhere in a listing by choosing the Stops In command, then clicking next to the lines where you want the breakpoints. Here, a breakpoint has been set on the line that fills the Drawing window with a gray pattern.

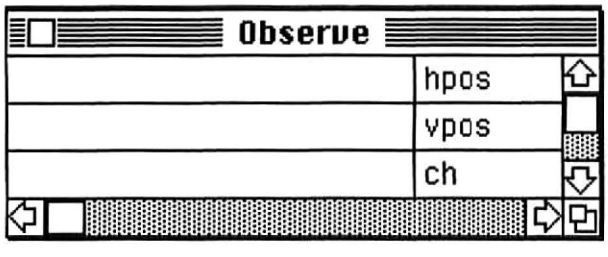

Figure 7
Macintosh Pascal's Observe window eases the program debugging process by letting you monitor program variables to make sure complex program routines work properly. Here, the Observe window has been configured to return the values of the Word Fun variables hpos, vpos, and ch.

Instant Gratification

Macintosh Pascal's Instant window lets you execute any Pascal statement at any time. You can use the Instant window to perform calculations and to change the values of variables while a program is paused. You can even use the Instant window to cheat at Word Fun by changing the value of min, the variable that keeps track of how much time remains.

First remove the second breakpoint (next to the line reading **if (ch = 'Q') then**) from the listing; leave in the first breakpoint. Choose Reset from the Run menu, then choose Go. When Pascal reaches the first breakpoint, the dimmed menus return to normal. Choose Instant from the Windows menu, and the Instant window appears. The highlighted text that reads "Any statements, any time" simply reminds you of the window's purpose. Drag the Instant window to the upper-left corner of the screen and type **min := 3**, but don't click the Do It button yet. Now choose Go to resume Word Fun. Click the mouse button to start the timer, and keep an eye on the time remaining. When you want to give yourself more time, stop Word Fun by

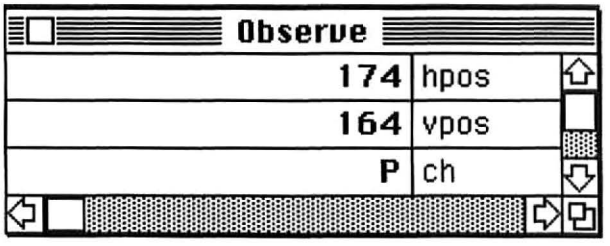

Figure 8
The Observe window in action. The values adjacent to hpos and vpos indicate the box in which the next letter, shown next to ch, will appear. In this case the letter P *will appear in the box located 174 pixels from the screen's left edge and 164 pixels from its top edge.*

Word Fun Procedures

Procedure Name	Purpose
Init	Assigns letters to 16 array variables, each of which represents a cube. Sets the time-remaining value to 3 minutes.
DrawBoard	Hides all windows, then opens the Drawing window and sizes it to fill the screen. Fills the Drawing window with a gray pattern, draws the Word Fun board, then displays the timer.
DoLetters	Randomly assigns each of the 16 cubes to a position on the board. "Rolls" each cube by randomly selecting one of its six sides as the top side, then draws the letter assigned to that side. Randomly selects one of the cubes and rolls it again, drawing the new letter in the appropriate box. Continues rolling cubes until you press the mouse button.
TimeGame	Waits for 1 second to elapse, then checks the timer. If more time remains, reduces the value on the timer by 1 second, then displays the new time remaining.
GameOver	Sounds the game-over alarm.

Word Fun Code

Don't worry about typing words in bold or indenting certain lines the way they appear here. Macintosh Pascal does both for you. It also alerts you to typing errors. You can go through the listing step by step or watch how variables behave at breakpoints that you set.

choosing Halt from the Pause menu, then click the Instant window's Do It button. Finally, resume Word Fun by choosing Go and watch the timer. Surprise! You have 3 more minutes. Try that with an egg timer sometime.

The Next Step

Word Fun illustrates how you can create a simple application in Macintosh Pascal using the language's QuickDraw graphics procedures and how you can study a program's execution using Pascal's superb debugging features. For more details on the procedures used in Word Fun, see the table "Word Fun Procedures."

As you become familiar with Macintosh Pascal, you might start thinking about ways to enhance Word Fun. One useful though complex modification would involve Word Fun searching for words itself, then displaying a list of all possible words at the end of the game. All players could then compare their word list to the game's. You could also modify Word Fun to be a one-player game that would let you type words as you find them. The game could then check the words you type to make sure they are found on the game board. And if you miss the rattling sound that the dice make when they're shaken, add sound effects to the procedure named DoLetters. Happy word hunting! □

Tim Field is a consultant and free-lance technical writer and the author of Using MacWrite and MacPaint *(Osborne/McGraw-Hill, 1984).*

Jim Heid is a free-lance writer and the author of a book on Macintosh BASIC programming, forthcoming from Ashton-Tate.

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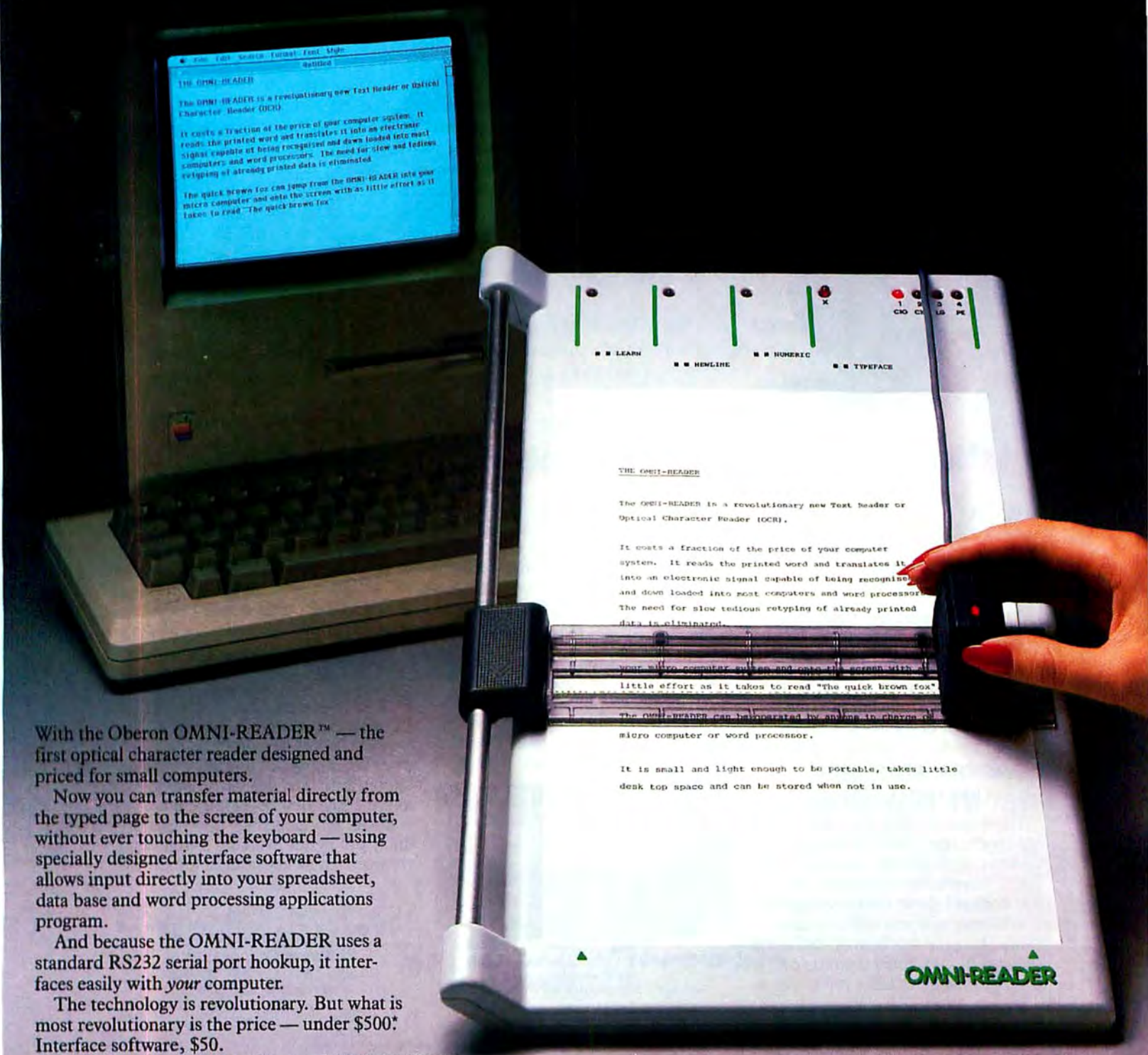

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Open Window

An exchange of Macintosh discoveries

Edited by Daniel Farber

Open Window *offers tips to help you use your Macintosh more efficiently. Submitted by readers, industry experts, and the* Macworld *staff, items in this department address all facets of Mac work, from applications to programming routines to capabilities of the Mac and software not covered in the documentation.*

This month's *Open Window* includes a Microsoft BASIC (MBASIC) program that gives the exact coordinates of the pointer on the screen. We also have a tip on how to use the Font Mover efficiently, a way to add animation to the Scrapbook, a method for creating mailing labels with *MacWrite* and self-adhesive address labels, and a speedy way to change *Multiplan*'s type size.

Mouse Coordinates

Long have I been looking for the perfect way to locate text or graphics on the Macintosh screen. In my ongoing quest I have used screen maps, special rulers designed to frustrate even veteran programmers, and other ideas and routines I am too embarrassed to mention. Photocopies of screen maps work if taped onto the Mac's screen and never moved. However, peering through lined and dotted plastic detracts from the Macintosh's superb graphics.

The MBASIC listing "Mouse Location" gives the exact coordinates of the pixel at the hot spot—the tip of the pointer—and prints them on screen. The only chore for the programmer is to write the two numbers so as not to forget them. A double-click locates and reports the coordinates of two separate pixel locations. This feature lets you measure size parameters for lines, boxes, circles, and even GET statement rectangles, which call for the upper-left and lower-right corner coordinates.

Mouse Location runs in MBASIC versions 1.0 and 2.0. In version 1.0 the program can be preceded by an END statement. Branching can occur in a program whenever some form of screen measurement is needed, as in locating text output. Mouse Location can be merged with any other MBASIC program, or you can renumber it from a distant line number such as 5000 to keep it out of the way. In version 2.0 Mouse Location can be set up as a subprogram and called from any place in a program. It can also reside in the Scrapbook for pasting into any program during writing or editing.

Running Mouse Location involves only pointing and clicking. The numbers that appear in the upper-left corner of the screen are the *X* and *Y* coordinates of the pixel at the tip of the mouse pointer at the time of the click. To measure a distance or a size on screen, position the tip of the pointer on the starting point and double-click. The current coordinates are displayed twice—one set below the other. As you move the mouse, the lower set changes to keep up with the new pointer coordinates. The next double-click freezes the new coordinates and completes the loop. A single click at this time changes the upper set to show the current coordinates of the pointer. To get the coordinates of many points one after the other, as in a complicated line drawing, position the pointer at the starting point of the first line, double-click, and read the upper set of coordinates. Move the pointer to the end of the first line, double-click, and read the lower set of coordinates. When plotting angles, continue double-clicking on the end points of lines and read the coordinates.

James L. Jennings
Solvang, California

```
REM Mouse Coordinates
30 IF MOUSE(0)<>0 THEN 30
40 IF MOUSE(0)=0 THEN 40
50 IF MOUSE(0)<-1 THEN 105
60 X=MOUSE(1):Y=MOUSE(2)
70 CALL MOVETO(20,20)
80 PRINT"X";X,"Y";Y
90 IF MOUSE(0)<>0 THEN 90
100 GOTO 30
105 IF MOUSE(0)<>0 THEN 105
110 X=MOUSE(1):Y=MOUSE(2)
120 CALL MOVETO(20,70)
130 IF MOUSE(0)<>0 THEN 160
140 PRINT"X";S,"Y";Y
150 GOTO 110
160 IF MOUSE(0)=0 THEN 160
170 IF MOUSE(0)<-1 THEN 30
180 GOTO 110
```

Mouse Location

With this MBASIC program you can get multiple measurements, accurate to one pixel, of the pointer's location on the Mac's screen.

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Fast Font Moving

With the following trick, owners of a two-drive Mac can use the Font Mover application with more ease than they might have thought. Contrary to the information given in "Making the Most of the Mac's Fonts" [*Macworld*, January 1985], the Font Mover does not have to reside on the same disk as the System file to be modified. With two disk drives the only requirement is that the disk containing the Font Mover not contain a System file.

I have created a fonts disk that contains only the Font Mover and all my fonts. If I want to change the fonts on a disk, I simply insert the disk into the internal drive, making it the startup disk. I insert my fonts disk into the external drive and double-click the Font Mover icon. The Font Mover acts on the System file in the internal drive, installing or removing fonts, even though the application itself resides in the external drive. In addition, all font files created are saved on the disk in the external drive. With this procedure you don't need to move the Font Mover or font files to the disk you want to modify. This setup speeds font modifications in the System file and saves you the space on the startup disk that would otherwise be occupied by the Font Mover and the fonts file.

Geoff Joslyn
La Jolla, California

Animated Scrapbook

You can add animation to a Scrapbook using *MacDraw* and a modicum of patience. The procedure takes advantage of the way *MacDraw* treats shapes as objects that can be stacked one on top of the other.

To begin, start up *MacDraw* and create a series of overlapping objects that get bigger and bigger or a stack of squares with different textures that pile up. Keep in mind that the design shouldn't take up more than about 4½ by 2¾ inches, the size of the Scrapbook window. Then draw a large, white rectangle completely over the drawing. With the rectangle still selected, delete it by pressing the Backspace key. *MacDraw* then recreates the objects, one by one, in the order that you created them. The speed at which *MacDraw* recreates your masterpiece depends on its complexity. You can move or reshape objects to make a drawing more interesting. When you are finished, select the entire drawing by pressing ⌘-A and choosing the Copy command. Paste the drawing into the Scrapbook. Each time you open the Scrapbook and select the drawing, the objects that make up the drawing are redrawn, creating an animation effect. You can move the Scrapbook file from the *MacDraw* disk to any other program, and the animation effect still occurs.

Gordon McComb
Carlsbad, California

Address Labels

When I put my mailing list in *MacWrite* and printed it out on self-adhesive address labels, I came across some problems and solutions I thought might be of interest to anyone wanting to do the same. Because different fonts have different vertical

spacing, if you have 1 inch in which to print an address, you need to find a font that repeats in 1-inch cycles. The *MacWrite* manual, however, doesn't have this information. With a little experimentation I found that six lines of 9-point are in 1 inch.

When I print the labels, I use Geneva although it looks a bit cramped, while Monaco spreads the characters further apart.

I use Avery #4139 labels (3½ inches wide by 15/16 inch high). They have sprocket holes that fit the printer's pin-feed mechanism and are wide enough for the Imagewriter. The labels are on a 12-inch-long backing, which doesn't match any of the choices in the Page Setup dialog box. I use U.S. Letter, Tall, and select the Cut Sheet option. Every time I'm instructed to reload the paper, I press the Return key.

You could get three lines per 1-inch label with 18-point fonts, but the characters would be so wide that some names would be too long. Labels that measure 5 by 2 15/16 inches are available.

Michael R. Casey
Highland Park, Illinois

Type Size Switch

Instructions have been widely published on how to display *Multiplan* spreadsheets in smaller type by modifying the System file. A smaller type size is useful for getting a wider view of the spreadsheet, but extensive editing is difficult because the small type requires near-perfect pointer precision. I would like to switch between large and small type, but the problem is how to do so efficiently.

Two System files can be in the Mac at the same time, one in the internal drive and another in the external drive. The disk in each drive must contain the Finder, a System file, and *Multiplan*. If one System file contains *Multiplan*'s Seattle font and the other has Seattle deleted and Geneva-18 added, you can switch *Multiplan*'s type size by controlling which disk is the startup disk and which System file *Multiplan* uses. You hold down the Option and ⌘ keys while double-clicking the Finder icon on the disk that you want to be the startup disk. A spreadsheet opened from either disk displays the type size available in the startup disk's System file. This technique works only with *Multiplan* version 1.02 and the Finder version 1.1g. To show clearly which is currently the startup disk, you can make a distinctive desktop pattern for one of the disks by using the Control Panel.

Thomas Piwowar
Washington, D.C.

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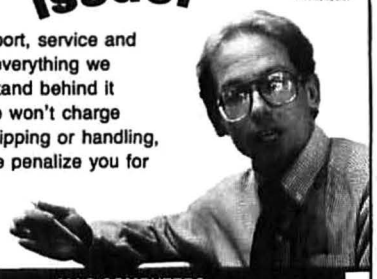

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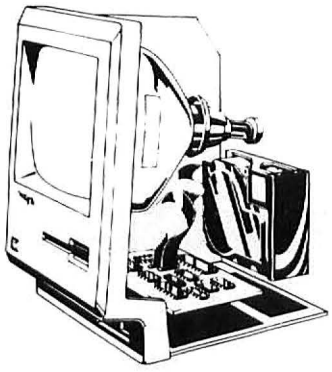

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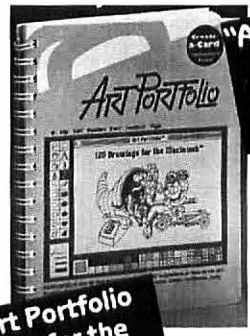

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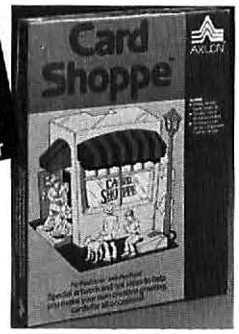

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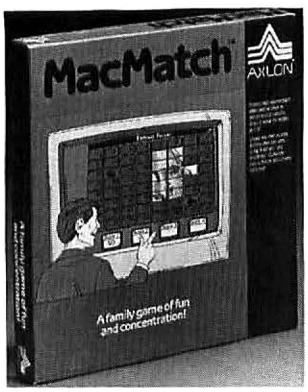

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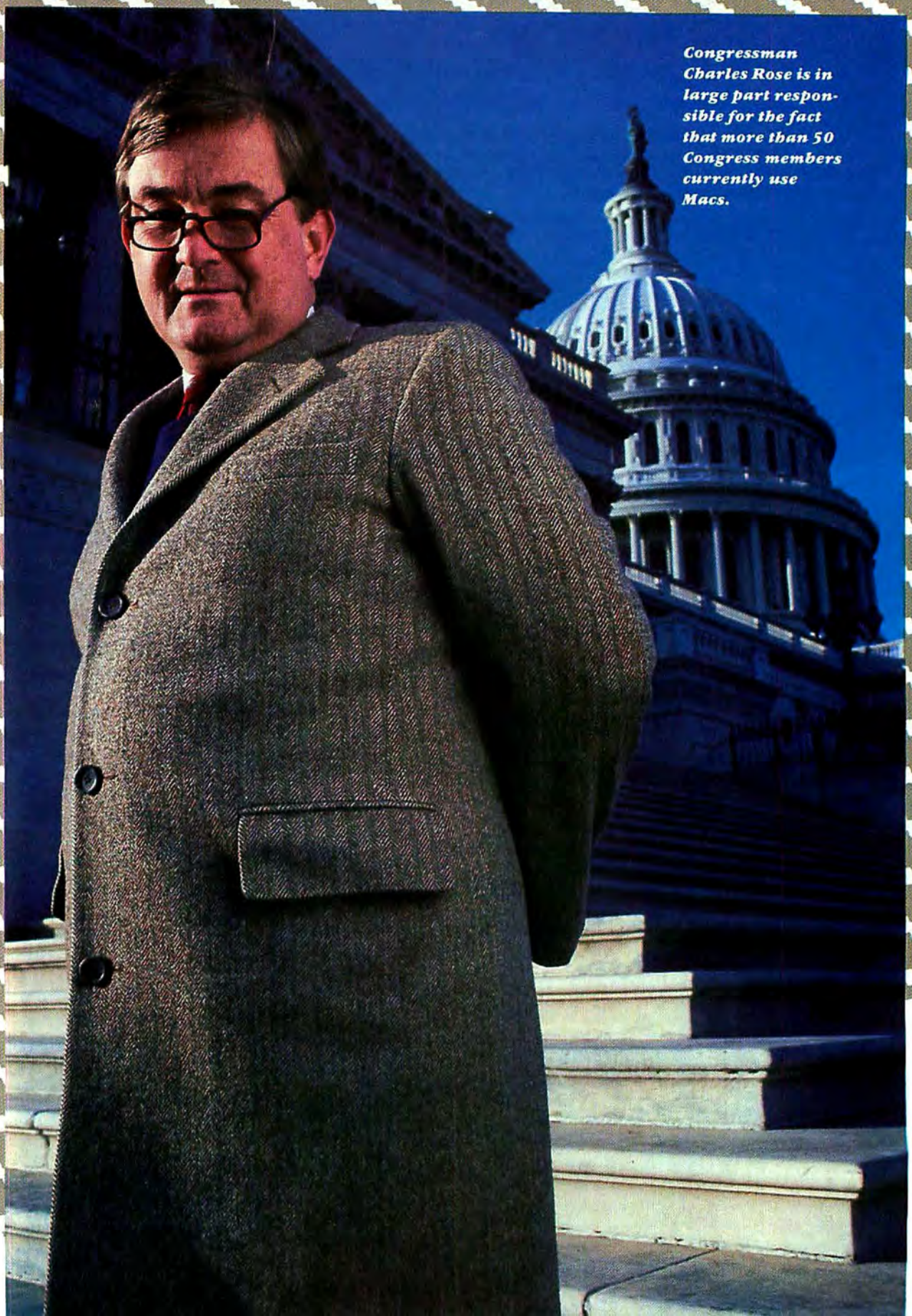

Congressman Charles Rose is in large part responsible for the fact that more than 50 Congress members currently use Macs.

Washington's Capitol Improvement

Rex Hammock

You might expect changing technology to clash with tradition in a 198-year-old institution like the United States Congress. But some people on Capitol Hill believe that the Macintosh may help complete a 12-year effort to turn the House of Representatives into a legislative electronic village.

If you met him in the halls of Congress or out on a tobacco farm in his North Carolina congressional district, you would never guess that Democratic Congressman Charles Rose is the commander-in-chief of a Capitol Hill office automation revolution. Yet even with his good-old-boy looks and southern drawl, this former district prosecutor with a passion for tinkering has led–and at times dragged–the House of Representatives into the high-tech era. When Rose talks computers, people on Capitol Hill listen. And these days Rose is talking Macintosh.

"I have two Macs . . . well, actually three," Rose says, proudly patting the one on his desk. "I have a 128K Mac in my office, and at home I have a 512K Mac with a Tecmar 10-megabyte hard disk. My secretary also has a Mac on her desk."

With typical Mac-owner enthusiasm, Rose shares his vision of a day "in the near future" when Macintoshes will be on the desks of most of his aides, tied together in a hard-disk network driving daisy wheel printers or a shared laser printer.

When Rose arrived on Capitol Hill in 1973, he was surprised to learn that "no one was concentrating on adapting changing technology to help Congress be more effective and efficient." But the American public, he says, "is screaming for us to do our job better and faster."

During the past decade, Rose has led the development of the House Information System (HIS), a computer network that today boasts 22 informational and administrative databases, with another 8 in development. At the same time, Rose has been instrumental in getting the proceedings of the House of Representatives televised and in setting up a 32-channel cable system to carry the proceedings into congressional offices. Eight of the cable channels have been reserved for electronic data transmission in anticipation of changing technological needs.

Today Rose chairs the congressional subcommittee that evaluates new products for placement on an approved list of office equipment House members may lease using government funds. Rose is asked constantly by his colleagues for advice on office automation systems and personal computers.

The growing number of Congress members with Macs in their offices–more than 50 as of this writing–can in part be attributed to Rose's enthusiasm for what he jokingly refers to as "a computer even congresspeople and their top aides can use." Congress members use the Macintosh to organize hectic schedules, manage office budgets, design and illustrate constituent newsletters, send electronic mail between Washington and their district offices, and link up with any of the more than 40 databases maintained by the House of Representatives and the Library of Congress. And of course congresspeople use the Mac to write speeches.

On the Approved List

Indeed, when it comes to speech writing, the Macintosh has provided an unanticipated yet pleasant bonus to at least one farsighted congressperson. Doug Thompson, administrative assistant to Republican Congressman Dan Burton of Indiana, says, "We discovered that printing Dan's speeches in 14-point bold means that he now doesn't have to wear glasses when he delivers statements on the House floor." If Rose may be considered the main Mac backer on Capitol Hill, then Thompson can be called the resident Macintosh guru.

A former journalist and Hill press secretary who got "hooked on computers" in the mid-1970s when his paper's newsroom was computerized, Thompson today manages a fully automated congressional office. And somewhat to his surprise, a Macintosh is the tool he uses to manage it.

"I was the ultimate IBM Personal Computer snob," he explains. "I had a PC at home and one here in the office, and I was convinced that I was going to keep on using it." But that was before his curiosity led him to check out the Macintosh on the day it arrived in Washington stores.

"I was determined not to like the Mac," he says, but he was immediately struck by the computer's simplicity and versatility. "After playing with it for about 15 minutes, I turned to the salesperson and asked how long it would take to get one." That evening Thompson had a Macintosh at home, along with his three other personal computers. A few weeks later, when the Mac made it onto the House approved list of equipment (in near record time due to Rose's enthusiasm), Thompson leased two for the office.

"It took me about a week to transfer all my PC files to the Mac using the Hill's electronic mail system and an early version of *MacTerminal,*" Thompson recalls. Soon he had the office budget on *Multiplan* spreadsheets. He still keeps his old PC *Multiplan* spreadsheets to show people the difference.

On the wall behind his desk, Thompson started posting *MacProject* schedule charts outlining long-range office projects. Bar and pie charts produced with *Microsoft Chart* began appearing in Congressman Burton's constituent newsletter detailing topics ranging from the federal deficit to the balance of trade. The newsletter also began to display a map of Burton's Indiana district drawn by Thompson in *MacPaint.*

Thompson quickly became the Hill's unofficial staff expert on the Macintosh, and a steady stream of congressional aides began to flow through Congressman Burton's office to see how the Mac could be used. "It's gotten to the point," jokes Thompson, "where I feel like asking for a commission from Falcon Systems, which is Apple's vendor to all federal government agencies."

Another person on Capitol Hill who used the Macintosh early is Kevin Peterson, an aide to House Speaker Thomas P. "Tip" O'Neill. Peterson used a Macintosh and *Habadex* software at last year's Democratic National Convention in San Francisco to keep track of the Speaker's schedule and to organize the invitation lists of numerous meetings and social events. The Mac was also used to record the whereabouts of the more than 200 House members who were delegates to the convention.

To keep in touch with constituents in a congressional district that sprawls over three-quarters of Oregon, Republican Congressman Bob Smith employs an aide called a "circuit rider" to travel around the small towns dotting the 75,000-square-mile area. When he hits the road, circuit rider Mike Hanna uses a Macintosh to record information, opinions, and concerns from the constituents he meets in small groups and at town meetings. If a problem needs immediate attention, Hanna uses an Apple 300 modem and *MacTerminal* software to communicate the information to Smith's district office in Medford, Oregon, or directly to Capitol Hill. By dialing into the electronic mail service maintained by HIS, Hanna can leave messages day or night, knowing that Smith's aides using Macs in Medford or Washington are looking for incoming messages.

Congress Goes On Line

With either modems or networks, many offices are using the Macintosh to access the growing number of legislative, bibliographic, statistical, and informational databases maintained by HIS and the Congressional Research Service (CRS) of the Library of Congress. At their fingertips legislative aides now have up-to-the-minute information on the status of any legislation, including the bill that is currently being debated on the House floor.

Press secretaries have access to the wire services and can scan the stories for news from their home districts or, using a congressperson's name as a keyword, see if the press release issued that morning has made the news. Speech writers can browse for information through the Library of Congress Computerized Card Catalog or copy documents from a CRS database containing briefing papers and background reports on hundreds of public policy issues.

Other available databases include information on federal grants, labor statistics, census data, and an online text of the *Commerce Business Daily,* the government document that announces all requests for bids on federal contracts.

The Mail Explosion

While the Macintosh is enjoying growing popularity on Capitol Hill, the computer's continued success there depends greatly on the introduction of the enhancements that will make it more practical for managing heavy volumes of mail. America's fondness for writing congresspeople and the congressional franking privilege have combined to create an explosion of mail to and from Capitol Hill. With the introduction of computer technology, which allows Congress members to store information on the individual

Doug Thompson, administrative assistant to Congressman Dan Burton, is Capitol Hill's unofficial Macintosh expert. He uses Macs to run a completely automated office.

legislative concerns of thousands of constituents, you have the makings of a major direct mail operation. In some offices pieces of outgoing mail—including newsletters and computer-generated "personal" letters—number in the millions per year.

With so many stacks of mail, even offices with Macs typically have another network of terminals tied into a personal computer with hard-disk storage and shared high-speed daisy wheel printers or, more recently, laser printers. Other offices subscribe to on-line data management services.

However, Congressman Rose foresees a day when the Macintosh could play an even more important role in Capitol Hill offices. "What I'm really waiting for is Apple's laser printer for the Macintosh. The Imagewriter is close to being good enough for some office printing, but when you print in high-quality mode, it's just far too slow for our mailing needs."

Assuming that high-speed, high-quality printing will soon be available, Rose becomes even more bullish on the Mac's future in the House. "There's no reason that sometime in 1985 a Macintosh with a 10-, 20-, or 30-megabyte hard disk could not become a reliable correspondence management tool for most Capitol Hill offices. Right now we have congresspeople spending thousands and thousands of dollars for minicomputers and on-line database storage services to do the exact same thing that a feisty little Macintosh can do if it is configured right."

Even with his admitted bias for the Macintosh, Rose encourages his colleagues to get hands-on experience with any type of personal computer. He says, "For the rest of this century, for a politician not to learn how to use both television and personal computers would be a tragic mistake." He has even helped to set up a one-day crash course in computers for House members, offered three days a week while Congress is in session. For Commander-in-Chief Rose, the Capitol Hill computer revolution continues. With the computer that "even a congressperson" can use, he just might win. □

Rex Hammock, a former Capitol Hill press secretary, is an advertising executive and free-lance writer based in Nashville, Tennessee.

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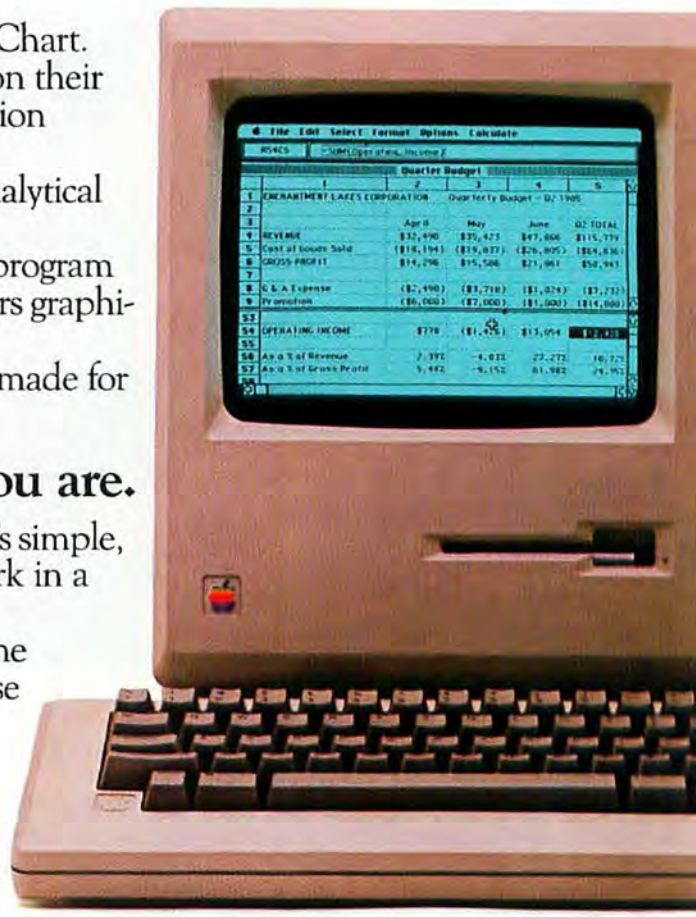

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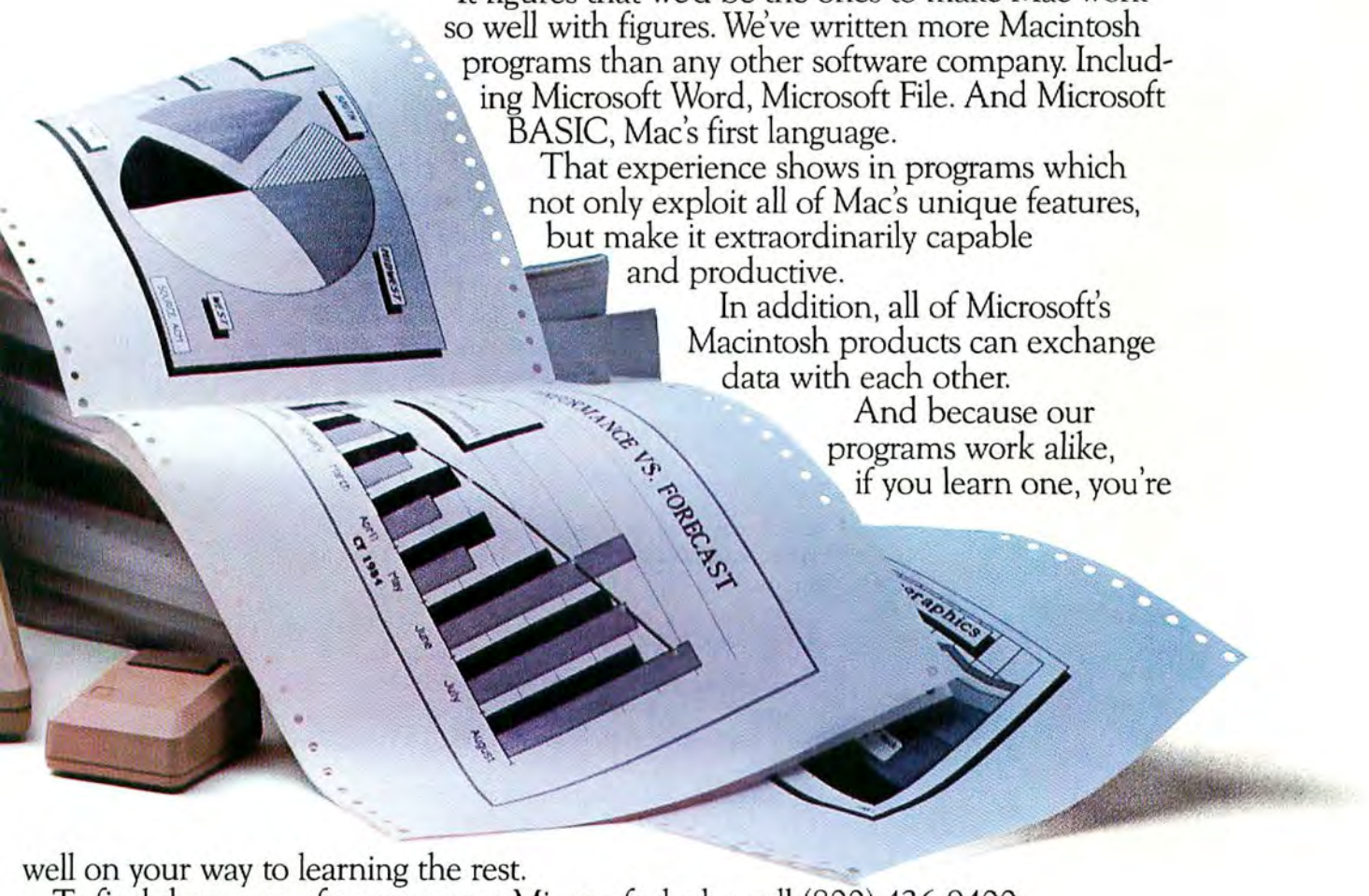

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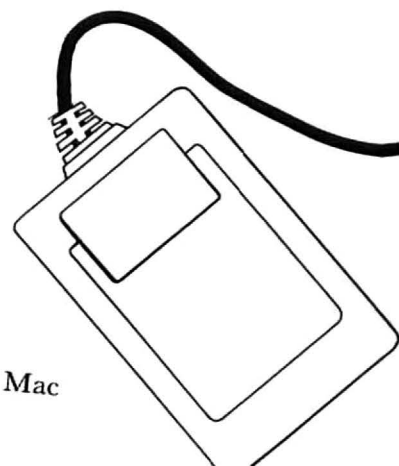

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An exhibition of Macintosh graphics

Edited by Erfert Nielson

We're now receiving 20 or 30 Macworld Gallery *entries a day, so we're unable to respond to individual questions about the Macworld Art Contest. To enter the contest, send a paper copy of your original artwork and a description of how you created it to* Macworld Gallery, *555 De Haro St., San Francisco, CA 94107. All drawings sent to* Macworld Gallery *are eligible for the art contest.*

One $500 prize and two $250 prizes are awarded each month. In addition to the prizewinning drawings, several pieces are exhibited in the regular Gallery *section; those exhibitors are paid $25 each. If your drawing is selected, we will ask you to send a copy of it on disk.*

$500–First Prize

High Noon

My drawing started out as a caricature of a familiar figure. I liked the way the picture turned out, so I saved it. Several weeks later I came across a photograph of Gary Cooper as Marshal Will Kane, walking down an empty street to meet the bad guys in *High Noon*. I decided that the scene would make a suitable background for my caricature, so I added the buildings, hitching rail, and ground.

Steve Momii
Seattle, Washington

High Noon

$250–Second Prize

Portrait of F. E.
I drew the face freehand, using the spray can to create the various tones. I used FatBits to trim and clean up the edges of the shaded areas. To create the beard, I first used the spray can to make the area around the face dark. Then I used several brushes in white to draw the beard and the hair.

Dave Meyers
Fort Myers, Florida

Portrait of F. E.

$250–Second Prize

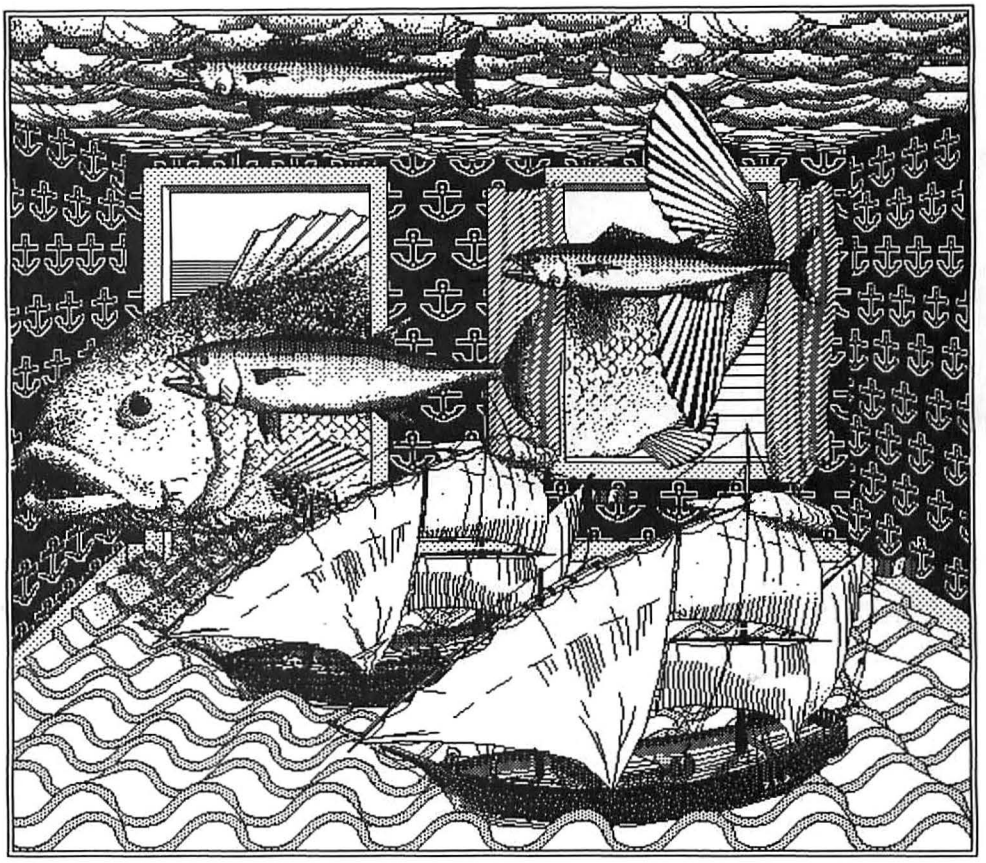
Sunset
I've had my Macintosh for a week, and this is the first drawing I've done with *MacPaint*. I drew the buildings using the large square brush. I outlined the darkest portion of the sky with the pencil, then filled it with black from the paint bucket. I used the spray can to fill in the rest of the sky. I found that *MacPaint*'s editing features gave me more flexibility than other media I've used.

Keith Aeschliman
Medford, Oregon

Sunset

Nautical Interior
I wanted to make this image rich in detail without getting too hung up with the tedium of rendering a lot of different objects. Using the lasso and the Option key, I copied shapes to create the patterns in the floor, the ceiling, and the walls. I added a sense of perspective by using the marquee and the ⌘ key to shrink various patterns and objects. I drew the fish and the sailboats in a separate file, cut them to the Clipboard, and then pasted them in over the background.

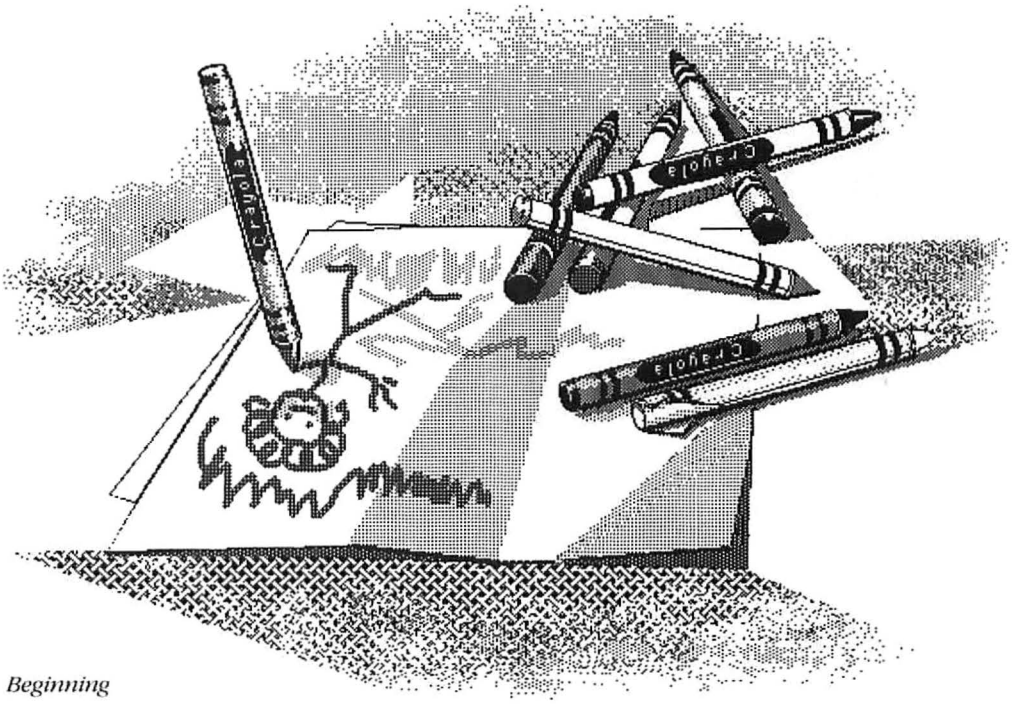
David Herrold
Greencastle, Indiana



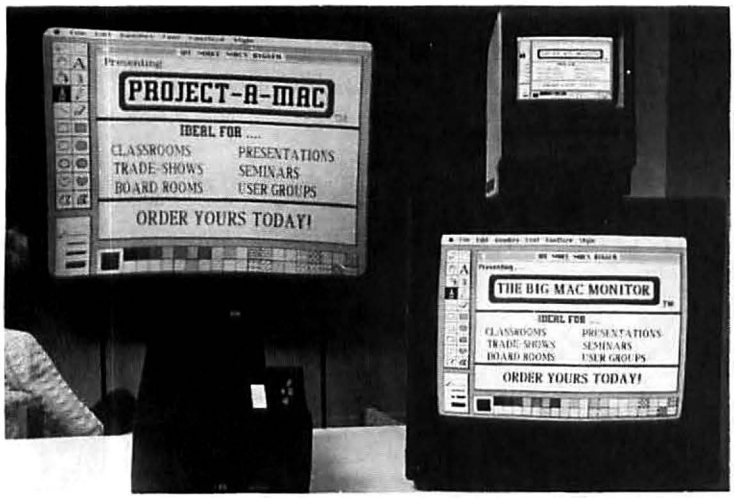
Nautical Interior

Beginning
I got the inspiration for this drawing while watching my toddler son play with his crayons. The problem was to choose an angle for a couple of crayons that could be rotated into what seemed to be a random pile. The basic drawing tools I used were the straight line, the spray can, and the paintbrush.

Raymond E. Coia
Canton, Ohio □



Beginning



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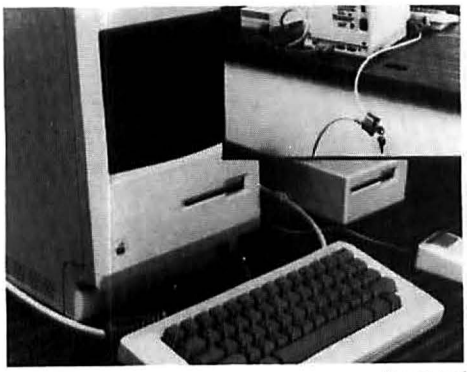

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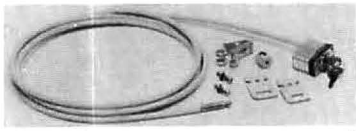

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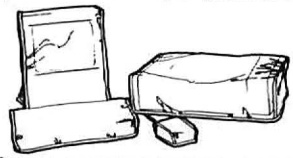

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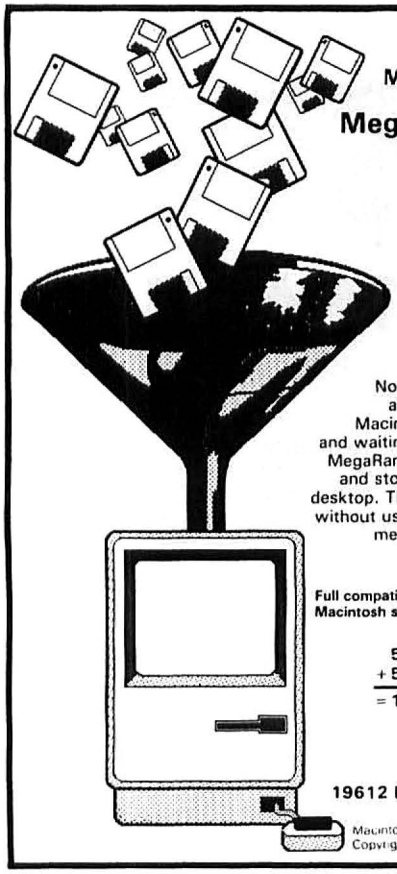

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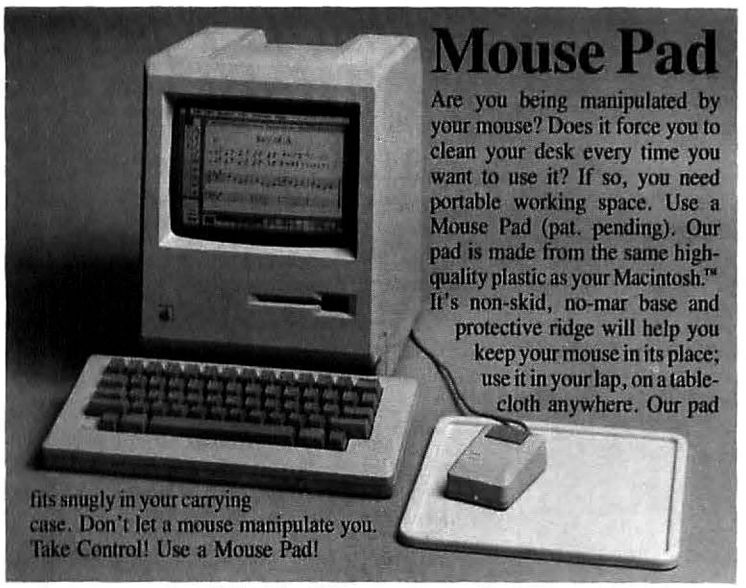

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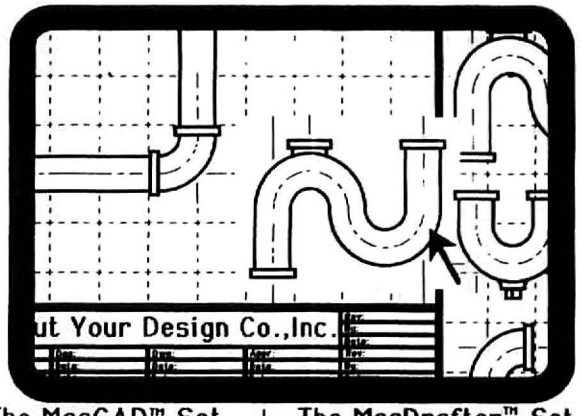

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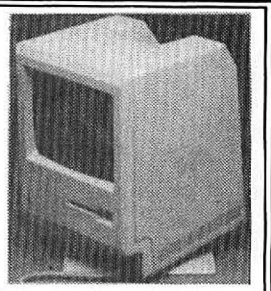

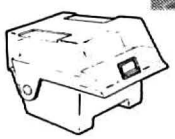

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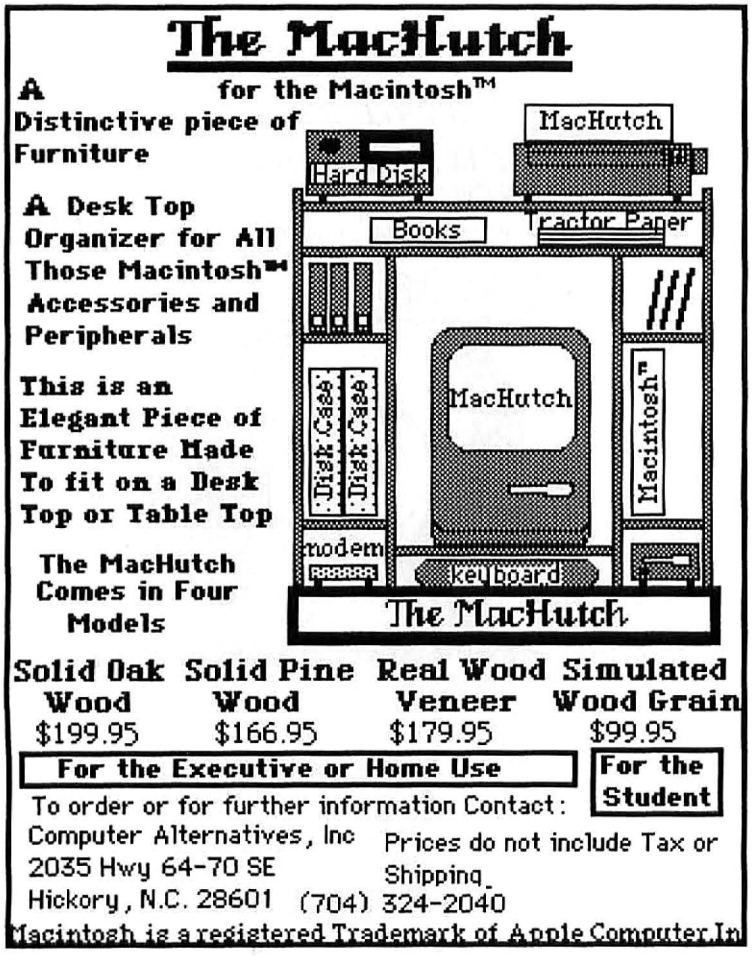

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