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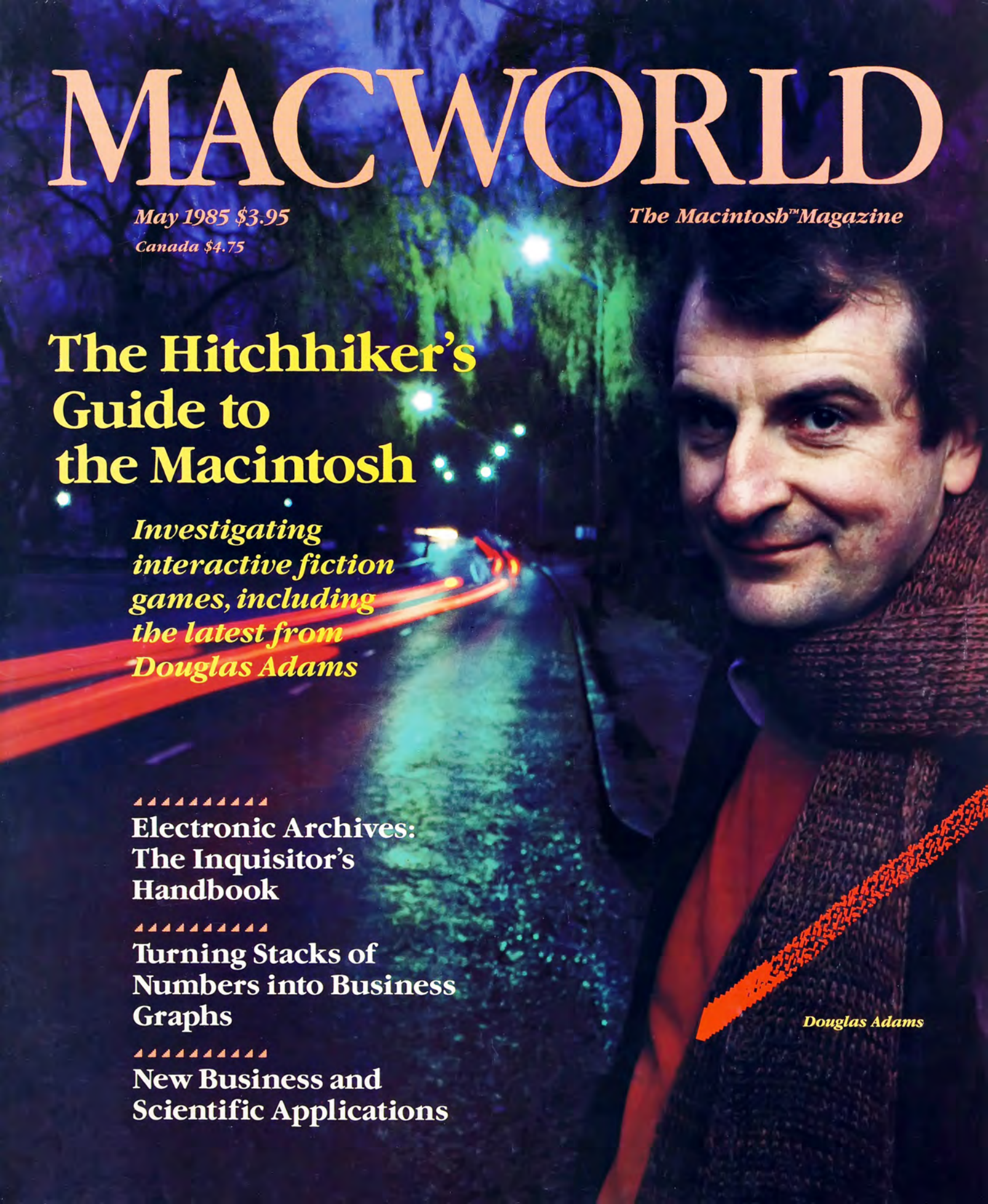
The Macintosh™ Magazine



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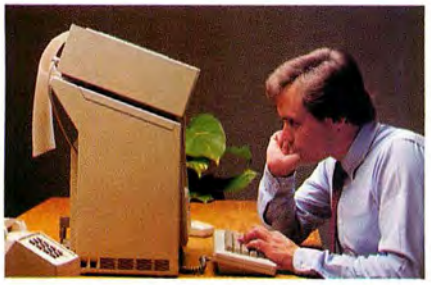

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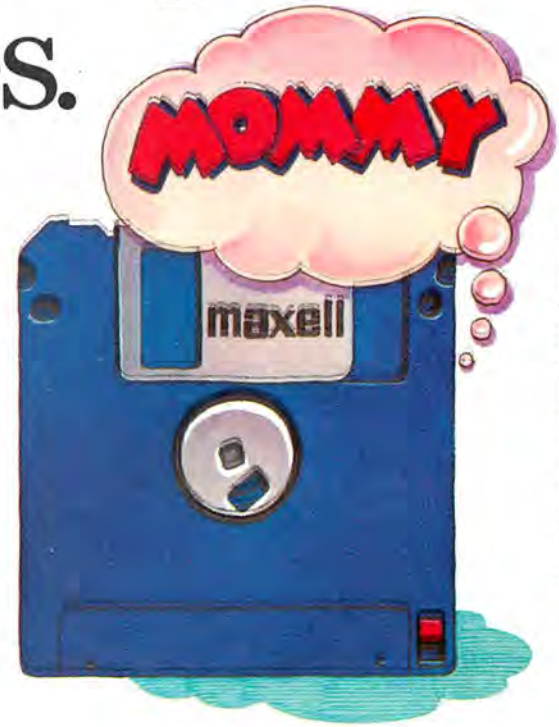

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MACWORLD

May 1985

The Macintosh™ Magazine

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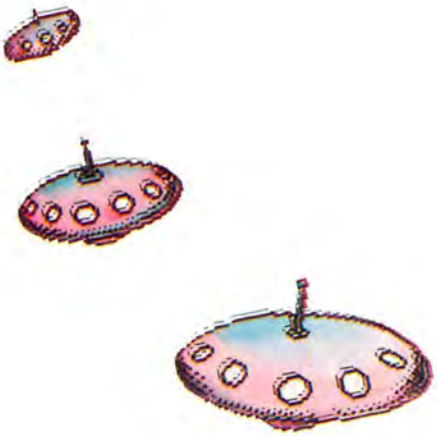

Increasingly popular programs allow you to compose, revise, and play music on the Mac. Read about a pastoral suite for clarinet and Macintosh that gives new meaning to a computer's performance on page 107.

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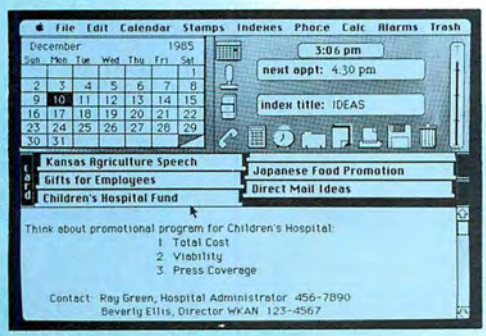

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Because, unlike traditional office computer solutions, we didn't design The Macintosh™ Office around a mainframe. We designed it around an idea.

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.*

That's why we put Macintosh at the heart of The Macintosh Office. Its powerful, 32-bit technology reduces the time it takes to become productive with a computer from well over a work week, to just under a lunch hour.

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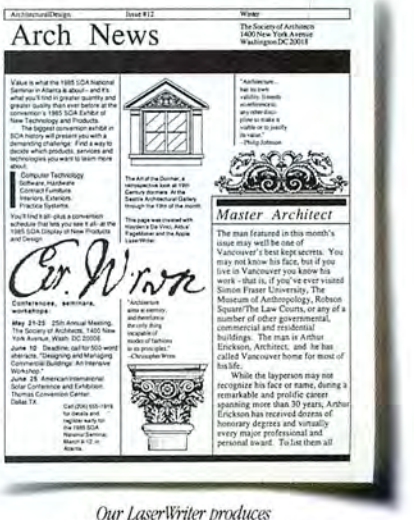
Third party developers are also working on The Macintosh Office. Next month,



Arch News

The Society of Architects
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Master Architect

The man featured in this month's issue may well be one of Vancouver's best kept secrets. You may not know his face, but if you live in Vancouver you know his work – that is, if you've ever visited Simon Fraser University, The Museum of Anthropology, Robson Square/The Law Courts, or any of a number of other governmental, commercial and residential buildings. The man is Arthur Erickson, Architect, and he has called Vancouver home for most of his life.

While the layperson may not recognize his face or name, during a remarkable and prolific career spanning more than 30 years, Arthur Erickson has received dozens of honorary degrees and virtually every major professional and personal award. To list them all

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David Bunnell

A Mac Awakening

After the Macworld Expo, there's no turning back

A contagious excitement crackled through the aisles as thousands of Macintosh enthusiasts bustled from exhibit to exhibit at the first Macworld Expo, held at Brooks Hall in San Francisco, February 21-23. Apple's newest fans congregated to scope out the latest software, hard disks, communications services, and Macintosh enhancements. The Expo also had extras not seen at your average trade show: hands-on Mac clinics staffed by Macintosh user group members, forums on improving computing skills, programming tutorials, and conferences on the Mac's impact on various areas of computing.

The show was truly electric. It reminded many attendees of the first days of the Apple II, when it was unveiled to hordes of hobbyists at the 1979 West Coast Computer Faire at the San Francisco Civic Auditorium. The Macworld Expo brought back the fervor of early computer hobby days, which just isn't present at shows such as COMDEX anymore.

It is interesting to watch computer and business journalists change their initial impression of the Macintosh. For months they insisted that not enough software was available and the disk drives were too slow. The Mac was termed a toy, and the press doubted that it would ever be seriously considered for the office. And yet many of the loudest critics were at the Mac Expo, singing praises to Apple and to the Macintosh. Without Apple and the Mac, those journalists' jobs would be boring. A personal computer industry stuck under one big, blue umbrella would be dull and dry indeed.

The Macworld Expo exhibited clearly for the first time that the Macintosh revolution is going to happen. Exciting new software that makes full use of the Macintosh graphics interface, much of it incomparable to the programs that surfaced for earlier personal computers, is starting to appear on the market. These new applications are opening eyes to the possibilities for personal computing and are allowing people to use computers with more creativity and productivity. Just try making a newsletter on the IBM PC.

A tax preparation program that I played with is one of those pieces of software that has what seems like 50 versions for the IBM PC and the Apple II. Yet the Mac program stands out of the crowd by displaying a realistic, graphic rendition of the IRS Form 1040. You fill out the form, but the Mac handles the calculations and table searches. A simple double-click of the mouse provides an explanation of a specific item on the form in a text window. Can H&R Block top that?

The new version of *OverVUE*, written in machine language, is an incredibly quick combination database and spreadsheet that has several nice presentation features and sorts hundreds of records in the blink of an eye. And judging from the heavy traffic at the *Microsoft Word* and Lotus *Jazz* demonstrations, these programs offer features that people want to use.

A game called *Airborne*, produced by a startup company that could barely afford to be at the show, created a sensation with digitized sound. The whir of helicopters landing troops and the roar of jet planes firing missiles at your gunnery position were digitized from the actual sounds.

The simple addition of digitized sound turns an average shoot-'em-up video game into an extraordinary product. When I returned to the office

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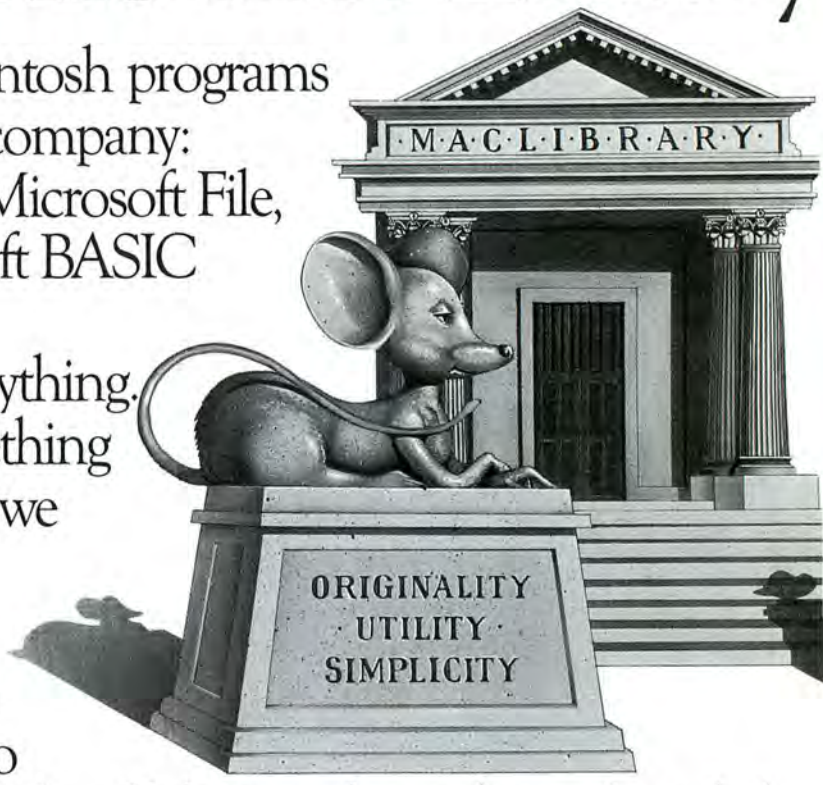

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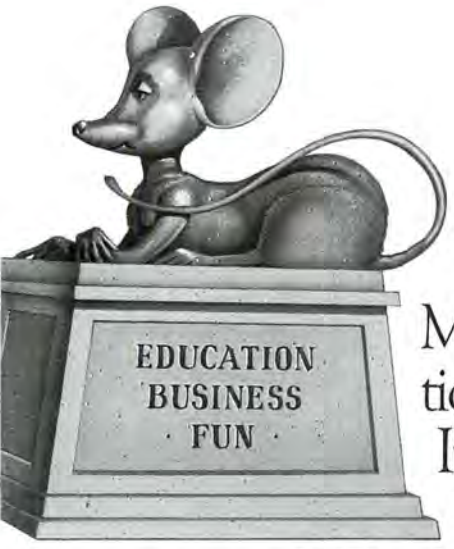

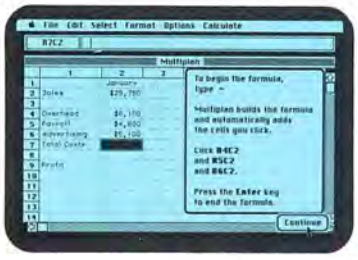

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David Bunnell

the next Monday, the *Macworld* editorial department was hard at work playing *Airborne*. We'll never get anything else done, I thought–and booted it up on my Mac. *Airborne*'s only problem is that it requires 512K, and my Mac at home, which the kids play on, is 128K.

It's just so much more fun to use a Macintosh, whether for games or business applications. Based on enthusiasm alone, the Macintosh is the computer to own.

The next Macworld Expo, to be held in Boston on August 21-23, should be even bigger and more exciting than the San Francisco show. The few companies that didn't exhibit in San Francisco want to be first in the aisles at the Boston show, and the spreading Mac evangelism should effectively build up the momentum.

So if you weren't one of the nearly 20,000 who participated in Mac history at the Expo in San Francisco, you've got another chance. And don't let distance get in the way. I was amazed at how many people at the first Expo were from faraway places like Tennessee and England. Considering that *Australian Macworld* was launched in January, and our French sister publication, *Golden*, has published a Macintosh software buyer's guide called *Golden Mac*, the Macworld Expo will probably move off the continent soon.

For more information on the Macworld Expo, Boston, contact: Mitch Hall Associates at 617/329-7466. □

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.

In other words, your networking capability goes beyond the Apple family.

The Macintosh keyboard slides right into MacCharlie's keyboard. About as easy as slipping a letter in an envelope.

Macintosh sets snugly beside MacCharlie, on a custom-fit pedestal.

Once you plug in MacCharlie's power and keyboard cords, you're ready to enjoy a very happy marriage.

How does it happen? As easily as slipping on penny loafers.

In mere moments, MacCharlie combines the best features of the world's premier personal computers.

And despite the fact that it turns one computer into two, MacCharlie adds but a handful of square inches to Macintosh's physique.

In short, one of life's most perplexing decisions—whether to buy a Macintosh or an IBM PC—can now be made with the greatest of ease.

Ask for MacCharlie at your local computer store. Or, for more information, call Operator 15 toll-free, 1-800-531-0600. (In Utah, call 801-531-0600).

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

MacCharlie™

THE BEST OF BOTH WORLDS.

MacCharlie is a product of Dayna Communications,
50 S. Main, Salt Lake City, Utah 84144

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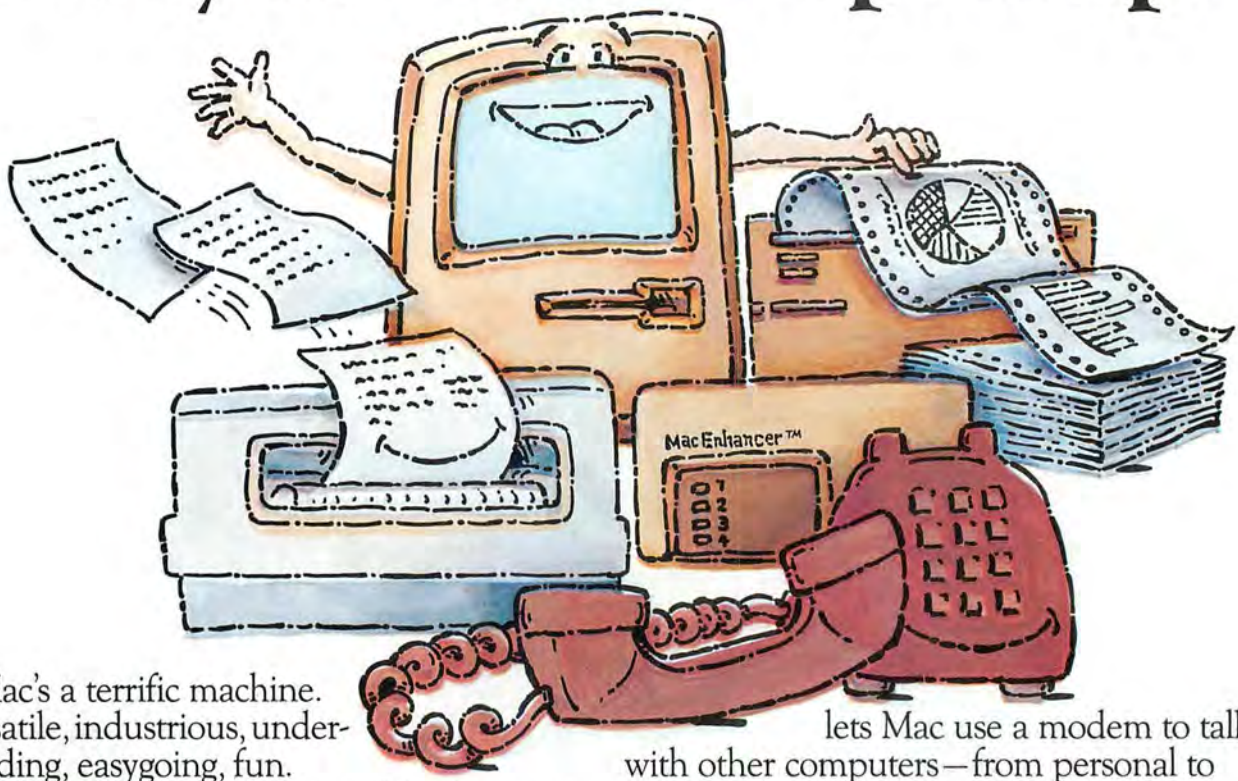
Circle 232 on reader service card

Get your Mac to open up.

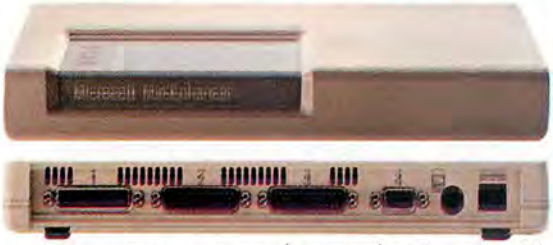


Mac's a terrific machine. Versatile, industrious, understanding, easygoing, fun.

Trouble is, Mac lives in a world of his own. He doesn't communicate well with his coworkers. Doesn't work well with them.

Now there's help.

The Microsoft® MacEnhancer™ expansion system can get him out of his shell. It'll open



his communications channels. Expand his horizons.

MacEnhancer simply plugs into Mac's communication port. It lets you keep that original port while adding an IBM®-type parallel connector for your printer and two IBM-type serial connectors.

So now Mac can hobnob with even the finest letter quality printers. Cope with hyperactive dot-matrix printers.

And it comes with MacEnhancer terminal software. A communications program that lets Mac use a modem to talk with other computers—from personal to mainframes.

All without losing the loveable Mac personality. Just "point and click."

Getting Mac to expand his horizons wasn't easy, but somebody had to do it. And

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who better than Microsoft? We've written more Macintosh™ programs than any other software company. Including Microsoft Word, Microsoft File. And Microsoft BASIC, Mac's first language.

For more information, or to free associate with your nearest Microsoft representative, call (800) 426-9400. In Washington State, Alaska, Hawaii and Canada, call (206) 828-8088.

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Letters

Index Thanks

I cruised through the 1984 index in your January issue. Indexes generally cross-index topic, issue, and title and make it nearly impossible to find something you remember only vaguely. Your index, on the other hand, reminded me of little things I had halfway forgotten but wanted to review. I spent about an hour with the index, going directly to the issue and page that had the information I wanted. What a pleasure!

H. G. Henry
Atlanta, Georgia

Bad Wrap

While picking up my just-fattened Mac the other day, I decided to indulge my high spirits by buying a copy of Assimilation's *Mac Spell Right*. I do a great deal of writing with my Mac, and the prospect of having both a spelling checker and a thesaurus on line was extremely attractive. Thus, it was with considerable anticipation that I slit open the shrink-wrapping on the box and repeated the operation on the separately wrapped manual inside. Then, and only then, did a little card emerge from the manual informing me that "the . . . programs require version 3.3 or later of *MacWrite*."

I have *MacWrite* 2.2. None of my Mac-owning friends has anything but *MacWrite* 2.2. When I phoned Assimilation, I was breezily informed that being a beta test site for *MacWrite* 3.3, Assimilation had no trouble developing and marketing products to go with it. My dealer, I was informed, would get it soon.

Outrageous! There is absolutely no hint of *Mac Spell Right*'s requirements on the package and none in any of the vendor's advertisements.

It is becoming more and more difficult to take the Macintosh world seriously. I think it is silly to have to open two layers of shrink-wrapping in the store in order to examine a potential purchase, but that is what I propose to do in the future. I invite other owners to join me in interrogating vendors of aftermarket software until it becomes standard practice for those folks to be candid about issues of compatibility.

Scott L. Norman
Framingham, Massachusetts

Upgrade Got You Down?

This is an open letter to all those 128K Macintosh owners who are complaining about the cost of the 512K memory upgrade. First let's get several facts straight. Apple Computer is a business. To upgrade a Macintosh to 512K, Apple must not only buy the 256K RAM chips and figure out something to do with the 64K chips but upgrade the motherboard as well. If Apple offered this service at substantially less than $1000, they would probably lose money.

With that out of the way, let me progress to the real problem. The diatribe that I have heard most often against Apple's upgrade policy is based on some misguided notion of loyalty. I would like to present a fictitious letter and see if anyone recognizes the argument:

Dear Seaside Motor Company,

Last year I purchased your 1983 Seaside Whizcar. While driving it by one of your dealers, I noticed that the 1984 Whizcars have a more powerful six-cylinder engine, quartz halogen headlights, and a better-looking dashboard and cost $245 less than my car. I asked the dealer how I could get my car upgraded to the new model. I was furious when he told me that a new engine would cost me $1600, the headlights $135, and the dashboard over $400. How could you have the gall to produce cars in 1983 if you knew that better cars would be made in 1984? Why don't you give new engines away to people who already own your cars? I'm buying my next car from Gigantic Blue Motors—at least they'll treat me right!

Apple extended the time, effort, talent, research, and money to develop an easy-to-use computer. It used the most advanced circuit design in a package that can be dropped into a knapsack. Apple built in a friendly interface and encouraged software developers to take advantage of the computer's power so that everything written for it could be as powerful, productive, and friendly as its creators envisioned. Did any other company do this? Did anyone even try? So, you want a technological miracle, creative software, innovation, *and* the shirt off Apple's back?

James Bucanek
Coolidge, Arizona

The Good, the Bad, and the Ugly

Copy-protection schemes on the Macintosh can be divided into three types. The first is friendly (for example, MacFORTH). A serial number is encoded into the program. The owner is free to make copies, but if any "unfair use" comes to the attention of the manufac-

Maccessories.™ 12 ways to improve the performance of your Macintosh.™

Maccessories from Kensington Microware—an entire family of products to enhance your Macintosh. Maccessories make your computer more convenient. They increase your system's flexibility. And they protect your investment. In a dozen different ways.

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Organizes all your power needs. Styled to fit underneath your second disk drive, it provides fingertip control over your whole system. There's a master switch to power the whole system on and off, and individual switches for a printer, modem and one auxiliary device. And Control Center protects your entire Macintosh system from damaging power surges, line noise and static shocks.

2 Surge Suppressor

Portable protection for a travelling Macintosh. Surge Suppressor replaces your power cord, providing UL listed surge suppression and line noise filtering. It's light and fits easily into your carrying case.

3 Universal Printer Stand

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

4 A-B Box

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

5 Swivel

A slim swivel base that attaches underneath the Macintosh, making it easier to reposition the computer. Fits inside the carrying case.

6 Portable Modem

The perfect travelling modem. It's small, sturdy, battery powered, weighs less than a pound and even has its own carrying case. Operates at 300 baud with any communications software.

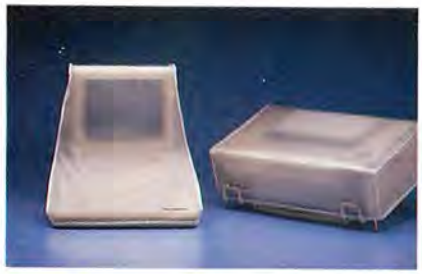
7 Disk Case

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

8 Travelling Disk Case

A stylish solution to disk transportation. Constructed of sturdy but lightweight plastic, it has room for 12 Macintosh disks. It's small enough to fit in a briefcase. And it comes with 12 spare disk labels.

9 Dust Covers



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

10 Cleaning Kits

Take care of your system. A Disk Drive Cleaning Kit helps you avoid disk read errors. And a Mouse Cleaning Kit keeps your mouse rolling at top speed.

11 Professional Type Fonts

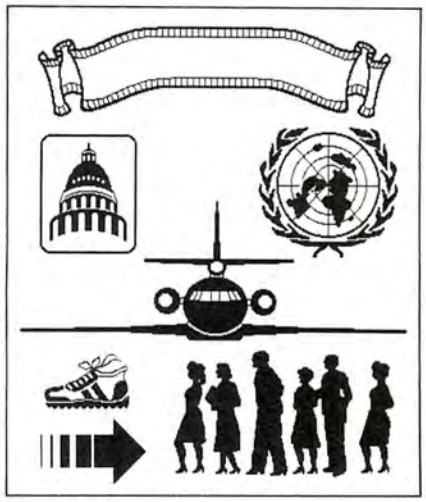
Styled after the most popular type faces in the advertising and publishing industries. In two volumes. Professional Type Fonts For Text contains 16 fonts in sizes 12 to 24 point. Professional Type Fonts For Headlines (for the 512K Mac) contains the same fonts in sizes 24 to 72 point.

Font	
Beta Italic	Phi Display
Epsilon	Rho Semi
Eta Medium	Sigma
Kappa Bold	**Sigma Bold**
Lambda	THETA
Nu Black	Upsilon
Omega	ZETA BOLD
Omicron	♠♥▲★◉▲☎♥

Circle 11 on reader service card

12 Graphic Accents

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



Maccessories are available at Apple dealers everywhere.

For more information, please contact Kensington Microware Ltd., 251 Park Avenue South, New York, NY 10010. (212) 475-5200. Telex: 467383 KML NY.

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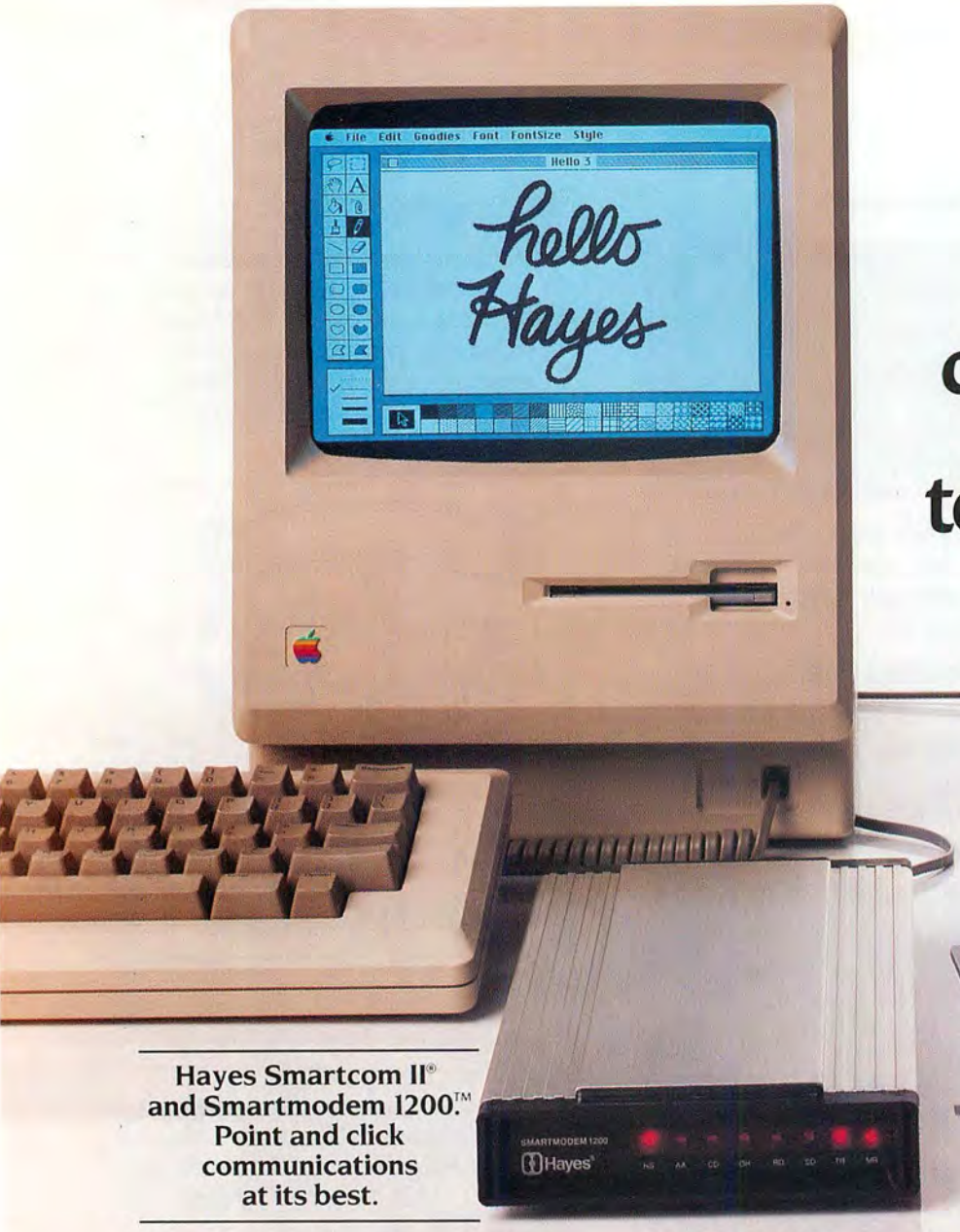

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Now Macintosh* can communicate with the best: Hayes.

When it comes to personal computer communications, Hayes set the standards. For the IBM* PC and compatibles. And now for Macintosh, too.

All you need is the industry leader, Smartmodem 1200 (or our 300 or new 2400 bps modems), and a special Mac version of Smartcom II software. For sophisticated, computer to computer communications– a la Macintosh.

Utilizing your mouse, icons and pull-down windows, Smartcom II makes communications as easy as pointing. And clicking.

Mac to Mac graphics. Picture perfect!

Now your Mac can send and receive pictures and drawings long distance with other Macintoshes. And if you have a powerful 512K Mac, you can also take advantage of the unique interactive graphics capabilities of Smartcom II. So that pictures or text sent to other 512K Macs can be simultaneously reviewed, perfected and updated from both locations! For the fun of it, you can even try interactive games on the graphic gameboards.

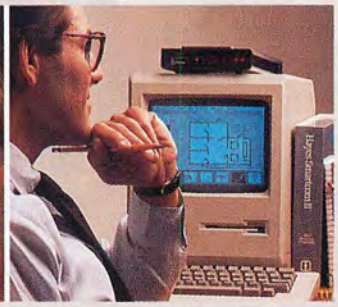
Mac to personal computers and data bases everywhere.

Want to communicate with an IBM PC? Or dozens of other personal computers? Your Smartmodem 1200 and Smartcom II communications system makes it easy to send and receive text over ordinary phone lines. Quickly. Accurately. Economically.

And a wealth of business, personal and financial information awaits you from on-line data bases. Smartcom II even comes with automatic log-on for many of these services (and introductory bonus subscription and access time discounts valued at over $300!).

Atlanta, 3 P.M. "Here's the plan for the new space. What do you think?"

Boston, 3:04 P.M. "Looks good. But can you move the lounge over here, and add a second exit, like this?"



Atlanta, 3:05 P.M. "Brilliant! I'll incorporate these changes for tomorrow's meeting."

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turer, the source can be traced. I call this friendly rather than neutral because the serial numbers could presumably be used to identify copies stolen from the purchaser.

The second type is obnoxious (for example, *Multiplan*). You can make copies, but when you run them, you must first insert the original disk. While this copy-protection scheme is a real nuisance on the Mac, which doesn't let you leave a program temporarily to run another, it is tolerable when you expect to run a program for some time without interruption. The copy protection can be intolerable, such as when it won't take Cancel for an answer or when you have to go back and forth into the program.

The third type of scheme is downright hostile. The example, unfortunately, is MacPascal, marketed by Apple itself. No copies can be made. Apple seems to be saying, "We don't care if you want a working copy of the thing. We don't care if you laid out a couple of grand for a hard disk to get decent response. Use the original slow floppy or don't use the program at all."

This copy protection is particularly intolerable on a supposedly "friendly" computer like the Macintosh. The Mac is potentially a great computer, but it's not there yet. If Apple sets this trend, I'm afraid it won't arrive. Let's boycott MacPascal until Apple relents. I urge every Macintosh owner who is considering MacPascal to write Apple saying that you will buy it only when the hostile copy protection is ended.

Barry Hill-Tout
Kingston, Ontario
Canada

Where No Mac Has Gone Before

I can't resist the lure of your pioneering certificate, although I am a late bloomer in personal computing. I do indeed qualify as a *Macintosh* pioneer. To the best of my knowledge, I have one of the first Macs ever in Kansas City. The Macintosh is the first computer I have owned or operated, and it was love at first sight. I do resent having paid a thousand dollars more in February 1984 than people are paying now, but I still like the machine.

I have all the issues of your magazine, and if I'm qualified as a pioneer, I'd love to receive the certificate. If not, I still have the machine and the magazine.

Please keep up the good work. Your magazine is great for Mac owners, as you really cover the subject.

John W. Fisher
Kansas City, Missouri

Pricey Pioneering

I have just finished reading "The Price of Pioneering" [*Macworld*, January 1985]. I am one of the 50,000 who put their money down so that I could be among the first to own a Mac. Now I find that for $995 more I can get a 512K upgrade, for a total of $3490 on merchandise that can be bought today for under $3000 by anyone who was smart enough to wait nine months—clearly a case of reaching into the barrel first and coming up with a wormy apple.

And *Please*.™ Mac-organize your data. Mac-nificently!

Hayes offers more than communications. *Please*, the easy-to-use yet powerful file management software, will be available for Macintosh soon. To manage mailing lists, print forms or handle dozens of other tasks.

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Meet The New Teachers...

MathFlash, WordPlay, and MacType

MathFlash: The math teacher that works

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

For parents and teachers, MathFlash takes away the tedium of administrating rote drills. And for youngsters, MathFlash takes away the pressure and fear of failure.

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.

MathFlash keeps detailed records to measure a student's progress and adapt drills to individual needs. One copy of MathFlash is good for the whole family—or the whole classroom. (Retail price: $49.95)

WordPlay: The word teacher that plays

Limber up your brain and beef up your vocabulary with WordPlay, the power tool for word puzzles. Use WordPlay to solve more than 50 puzzles that come with the program—or use it to help with the brain twisters in your daily newspaper.

WordPlay features crossword, diagramless, and other puzzles in a range of difficulties. WordPlay keeps all the fun intact, but eliminates the aggravation. No messy erasures, no getting stuck over one letter in the name of that pesky East Indian mulberry. Take a guess—if it doesn't work, try something else.

WordPlay lets you get help without actually cheating. Whether it's a single work, a section of the puzzle, or the whole thing. WordPlay can tell you (A) if it's right or not; (B) where the mistake is; or (C) the correct answer. You pick the amount of help you want.

Compete with your friends—WordPlay keeps track of all your scores. Save a puzzle in progress and pick it up later. Or print it out to work on when your Macintosh isn't handy. With WordPlay, you've got someone who plays your language. Retail price: $44.95)

MacType: The typing teacher that works

Touch-typing "games" look like a great idea. But when the novelty wears off, you're left with a frustrating (or boring) way to learn to type.

MacType is for people who want to type well, quickly. Based on the experience of a former touch-typing instructor. MacType gets you comfortable with the keyboard in just a few 15-minute sessions. Then you build your skill with MacType's training cycle: review, drill, test. And you use realistic practice text of words and sentence fragments that mix upper case, lower case, and punctuation.

MacType has no "Beat-the-Clock" drills to undermine your confidence. You cannot fail. You gain skills you can begin to use from the first day.

MacType offers advanced placement for rusty typists. It doesn't intimidate you with performance statistics, but you can see them when you want to. And if you start typing erratically, MacType turns on a metronome to even out your strokes.

MacType tracks your progress—it can handle more than 100 students. And when you reach your chosen goal, MacType prints out a personalized Certificate of Achievement. (Retail price: $49.95)

The new educational programs from Palantir make learning fun. And fun, a learning experience. Bring these friends into your home or classroom. Available from your dealer or Palantir Software, 12777 Jones Road, Suite 100, Houston, Texas 77070. Call (713) 955-8880, or you may contact our WATTS lines. (800) 831-3119 (Texas), (800) 368-3797 (National), or (800) 235-0025 (Canada).

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- Multiplan™ transfer. Extract data for spreadsheet programs and other forecasting systems.
- 400 accounts on one 400K disc.

Retail price: $145

Accounts Receivable

Keep track of who owes you what from how long ago. Print reports or display them on the screen. Either way you've got solid control of your business with features like these:

- Up to 9,999 customers.
- Full three-period aging. You define the periods.
- Open-item or balance-forward accounts or both. Your choice.
- Sales analysis by customer, salesperson, branch, type of sale, product, or just about anything else you can think up. 999 ways to analyze your sales for the period and year-to-date. Pinpoint your problems and your opportunities.
- Compatible output to the Financial Series General Ledger. Analyze profits as well as sales.
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The perfect system for your retail or wholesale business.

- Handles all these transactions: purchase orders, receipts, transfers, adjustments, issues and returns.
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Sales Edge	250	169
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Intermatrix MacPhone	199	170
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Koala MacVision	400	345
Living Videotext ThinkTank 512K	245	185
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Apparently David Bunnell feels a sucker-of-the-year award is now in order for those 50,000 who were dumb enough to fall victim to Apple's unique form of merchandising. Early Mac enthusiasts are punished financially, and those who waited are rewarded with approximately $900 in savings. As a consolation prize you are offering me a certificate to hang on my wall. Well, you can keep it. I do not need a daily reminder that I was naive enough to rush out and spend my hard-earned money foolishly. Early buyers deserve more than a certificate. By what logic do you see fit to make further fools of us by issuing us certificates?

However, I accept your congratulations for being a charter subscriber. *Macworld* is by far the finest computer publication. As far as I know, you are not selling the magazine to noncharter subscribers for less than I'm paying.

C. A. Jendrisak
Akron, Ohio

Spousal Support

I am a Macintosh pioneer, and I'm proud of it. I bought my Mac in April 1984. My wife thinks it's funny how I sit and wait for the next *Macworld* issue to arrive. Last year it was a two-month wait. I've settled down some since *Macworld* became a monthly magazine. I would like to compliment the staff for doing a fine job. I hope you never change the format.

One thing you fail to mention in "The Price of Pioneering" [*Macworld*, January 1985] is how we pioneers have to beg our wives or husbands for the 512K upgrade. My wife thinks the Mac is a $3000 toy, and she's upset at me for even thinking of spending another $1000 for an upgrade. Oh, well. I'm putting away $5 a week until I can afford it, which will be in four years.

I feel I deserve this certificate, and I hope you find it in your heart to send me one.

Mike Schneider
Kaukauna, Wisconsin

Sonar Sub Correction

Several readers have written about problems with the *Sonar Sub* program listed in the December issue of *Macworld*. Before you call or write, we urge you to check your listing for typos; the program published in *Macworld* does run, although it contains a few cosmetic flaws. For example, the submarine is missing the bottom part of its hull. You can easily correct this problem by changing the first two CIRCLE statements on page 133 to read as follows: **CIRCLE(25,80),43,,1.21,1.93** and **CIRCLE(25,0),43,,4.35,5.1**. To fix a slight defect in the appearance of the enemy mine, change the third CIRCLE statement on page 133 to read as follows: **CIRCLE(20,16),13,,88,2.25**.

Letters should be mailed to Letters, Macworld, *555 De Haro St., San Francisco, CA 94107, or sent electronically to CompuServe 74055,412 or The Source STE908.* □

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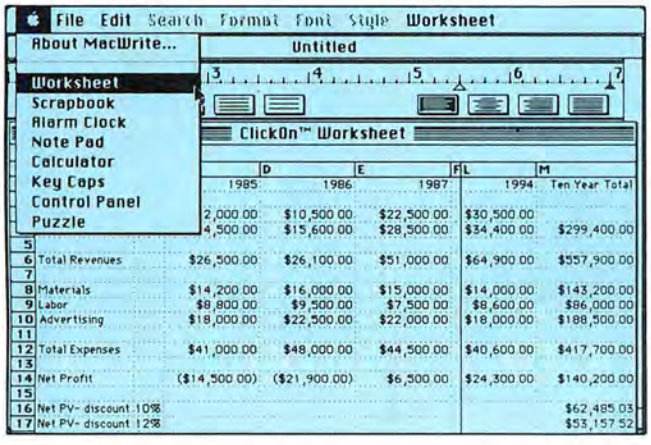

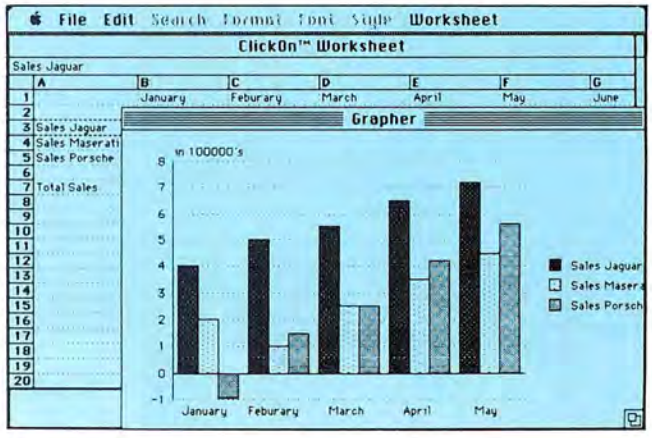

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Each one compliments the other to make your Macintosh into a super machine by forming a powerful, integrated system!

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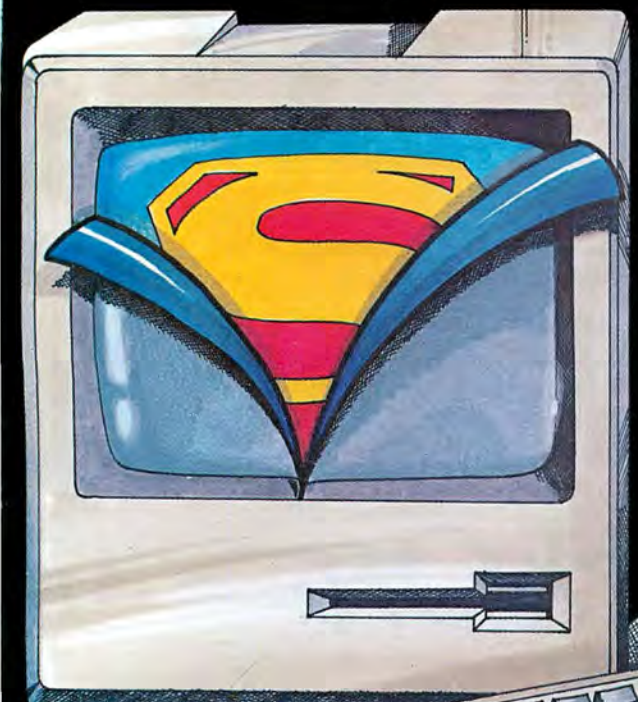

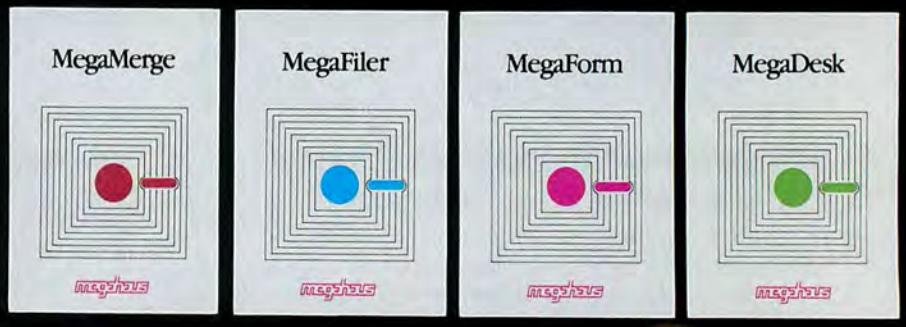

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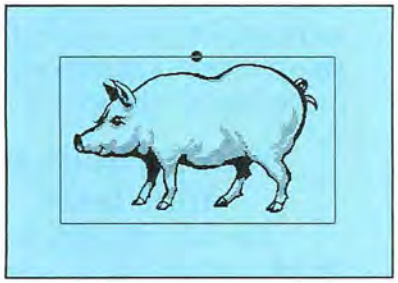

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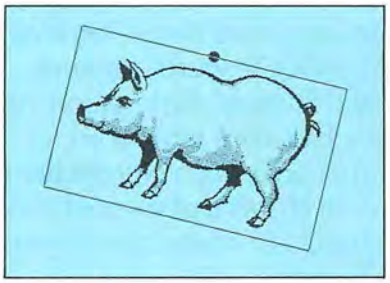

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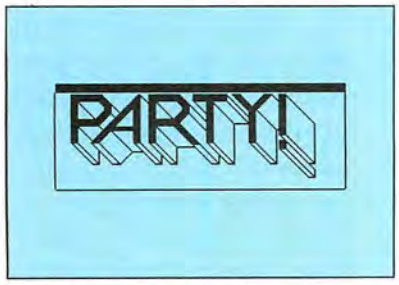

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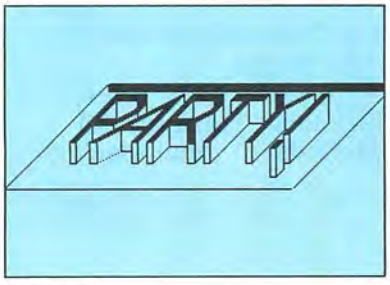

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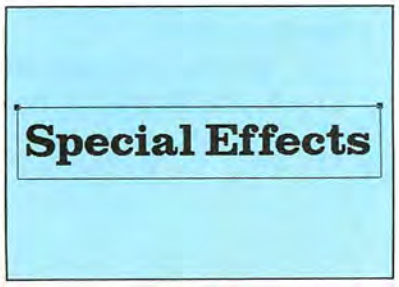

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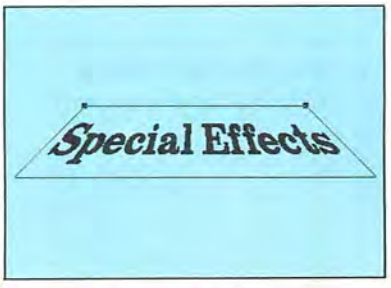

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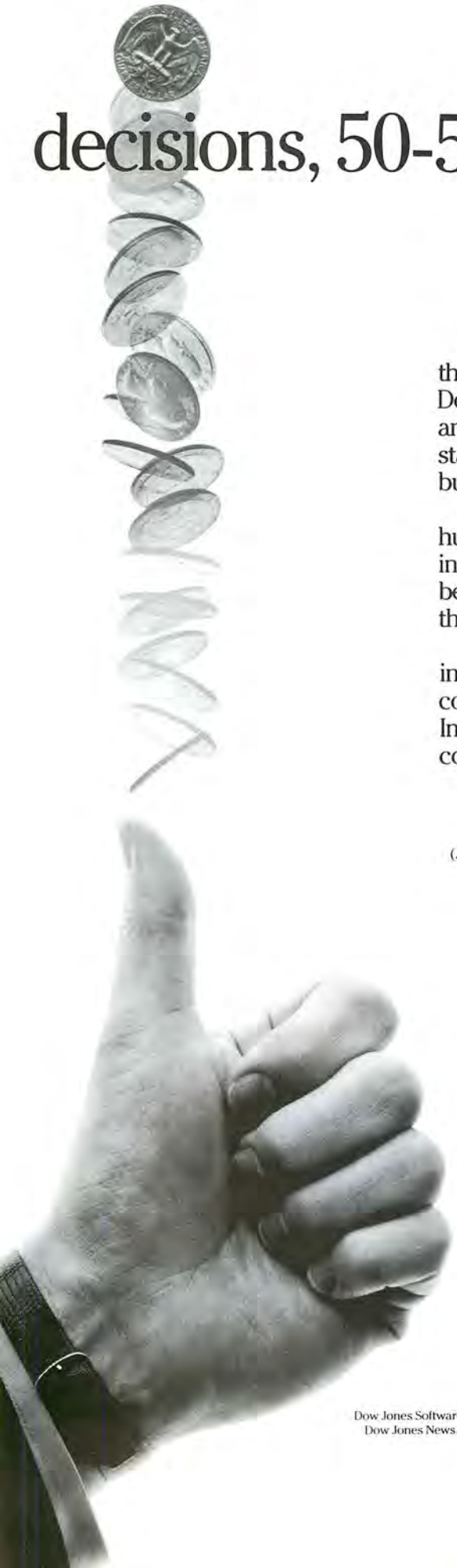

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Now you can turn any printed image into a detailed, high-resolution Macintosh graphic.

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.

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Macworld View

News and notes for the Macintosh community

Edited by Janet McCandless

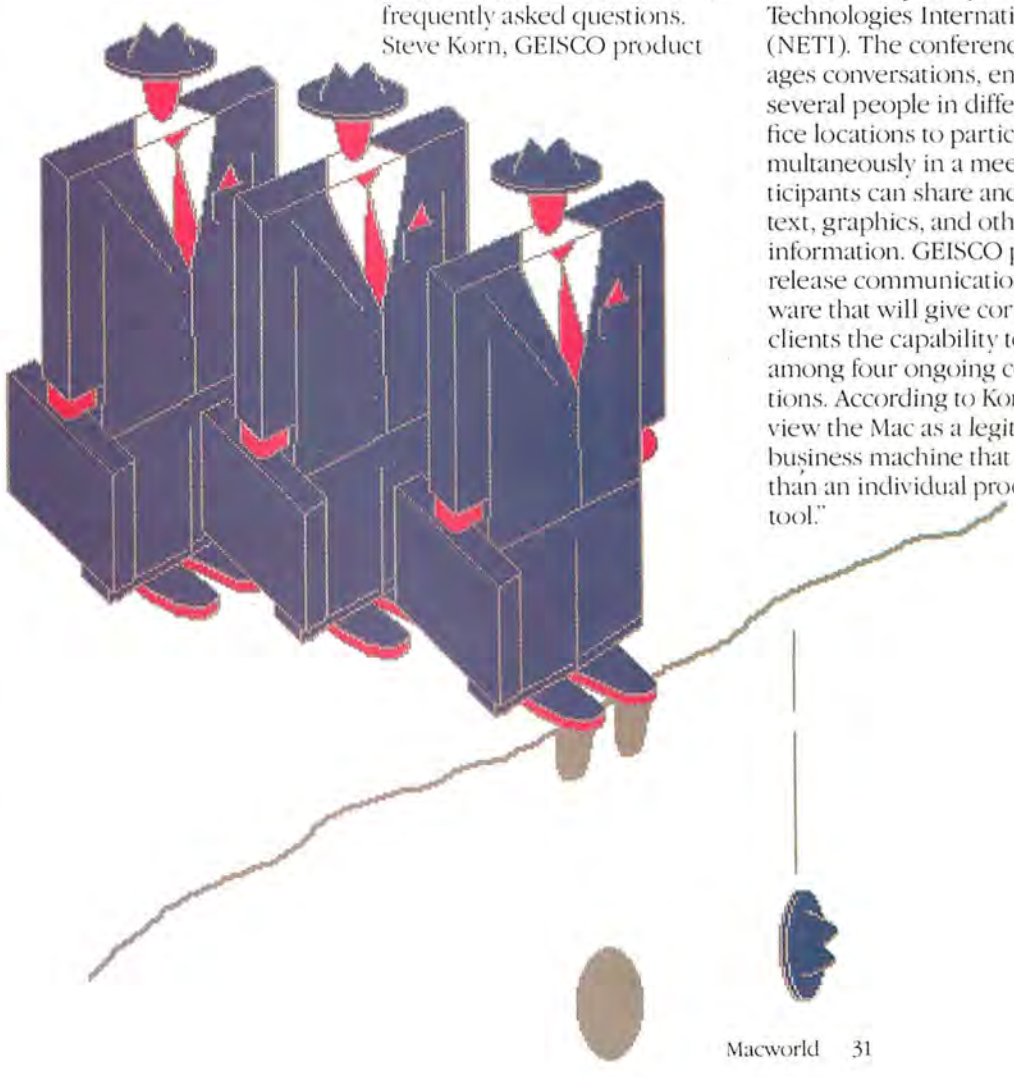
Macworld View *reports on new products and developments in Macintosh technology. We cover items of interest to Mac users and comment on industry trends. We welcome contributions from readers and pay up to $50 for each item we use. Please include your name, address, and phone number with your contributions;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

The Mac Enters the Fortune 500

Many people have wondered when the Macintosh would begin to appear in the corporate suites of the Fortune 500. General Electric Information Services (GEISCO) in Rockville, Maryland, has signed a value-added reseller agreement with Apple and is selling the Macintosh to its corporate clients. Matt Slavik, VAR/OEM (value-added reseller/original equipment manufacturer) sales program manager at Apple, states that the value added to the Macintosh by GEISCO is in the form of business applications and high-level networking communications hardware and software. GEISCO provides telecommunications services and business systems to over 6000 corporate clients.

GEISCO's influence in the corporate world extends beyond its arrangement to sell and lease the Mac to its clients. With Apple the company has developed a business application called DealerTalk. Apple is using the software to give its dealers access to a database that contains technical information and answers to their most frequently asked questions. Steve Korn, GEISCO product marketing manager, anticipates that DealerTalk will be used to supplement toll-free service lines by handling routine questions. Operators will then be free to answer more complex questions.

GEISCO's clients who use the Mac will have access to electronic conferencing software developed by Network Technologies International (NETI). The conferencing manages conversations, enabling several people in different office locations to participate simultaneously in a meeting. Participants can share and revise text, graphics, and other visual information. GEISCO plans to release communications software that will give corporate clients the capability to switch among four ongoing conversations. According to Korn, "We view the Mac as a legitimate business machine that is more than an individual productivity tool."



Mac Graphics Make News

Richard Curtis, managing editor for graphics and photography at *USA Today,* used to think of the Macintosh as a painless way to introduce his graphic artists to computers. "The Mac was used as an electronic sketch pad," says Curtis. But finished charts were impossible to produce on the Imagewriter because its resolution was too crude for *USA Today*'s production standards. Consequently, the artists literally had to take their computer-drawn sketches back to the drawing board and produce graphics the usual way, with rub-on letters, air-brushed photographs, and ink drawings.

The stumbling block was cleared with the introduction of Apple's laser printer. The LaserWriter provides the necessary resolution that artists couldn't get with the Imagewriter. Curtis expects that in a month or so his staff will be turning out charts daily for the nationwide newspaper, which has a circulation of 1.25 million. He predicts the Mac will cut production time in half and allow the staff more freedom to create the 20 to 30 pieces of artwork demanded of them daily. Curtis also foresees the newspaper using the Mac to maintain a visual reference library of pictures, charts, and sketches.

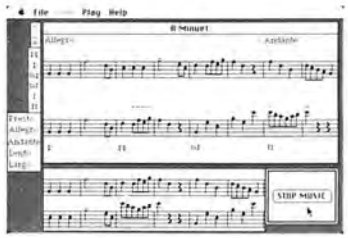
Richard Curtis of USA Today *relies on the Mac to produce the 20 to 30 charts needed daily at the newspaper.*

Similar plans are in store for an Apple system across the Potomac River from the *USA Today* offices at the world headquarters of United Press International (UPI). At UPI a new graphics department has been set up to produce charts and diagrams for the thousands of the wire service's subscribers worldwide. The driving force will be a new Lisa system, linked to a Compugraphic typesetter.—*Craig Webb*

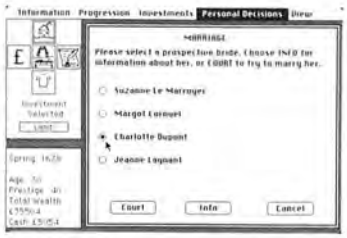
Consortium Update

As the Macintosh's first academic year comes to a close, the universities and colleges in Apple's University Consortium Program report that the Mac is being used in history, music, photography, nutrition, mathematics, and business management courses, to name a few. The software applications range from an organic chemistry nomenclature tutorial to a pictorial atlas program to a nutritional analysis system.

At Dartmouth College the music department uses a music-building program for the Mac in introductory courses. Students compose musical pieces by selecting items from a palette of notes, chords, glissandi, and so forth. Timbre, volume, and duration can be changed in each measure. Students can save a work, play it back, and edit it. The college math department uses a Macintosh program to teach algorithms in introductory computer science courses. The program allows students to construct binary trees on the Mac with various traversing and construction algorithms.



Music students at Dartmouth College compose on screen and play back the results.



At Stanford University a historical simulation places students under the reign of Louis XIV.

At Stanford a historical simulation similar to a narrative game is being developed on the Mac that places the student in the role of a young French man of modest means who reaches the age of majority in the first year of the reign of Louis XIV. The goal in the simulation is to accumulate wealth and prestige through wily investment, marriage, and political maneuvering and to pass that accumulation on, first to a son and then to a grandson.

A neurobiology course at Cornell University features a program that produces a high/low pass filter to teach students about waveforms and filters. In the input window a student can select sine, step, and impulse waveforms or select free-form waves. The filtered waveform appears in the output window. The cutoff frequency of the filter is chosen in the output window, and the high/low selection is done by menu.

The sociology department at Drexel University has an instructional program underway that will enable students to test their grasp of dynamics in the labor force, explore their own career destinations, and build models of alternative work worlds in the year 2000. A five-year study begun at Drexel in 1983, conducted by sociology professor Joan McCord, evaluates the impact the Mac is making on the academic community. Students fill out questionnaires that ask how the Macintosh is changing their leisure time, enjoyment of course work, study habits, topics of conversation, and attitudes toward computer crime. Faculty members respond to similar questions that include how the Mac is used for class preparation, whether using it has changed their attitude toward teaching, and how the Mac has affected productivity.

The value of the Drexel study may be broadened by other research proposed at Boston College that would determine the changes in learning and study habits of students and in teaching and testing styles of faculty. If several universities participate in these surveys, the conclusions may give a clearer picture of the impact of the personal computer in academic settings.—*Peter Olivieri, Apple University Consortium Newsletter*

Mac Toots Its Own Horn

The potential of the Mac as a musical instrument was recognized by *Macworld* Publisher David Bunnell when he commissioned organist David Kelsey to write Macintosh music for the Macworld Exposition in San Francisco in February. Known for his innovative and sometimes outrageous work on keyboard instruments, Kelsey chose to compose his piece using *MusicWorks* from Hayden Software. He hadn't used a Mac before. *MusicWorks* author Marc Canter heard about the project and flew to San Francisco from Chicago to lend some technical assistance. Canter also previewed *Advanced MusicWorks,* which allows lengthier compositions than the original version and features other enhancements as well.

In another musical development Ted Lane, faculty member of the Department of Music at California State University, Sacramento (CSUS), commissioned a work for Macintosh and clarinet. The piece, entitled Suite for Ted/Mac, was performed at a CSUS concert in February. An assistant cued the Macintosh while Lane played the clarinet. One of the highlights of the suite is a cadenza for the Macintosh. The piece was composed by Jackson Berkey, composer for the musical ensemble Fresh Aire, using *MusicWorks.*

Lane suggests that personal computers will widen the public's understanding and appreciation of music. A Mac owner can use a program like *MusicWorks* and listen selectively to the various elements of a piece, starting with a single voice, then adding more voices, layer upon layer.

Because Lane eagerly embraces the advent of personal computers in music, he thinks he is in a minority among his colleagues. Lane believes that personal computers can help professional musicians express their ideas. For example, performing musicians do not usually receive extensive training in composition. Writing down musical ideas tends to be a difficult and time-consuming task for those musicians. A program such as *MusicWorks* not only allows them to experiment and compose more easily than with pen and paper but also lets them hear the results immediately.

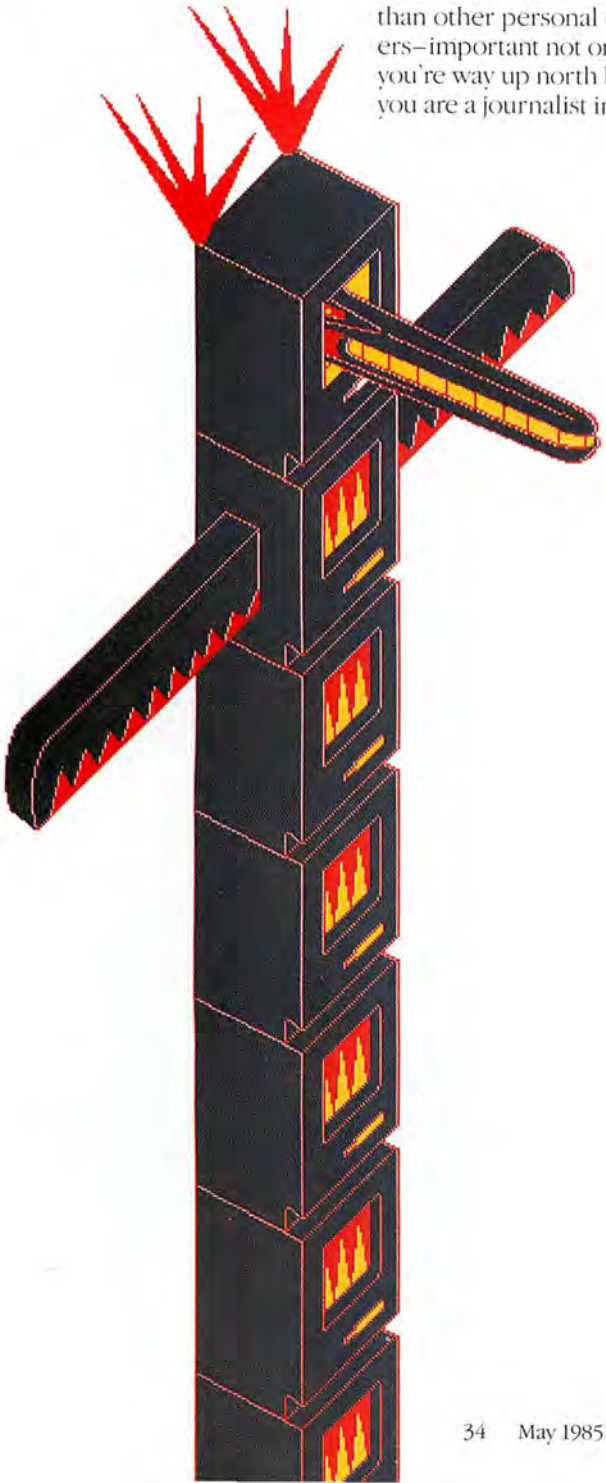
Lane predicts that the personal computer's ability to telecommunicate music will lead to exciting collaborative efforts and a freer exchange of musical ideas among people at all levels—from the professional to the novice.—*Jeffrey Glines*

Organist David Kelsey uses the Mac to store and print musical scores and to manage the business aspects of his career.

Portable Journalism

At the University of Alaska, Fairbanks, Department of Journalism and Broadcasting, the image of a reporter pounding out a late night story on a typewriter and calling it in to a busy news desk has changed. George Winford's 85 journalism students carry Radio Shack Model 100s into the field and telecommunicate their stories to a Macintosh. When Winford decided to introduce his students to computers, he didn't want computerphobia to distract the students from writing. Winford emphasizes that the department's job is to teach writing, not computer science.

Winford selected the Mac for the classroom because of its ease of use and graphics capabilities. The Model 100, on the other hand, is easily carried to press conferences and other locations. Both computers have better local dealer support than other personal computers—important not only if you're way up north but also if you are a journalist in the field.



Students write their articles on the Model 100s and telecommunicate them via modem to their instructors' Macintoshes. Back in the classroom the students rewrite the stories on the Mac and add graphics. They use *MacPaint* and clip art such as *Mac the Knife*. The use of illustrations is emphasized in the department's course on typography and publication design.

To enable students to complete the transformation of field notes into a published story, the department plans to have a customized user interface for its Lisa that will enable students to typeset on the Compugraphic 8400. The plan fits in with Winford's objective of keeping students focused on writing and the publishing process rather than on the coding involved in most typesetting.—*Heidi Mitchell*

Voilà! A New Product

The Lisa 2/10 has been renamed the Macintosh XL. Apparently Mac shoppers have been asking dealers for a Mac with a built-in hard disk, a larger screen, and the capability to handle multiple tasks. The Lisa 2/10 offers these design features, but the computer is not well known to Mac dealers or owners. The Macintosh XL comes with a 12-inch screen and 512K of memory, expandable to 1 megabyte. A built-in hard disk offers up to 10 megabytes of storage space, which means that XL owners can build larger databases and spreadsheets and run other applications such as UNIX-based programs. Although the other two Lisa models, the Lisa 2 and the Lisa 2/5, will be phased out, Apple has designed software that will allow Lisa owners to transfer files created with *Lisa 7/7* business software to Macintosh applications. □

Knowledge worker with Lisa 2/10

Knowledge worker with Macintosh XL

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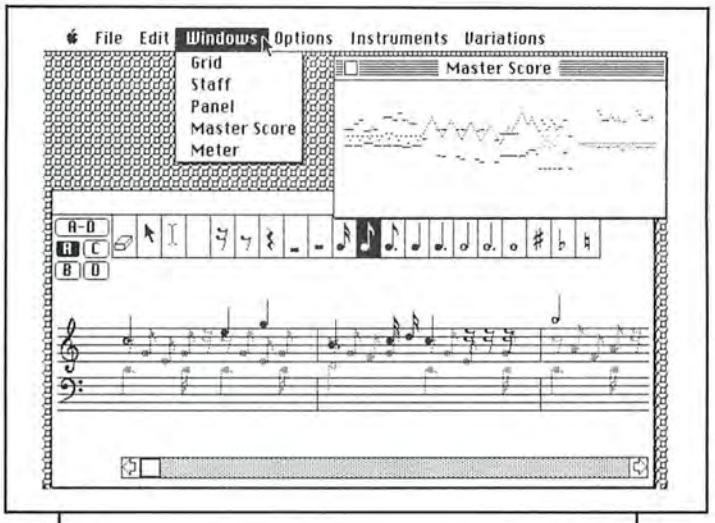

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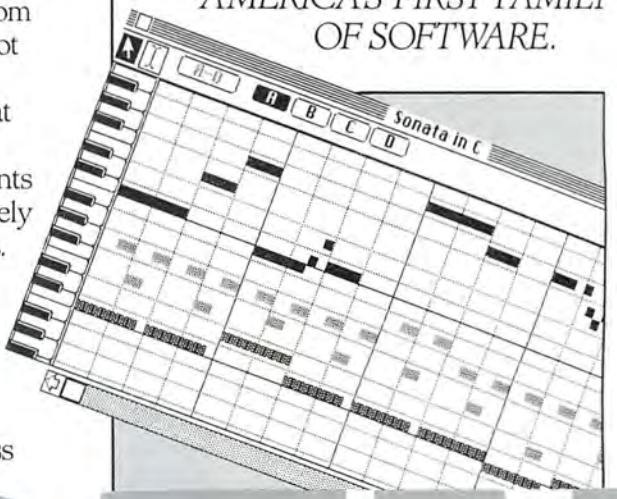

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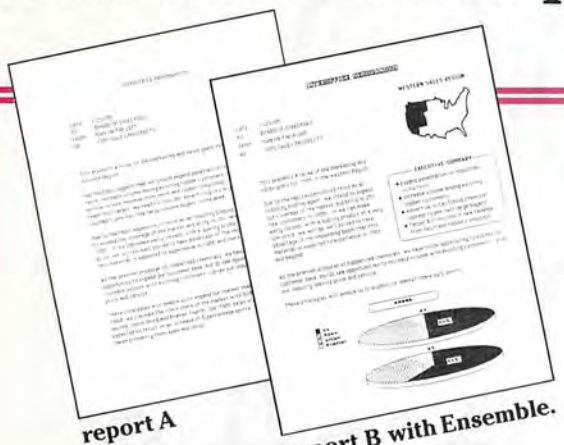

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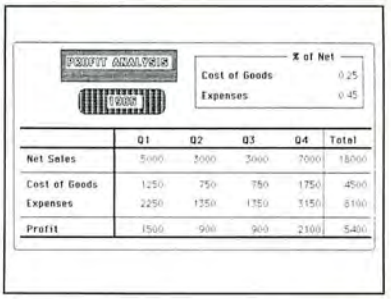

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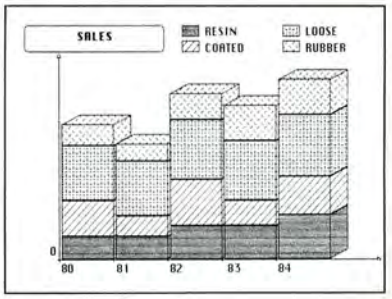

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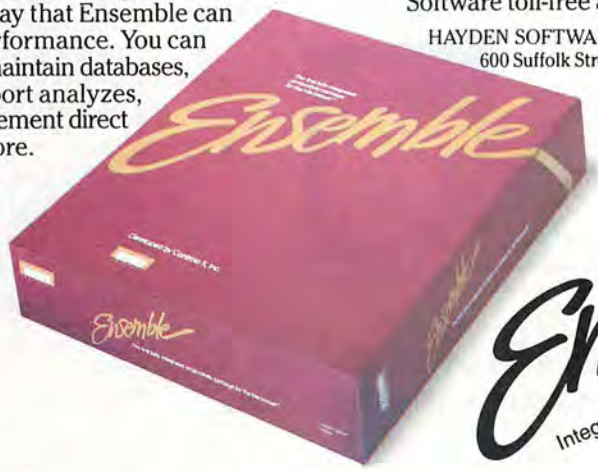

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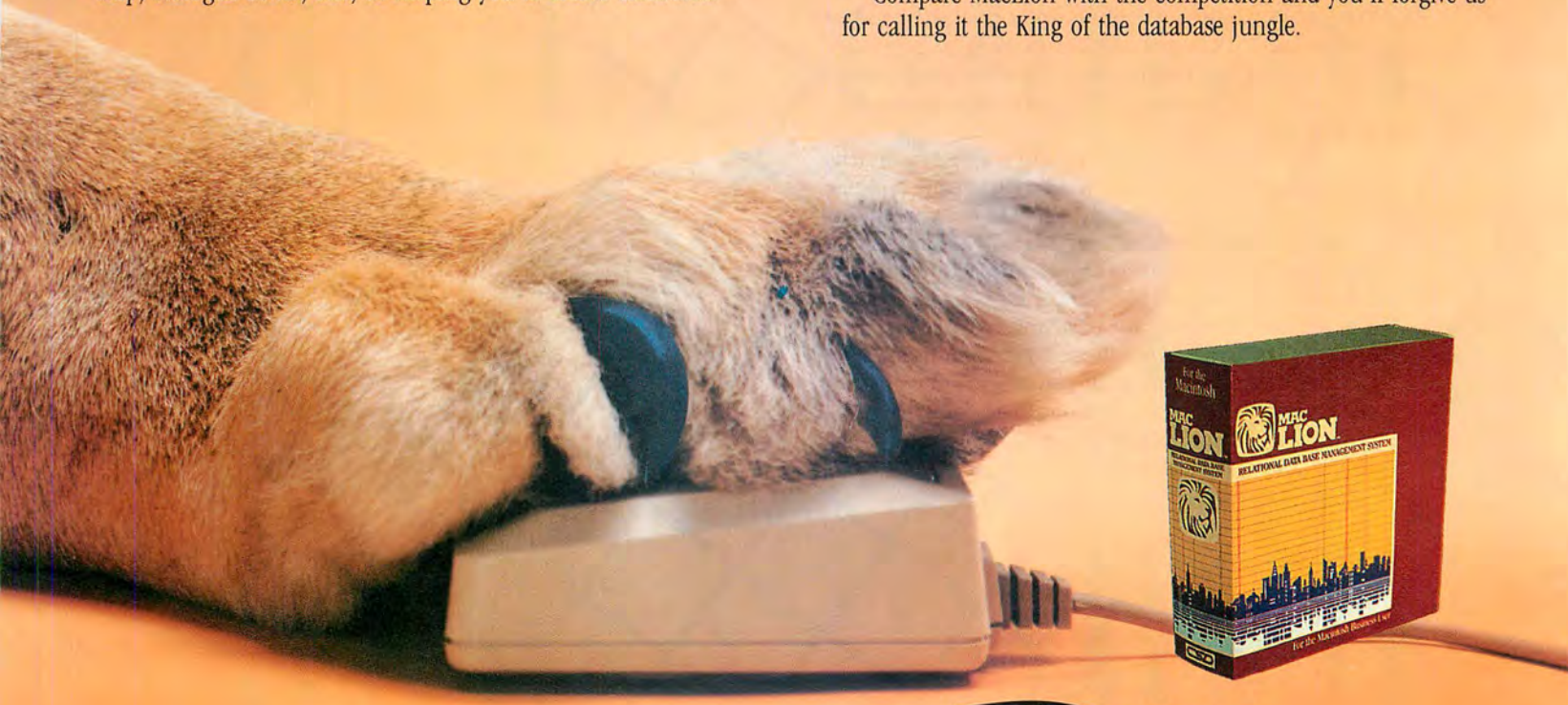

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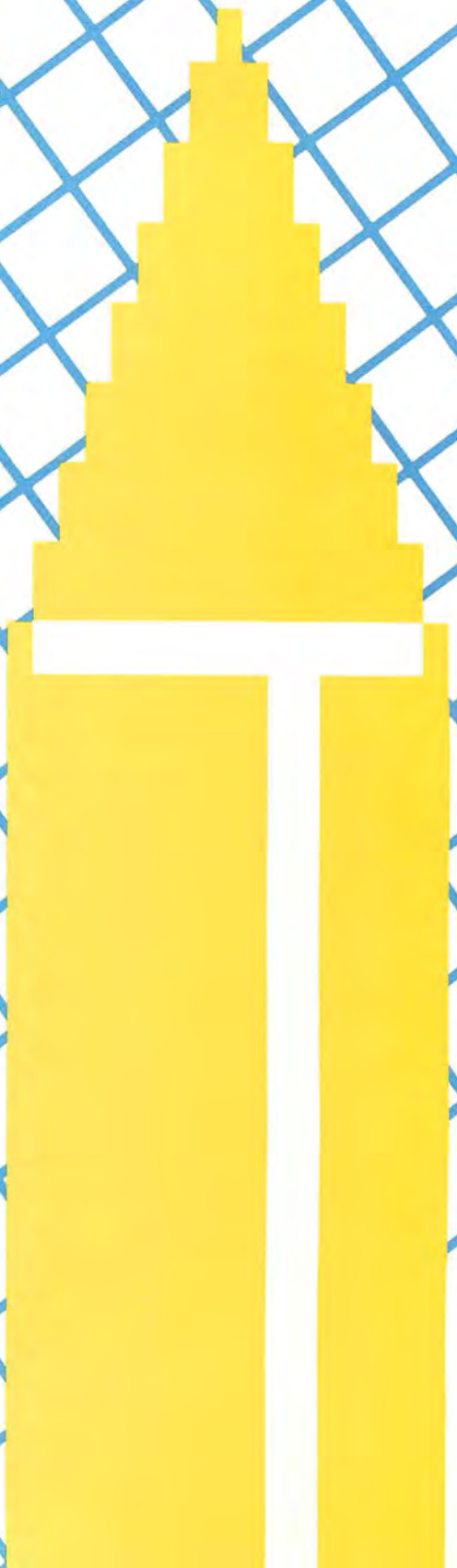
From Charts to Art

Gordon McComb

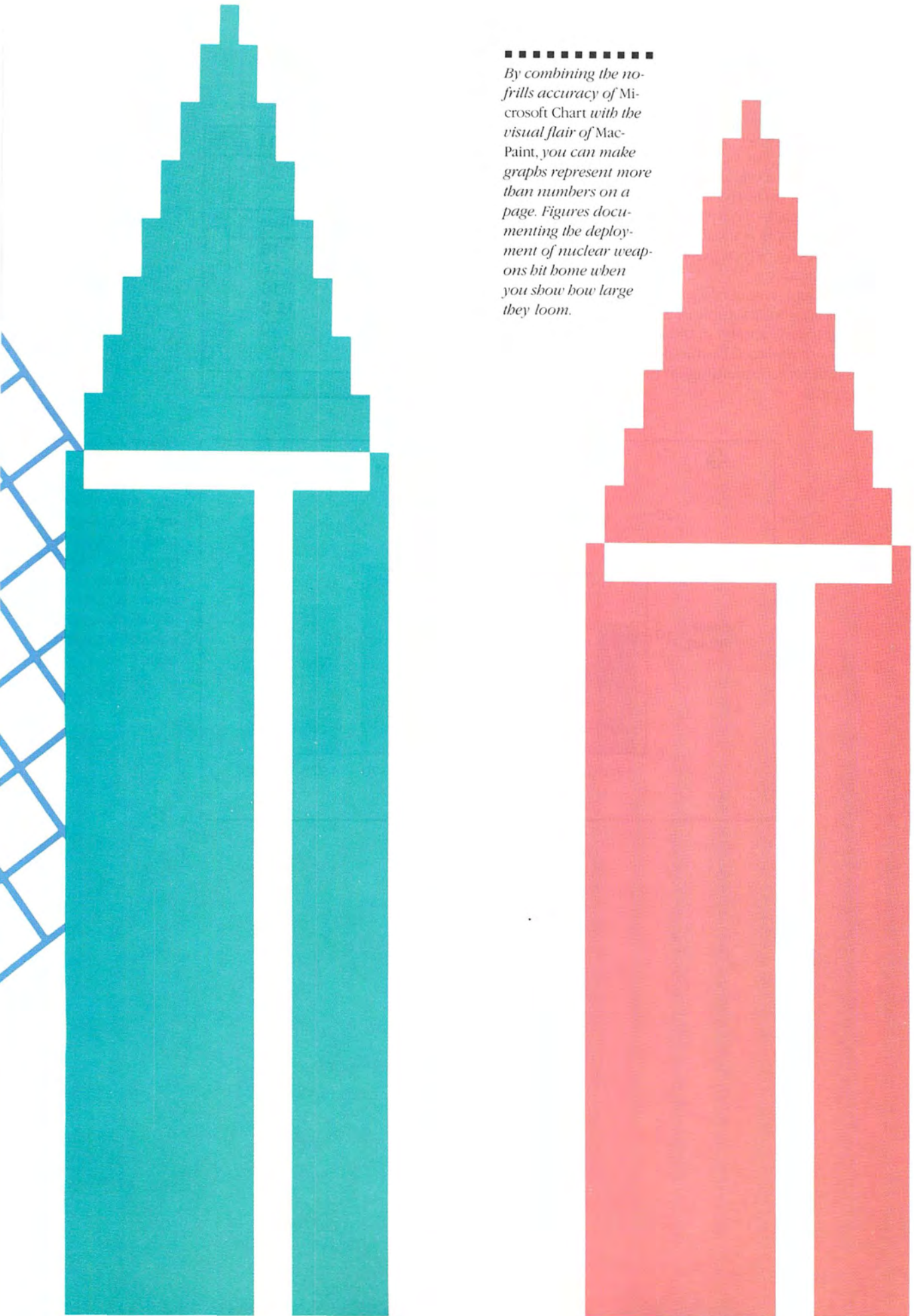
Microsoft Chart can turn stacks of numbers into easy-to-read business graphs. Creating presentation-quality pie, bar, and line graphs is as easy as writing a few paragraphs of text with MacWrite. *MacPaint can make the graphs thought-provoking as well.*

With *Microsoft Chart* you can produce clean, professional-looking graphs—each one good enough to show the boss or your favorite customers. Most of the time, the graphs *Chart* provides are probably more than adequate for your needs. But for special occasions you want a highly visual graph, one with lots of dramatic impact and flair. You want to create a chart that's stunningly outrageous and out of the ordinary. Unfortunately, *Chart* can't help. *Chart* gives you a great deal of creative freedom, but the program is staid and conservative in its approach to business graphics.

You can use *MacPaint* to spice up a graph originally created with *Chart*. With a little time and patience, you can turn bar and column charts into interesting "one-glance-tells-the-whole-story" pictographs. With the right technique, you can even combine the powers of *Chart* and *MacPaint* and highlight a *Chart*-produced graph with a *MacPaint* picture. The recipes for these fancy graphs are simple and straightforward. Of course, you'll want to adjust the ingredients to suit your tastes and needs. Use the examples that follow as springboards for your own charting endeavors.



By combining the no-frills accuracy of Microsoft Chart *with the visual flair of* MacPaint, *you can make graphs represent more than numbers on a page. Figures documenting the deployment of nuclear weapons hit home when you show how large they loom.*



Sculpting New Columns

You don't always have to settle for the heavy black stakes *Chart* provides in its column and bar graphs (column graphs have vertical bars; bar graphs have horizontal bars). If the subject is right for it, turn the columns or bars into symbols–symbols that represent the idea you're charting. For example, if you are graphing the yield of a series of oil fields, you can turn the columns into stacks of oil barrels. The taller the column, the higher the stack of barrels. This kind of chart, called a pictograph, is ideal when you need to convey your point as quickly as possible or don't plan to use legends or captions.

Charting the deployment of a particular type of nuclear missile is another example of a subject begging for a pictograph. As shown in the figures that follow, the columns are replaced by missiles. The size of each missile is different, depending on the height of the original column.

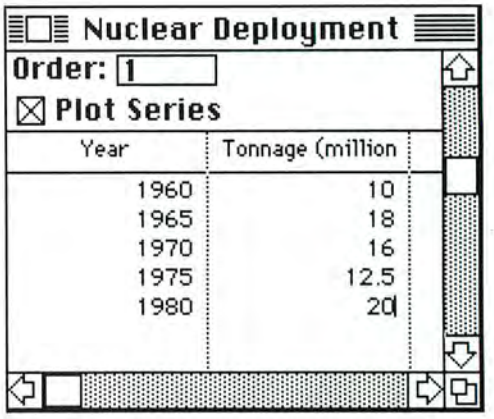


Figure 1-1
After starting Microsoft Chart, *choose a command from the Data menu to create a new series (the Date command was used here). In the box that appears, name the data series and provide* X *and* Y *axis labels. Enter the data in the series window.*

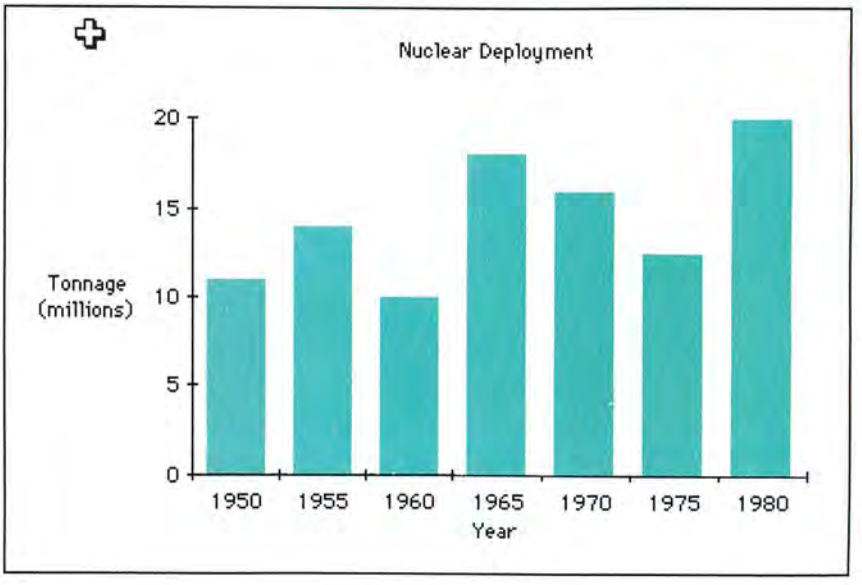


Figure 1-2
Chart *automatically chooses the simple column graph when it starts up; you can change the graph type by selecting another type from the Gallery menu. For this example the column graph is exactly what you want.*

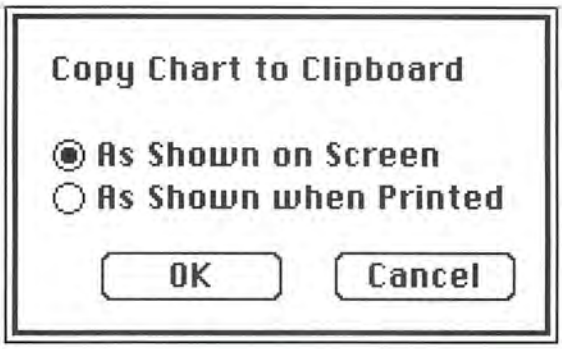


Figure 1-3
To capture an image of the graph to modify with MacPaint, *choose the Copy Chart command from the Edit menu. A dialog box asks how you want to save a copy of the graph; choose As Shown on Screen and click the OK button. The As Shown when Printed option can't be used with* MacPaint *because the graph is usually too big to fit in* MacPaint's *drawing window.*

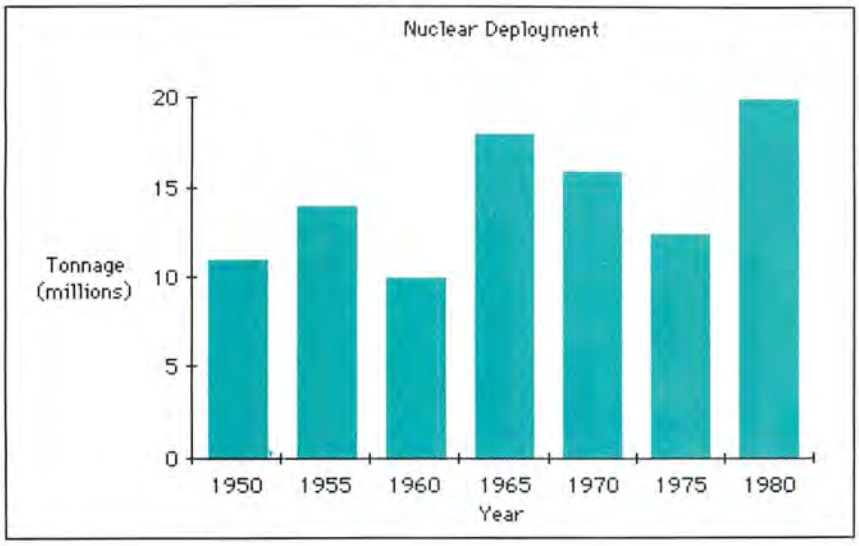


Figure 1-4
Save the graph, quit Chart, *and start* MacPaint. *Don't turn the Mac off or you'll erase the copy of the graph that's stored in the Clipboard. Once you're in* MacPaint, *choose Paste from the Edit menu. After a few seconds, the graph appears in the* MacPaint *window. Since you'll be experimenting, place a copy of the graph in the Scrapbook for safekeeping.*

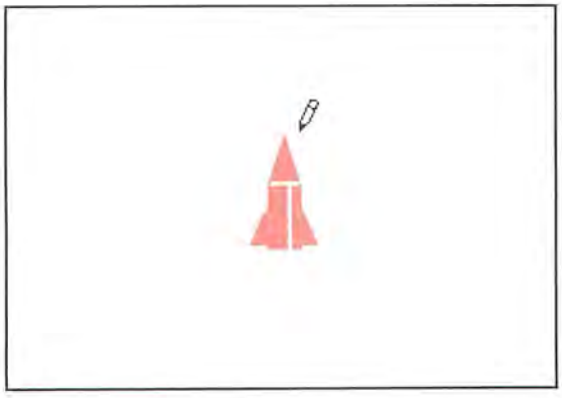


Figure 1-5
Use the grabber (hand) tool or the Show Page command to move the drawing window to a blank part of the page, then create the pictograph symbol shown here. Whenever possible, the symbol should be slightly wider than the bars or columns in the graph. Here the fin-to-fin width is a few hairs wider than the columns. Make the symbol as short as possible; you'll be stretching or stacking it to the correct length later.

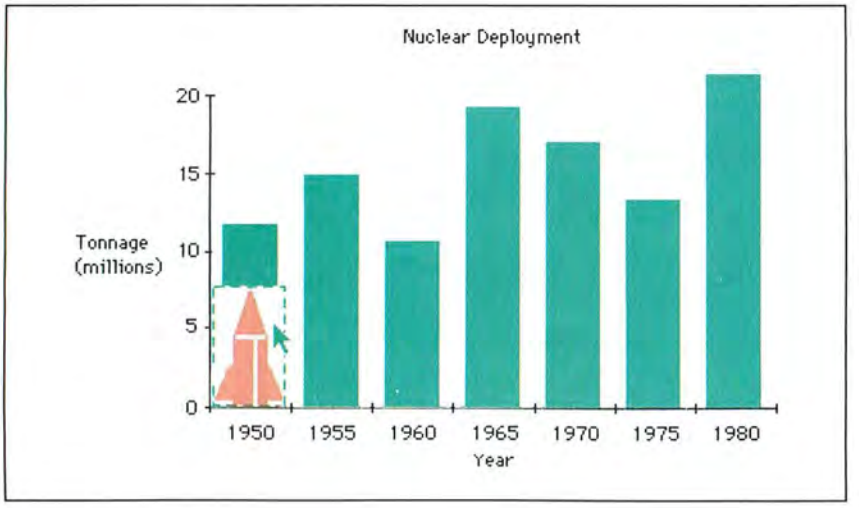


Figure 1-6
Once you finish drawing the symbol, surround it with the marquee and choose Cut from the Edit menu. Move the window back to the graph, paste a symbol at the base of the leftmost column, and click anywhere outside the marquee.

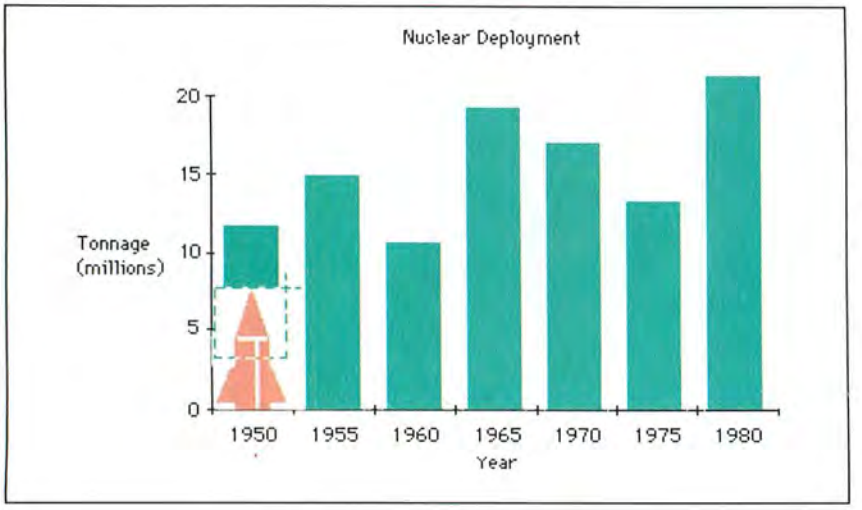


Figure 1-7
Surround the top portion of the symbol with the marquee; you'll be stretching just the midsection, not the whole symbol. Take care not to include a piece of the column or any other part of the graph.

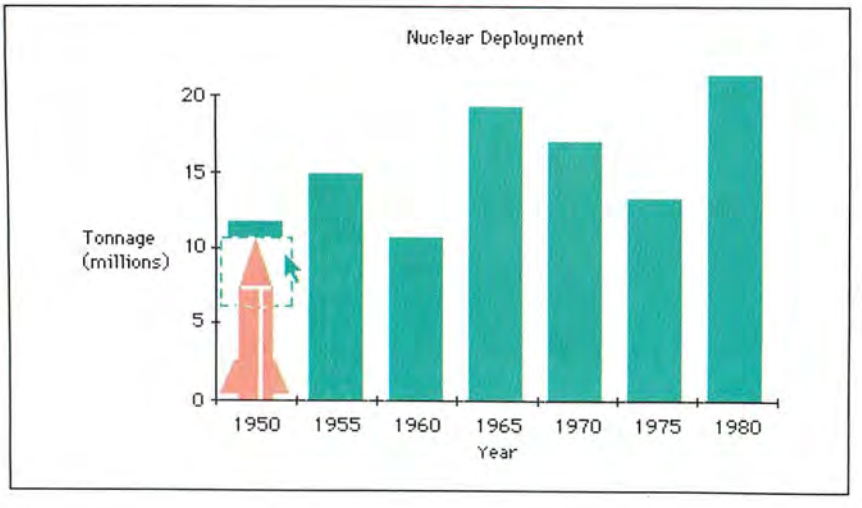


Figure 1-8
Place the pointer along the top line of the marquee. The pointer should still be arrow-shaped. Hold down the Shift, Option, and ⌘ keys simultaneously and drag the pointer upward. The symbol will stretch. Release the mouse button and the keys when the tip of the symbol reaches the top of the column.

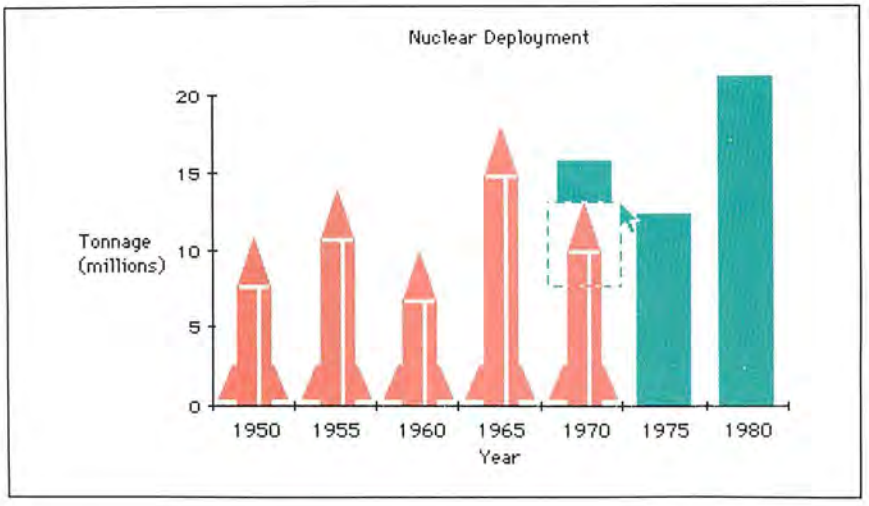


Figure 1-9
Repeat the stretching procedure for each column in the graph. If you make a mistake while modifying a column, use the Undo command and start over. The upper-left key on the keyboard is a handy Undo shortcut.

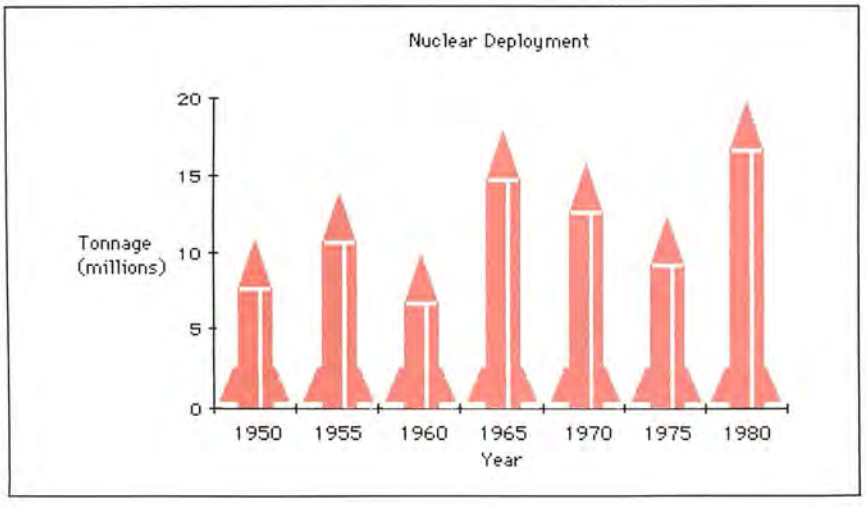


Figure 1-10
Compare the chart in Figure 1-2 with the finished chart here. As you can see, taking an extra 10 or 15 minutes with MacPaint *can add considerable impact to a chart. You can use many of the same techniques to embellish charts with buildings, pipes, girders, lumber, or other images. But don't overdecorate a chart; a busy graph loses its effectiveness.*

Combining Charts and Pictures

Gordon McComb is a Contributing Editor of Macworld.

A favorite graphics trick that many slick newspapers and magazines use is to lay a chart over a picture. *Microsoft Chart* doesn't let you combine pictures and charts, but with the help of *MacPaint,* the operation is relatively painless.

You can enhance a chart with just about any picture, including houses, airplanes, boats, or dollar bills. You can draw the picture yourself with *MacPaint,* or you can use one of the Mac clip art collections. You can even use the images created with digitizers, like those from Koala, Thunderware, and Micron Technology (see "Pictures to Pixels," *Macworld,* April 1985). Don't be afraid to experiment. Try several *MacPaint* pictures with each chart, and play around with textures, sizes, and placement.

Microsoft Chart
Microsoft Corp.
10700 Northup Way
Bellevue, WA 98004
206/828-8080
List price: $125

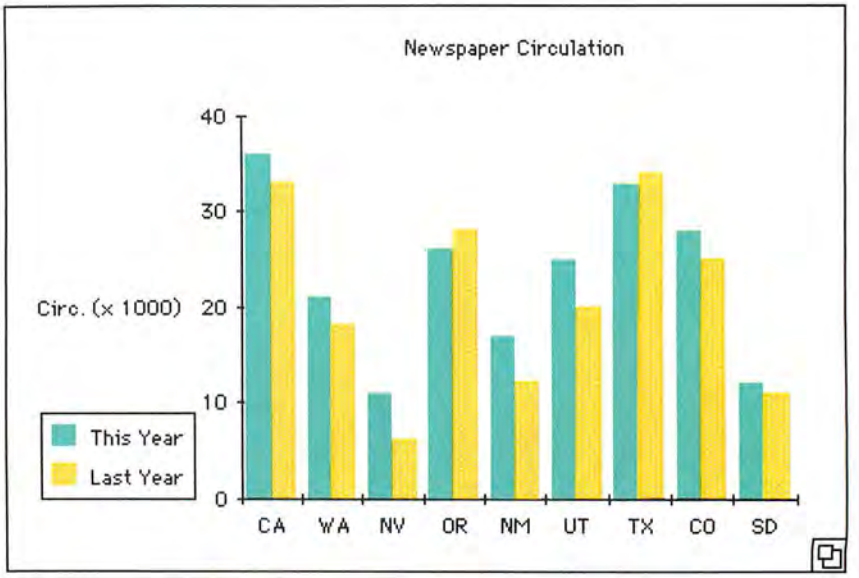


Figure 2-1
Create a graph. Almost any type of graph will do, but bar and column charts work best. Copy the graph, save the document, and exit Chart.

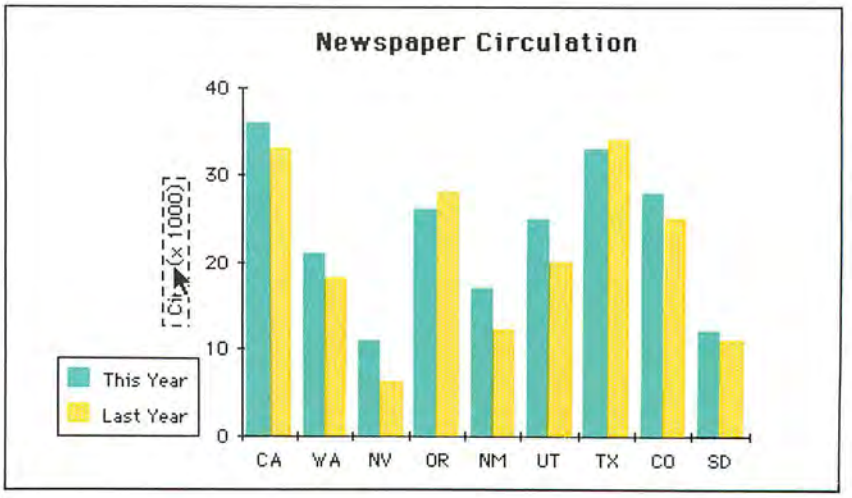


Figure 2-2
Start MacPaint *and paste in the graph. Add refinements to the graph now, such as changing the type style of the title or making a vertical Y-axis label using the Rotate command. Finish by lassoing the entire chart, choosing the Cut command, and pasting the chart into the Scrapbook.*

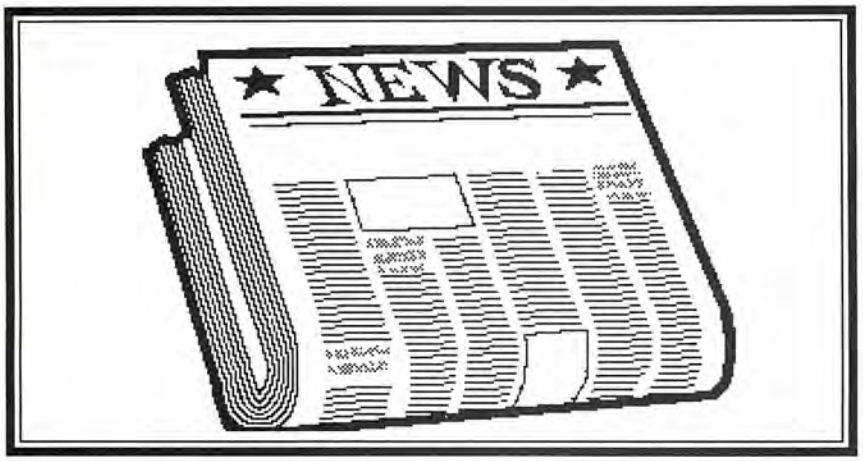


Figure 2-3
Create or copy the background art for the chart. This newspaper is from Magnum Software's McPic! *clip art library (each* McPic! *picture is stored as a separate Scrapbook entry). For this example, the newspaper was copied from the Scrapbook with the Copy command and placed into the* MacPaint *document with the Paste command.*

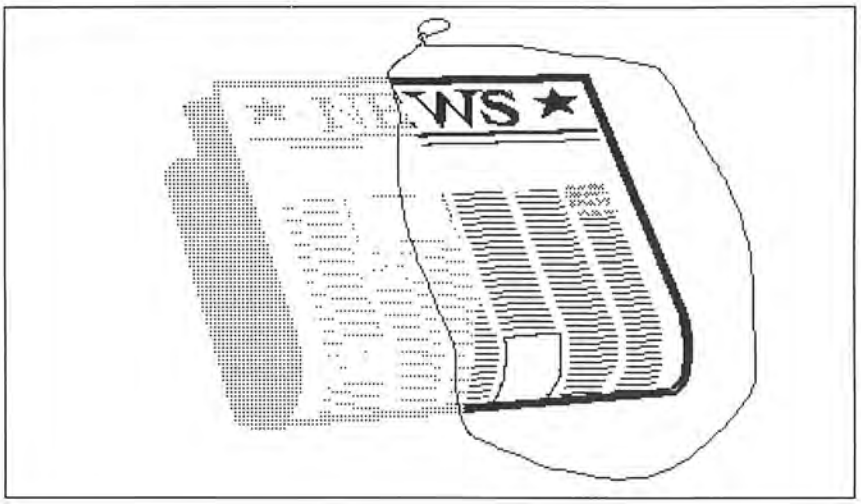


Figure 2-4
Many drawings are too dark and solid to use as background art for a business chart. You can "dim" a drawing with the Fill command in the Edit menu. Select a light pattern from the pattern palette, surround a section of the picture with the lasso, and choose the Fill command. Repeat this procedure until the entire image is dimmed. You normally shouldn't lasso the entire picture at once because you'll lose too much detail and end up with a featureless blob. If you have a steady hand, you can also fill black lines or areas with a lighter pattern using the paint bucket.

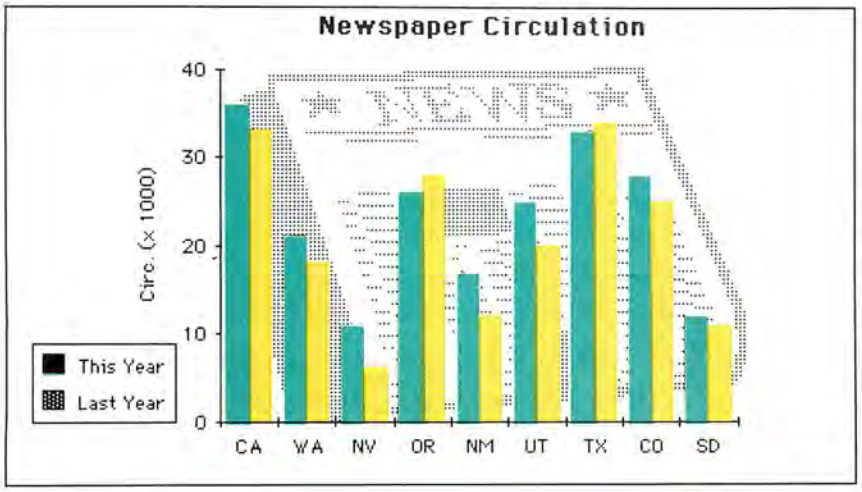


Figure 2-5
Open the Scrapbook, cut out the graph, and paste it over the dimmed art. Drag the graph with the arrow-shaped pointer to position it over the art. When the graph is in place, click anywhere outside the shimmering image. Compare the graph in Figure 2-1 with this enhanced version. In many cases titles and legends aren't necessary, particularly if the chart is for an audience already familiar with the subject matter. You can further enhance the graph by adding borders, grids, and the like, but remember to keep it simple. □

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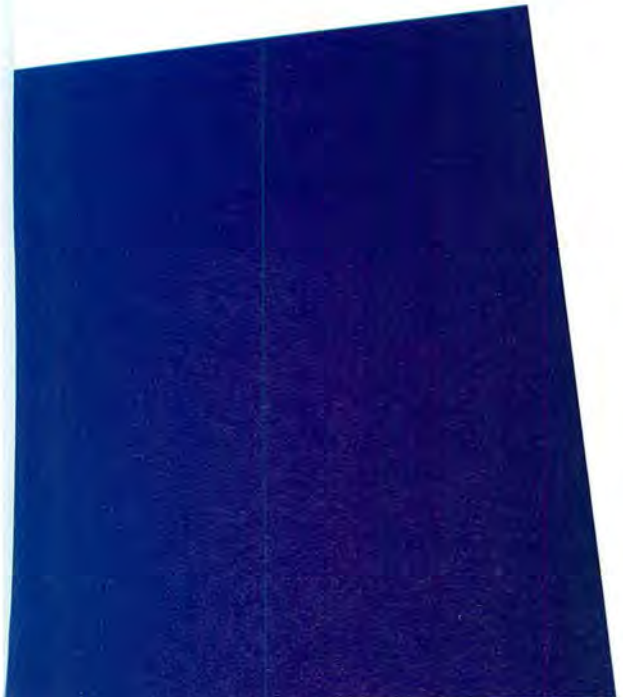

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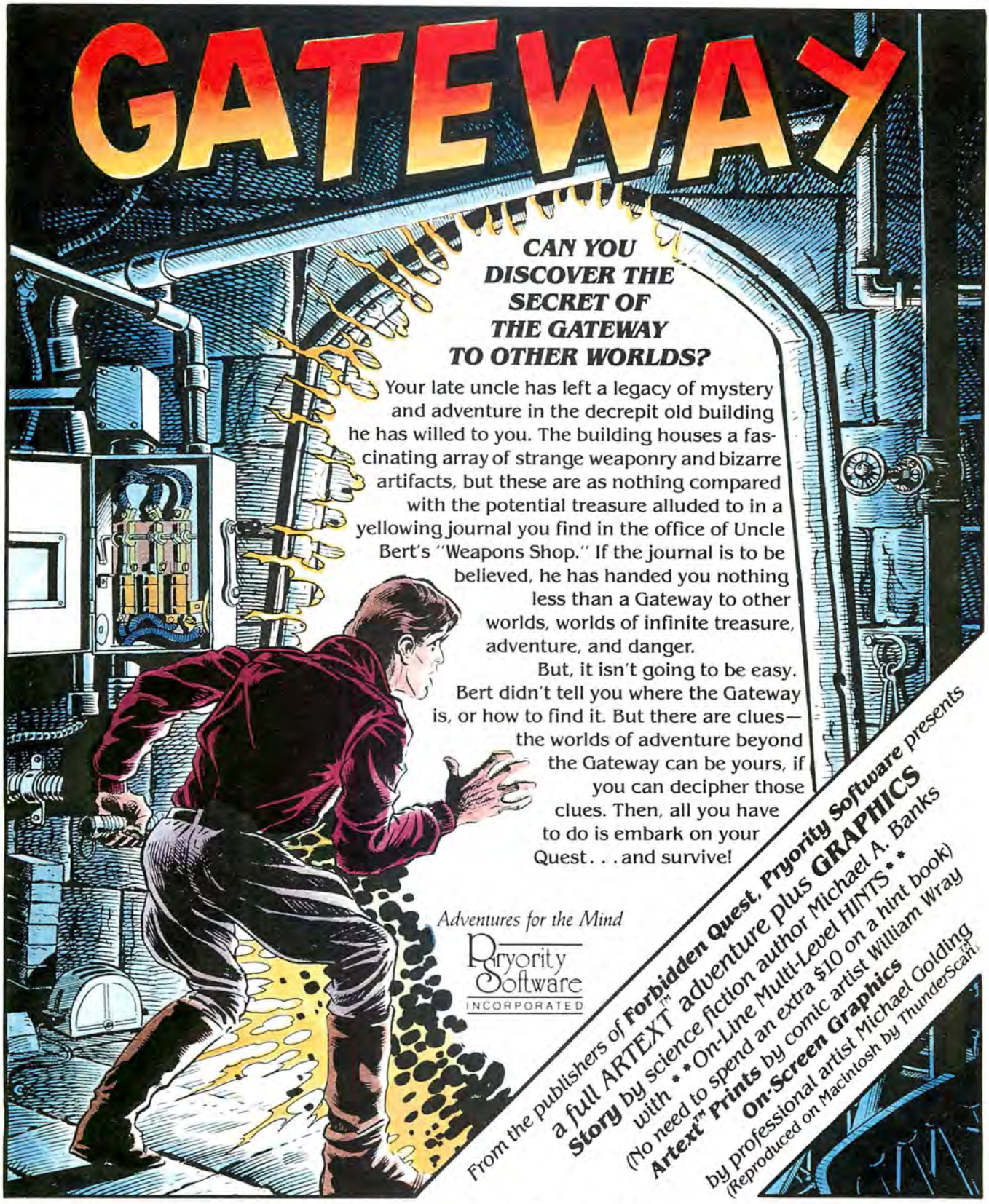

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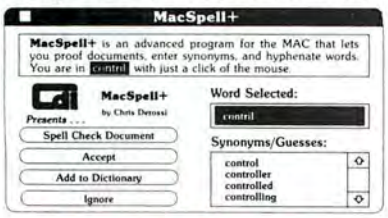

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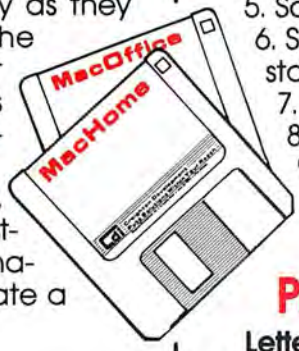

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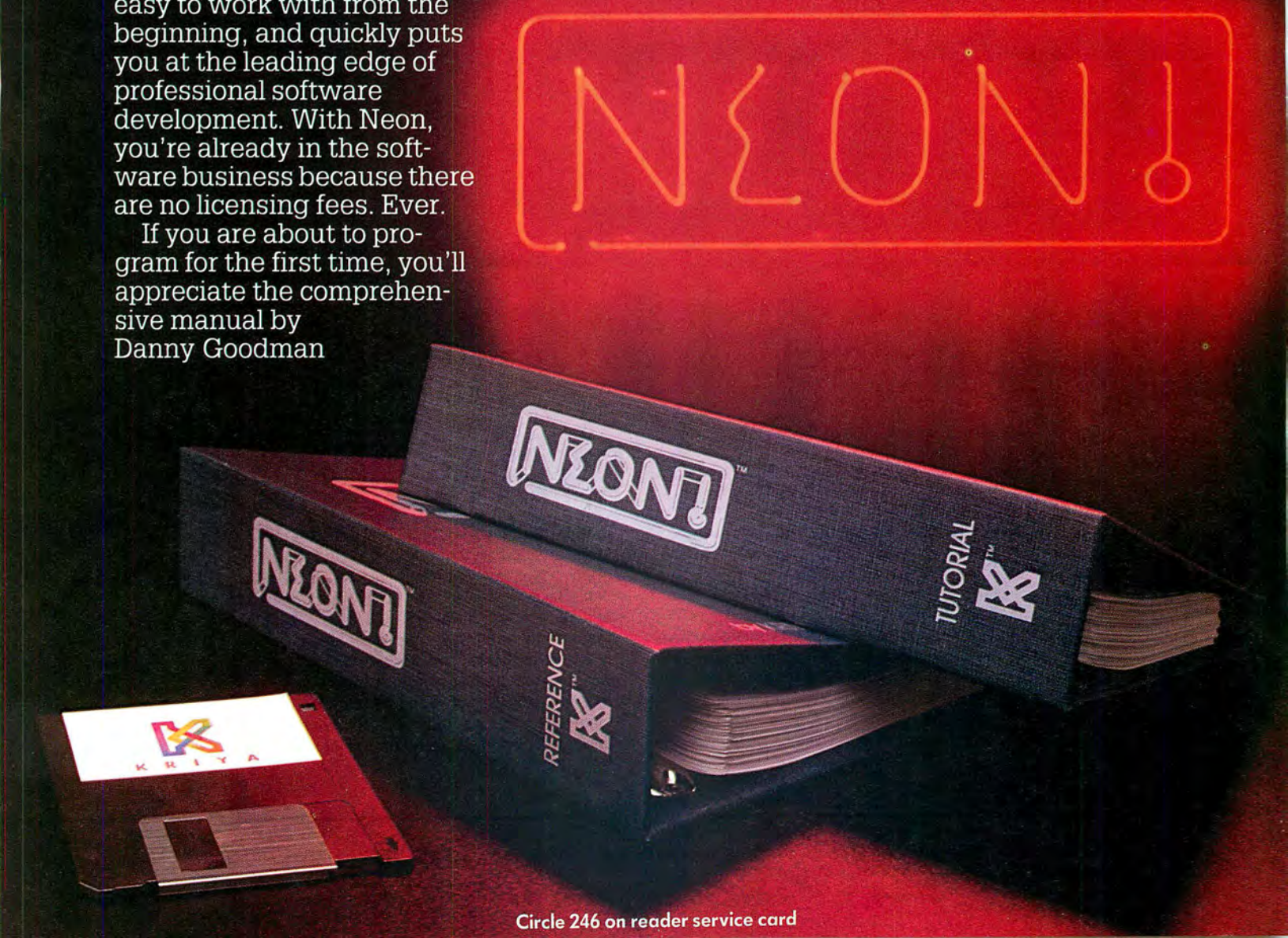

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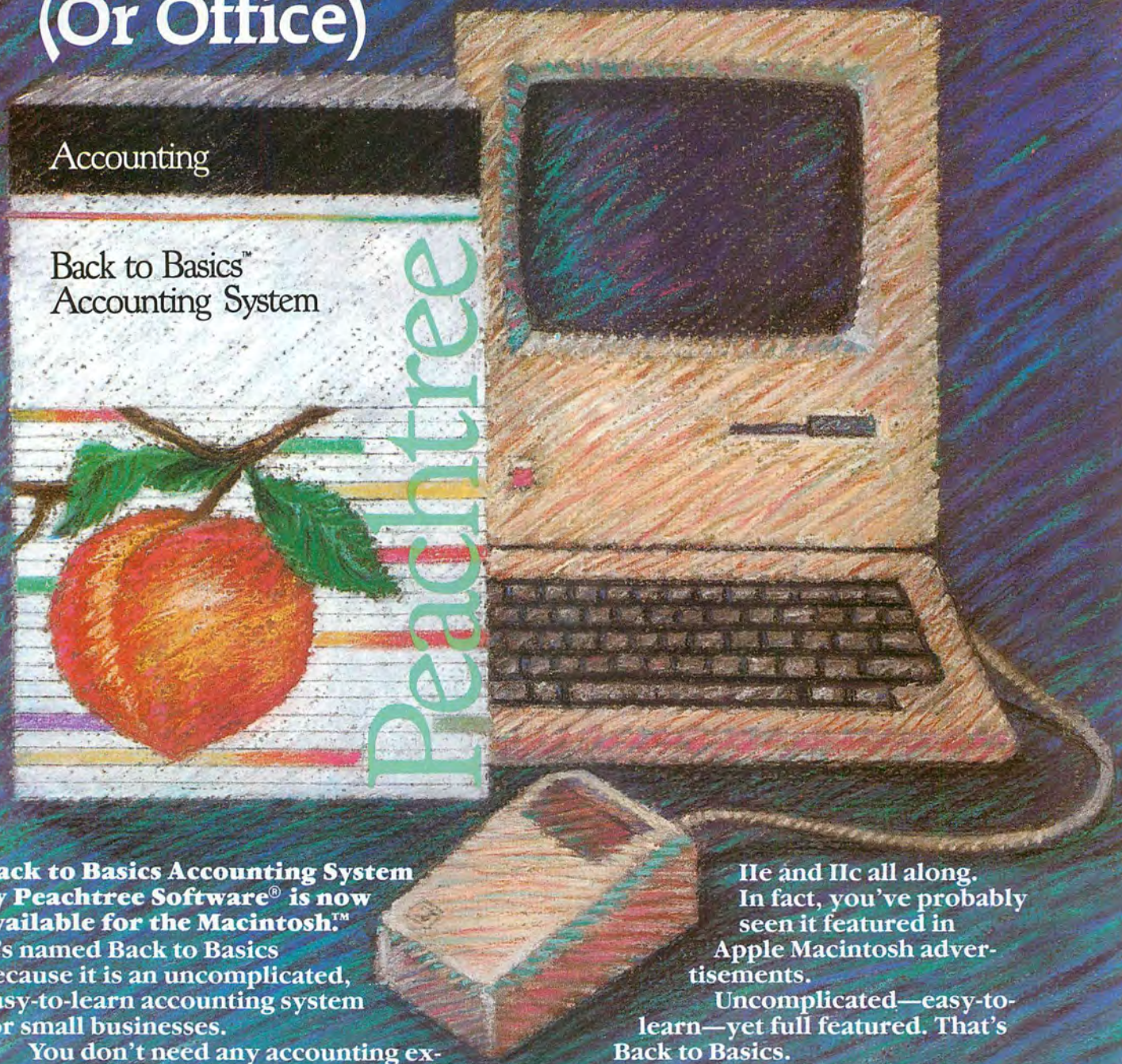

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Get Info

Macworld's tutor answers questions about 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.

I often wonder what I would do for material for this column if Microsoft had put Font and Style menus in *Multiplan*. People keep writing to me with more questions and discoveries about alternatives to *Multiplan*'s standard 10-point Seattle font. This month's column includes two more letters that—who knows?—may wrap up the discourse.

I receive a lot of inquiries about transferring *MacPaint* drawings into *MacWrite*. This month I explain how you can situate and manipulate drawings once you paste them into *MacWrite*. Transferring information between application programs and BASIC or Pascal programs is also a popular topic. This month I explain how to read *Multiplan* files from a BASIC program.

Finally, this month's column includes a question concerning telecommunications. When you attempt to reach out and touch some remote computer, you leave behind icons, windows, pull-down menus, and cut-and-paste editing and enter a strange new world governed by keyboard commands. One telecommunicator wants to know if he can send keyboard commands to a non-Apple modem with *MacTerminal*.

Compressed Multiplan Rides Again

Q. I have been following with interest your discussions on how to convert *Multiplan*'s 10-point Seattle font to 9-point Geneva. I substituted fonts but got a difficult-to-read 9-point font, as discussed in "Compressed Multiplan II" [*Get Info, Macworld,* January 1985]. I attempted to solve the problem by copying a more recent version of the System file to the *Multiplan* disk as you recommended. But when I perform that operation, it doesn't work. Instead I get the message, "There are items that can't be replaced because they are locked or in use." How can I solve this problem?
Jim Pickering
Sunnyvale, California

A. You must have started up with the *Multiplan* disk, making it the startup disk. The Macintosh uses the System file, the Finder, and the Clipboard file from the startup disk and does not let you remove them or copy over them. The solution: start up with the System disk instead of the Multiplan disk, making the System disk the startup disk and its System file the one that can't be removed or copied over. This arrangement allows you to copy the System file from the System disk to the *Multiplan* disk.

Multiplan . . . The Final Chapter

Q. I discovered a method for printing a *Multiplan* spreadsheet in 9-point Chicago. First you prepare a 9-point *Multiplan* disk following the procedure described in "Spreadsheets Printed in Style" [*Macworld,* December 1984].

To get the 9-point Chicago font, start up the Mac with the *Multiplan* 1.02 master disk and eject the disk as soon as the desktop appears. Insert the 9-point disk copy and open *Multiplan* from it. The program ap-

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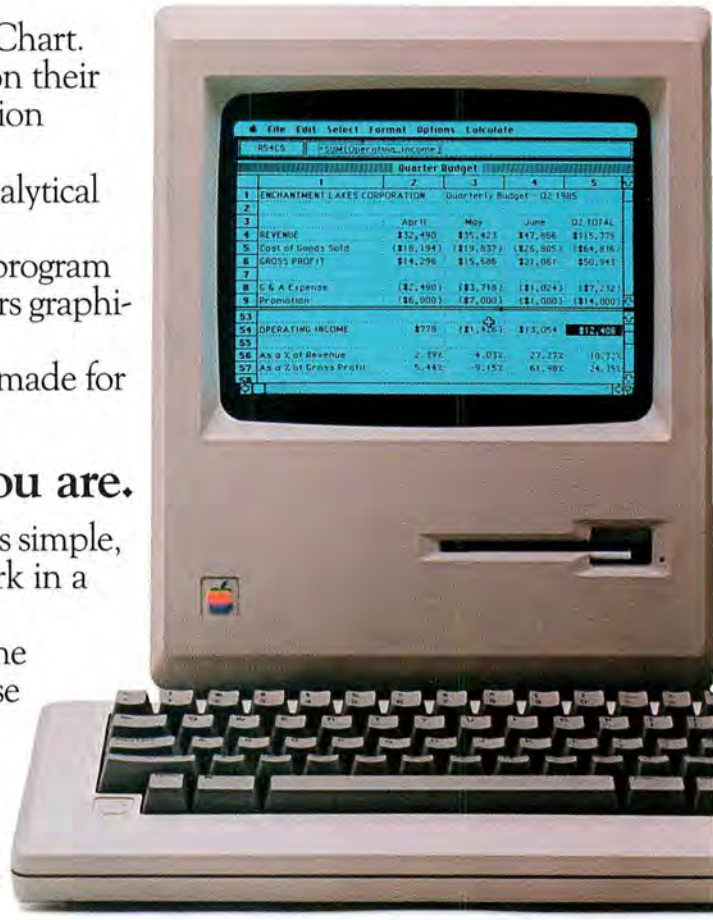

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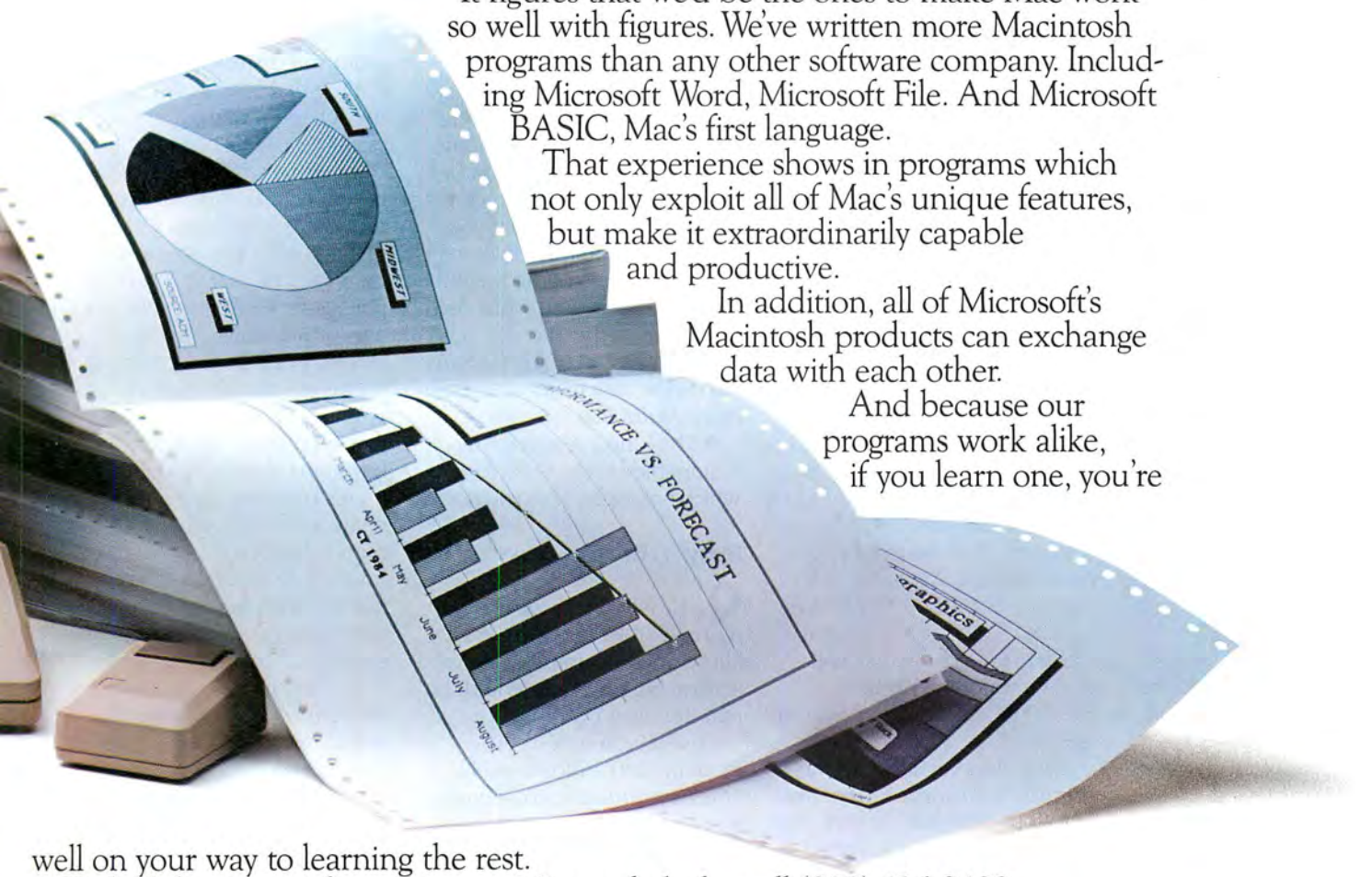

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Version of Startup Disk System File	Version of Multiplan System File	Fonts in Multiplan System File	Font Used by Multiplan
Any	Any	Any size Seattle	10-pt. Seattle
Old	Old	No Seattle	9-pt. New York
New	Old	No Seattle	9-pt. Geneva
Old	New	Any size New York but no Seattle	9-pt. New York
Old	New	No New York or Seattle	9-pt. Chicago
New	New	No Seattle	9-pt. Geneva

Summary of Multiplan Fonts
The font in which Multiplan *displays type depends on a number of factors.*

pears in 9-point Chicago. Because 9-point Chicago does not exist, the Mac scales down 12-point Chicago. The scaled font looks indistinct when displayed on screen or printed in standard resolution. Printed in high resolution, the scaled font looks good. It looks even better to someone who is a Chicago lover to begin with.
J. E. McConnell
Port Lavaca, Texas

A. This trick works because of quirks in *Multiplan* and the System file. The System file always contains at least four fonts: the system font, the standard application font, and two others. The system font, Chicago, is used for menus, window titles, and dialog and alert boxes. The standard application font is either New York or Geneva, depending on the age of the System file. The standard application font is used to display information you type in application programs such as *MacWrite* and *MacPaint* or in a desk accessory such as the Note Pad.

The Macintosh's first System file designated New York as the standard application font, but with the release of version 1.1 of the Finder in May 1984, the standard application font became Geneva. A system disk with the number 690-5003A on its label has the early System file, while a system disk with the number 690-5003B or 690-5003C has the later System file.

Multiplan version 1.02 was shipped with version 1.1 of the Finder but still had an early version of the System file with the Seattle font included. *Multiplan* normally displays data in Seattle instead of the application font. But if Seattle is not in the System file, *Multiplan* uses the application font (Geneva or New York). When the application font is also absent, *Multiplan* displays data in the system font (Chicago).

Another factor that determines the font in which data appears is the startup disk's System file, which designates the application font. If the startup disk has an early version of the System file, the application font is New York. If the startup disk has a later System file, the application font is Geneva. The application font stays in effect until you turn the Mac off or press the reset button. Opening an application program on a different disk changes the startup disk for all other intents and purposes but does not change the application font.

In summary, you can actually type in four fonts with *Multiplan:* 10-point Seattle, 9-point Geneva, 9-point New York, or 9-point Chicago (scaled from 12-point Chicago). The font you get depends on these factors:

- The version of the System file on the disk with which you initially start the Mac.
- The version of the System file on the disk from which you open *Multiplan.*
- The fonts present in the System file on the disk from which you open *Multiplan.*

Busy . . . Busy . . . Busy

Q. I wish *MacTerminal* were more flexible; nevertheless it allows me to communicate with several bulletin boards and the mainframe at my office.

I use a Prometheus ProModem 1200. Unfortunately, *MacTerminal* doesn't seem to work with ProModem commands like A/, which tells the modem to repeat the last command received. I think *MacTerminal* should provide a way to redial a busy number.
Mark C. Kerstetter
Kalamazoo, Michigan

A. Automatic redialing following a busy signal is controlled by a configuration switch on the bottom of the ProModem, not by *MacTerminal.* If configuration switch 9 is on, the ProModem hangs up when it gets a busy signal. But if configuration switch 9 is off, the ProModem waits 30 seconds and then redials. Redialing occurs every 30 seconds until the modem makes the connection. You can stop the redialing by pressing any key on the Macintosh keyboard.

With *MacTerminal* the first redial occurs while the program still displays the Now Calling dialog box. By the time the second redial occurs, however, that dialog box is replaced by one that reads "No modem is connected. Make sure your modem is connected and turned on." If you ignore the message, the dialog box disappears shortly. At this point you must wait through the 30-second period when nothing seems to happen. *MacTerminal* is in fact inactive, but if you keep your hands off the keyboard, the ProModem continues counting the seconds while it waits to redial the number. When the modem is finally able to establish a connection with the remote computer, you can communicate as usual.

You can include the ProModem's special dialing commands with the phone number you type in the Phone menu's Phone Settings dialog box. For example, typing the number 9W5558700 instructs the ProModem to dial 9, wait for a second dial tone, and then dial 555-8700. The number 5555016,14155559196 instructs the modem to dial 555-5016, wait 2 seconds, and then dial 1/415/555-9196. The program recognizes the use of commas with Apple, Hayes, and other modems as well.

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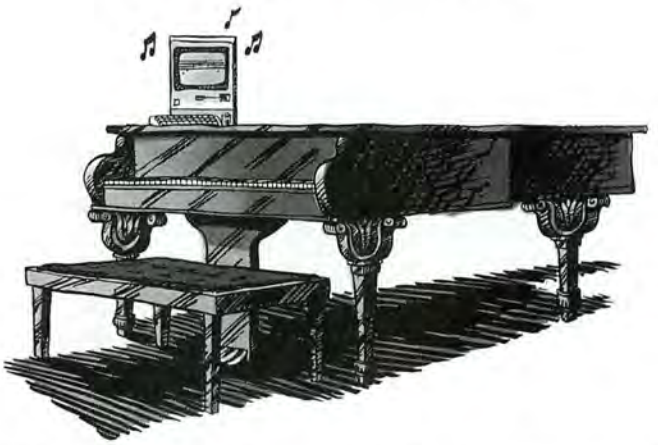
M585

How to Mac Music



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You can also send commands directly to the ProModem (or any other modem, for that matter) by typing them on the Mac's keyboard. Assuming you are not yet connected to another computer, you type the commands in capital letters. For example, typing ATD14155559196 and pressing Return dials the number 1/415/555-9196 directly, bypassing the Phone menu altogether. However, after you establish a connection with another computer, the modem stops watching for commands. To get the modem's attention, wait at least one second, type three plus signs (+ + +), and wait another full second. You should see "OK" appear on screen, after which you can type commands for the modem, such as ATH (hang up).

Prometheus also makes a terminal program called *ProCom_M,* which you can use on the Mac instead of *MacTerminal.* The program works with most Hayes-compatible modems but is designed especially for a ProModem 1200. *ProCom_M* lacks some of *MacTerminal*'s features, such as line break and word-wrap options, the VT-100 and IBM 3278 terminal modes, the tab ruler, and the keypad. The program has several features that *MacTerminal* lacks, however, including a phone log, a dialing directory, and automatic redialing when a busy signal is received. You can also use the program to dial phone numbers for voice communications, set the ProModem clock from the Mac's clock, transfer *MacPaint* documents and other binary-format files to another Mac that uses *ProCom_M,* and set up a chain of automatic responses to a remote computer. *ProCom_M* allows off-line cutting and pasting of text you receive.

Putting a Drawing in Its Place

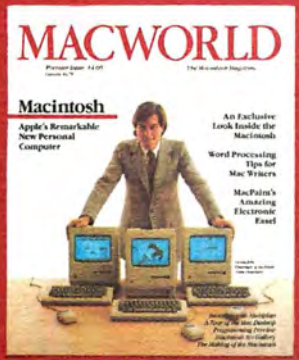
Q. When I create a drawing with *MacPaint* and want to move it to another document, such as a letter in *MacWrite,* I put it in the Scrapbook, then cut or copy for pasting in the letter. However, when I paste, the drawing always ends up at the upper-left corner of the page, not where I place the cursor. Once I paste the drawing, I can't move it. How do I cut and paste a selection to a specific point in the new document or move the drawing once pasted?
Phil Holts
Brasilia, Brazil

A. The fastest way to transfer a drawing from *MacPaint* into a single *MacWrite* document is to use the Clipboard. However, if you expect to paste the drawing into more than one *MacWrite* document, it's faster to use the Scrapbook.

Whether you paste a drawing into one *MacWrite* document or several documents, begin by selecting with the lasso or the marquee the portion of the *MacPaint* drawing you want to transfer. Exclude any extra white space surrounding the drawing because this space prevents you from placing the drawing flush against the *MacWrite* document's margins. You cannot remove the white space in *MacWrite* because the program treats the whole picture–surrounding white space included–as an indivisible unit.

Next choose Copy or Cut from the Edit menu to place the selected drawing on the Clipboard. The drawing stays on the Clipboard until the next time you choose Cut or Copy from the Edit menu. Once

Sign me up!



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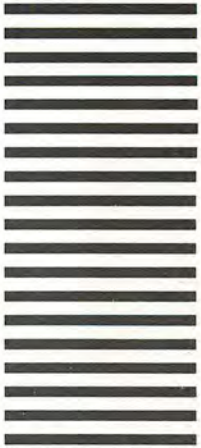

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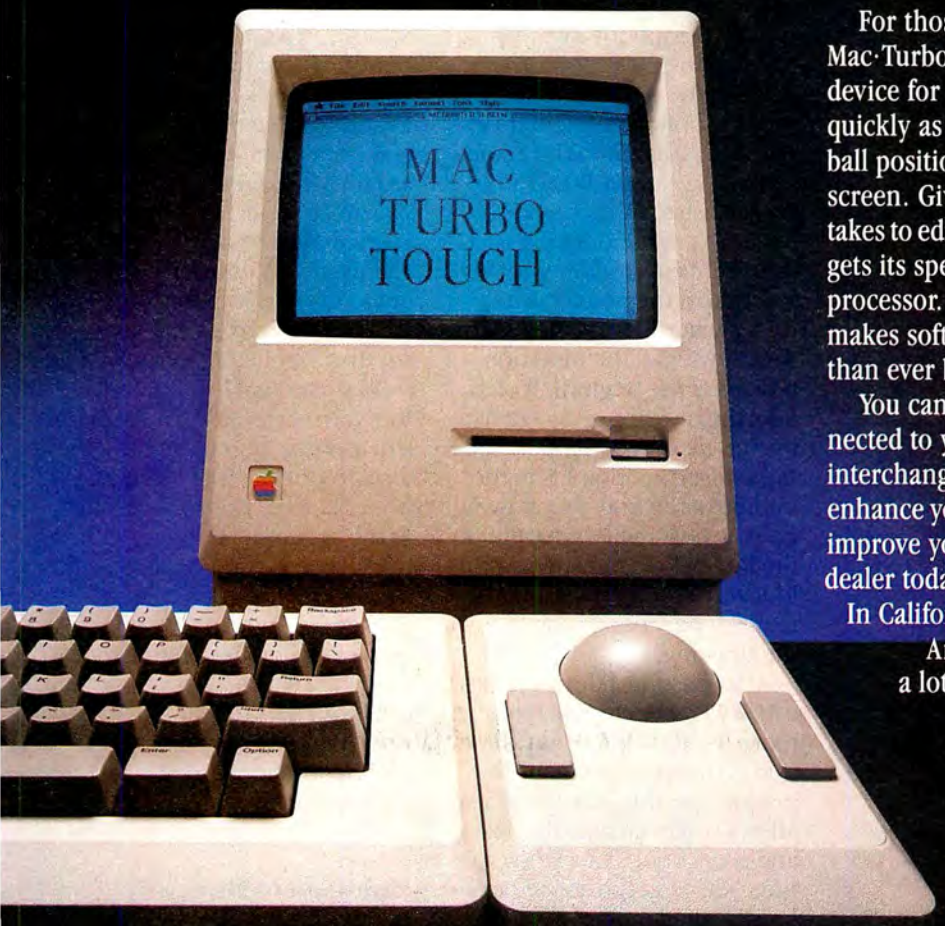

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you've copied the drawing to the Clipboard, quit *MacPaint* and open the *MacWrite* document into which you want to paste the drawing.

If you plan to use the drawing in several *MacWrite* documents, paste it into the Scrapbook as soon as *MacWrite* is open. Unless *MacWrite* and *MacPaint* are on the same disk, do not paste the drawing into the Scrapbook directly from *MacPaint*. Each disk has a separate Scrapbook, and an application like *MacWrite* or *MacPaint* has access to only the Scrapbook on its own disk. Choose Scrapbook from the Apple menu, then choose Paste from the Edit menu and finally put the Scrapbook away by clicking the close box.

Since the drawing remains on the Clipboard whether or not you paste it into the Scrapbook, you can go ahead and choose Paste from the Edit menu to put the drawing into the *MacWrite* document. The location of the pointer determines where *MacWrite* inserts the drawing. If the insertion point is at the beginning of a line, the drawing goes against the left margin of the same line. If the insertion point is in the middle of the line, the drawing goes against the left margin of the line below, and any text that follows the insertion point becomes a new paragraph below the drawing.

After pasting a drawing into a *MacWrite* document, you can move the drawing in any direction on the page, as far as the margins permit. *MacWrite* also allows you to change the size and proportions of a whole picture. You can type above or below the drawing but not alongside it. All other modifications to the drawing must be made in *MacPaint* and copied to *MacWrite* as a new drawing.

To move a drawing down the page, insert blank lines above it by positioning the I-beam pointer just ahead of it and pressing the Return key. To move the drawing up, delete lines above it.

To move the drawing sideways, first select it by clicking anywhere on it, then drag it by its selection box. Be careful not to type anything while a drawing is selected because the typing will replace the drawing. Should this happen accidentally, immediately choose Undo from the Edit menu.

Place the pointer on the top or either side (but not the bottom) of the selection box and drag the rectangle right or left. When you release the mouse button, the drawing jumps inside the selection box at its new location. If the margins keep you from moving the drawing as far to the right or left as you'd like, insert a formatting ruler above the drawing and change the margins. Don't forget to insert another formatting ruler below the drawing to reset the margins.

To stretch or shrink a drawing, you can use the three black squares that appear on the bottom border of every selection box. Place the pointer over one of the squares and drag it with the mouse. As you drag the square, the selection box changes proportion. When you release the mouse button, the drawing adjusts its proportions to fit the box's. If you want to return the drawing to its original shape, choose Undo from the Edit menu immediately.

Multiplan to Microsoft BASIC Times 40

Q. I need to transfer data from 40 different *Microsoft Multiplan* spreadsheets to one Microsoft BASIC program. I could use the Clipboard as de-

scribed in the BASIC 2.0 manual, but this method is extremely time-consuming and troublesome to use on 40 spreadsheets.

The OPEN and LOAD commands in the program do not seem to work. Do you have a remedy for this problem?
Ilenna Tai
Toronto, Ontario
Canada

A. If you save the spreadsheets in *Multiplan*'s SYLK (Symbolic Link) format instead of the Normal format, you can access the data easily from a BASIC program. The Normal format represents data in binary form; the SYLK format represents data as regular text characters. You can't read a SYLK-format spreadsheet like a novel, because it is in code. For example, the characters **C;X4;ESUM(R[−6]C:R[− 2]C;K3753.98.** mean "the value of the cell in the fourth column of the current row can be computed by the relative-reference formula SUM(R[−6]C:R[−2]C, and its current value is 3753.98."

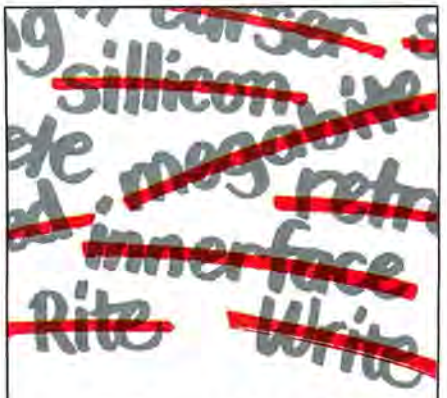
A six-page description in the appendix of the *Multiplan* manual tells you how to decode a file saved in SYLK format. You can use the decoded information to write a program that extracts the information you need. The following Microsoft BASIC 2.0 program lists all the codes in a SYLK file:

```
OPEN "filename" FOR INPUT
  AS #1
WHILE NOT EOF(1)
     INPUT #1,RECORD$
     PRINT RECORD$
WEND
CLOSE #1
END
```

For printed output, change the **PRINT** statement to an **LPRINT** statement. You can also use a general-purpose file editor to expose the exact, letter-by-letter contents of a file. The FEDIT (File and Volume Editor) program by John H. Mitchell is both useful and easy to use. You can get a copy from the Berkeley Macintosh Users Group by contacting Reese Jones at 1442A Walnut St., Berkeley, CA 94709.

Send your questions about the Mac, Mac applications, or Mac programming to Get Info, Macworld, *555 De Haro St., San Francisco, CA 94107. You may inquire electronically via CompuServe 74055,412 or The Source STE908.*

Lon Poole is a Contributing Editor of Macworld. □



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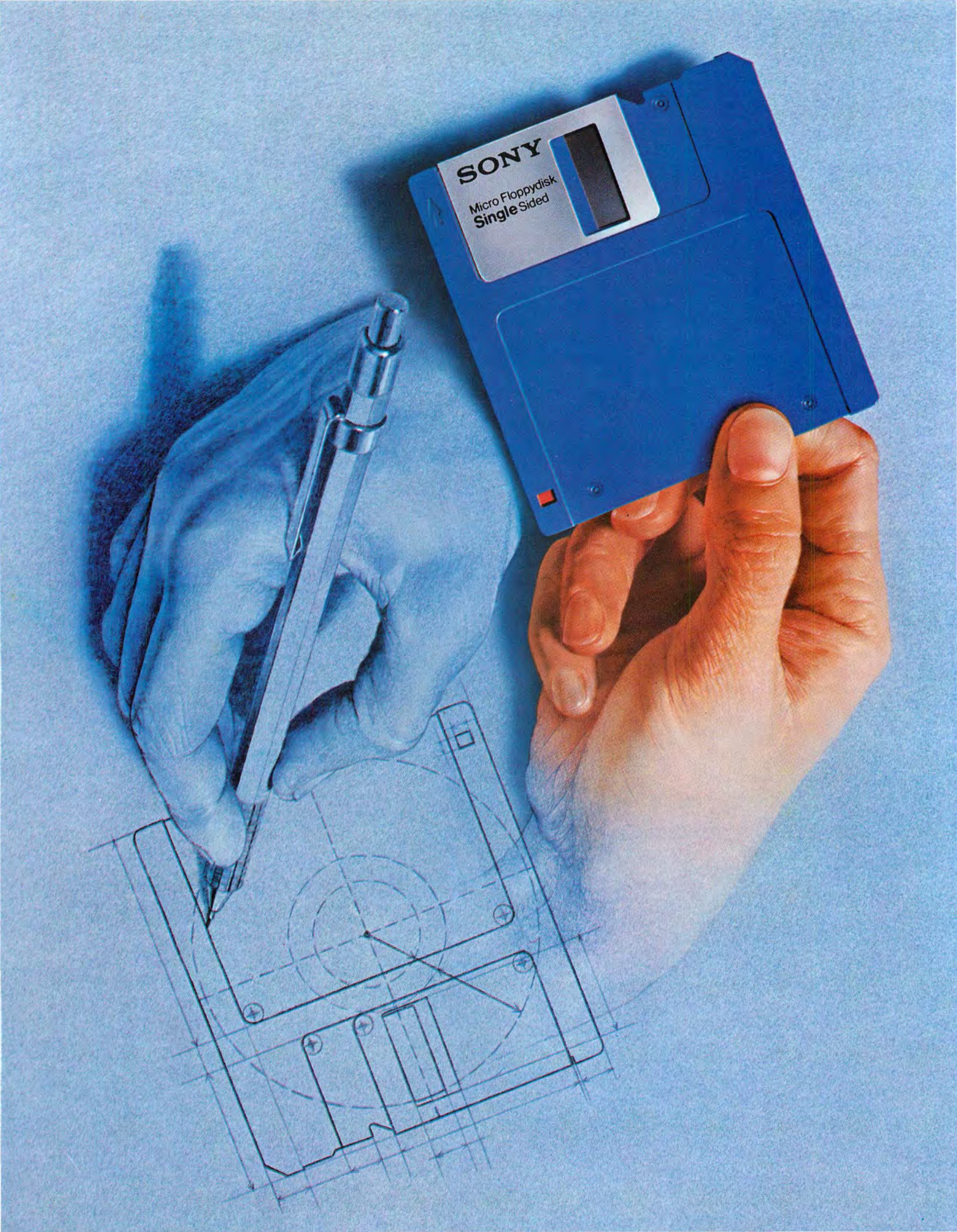
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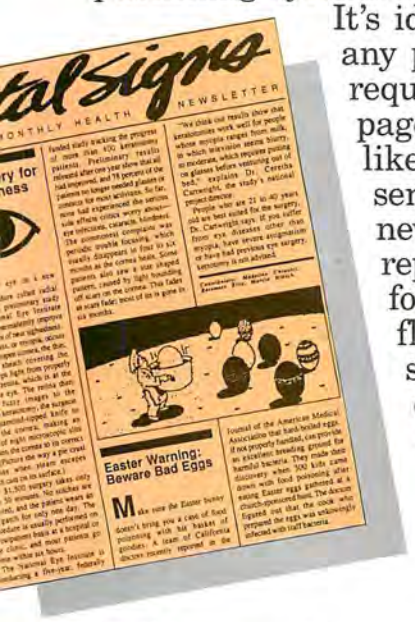

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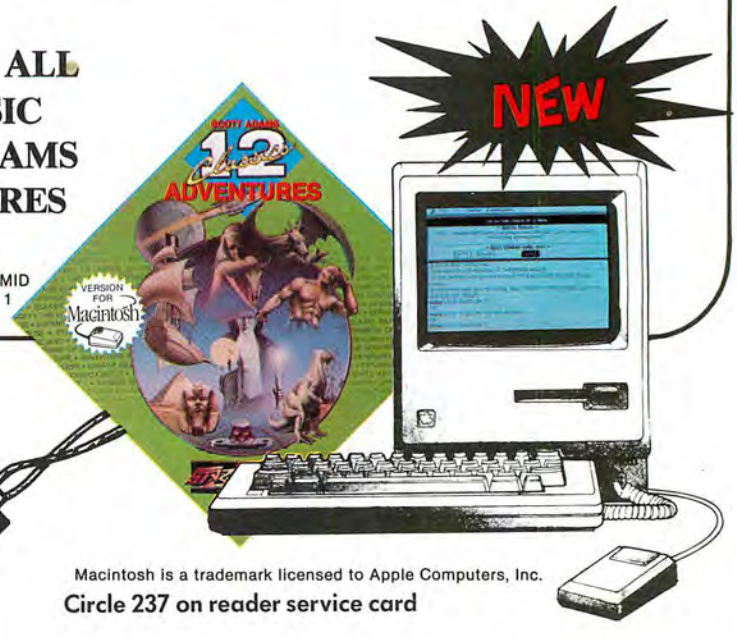

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> Wake Up to Adventure

Sharon Zardetto Aker

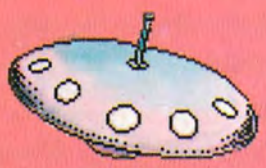
You wake up from an early afternoon siesta. Freshly picked coffee beans in a sack serve as a lumpy pillow, but that doesn't bother you as much as the ominous drone of low-flying aircraft and the urgent cries of people running for cover.

> Stand up.

You stand up.

> Look around.

You are on a hillside where coffee is grown. A sack of coffee beans is here. A dimolybdenum harvesting stick is here. People run past you toward a clump of acacia trees to the west. Three Alpha Galactic sublight interceptors are approaching the hillside from the north.



> Take the coffee and the stick.

Sack of coffee beans: taken.

Dimolybdenum harvesting stick: taken.

As people hurry by, they yell at you to run for cover. The interceptors will start strafing the hillside any second.

> Who am I?

You are Nancy Bowley, a retired schoolteacher from Toledo, Ohio, harvesting coffee on the tropical moon Fonseca-17. Welcome to the world of interactive fiction. . .

CAFE

Interactive fiction is a genre of computer adventure games in which you are the central character in a story, and your actions affect the development and outcome of the plot. The scenarios vary; you may be solving a murder, saving another world, or dealing with wizards, aliens, or denizens of the deep. But the underlying concept of interactive fiction games is the same: you are presented with a series of locations, objects, characters, and events. In the course of a game, you reason your way out of difficult situations and look for clues and objects essential to progressing in the game. While the ultimate goal is usually to achieve a high score, with points awarded for correct actions throughout the game, the immediate goal is to stay alive. The games reviewed here, coincidentally all in the science-fiction/fantasy category, use typed-in commands for the story to progress.

The Hitchhiker's Guide to the Galaxy

The bulldozer is coming, and so is the end of the world, but with that hangover you hardly care. If you manage to survive the hangover, you discover that your house is about to be demolished to make way for a highway. And as if that weren't enough, the earth is about to be demolished to make way for an interstellar bypass. Luckily you have a good friend, who sometimes speaks vaguely, a towel, and the incredible answer machine–the Guide.

Infocom's newest addition to its lineup is a joint effort between Steven Meretzky, who was responsible for *Planetfall* and *Sorcerer,* and Douglas Adams, author of the book *The Hitchhiker's Guide to the Galaxy* (Harmony Books, 1980; see "A Hitchhiker's Guide to Douglas Adams" in this issue). The game begins the same way as the book but quickly diverges, so you don't have to know the book to play the game. Infocom's innovative packaging gets you right into the mood of its games; *Hitchhiker's Guide* is supplied with such things as a Microscopic Space Fleet, peril-sensitive sunglasses, and a Don't Panic button.

The sophisticated parser (the translator that enables an adventure game to respond to English-language commands) and an involved story line take so much memory, however, that graphics are ignored entirely, resulting in the now-familiar designation of *text adventure* (see Figure 1). The lack of graphics is sometimes cited as a drawback, but when was the last time you read a novel that needed pictures?

For a taste of Infocom adventuring, become a reluctant hitchhiker at one point in the journey, when you're faced with a simple problem: how to catch a fish that comes out of a dispensing machine. Consult the Hitchhiker's Guide, which you may be lucky enough to acquire from your friend and fellow traveler in the game, to understand why you need the fish.

When you press the button on the dispenser, a fish shoots out, sails across the room, and flies through a hole in the wall. Despite various bodily contortions, you fail to both press the button and block the fish's passage at the same time. Standing in the fish's path and hitting the button with another object also fails. Trying to stuff the dispenser slot doesn't work, either.

Aha! Closer examination reveals a hook in the wall over the exit hole. With a sigh of self-satisfaction, you hang your robe on the hook, effectively blocking the hole. You cross the room, press the dispenser button again, and watch the fish shoot across the room, smack into the robe, and slide through the sleeve to the floor, right down a heretofore unnoticed drain.

Undaunted, you cleverly knot the sleeve of the robe and press the button again. Another fish shoots out, flies across the room, and slides down the body of the robe into the floor drain.

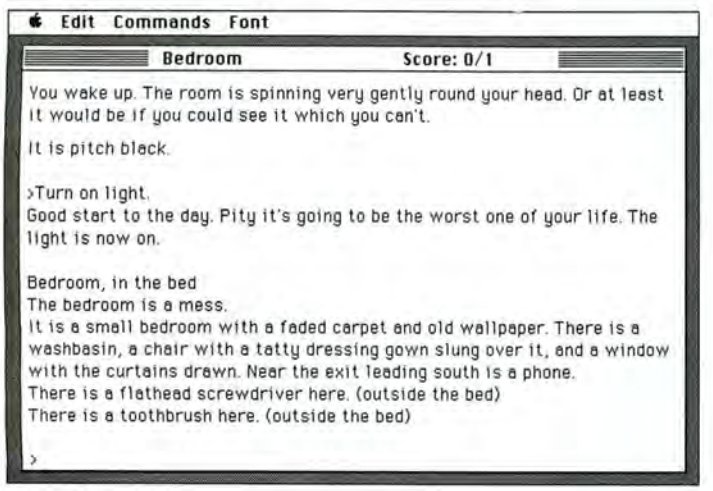


Figure 1
Infocom's The Hitchhiker's Guide to the Galaxy, *based on Douglas Adams's novel, is a deluxe text adventure. You have to ease your way into it and hope that eventually you find your way out again.*

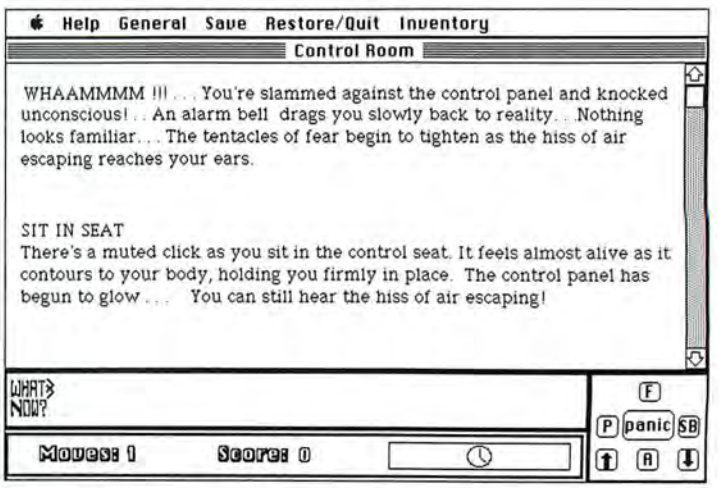


Figure 2
Forbidden Quest*'s screen gives you a scrolling window for the text of the game, an input area, a scoreboard, and a panic button that you hit when you're caught playing instead of working.*

After giving the problem more thought, you lay a towel over the floor drain. Another fish hits the robe, slides down to the floor, and lands on the towel. Before you can triumphantly retrieve the fish, a lower-half-of-the-room cleaning robot arrives, scoops it up, and disappears through a panel in the wall.

That is a taste of text adventuring, Infocom style. The possibilities for actions are seemingly endless, yet most have been anticipated in the program.

As an Infocom fan, I'm not disappointed in the *Hitchhiker's Guide*. As a reviewer, though, I have to point out a few shortcomings. While the packaging is amusing and appealing, you are left wondering what the point of the game is; sometimes the imaginative humor of the documentation overpowers its informative content. The Infocom program designers could use the Macintosh user interface better than they do. They might consider adding a pull-down menu for the inventory of objects you possess at any point in the game, a scrolling text window so you can check your last few moves without using the printer option, and on-line help instead of hint books that you have to order by mail.

My complaints about the game are minor compared to the compliments, however. Thanks to Infocom's writers, the retorts to your commands read somewhat like a novel. Almost every possible move has been anticipated, and while the overall complexity of the game may lead to hair pulling, you won't be frustrated by too many "I don't understand that word" replies from the program.

Here are a few hints before you begin your hitchhiking: don't let yourself get bulldozed, don't be a teetotaler, and above all, don't panic.

Forbidden Quest

The Intergalactic Civil War and all interplanetary trade ended 500 years ago. Technology has rusted away, and chaos reigns. Ancient tales of superior alien beings at the far ends of the galaxy offer hope, and you set off in a stolen starship to find them.

The adventure begins in the midst of a potentially disastrous situation. After your ship has an apparent collision with a meteor, you regain consciousness to a nagging alarm bell and the hiss of escaping air—not the most pleasant sounds when you're alone in a spaceship. If you can stop the leak and get to the engine room without dying of radiation poisoning, then maybe you'll find what you need to get yourself off the crippled ship—if you can land it. And that's only the beginning (see Figure 2).

The game consists of a mazelike series of locations. The object is to find the aliens and bring their knowledge back to the United Alliance of Planets. Comparisons to Infocom's excellent line of text adventure games are inevitable; *Forbidden Quest* is the only game I've seen that doesn't suffer in comparison. Although its vocabulary is a little more limited and the story line has fewer branchings than a typical Infocom text adventure, Pryority Software's *Forbidden Quest* is a rich, well-designed game with lots of features.

The screen includes the score tally, a clock, an area where you type commands, and a "compass" that you can click on instead of typing directional commands. Best of all, a scroll bar enables you to scroll through your last few moves and reread the text.

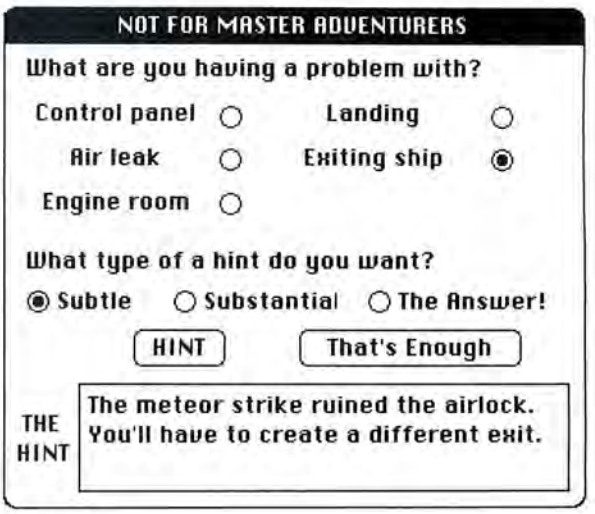


Figure 3
Forbidden Quest*'s on-line hint book provides hints on three levels. Clues are not always available; occasionally the message reads, "You're on your own here."*

Although not integral to the game, other features make *Forbidden Quest* special: the hands on the wristwatch move while the program is loading; the cursor turns into a skeleton's hand when you die (and you will); and when you hit the panic button in the corner of the screen, a spreadsheet appears so you can pretend you've been working all along if someone walks by unexpectedly. The spreadsheet has some of the funniest menu items you'll find on the Mac.

I was pleased to find five prints packaged with the program, showing scenes from the adventure and containing clues that you don't find on the screen. Prints are definitely the way to go if you want graphics in an adventure game. They don't take up memory needed for extensive branchings in the story line and add substance rather than visual Muzak to the game. The final extra is a hint menu with tips of varying subtlety for players who get really stuck (see Figure 3). All in all, I recommend *Forbidden Quest*.

A Look at What's Ahead

Rob Swigart

The history of computer games is in some ways a chronicle of the evolution of the computer itself. The first computer games, designed on monolithic mainframes, were number crunchers, such as Yahtzee, or numerical simulations like Hammurabi, in which you make decisions to ensure the survival of the people of Babylon.

The first text adventure, or interactive fiction, games were developed on mainframes in the 1960s at the Massachusetts Institute of Technology and made their way to personal computers in the late 1970s. The graphics capabilities of the Apple II and Atari computers, which appeared at about that time, enabled programmers to illustrate the text. While many more adventure games are available today, the programs haven't developed much further; adventures are still either all text or illustrated, even though they sometimes include simple animation.

Adventure and fantasy role-playing games can be fun, but their appeal is limited primarily to people who enjoy intricate puzzles. You have to be willing to put up with messages like "You used the word 'why' in a way I don't understand." You also have to play Guess My Parser, which means learning the particular language for each game you play.

Some personal computer games such as Pryority's *Forbidden Quest,* Broderbund's *Cyborg,* and Infocom's *The Hitchhiker's Guide to the Galaxy* have simple plots and rudimentary characters. But because characters hardly interact and stories are unsophisticated, the games seem to plod on from episode to episode.

On the other hand, player interfaces are becoming more sophisticated. *Forbidden Quest* for the Macintosh, for example, has a pull-down menu for hints that help a beginning or less avid player make it through the game. *Cyborg* has an attractive and well-designed interface, with a control panel full of flashing lights that gives you information on the progress of the game and helps you play your way through it.

Text adventure games cannot compare with the subtleties and richness of literary fiction. But consider the characteristics of a personal computer: what are its strengths as an entertainment medium or even as an art form? The computer can manipulate text. It can organize large databases of information. It has a monitor, which can present information graphically or textually.

A computer does not offer the image resolution of film nor provide the rich imaginary experience of a novel. But it can organize and reorganize information presented in a story and give you control over the sequence and timing of the plot.

Imagine, then, a world—even the real world. If you were an outsider and wanted to discover what the world was like and what was happening there, how would you go about it? You might find the information in a book the way you look in a travel guide to learn about Himalayan trekking on $50 a day or read a novel to recreate lives and events in your own imagination.

Another way to get such information is through a personal computer. With your computer you have access to information stored in large databases or information services such as CompuServe. Just as books offer imaginary worlds to explore, so could a database. Any database contains information that could provide the elements of stories in which characters develop and interact. Perhaps electronic mail could enable a writer to create the first epistolary computer novel. In addition, more and faster memory, higher-resolution graphics, sophisticated animation, and interactive optical disks will undoubtedly bring dramatic improvements to computer fiction.

I believe that with these advances computer entertainment can go beyond puzzles and games. A narrative form will undoubtedly be developed to take advantage of the personal computer's unique properties. I'm looking forward to a new, viable, and dynamic medium—one in which graphics and sound are integral and essential to a story, not merely beeping sounds and flashing lights.

Rob Swigart is a novelist and free-lance writer living near San Francisco.

If you need help getting started, remember: some things take time, map out your travels, and make sure you prepare yourself for the landing.

Transylvania

It's a dark and stormy night. Werewolves and vampires are about, and the sound of bat wings beating sends your heart aflutter. A princess is in great distress, and you have to rescue her by sunrise. But first you must locate her, somewhere in a sinister forest populated by natural and supernatural creatures that may deter or assist you. To save the princess, you must completely explore the land of Transylvania and solve the problems that come up during the journey.

Penguin Software's *Transylvania* is a text adventure with graphics in the upper-left corner of the screen to help identify your current location. The entire game is visually interesting. The black-and-white pictures call to mind Edward Gorey's macabre illustrations. Your commands are displayed in New York font, but the computer's replies are in Venice. You can click on a fancy compass instead of typing in directional commands (see Figure 4).

Transylvania's looks are, alas, its best feature. Because so much memory, and perhaps creativity, is spent on visual effects, the game is left with a rather elementary plot.

Compared to the richer text adventure games like Pryority's *Forbidden Quest*, Broderbund's *Cyborg*, or Infocom's *Zork*, *Transylvania* seems simplistic and outdated. The game's vocabulary is limited, as is the sentence structure for commands. The program can't interpret commands longer than two words. The story line allows few options and no room for creative thought—after all, if you walk into a room and all you see is a clove of garlic, you'll certainly pick it up.

Transylvania's lack of complexity may come as a relief to someone lost in a convoluted text adventure, but games can be less complex without sacrificing quality, such as Infocom's junior-level adventure, *Seastalker*. If you decide to play *Transylvania*, I have two pieces of advice: make sure you read the gravestone, and don't walk when the werewolf shows up—run.

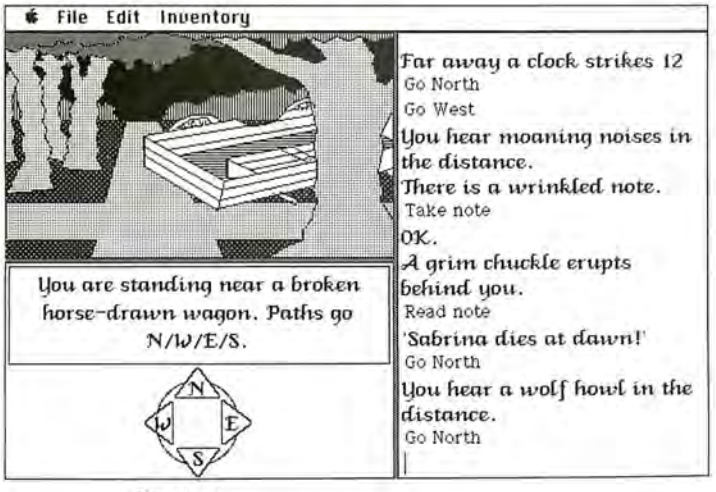


Figure 4

Transylvania's playing screen includes a location picture accompanied by a brief description, a dialog area at the right, and a compass for traveling around in the story.

Meanwhile . . .

. . . the interceptors start strafing the hillside. You are practically the only one left out in the open.

>Take cover.

There is no cover here!

>Run west to the clump of acacia trees.

Clump of acacia trees

Carrying your sack of coffee beans and the harvesting stick, you zigzag down the hillside and take cover under the acacia trees. Other coffee pickers are here. Your good friend Chris Lincoln is here. He has lost his glasses. A Fonsecan agricultural advisor is here. An SA-13 polycraft is here. The sublight interceptors stop strafing the hillside. They start buzzing the acacia trees, flying back and forth just over the treetops.

>Don't panic. □

▲▲▲▲▲▲▲▲▲▲▲ *Sharon Zardetto Aker is a free-lance journalist and the author of two forthcoming books:* MacPack *(Ashton-Tate) and* Microsoft BASIC for the Mac: A Beginner's Guide *(Scott, Foresman & Company).*

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The Hitchhiker's Guide to the Galaxy
Infocom, Inc.
55 Wheeler St.
Cambridge, MA 02138
617/492-1031
List price: $39.95

Forbidden Quest
Pryority Software
P.O. Box 221959
Carmel, CA 93922
408/625-0125
List price: $44.95

Transylvania
Penguin Software
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Spelling checker for MacWrite and Microsoft Word.
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The Larger Equation

David W. Smith

TK!Solver takes up where an electronic spreadsheet leaves off

Spreadsheets let you look at a problem from one perspective, while TK!Solver *lets you look at it from many different angles. You give* TK!Solver *the mathematical rules that apply to a problem and fill in the values that you know;* TK!Solver *computes and displays the values that you don't know.*

Spreadsheets deal with equations, or formulas, in a fairly limited manner. If you use a spreadsheet to determine the cost of a new car after sales tax, for example, you type the known values–the car's cost and your state's sales tax rate–in two cells. In a third cell you type a formula that tells the spreadsheet how to calculate the total cost. You can change the car's before-tax cost or the tax rate and immediately see the recalculated total cost.

The snags arise when you change the problem around. Suppose you know the car's cost before and after taxes but don't know your state's sales tax rate. You can't use the formula you created to compute the car's total cost, since it assumes that you know the tax rate and that the only unknown value is the car's after-tax cost. To determine your state's tax rate, you need a new formula.

The *TK!Solver* approach is different from the spreadsheet's. Once you give *TK!Solver* the mathematical rules that apply to a problem, the program can compute any unknown value, as long as you supply enough known values. In the car cost example you could determine your state's tax rate by supplying *TK!Solver* with your car's before- and after-tax cost. Or you could determine the car's before-tax cost by giving *TK!Solver* the after-tax cost and the tax rate.

An Overview

To use *TK!Solver* (*TK,* incidentally, stands for *tool kit*), you develop a mathematical model that uses equations to describe the relationships between all the variables in the problem. You then supply the details of the model and the known variables by typing them in various fields in one of seven *sheets.*

Each *TK!Solver* sheet holds a different type of information. The Rule sheet holds the equations that describe the model. The Variable sheet shows the variables used in the model and contains fields that hold input values, which you supply, and output values, which the program computes. Figure 1 shows Rule and Variable sheets for a simple car loan analysis model. The Rule and Variable sheets are sufficient to solve many simple models.

The List sheet supplements the Variable sheet by describing any variables containing lists of related values. You can create a model that details a year's worth of electricity bills, storing your power consumption figures in a list. Each month's value goes in its own slot, or *element.* In another list you can store the expense figures, again with each month's value in its own element. You can then tell *TK!Solver* to use the contents of both lists to compute the unit cost of electricity on a monthly basis by dividing each month's consumption figure by that month's bill. *TK!Solver* places the resulting figures in a third list, where you can use them with the program's Table and Plot sheets to create tables or line graphs.

The *TK!Solver* screen displays a maximum of two sheets at once. To display a particular sheet, click in the sheet you want to replace, choose the desired sheet's name from the Sheets menu, and the new sheet replaces the old one in the display. You edit text and values in sheets using standard Mac editing techniques. Scroll bars let you scroll vertically through sheets.

Making the Rules

Teaching *TK!Solver* the mathematical rules that apply to a problem involves creating a *knowledge database*. The basic component of a knowledge database is a rule—a relationship between entities in a domain that is always or almost always true. Every discipline has its rules. In physics, $E = MC^2$ is a well-known rule that specifies the relationship between energy, mass, and the speed of light. The relationship between adjusted gross income and income tax is a rule from the tax accounting field.

You type *TK!Solver* rules into the Rule sheet as mathematical equations. Expressions consist of numbers, variable names, functions, parentheses, and the standard mathematical operators for addition, subtraction, multiplication, and division.

Like most number-crunching programs, *TK!Solver* provides a set of functions—built-in mathematical and statistical operations that manipulate values you supply. Of *TK!Solver*'s 34 functions, some are designed to manipulate single values, while others work on lists. Single-value functions include common trigonometric and mathematic functions such as SIN, LOG, TAN, and COS.

TK!Solver's list-oriented functions include SUM for adding all the elements in a list, MIN for determining the smallest element in a list, and MAX for locating the largest element. In your monthly electricity cost model, you could use the MAX function to determine the month in which your electricity consumption was highest.

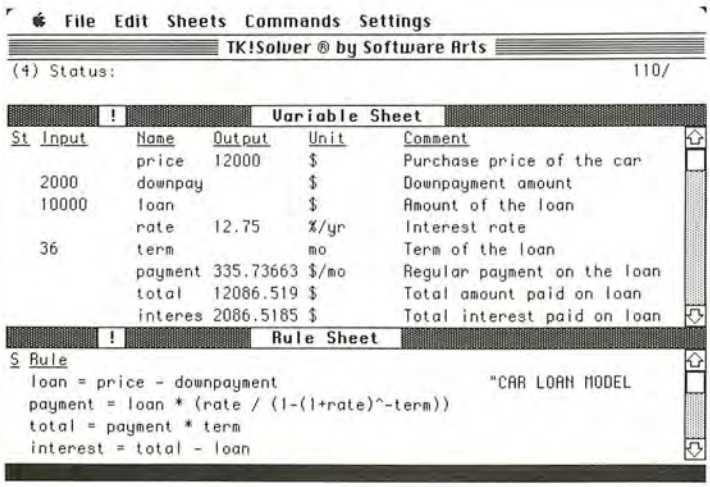

Figure 1
The TK!Solver *screen. The status area below the menu bar displays field information and error messages and indicates how much memory is free (a 128K Mac provides 16K of free memory; a 512K machine, 114K). The Variable sheet shows the variables used in the model. The Rule sheet contains the equations that describe the model.*

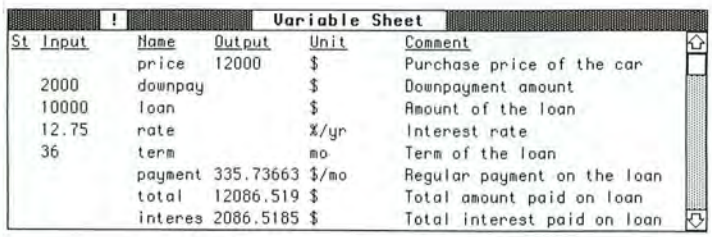

Figure 2
TK!Solver*'s direct solver uses a technique similar to the consecutive solution method taught in high school algebra.*

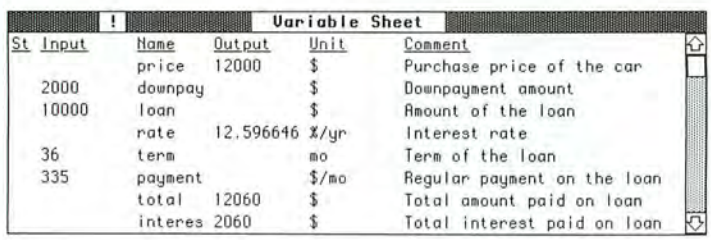

Figure 3
TK!Solver*'s iterative solver guesses a variable's value, then refines the guess until it's accurate.*

Unlike many number-crunching programs, *TK!Solver* also lets you create your own functions. A scientist might want to create a function called WATER that determines the boiling point of water, given various altitudes. An accountant could create a function called TAX that determines what tax bracket a client is in, given the client's income.

The ability to create your own functions is a feature usually found only in programming languages, such as Pascal or BASIC, and allows you to tailor *TK!Solver* to your needs. Creating a function is not a simple task, however. If you think *range* is an appliance and *mapping* is what a cartologist does, plan on studying the *TK!Solver* manual thoroughly before creating any functions.

Solving It

Once you set up a model and enter all known values in the Variable sheet's input fields, you can click on the exclamation mark (!), called the action icon, in the Rule or Variable sheet's title bar. Doing so causes *TK!Solver* to use one or both of its built-in problem-solving mechanisms to try to find all unknown values.

TK!Solver's *direct solver* determines unknown values using a procedure similar to the consecutive solution method taught in high school algebra. The program plugs known values, which you supply, into the equations, then attempts to determine as many unknown values as possible. Any values it determines are listed in the output fields of the Variables sheet and are plugged back into the equations as known values. This process repeats until no unknown values remain, no more unknowns can be determined, or some error or inconsistency in the rules is detected.

If the direct solver cannot determine all the unknowns for a given set of input values, the *iterative solver* may be able to help. The iterative solver arrives at a solu-

tion by starting with a guess at a variable's value, attempting to solve the model, and then iteratively refining the guess until the model is solved.

The solving method *TK!Solver* uses often depends on the type of information you request. Consider the car loan analysis model in Figure 1. When asked "What are the monthly payments on a 36-month loan of $10,000 at 12.75 percent?" *TK!Solver* determines the answer by straightforward substitution using its direct solver (see Figure 2).

However, the question "What is the interest rate for a monthly payment of $335?" is not as simple. *TK!Solver* can't determine the answer through substitution. Instead, starting with a guess of 10 percent or another initial value you specify, the program uses its iterative solver to find the results in Figure 3.

Apples + Oranges = Units

The *TK!Solver* Variable sheet contains a field called Units that you can use to specify a value's unit of measurement and to convert from one measuring system to another. An engineer might use the Units field to supply variables in feet and have the output displayed in meters. An accountant could use the Units field to convert currency values from United States dollars to French francs.

You specify the rules governing unit conversions using *TK!Solver*'s Unit sheet (see Figure 4). Conveniently, you specify the conversion rules in one direction only; once *TK!Solver* knows how to convert from feet to meters, it also knows how to convert from meters to feet.

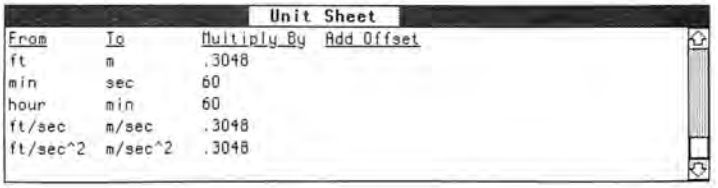

Figure 4
TK!Solver's *Unit sheet lets the program convert from one unit of measurement to another.*

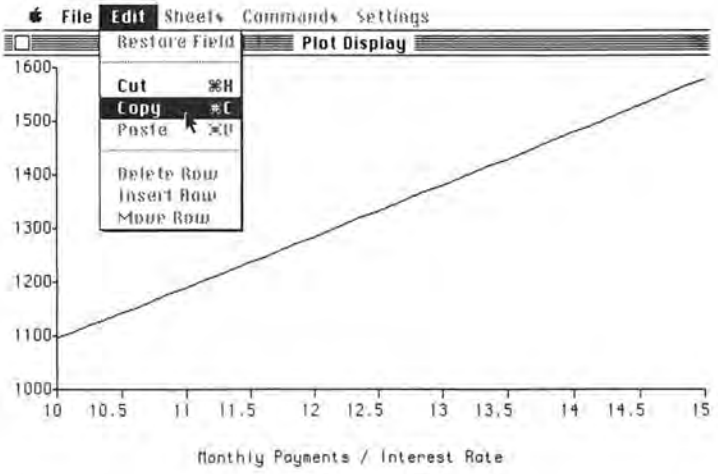

Figure 5
You create plots by filling in various fields on the Plot sheet, telling TK!Solver *which data lists to use for the plot's* X *and* Y *axes. You can cut or copy finished plots to the Clipboard for insertion into* MacWrite, MacPaint, *or other applications that accept graphics.*

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Plot Development

Sometimes the best way to see how a model behaves is to use *TK!Solver*'s plotting feature. A plot comprises a list of points; the *X* coordinates are drawn from one list and the matching *Y* coordinates from another list or from more than one other list if you're plotting multiple sets of data.

You create plots by filling in fields on the Plot sheet. Once you've told *TK!Solver* which lists contain the plot data, you click on the action icon to build the plot. Figure 5 shows a plot that results from asking *TK!Solver* for a list of monthly loan payments, given different interest rates.

TK!Solver's plots are not as flashy as the charts produced by *Microsoft Chart;* however, they're adequate and easy to create, since the feature is built into the program and always available. Best of all, you can cut or copy the finished plot to the Clipboard and paste it into *MacWrite, MacPaint,* or other applications that accept graphics.

Subtracting a Few Points

TK!Solver has its shortcomings. It has limited facilities for formatting output. You can't, for example, tell the program to display currency values with a dollar sign in front of them. Students should also note that *TK!Solver* doesn't show its work. You get results but no direct indication of the steps that the program used to obtain them. A more important limitation for serious mathematics applications is the program's inability to deal with matrices, lists with more than one dimension. You should also prepare to spend several evenings studying the program's documentation; some of the examples are presented out of order or are maddeningly incomplete.

TK!Solver also has some design quirks that may throw you off at first. The program has no Close command in its File menu. To close one model and load another, you must choose Reset Model from the Commands menu. Worse yet, the File menu's Load File command does not reset the program before loading a new model but instead adds the contents of the specified file to the end of any model still in memory. I'd like to see the people at Soft-

ware Arts give *TK!Solver* the more conventional New, Open, and Close commands found in other Macintosh applications. While they're at it, they should add a keyboard shortcut for clicking the action icon. I find it inconvenient to take my hand away from the keyboard every time I change variables and want to see the updated results.

Who's It For?

TK!Solver is a sharp tool that should have a tremendous appeal to a limited audience of scientists and engineers. Accountants can benefit from its approach to problem solving, too. If you use a Macintosh only for word processing, file management, and simple spreadsheets, you probably don't need *TK!Solver*. If, however, you find that spreadsheets limit the ways that you can look at a mathematical problem, *TK!Solver* might be the answer. College students in particular may find that *TK!Solver* can help them through physics and engineering courses.

TK!Solver isn't perfect, but it is powerful, and nothing else on the market provides its capabilities. And it isn't likely that we'll soon see a flood of solver clones. □

▲▲▲▲▲▲▲▲▲▲ *David W. Smith is a software engineer for Tolerant Systems and a free-lance writer.*

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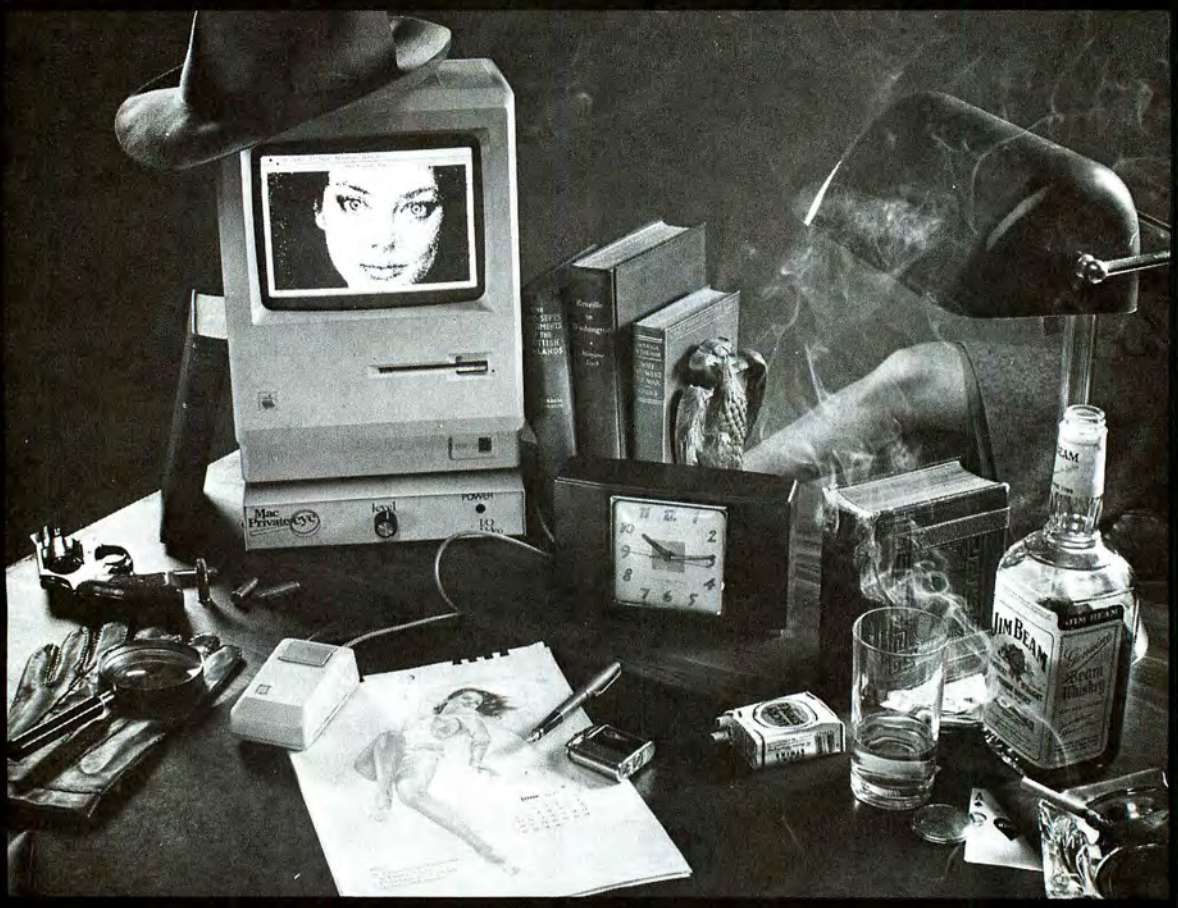

. . . that tipped me off. They looked out through the fancy fur and perfume and told me something was wrong, dead wrong. I'd seen those eyes somewhere, in some long forgotten place, some dingy nightclub on the south side of Chicago. But here she was, strictly East Side Manhattan, if you catch my drift.

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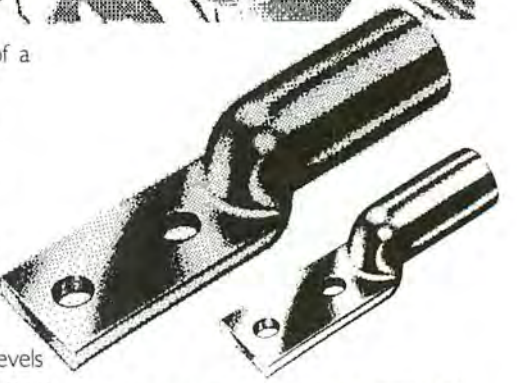
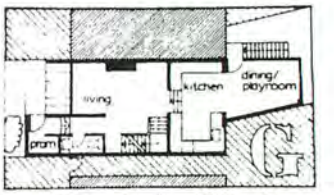
MAGIC™ — Macintosh Graphics Input Controller

The ultimate graphics digitizer



WOODWARD & LOTHROP



Color change--for instance, the use of a single hue in an achromatic

MAGIC™ at a glance:

- Makes full screen black & white pictures in ⅔ of a second (512 x 342)
- Makes 100% MacPaint compatible files via the standard Save Dialog Box
- Two capture modes—Black & White and user selectable Pattern Mode
- Black & White Mode allows you to make high contrast line copies, outlines, and reverse video pictures
- Pattern Mode allows you to assign any of 38 different patterns to one of 256 different light levels
- Fast enough to allow you to focus the video camera right on the Macintosh screen (2.5 Images per Second)
- 100% mouse driven interface so there are no messy knobs or moving parts to wear out
- Runs from either the Modem or Printer Serial Port
- Connector on unit allows real-time monitoring of incoming video signal
- Precision ⅛" graduated rulers to precisely size digitized images
- Ability to select any 512 x 342 area of the 768 x 480 incoming video signal for digitizing
- Displays MacPaint files full screen (512 x 342) in under 2 seconds
- Provides quick launch to MacPaint (without returning to Desktop)
- Comes with a utility program that allows you to print any MacPaint document at 75, 100, 150 or 300 dots per inch on the Hewlett Packard HP2686A LaserJet printer.

Technical Specifications:
The MAGIC unit is a microprocessor-based intelligent controller that transforms a selected portion of a video image into a serial bit stream which is sent to the Macintosh computer at 500,000 bits/second.

Video Input:
All known 2:1 Interlace 1.4 volt P-P composite video signals.
Acceptable sources include: Video Camera, Video Tape Recorders, Video Discs, and other Computers. Acceptable Signal Standards include: NTSC RS-170, PAL, SECAM.

Camera Specifications:
Horizontal Resolution: 550 dots. Vertical Resolution: 700 line. Light Range: 20,000 to 1. Lens Type: C-Mount 16mm f 1.6. Lens Mount Type: "C" Mount Type.

MAGIC without Camera includes:
- MAGIC unit with power transformer and Macintosh interface cable
- Software disk with MAGIC Application Program, HP Laser Program and sample pictures
- Instruction Manual

MAGIC with Camera includes:
- Everything in MAGIC without camera plus
- High resolution black and white video camera
- Camera interface cable

All pictures are unretouched as captured by the MAGIC video digitizer system. They were all printed by the Hewlett Packard HP2686A Laser Jet Printer.

Here are just a few prominent companies and institutions who have purchased the amazing MAGIC™ video digitizer.

Apple Computer, Inc.
AT&T Bell Laboratories
Dow Jones
IBM Corporation
Wang Laboratories, Inc.
U.S. Library of Congress
3M Corporation
General Electric
Honeywell

AT&T Information Systems

Logos captured by MAGIC

To order, call or write: New Image Technology, Inc.
Suite 104
10300 Greenbelt Road
Seabrook, MD 20706
301/464-3100

MAGIC with camera	$549.00
MAGIC without camera	$399.00
Micro Nikkor f2.8 55mm lens with C-mount adapter	$225.00
Demonstration disk	$ 9.95

Visa and MasterCard are accepted.
Maryland residents add 5% sales tax.

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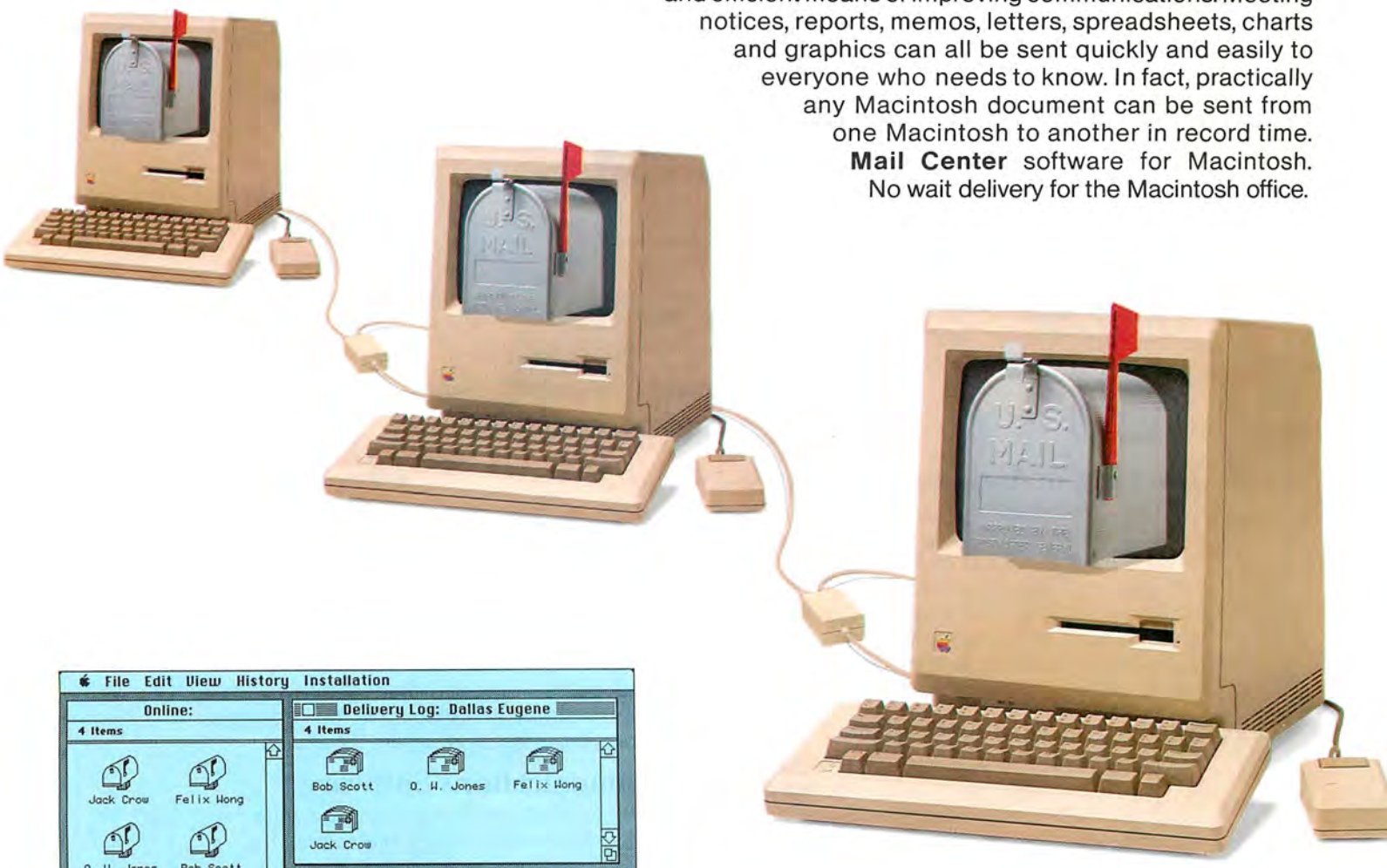
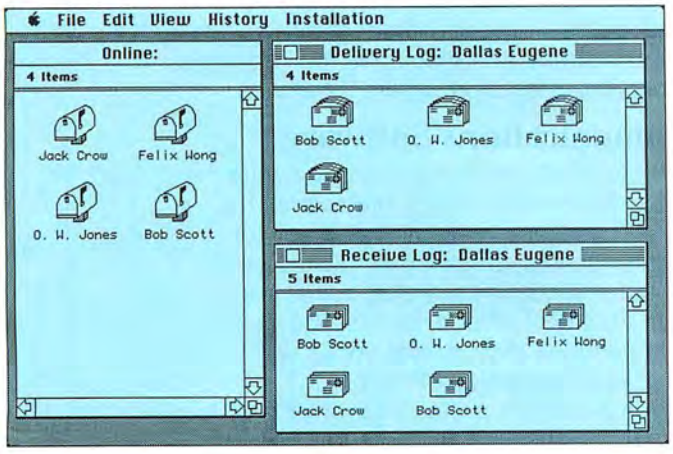
Mail Center™ Delivers!

Electronic Mail for the Macintosh™ Office.

Need to send a memo to everyone in your department? **Mail Center** will deliver. Even if they are working furiously with other programs on their computer. Designed to be used with the AppleTalk Personal Network™, **Mail Center** offers every office an easy and efficient means of improving communications. Meeting notices, reports, memos, letters, spreadsheets, charts and graphics can all be sent quickly and easily to everyone who needs to know. In fact, practically any Macintosh document can be sent from one Macintosh to another in record time. **Mail Center** software for Macintosh. No wait delivery for the Macintosh office.





Suggested Retail Prices
Twin Pack $299
Six Pack $499

Videx™

1105 N.E. CIRCLE BLVD., CORVALLIS, OR 97330
503-758-0521

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The Macintosh... HOT-LINE

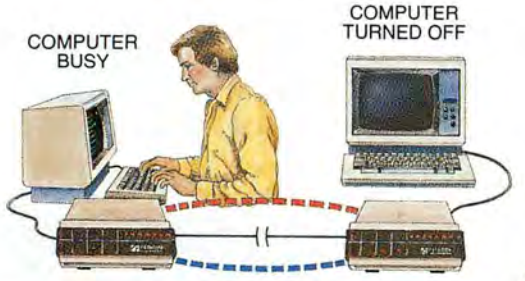
The Expandable Macintosh Modem With Software And Cable

Just Plug-In And Communicate

If you're a Macintosh user, you need our expandable 1200/300 baud intelligent modem. Supplied with our ProCom-M communications software and "Mac-to-modem" cable, ProModem 1200M is so simple to use that you'll instantly be on-line and communicating. It's Hayes compatible, and the price is right, too. Just $549 complete.

Electronic Mail A Reality

ProModem 1200M gives you something that's not available on any other modem in this price range. Our $99 Communications Buffer and Alphanumeric Display options provide you with a sophisticated electronic mail network.



Amazing but true, your ProModem 1200M answers the phone, collects messages up to 50 pages long, sends out electronic mail, and displays all messages sent or received even though you are gone and MAC is busy or turned off. Thanks to ProModem 1200M, expensive hard-to-use communications software is not needed. The communications is in the modem, and electronic mail becomes a background function, where it belongs.

Communications Software

Our ProCom-M communications software is designed specifically for Macintosh. It's simple to use, and maintains all Macintosh user interfaces such as icons, pull down menus, full windowing, dialog boxes and mouse control of all commands. You can initiate complex dialing sequences with two clicks of the mouse. ProCom-M includes X-modem protocol for error-free communications with any personal computer. This powerful software does a lot, but is so simple that most users will hardly have to refer to the manual.

The Hot Line **PROMETHEUS**
PRODUCTS INCORPORATED
4545 Cushing Pkwy. • Fremont CA 94538

Call Now For Complete Info...
415/490-2370

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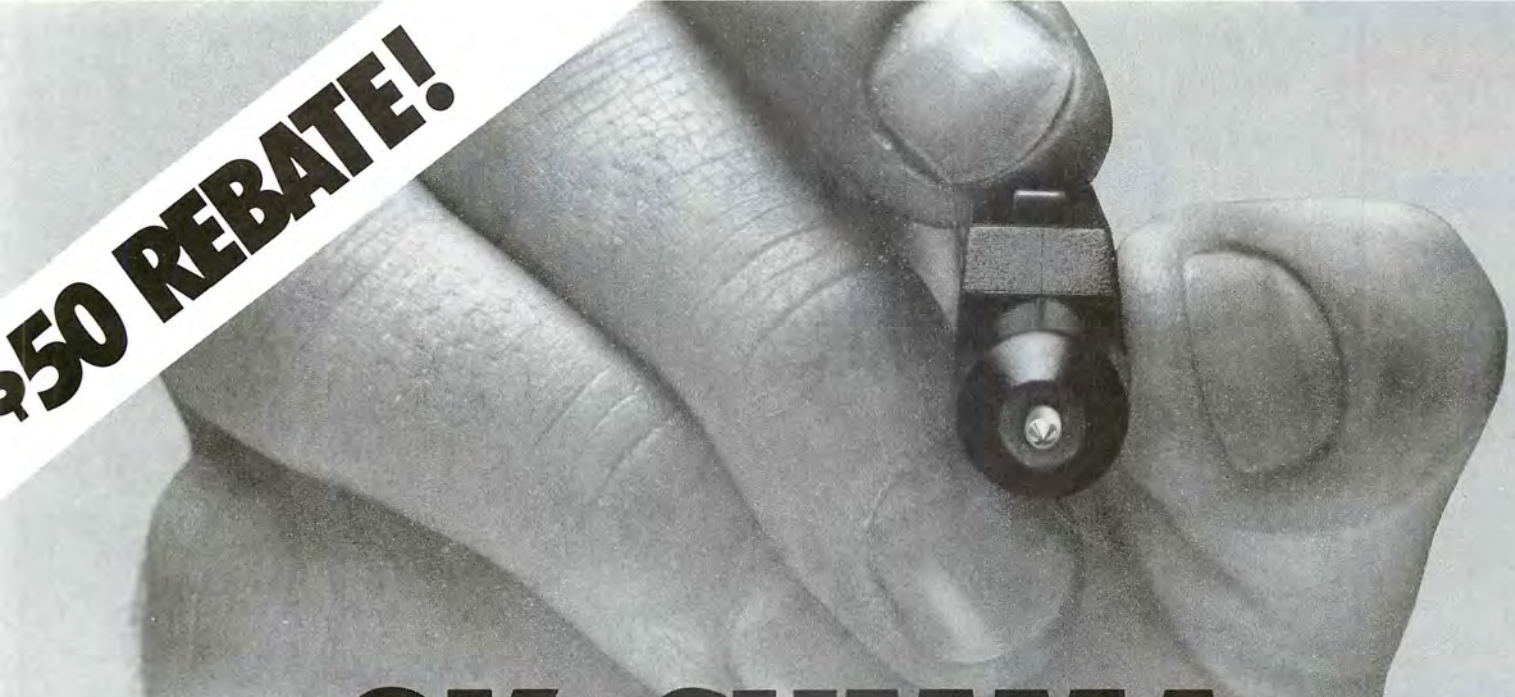

OK, SUMMA... MAC MY DAY.

We'll Mac your day, all right. With MacTablet™, the peripheral that turns your Macintosh™ into a real graphics work station. And a $50 rebate to boot.

Let's get one thing straight. MacTablet is *not* one of those kiddie pads. It's a serious digitizer. Like the ones we've designed for professional six-figure graphics systems since 1972.

We're Summagraphics. And when we showed up at Comdex last fall with MacTablet, people went ape. Like we'd invented fire. You see, MacTablet makes your Mac do what you always wanted it to do. Gorgeous graphics. And a bunch of other stuff. Face it, a mouse is fine for pointing, but drawing with one is like painting with a bar of soap. With MacTablet though, you have fingertip control, and 500 lines per inch resolution, to make your artwork a work of art.

MacTablet is a trademark of Summagraphics Corporation.
Macintosh is a trademark licensed to Apple Computers, Inc.

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OK . . . by now you're wondering "Why the $50 rebate?" Frankly, we want lots of MacPeople to go to their MacDealer and ask for MacTablet. Some will have it in stock or on order. So much the better. But if your dealer doesn't carry MacTablet yet, we encourage you to request/demand/beg that he/she do so at once. Tell 'em to Mac your day so you can get what's coming to you. A pad on the Mac. And $50 back! Summagraphics Corporation, 777 State Street Extension, P.O. Box 781, Fairfield, CT 06430, Telephone (203) 384-1344.

Summagraphics® CORPORATION

Draw on our experience.

$50 REBATE!

Send in this coupon or facsimile along with a completed warranty card to: MacTablet Rebate Offer, Summagraphics Corporation, 777 State Street Extension, Fairfield, CT 06430.

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Purchase is required. This information must be received by August 1, 1985. Allow 90 days for delivery of rebate check. 5/85

File, Macintosh Style

Jim Heid

Microsoft eases data management without compromising

To my mind, most Macintosh database programs compromise. Of the nine or ten database managers I've used and written about, few take advantage of the Mac user interface as well as they could. The Macintosh fonts are almost completely ignored, the Clipboard isn't used as much as it could be, and none of the programs lets you store pictures as fields in a record, even though the Mac is known for its graphics. But now meet Microsoft File, *the Macintosh database manager that doesn't compromise.*

In *File* the design of the database—the names, positions, and types of all the fields—is called a form. You can choose between two kinds of forms: a predesigned form called List Helper and one that you design yourself in the Form window. List Helper, which you use for simple databases or for viewing many records at once, organizes data in rows and columns. Each field occupies its own column, and each record takes up its own row. You can adjust a List Helper field's width by positioning the pointer between fields so that it becomes a double arrow and then dragging it. However, you cannot reposition the fields to resemble real-world reports or labels.

To design your own form, turn off List Helper by choosing it on the Form menu. Now you can let your creative juices flow and design any type of form you can imagine. Enlarge the form by dragging what's called the hide line. You create a field by typing its name, and you position it by dragging it to its destination. You adjust the field's size by dragging its bottom or right edge. When List Helper is off, you can create a label to describe each field's contents.

Interestingly, a field's size on screen does not denote the number of characters it can hold, only how many it can display. If you type past a field's right edge as you enter data, the text scrolls to the left. Since fields have no fixed length, you never have to estimate in advance how long one should be.

Fields of Four Types

File offers four field types: text, number, date, and picture. Text fields store any kind of characters. A number field stores numbers in any of five formats (see Figure 1) and can function as a computed field that uses a formula to determine its contents. You might use a computed field called Total Sales, for example, to have the program add the contents of four fields called First-Quarter Sales, Second-Quarter Sales, Third-Quarter Sales, and Fourth-Quarter Sales. A computed-field formula can contain up to 255 characters. *File* performs addition, subtraction, multiplication, and division and has parentheses for nested computations. A date field displays dates in one of three formats: short, as in 4/5/85; medium, as in Apr 5, 1985; or long, as in April 5, 1985.

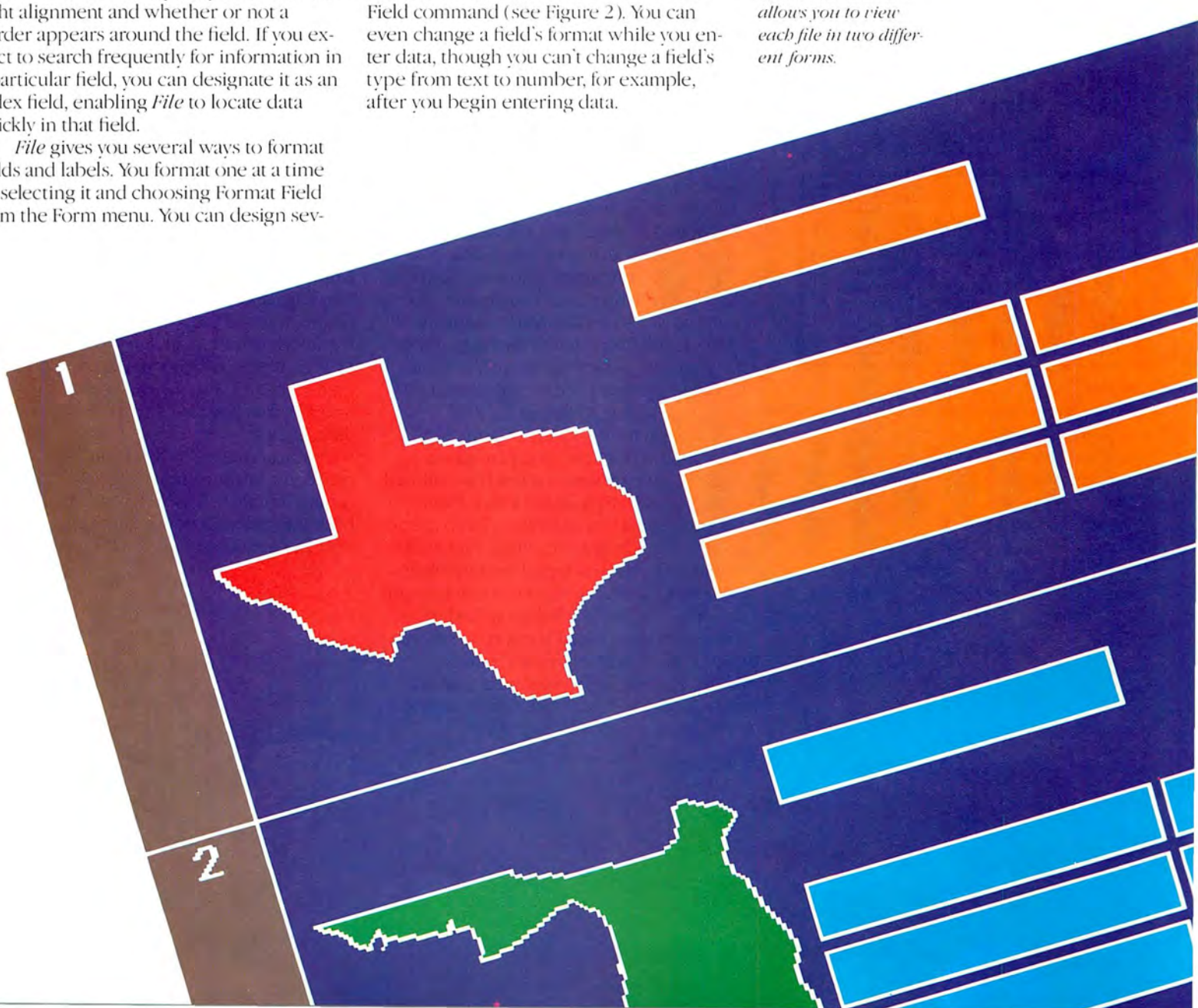
A picture field stores graphics that you create with *MacPaint, MacDraw,* or *Microsoft Chart* and paste in from the Clipboard. You can use picture fields, for example, to store icons representing items in an inventory or to store digitized pictures of employees in a personnel database.

The picture field is a unique feature of *File.* Don't confuse this field with the graphics capabilities of *Filevision* (see "Filevision: A Data Base in Pictures," *Macworld,* January 1985). In *Filevision* you draw graphics from within the program, and each graphic is linked to data in the database. If you delete a graphic in *Filevision,* you also delete the corresponding data in the database. In *File* deleting a graphic simply leaves an empty field; the rest of the record remains intact.

You can format labels and nonpicture fields to appear in any Macintosh font and size and in any style except outline and shadow. You can also specify left, center, or right alignment and whether or not a border appears around the field. If you expect to search frequently for information in a particular field, you can designate it as an index field, enabling *File* to locate data quickly in that field.

File gives you several ways to format fields and labels. You format one at a time by selecting it and choosing Format Field from the Form menu. You can design several files at once if they share the same format. Select the fields by Shift-clicking on each or by enclosing them in a marquee like the Finder's and choose the Format Field command (see Figure 2). You can even change a field's format while you enter data, though you can't change a field's type from text to number, for example, after you begin entering data.

In addition to text, number, and date fields, Microsoft File *lets you set up a picture field in which you can store graphic information. The program offers a variety of Macintosh fonts, styles, and sizes and allows you to view each file in two different forms.*



A Form with Two Views

The ability to design forms that make the task of data entry familiar and unintimidating is remarkable enough. The ability to design two forms and switch between them is even more so. Every set of records in *File* can be viewed in two versions. You can create a custom form for one view and leave the other view as a preset List Helper form, or you can design two custom forms.

Why are two forms–or two views–better than one? For some work you may want a form that shows all the information you have in a record. For other situations you may need a simple List Helper form that shows many records at once with only specified information displayed for each record. Or in a database of phonograph albums, for example, you could design one view to show the artist name, the album title, the record label, and each selection's running time. Then you could design another view showing just the artist name and the album title for times when you want to display many records at once and are not concerned with the other information.

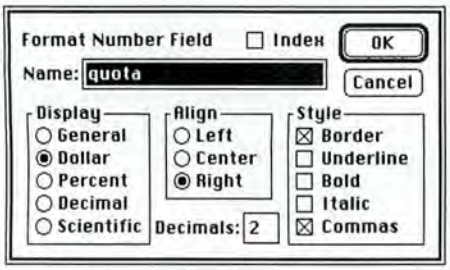


Figure 1
File *displays numbers in one of five formats. Here, the Quota field is being formatted to display numbers in dollar ($0.00) format, flush right with a border around the field and commas in long numbers.*

Working with Your Data

In *File* a set of organized records–your mailing list, for example–is called a *datafile*. You enter new records and change existing ones in the datafile window, which shows information organized according to the design you created in the Form window. You can browse through the database using the datafile window's vertical scroll bar. I found that browsing through data was more convenient in *File* than with most other database managers because the program displays more than one record at once–unless your form design is as large as or larger than a full-size window.

To enter a new record, scroll to the end of the datafile and begin typing in the blank record labeled New. *File* numbers the record and creates another New record below it. You move from field to field by clicking the mouse pointer in each or by pressing the Tab or Return key.

File provides many keyboard shortcuts that make long data entry sessions almost painless (see Table 1). Typing ⌘-quotation mark (") copies information from a field in one record into the same field in the next record. This feature is handy when you enter a long list of addresses with the same city and state.

You can type just the day and the month in date fields, and *File* adds the current year for you. If you type the day, *File* adds the current month and year. Better still, typing ⌘-hyphen (-) copies the date from the Mac's clock. *File* automatically converts the date into the format you specify when you design the form; if you specify the long format and type 8/12/85, *File* converts the date to August 12, 1985.

To search for specific information, choose Find from the Organize menu. A window appears with the fields positioned as they appear in your form (see Figure 3). Type the items you're looking for in the appropriate fields and click Find; the records that match what you typed are displayed. *File* saves the search criteria when you quit the program, making it easy to find the same records in a later session. To sort records, choose Sort from the Organize menu. The Sort window appears, again with the fields positioned as they appear in the form. Click anywhere in a field to designate it as a sort field. Click again to change the sort order from ascending to descending. As with the Find command, *File* retains sorting specifications when you quit the program.

Putting It on Paper

File lets you print data in two ways. To print records as they appear on a form, choose Print Records from the File menu. You can also design tabular reports by choosing Report from the Organize menu.

Certain fields can be totaled, averaged, or otherwise computed by any or all of six statistical functions.

Choose the fields you want to print by dragging fields into specific areas of the Report window. Certain fields can be totaled, averaged, or otherwise computed by any or all of six statistical functions. You can specify the font and the size of column headings and data, and you can print a header and a footer on each page. Clicking the Preview button allows you to see how a printed report will look before you print it (see Figure 4).

File lets you save a report's design on disk. You can also save the text of a report so that you can embellish it with a word processor or transmit it by modem to another computer. You can even read the text back into *File* as a new datafile containing only the fields you selected for printing.

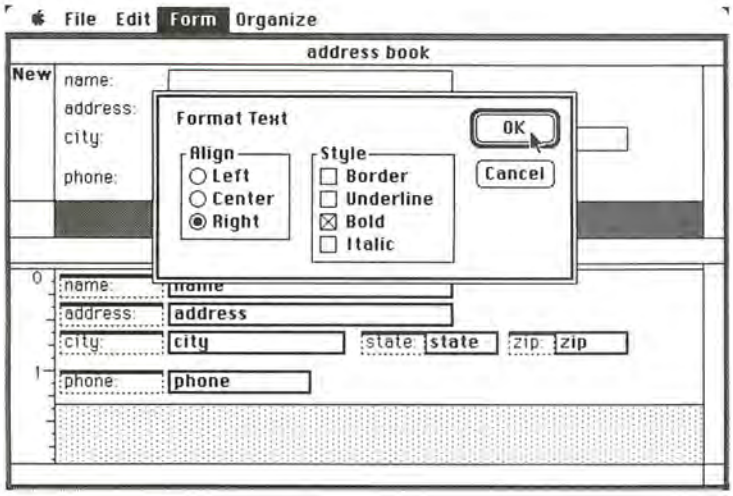


Figure 2
The Format Text dialog box lets you specify the appearance of text fields and labels. All six labels of this database are being formatted at once. A datafile window called address book and the Form window are behind the box.

Table 1
These keyboard shortcuts keep your fingers in flight as you enter data in File.

Key Sequence	Effect
⌘-quotation mark (")	Copies contents of same field in previous record
⌘-hyphen (-)	Copies the current date from the Macintosh clock
⌘-semicolon (;)	Copies the current time from the Macintosh clock
⌘-T	Opens the alternate view of the form
Option-⌘-Backspace	Clears selected field or record without requiring verification
Return or Tab	Advances to next field
Shift-Return or Shift-Tab	Moves to previous field
Enter	Advances to first field in next record
Shift-Enter	Moves to first field in previous record
⌘-Enter	Advances to same field in next record
Shift-⌘-Enter	Moves to same field in previous record
Option-Enter	Selects and displays records one screenful down
Shift-Option-Enter	Selects and displays records one screenful up

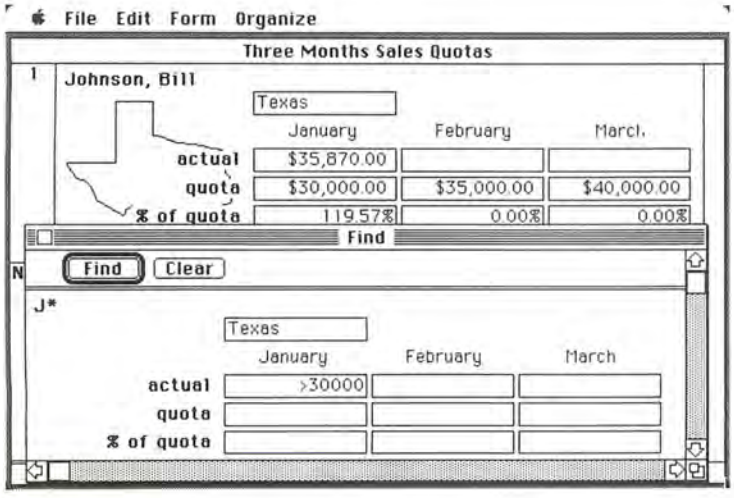
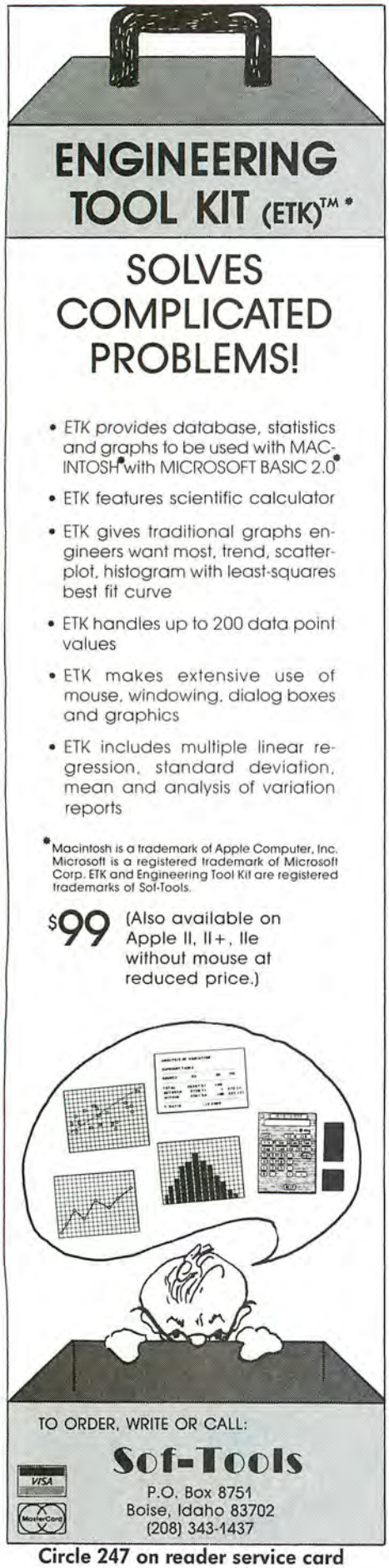


Figure 3
The Find window lets you locate records that meet certain specifications. Here, File *is set to find all records with last names that begin with* J, *located in Texas, with January actual sales greater than 30,000. The asterisk following the* J *is a wild-card character.*



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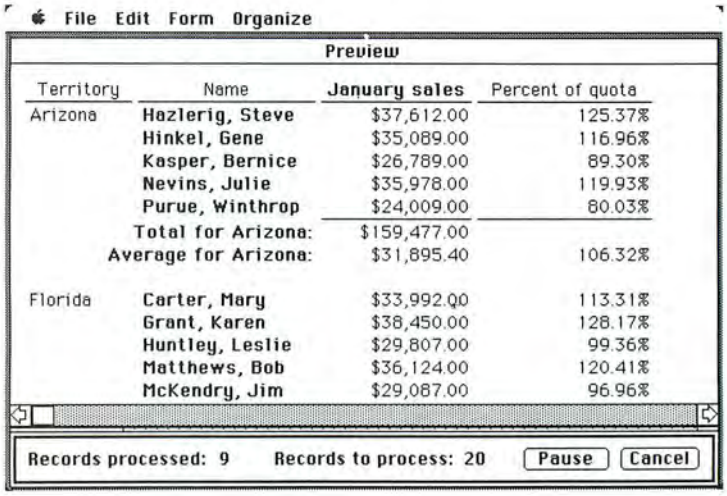


Figure 4
You can see what a printed report will look like by clicking the Report window's Preview button.

Picking Up the Tabs

File can accept data from other Macintosh applications through the Clipboard or through text-only files created in programs such as *Multiplan, MacWrite,* or *Microsoft Word.* The only formatting requirements are that each field be separated by a tab character and each record be separated by a carriage return. And of course, the data has to match each field type; you can't paste a word into a field formatted to hold numbers, for example. You can transfer data from *File* to other applications either through the Clipboard or by saving datafiles in text format.

File is loaded with little niceties that illustrate what Microsoft's Jeff Harbers calls "overengineering." If you don't touch a key or move the mouse for 30 seconds, *File* saves any data that hasn't been written to disk. You can resize a window to fill the screen by simply double-clicking the title bar or the size box—a feature I would like to see on every Macintosh application.

Closing the File

File performs swiftly on the 512K Macintosh but is slower on the 128K Mac because its large, complex code must be shuffled between disk and memory often. If your database involves large, complex files and requires frequent sorting or searching, you'll probably want to use the program on a 512K machine. Scrolling through a datafile on a 128K Mac can try your patience if the database contains picture fields or several font styles that the program has to redraw as you move through the file. I suggest running *File* with a RAM disk or a hard disk for best results.

I'd like to see two features added to a future version of the program. If you could "lock" one of the two views of a form with a password or a similar protection scheme, you could design one view with fields containing sensitive information, such as payroll records, that would not be displayed in the other view. I'd also like to see a keyboard shortcut for adding new records to a database. Scrolling to the last record before you can enter a new one takes too much time in a large database.

Finally, I'd like to point out two limitations. First, *File*'s Find command is actually a search function, which scans the entire

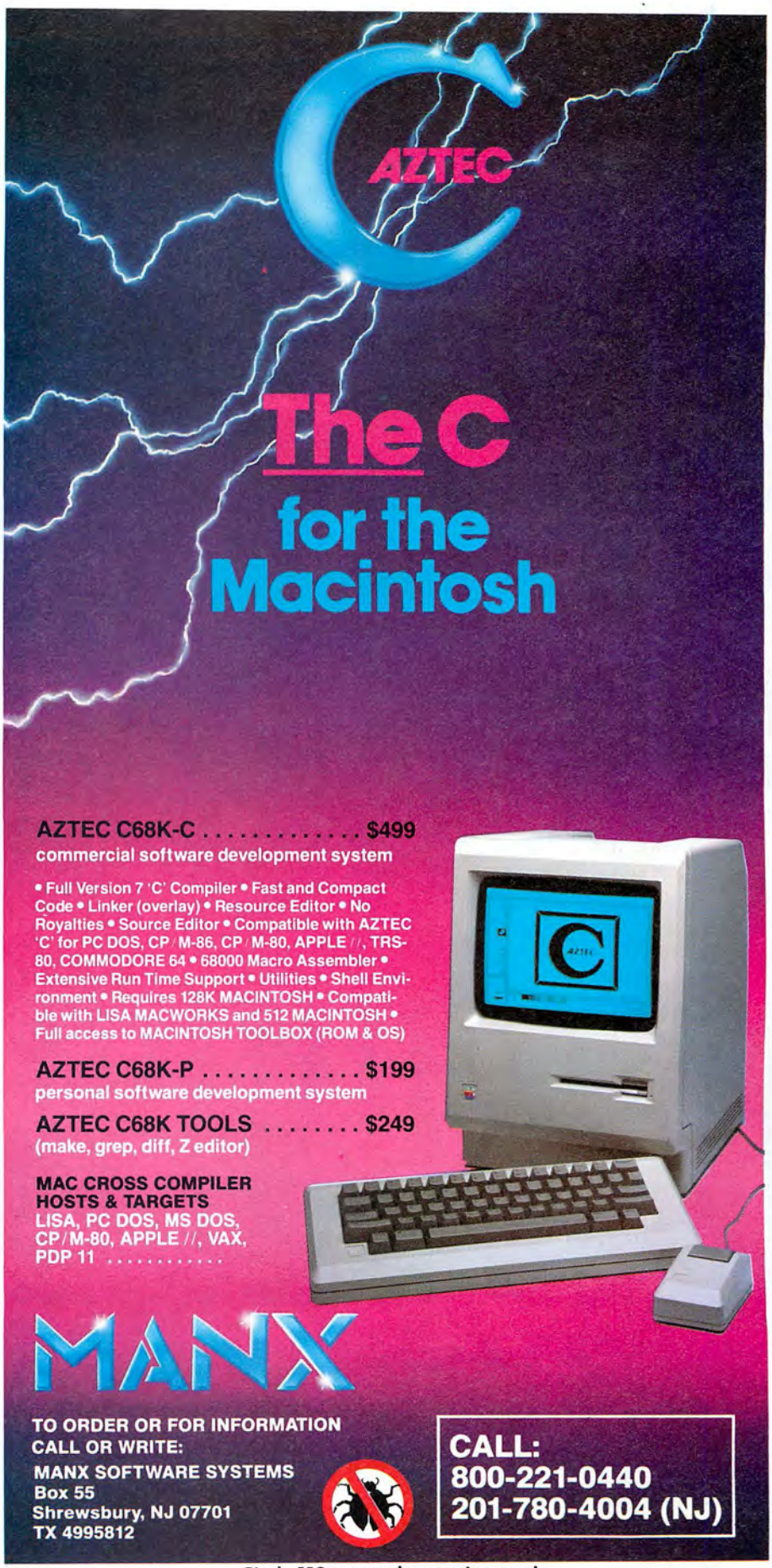
database for records that meet the Find criteria. You can't go directly to a known record even if the field is indexed. Searching for one record through a database of 500 or more records is inconvenient. Second, since *File* is not a relational database, you can't use it for related but separate databases that share common fields.

File is loaded with little niceties that illustrate 'over-engineering.'

Despite the fact that there is room for improvement, *Microsoft File* is an outstanding product. Its data entry, sorting, and searching features are more than adequate. By putting form and report design in graphic terms, it brings a new level of ease to what has traditionally been a complex, often frustrating, chore. That's what a Macintosh application is supposed to do. □

Jim Heid is a Contributing Editor of Macworld.

Microsoft File
Microsoft Corp.
10700 Northup Way, Box 97200
Bellevue, WA 98009
800/426-9400, 206/828-8088 in Washington and Canada
List price: $195



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THE WORLD'S MOST MANAGER HAS ARRIVED

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Powerful enough for American Express (UK) Security sensitive enough for Her Majesty's Secret Service, MI5. Easy, flexible, and inexpensive for small businesses all over Europe.

Omnis comes in two versions: Omnis 2 for managing a single file; Omnis 3 for up to twenty four files. To grow from 2 to 3, simply pay the difference.

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Guy Kawasaki
Software Marketing Manager
Apple, Macintosh Division

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POWERFUL DATABASE IN AMERICA.

C O M P A R E

Comparison:	PFS File/Report	Microsoft File	OMNIS 2	MacLion	Helix	OMNIS 3
Relational/Hierarchical†	NO	NO	NO	only relat'l	only relat'l	YES†
Multi-user, with record locking	NO	NO	NO	NO	NO	YES
User Defined:						
–Pulldown Menus	NO	NO	NO	NO	NO	YES
–On Screen Button Commands	NO	NO	NO	YES	NO	YES
–Messages/Command Sequences	NO	NO	NO	YES	NO	YES
Password Security	NO	NO	YES	NO	NO	YES
Open/Available Files	1/1	1/1	1/1	14/150	"Unlimited"*	12/24
Fields per Record	3,100	1,024	120#	350	"Unlimited"*	1,440#
Numeric/Date Calc's	Report only/No	YES/NO	YES/YES	YES/YES	YES/YES	YES/YES
Mail Merge	NO	NO	YES	YES	YES	YES

†Hierarchical file links can make handling of data faster and simpler.
*Numerically unlimited, but performance constraints do apply.
#Plus 60 additional temporary fields for each data entry & report format.

Note: Information for this chart was obtained directly from the companies involved.

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OMNIS™

ORGANIZATIONAL SOFTWARE CORP.

A subsidiary of Blyth Computers Ltd.
2655 Campus Drive, Suite 150
San Mateo, CA 94403

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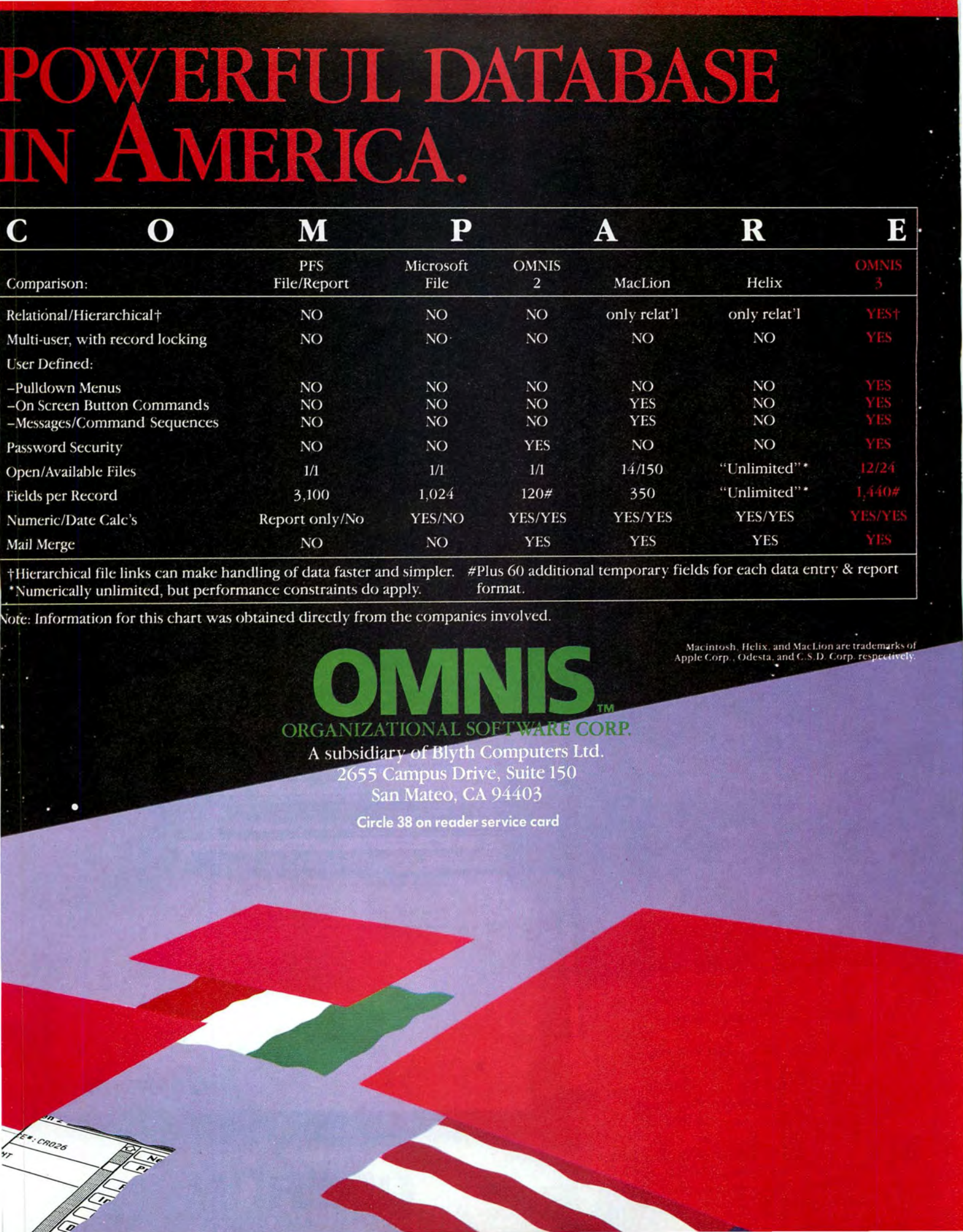
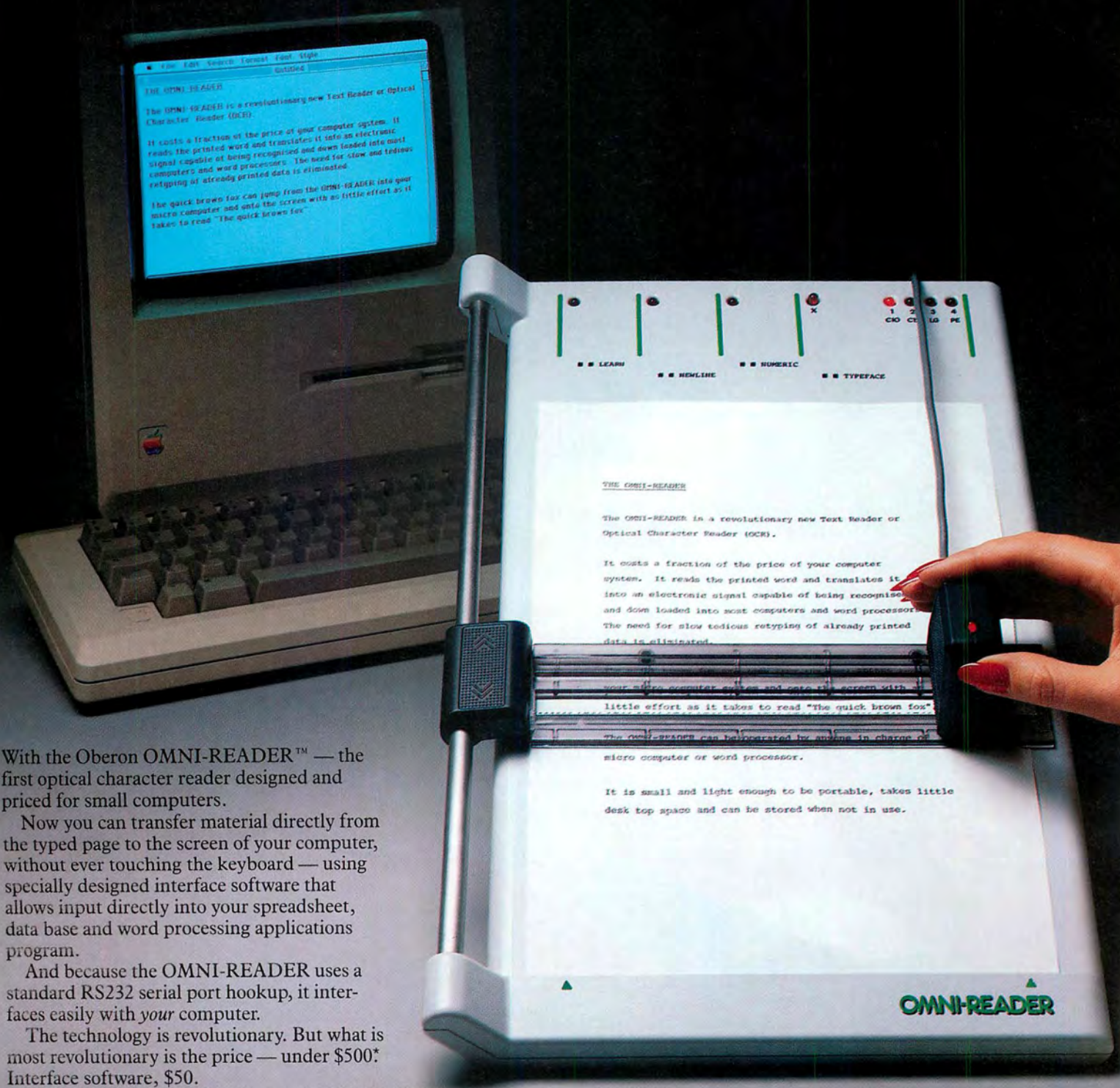


Now your Macintosh™ can read



With the Oberon OMNI-READER™ — the first optical character reader designed and priced for small computers.

Now you can transfer material directly from the typed page to the screen of your computer, without ever touching the keyboard — using specially designed interface software that allows input directly into your spreadsheet, data base and word processing applications program.

And because the OMNI-READER uses a standard RS232 serial port hookup, it interfaces easily with *your* computer.

The technology is revolutionary. But what is most revolutionary is the price — under $500.* Interface software, $50.

Find out more about the Oberon OMNI-READER. Dial 800-2-OBERON. In Texas, (214) 446-9567.

Macintosh is a trademark licensed to Apple Computer, Inc.
*Manufacturers suggested retail price.

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INTERNATIONAL

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.*

Software

■ *Absoft*

4268 N. Woodward
Royal Oak, MI 48072
313/549-7111

MacFortran
A disk-based software development system that allows you to edit, compile, link, and execute ANSI FORTRAN 77 programs on a 128K Macintosh. MacFortran includes a linker, a library manager, Absoft's own IEEE routines, and an interactive source code debugger. Windows for displaying or modifying variables, viewing the status of the file system, listing breakpoints, and performing calculations are available for concurrent use with the debugger. MacFortran includes a 500-page reference manual with over 150 pages on Macintosh Toolbox routines. Large programs can be developed in limited memory with the use of a disk-based system, virtual array support, and subroutine calling. MacFortran compiles directly to the MC68000 processor. List price: $395.

■ *Altsys Corp.*

P.O. Box 865410
Plano, TX 75086
214/596-4970

FONTastic
A font editor that allows you to customize existing Macintosh fonts or create your own. *FONTastic* allows you to scale fonts and smooth jagged edges. The program's scrolling feature lets you create fonts up to 127 points in size. Very large fonts may require a 512K Macintosh. The program provides a variety of drawing tools, including a pencil, an eraser, and line- and box-drawing tools. Commands allow you to edit italic or boldface fonts for optimal appearance. List price: $39.95.

■ *Artsci*

5547 Satsuma Ave.
North Hollywood, CA 91601
818/985-5763

Hearts
A card game with the Macintosh as your opponent. The Mac shuffles, deals, and keeps score; you select the cards you want to pass. The game includes an on-disk tutorial and variations in skill level, passing, and first trick discard rules. List price: $29.95.

SoftForms
A disk containing 22 business forms to be used with *MacPaint*. The forms include Employment Application, Weekly Reminder, Customer Invoice, Time and Materials Invoice, Monthly Calendar, Things-to-Do List, Credit Application, Payment Reminder, Call Report, Speed Memo, Inventory Report, Receiving Record, Three-Column Accounting Paper, Graph Paper, Credit Card Recordkeeper, Bank Account Recordkeeper, Checkbook Balance, and SpeedGram. You can customize the forms using *MacPaint*. List price: $39.95.

■ *Certificate Plus*

30 W. 47th St. #900
New York, NY 10036
212/227-3331

HebreWriter
A disk containing a Hebrew font that can be typed from the Mac's keyboard (left to right). The font is available in from 9- to 24-point in *MacWrite* and from 9- to 72-point in *MacPaint*. Style options such as boldface and italic are available. The disk also includes graphics characters, a transliteration guide, and a map of Israel. List price: $39.95.

■ *Cody Computers*

502 S. State St.
Orem, UT 84058
801/225-3731

MacBorders
A disk containing 32 border patterns, implemented as a font, that you can use in *MacWrite, MacPaint,* or other applications. You load the border font with the Font Mover and type the patterns from the keyboard in 12-, 18-, or 24-point. Also included is Atlantis, a pictorial font similar to Apple's Cairo, available in 12- or 24-point. List price: $27.95 plus $2 shipping and handling.

■ *Hayden Software Co.*

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

Score Improvement System for the SAT
A system designed to help students improve test-taking skills for the Scholastic Aptitude Test (SAT). The system includes three simulated exams, as well as reviews of verbal and math topics typically found on the SAT. Test questions, including diagrams, appear on the screen; you either select an answer using the mouse or type it in from the keyboard. Menu options allow you to show or

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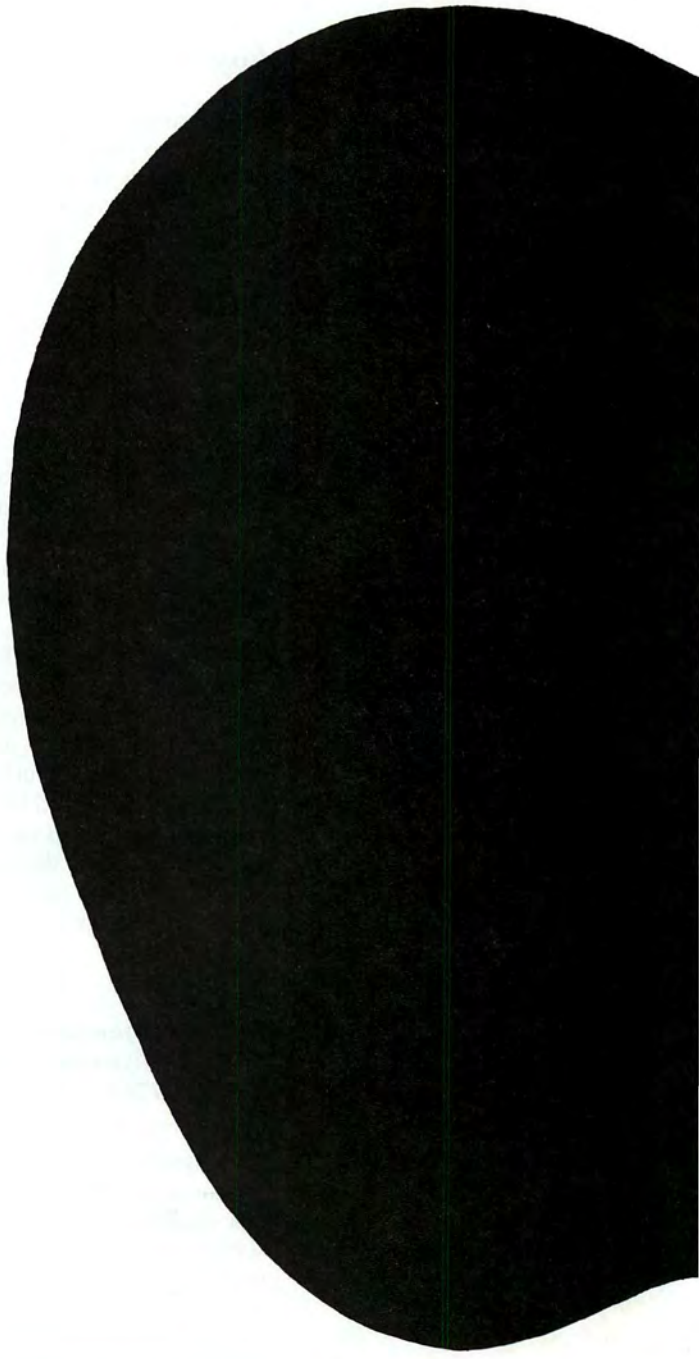

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IS COMING.

ESS SOFTWARE FOR THE MACINTOSH™

hide test answers, display detailed descriptions of how answers were reached, and activate or deactivate a 30-minute timer.

The system's Practice Tests module contains three sections: Analysis of the SAT explains the organization and scoring of the exam and provides test-taking strategies; the Pre-Test section determines your strengths and weaknesses in math and verbal sections representative of the SAT's; the Practice Test section includes simulated exams timed and formatted according to the latest SATs. The system's Verbal module covers vocabulary and reading comprehension, and the Math module includes algebra, geometry, quantitative comparisons, and word problems. You can save a test in progress and return to it later. List price: $99.95.

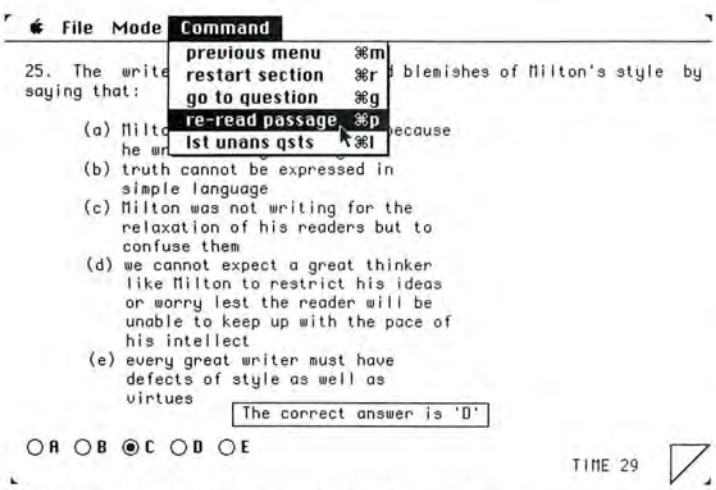
Turbo Turtle
A program designed to teach elementary school students as well as older students the Logo programming language. You write instructions to move the turtle cursor around the screen; the turtle leaves tracks, creating graphic designs. You can start by using the turtle to draw simple geometric shapes, then move on to more complex programming tasks. *Turbo Turtle* uses standard Apple Logo commands, so you can use any of the available Logo instruction books with the program. List price: $59.95.

Word Challenge II
A computerized version of the Parker Brothers game Boggle. You use the mouse to connect letters that are placed in random order on a grid. You compete against Lex, the program's 90,000-word lexicon, to find as many words as possible within a given time limit. You win points for every word you find that Lex doesn't. *Word Challenge II* provides 26 skill levels and several grid sizes. List price: $39.95.

■ *Hippopotamus Software*

1250 Oakmead Pkwy. #210
Sunnyvale, CA 94086
408/738-1200

Hippo-Lock
A data security system that encrypts files, allowing only those people who know a password access to protected files. *Hippo-Lock* protects text documents, data files, picture files, and application programs. Three levels of security are available. List price: $119.95.



Score Improvement System for the SAT, Hayden Software

■ *Intermatrix*

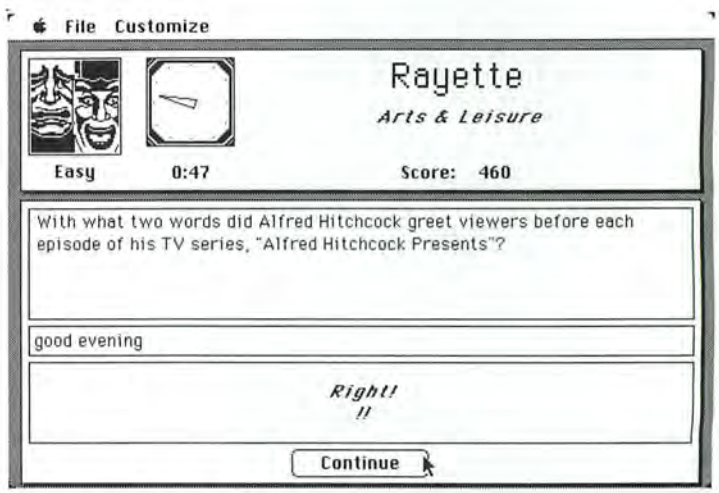
5547 Satsuma Ave.
North Hollywood, CA 91601
818/509-0474

ChequeBook
A program that manages checkbook transactions. You enter information into a checkbook or checkbook register, and the program calculates month-to-date and year-to-date totals. *ChequeBook* also displays a bank statement that includes daily total deposits and total checks. The program can register all checks, produce a forward balance, reconcile bank statements, disburse entries into budget categories, post all checks cleared, generate a general ledger for 100 accounts, display a trial balance, analyze cash flow, and maintain personal files. List price: $54.95.

■ *Kastel Technology Corp.*

621 Minna St.
San Francisco, CA 94103
800/521-5321, 415/863-5636

Trivia Savant
A game that offers 6000 trivia questions in the following categories: Geography, History and Politics, Sports, Math and Science, Arts and Leisure, and Potpourri. Up to six players or teams can participate. The game provides three levels of difficulty, optional hints, and the ability to save and resume games. Questions become more difficult as correct answers accumulate in a category. *Trivia Savant* makes use of the Mac's sound capabilities for questions about music. Additional question disks will be available in the categories of music, sports, the 1970s, and Hollywood. List price: $54.95.



Trivia Savant, Kastel Technology

■ *Macadam Publishing*

P.O. Box 69001
4700 S.W. Macadam Ave.
Portland, OR 97201
503/241-8060

WindoWare Calendar
A desk accessory that provides several time-management functions. You install the Calendar in the Apple menu of a Macintosh application with an included installation utility. The Calendar displays any month in the past or future, one month at a time. The current date is out-

lined in black, and dates with scheduled appointments are shadowed. The Find feature allows you to search an entire year for any appointment using fragments of names or addresses. List price: $49, with WindoWare Phone Book $79.

WindoWare Phone Book
A desk accessory that stores a directory of names, addresses, and phone numbers. Phone Book can automatically dial phone numbers using the Mac's sound generator to produce touch tones. You can use either a modem or a standard phone with a speaker or dialer attachment. Each entry can be up to 255 characters long, allowing you to include notes. You can use the Copy command to transfer information to another application. Numbers are stored alphabetically by name and can be located by using either the scroll bar or the program's Find feature. The Write Phone Book utility allows you to convert the entire Phone Book file into a *MacWrite* document. List price: $49, with WindoWare Calendar $79.

■ *Manhattan Graphics*
163 Varick St.
New York, NY 10013
212/924-2778

ReadySetGo
An application that lets you design and "paste up" pages on the Macintosh screen. You can use *ReadySetGo* to lay out multicolumn newsletters, reports, flyers, and brochures. You build pages from blocks containing text or graphics that can be moved around the page or resized with the mouse. A ruler shows page dimensions to help you visually position blocks, and a specification sheet gives each block's exact design parameters and allows you to position it accurately. A Show Page feature provides a scaled view of the entire page, which can be positioned in tall or wide format. The program provides text-editing features and lets you type in text or paste it in from other programs. *ReadySetGo* can use standard Macintosh fonts as well as typefaces such as Times and Helvetica; you can print pages on the Imagewriter or the LaserWriter. *ReadySetGo* requires a 512K Macintosh. List price: $125.

■ *Marlow & Associates*
136 Lowell St.
Somerville, MA 02144
617/666-3591

The Missing Link
A program that enables you to transfer files between any of the following computers: the Macintosh, the Apple IIe, the IBM PC, the Epson QX10, and the Epson Geneva (PX-8). *The Missing Link* does not require a modem; computers can be directly linked with a cable. The program offers error checking and high-speed data transfer. List price: single operating system version $99, combination package $129.

■ *Professional Software*
51 Fremont St.
Needham, MA 02194
617/444-5224

Trivia Fever Volume 2
A disk containing thousands of questions in seven categories: Science and Technology, Geography, History, Nature and Animals, Sports, Films and Entertainment, and Famous People. The game offers sound, three levels of difficulty, and three levels of handicapping. Up to eight individuals or teams can play. A Super Sports edition offers the categories Baseball; Basketball; Football; Amateur Sports; Golf, Tennis, and Racing; Nicknames, Numbers, and Places; and All Sports. List price: $24.95, Super Sports edition $29.95.

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Marry an Epson to your Mac.

With EPSTART. The completely compatible printer driver.

The perfect couple. Your Macintosh linked to an Epson—Epson reliability, Epson quality reproduction of Apple's ingenuity—all the text, all the typestyles, all the graphics. All you need is EPSTART software for an Epson marriage made in paradise.

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Marsh Creek Corp Center
Lionville, Pennsylvania 19353

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HEWLETT PACKARD ThinkJet

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With JETSTART. The completely compatible printer driver.

Your Macintosh side by side with Hewlett-Packard's 7-lb. portable, ThinkJet. Think of it. Every Macintosh printing capability and Macintosh quality as you jet through the text and graphics at less than a whisper. All you need is JETSTART software for a ThinkJet marriage made in paradise.

$45 at your Hewlett-Packard dealer. Requires a standard Macintosh printer cable and a ThinkJet serial printer.

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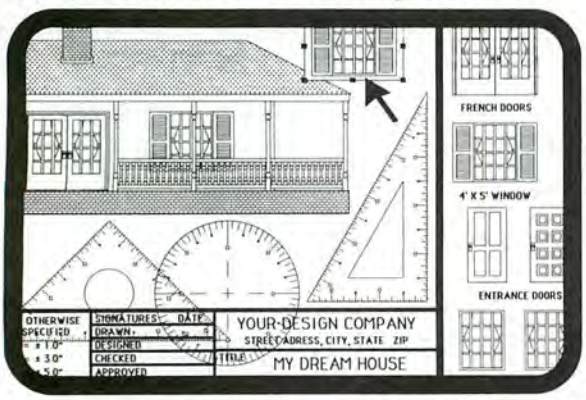
Introducing... MacDraft™ From CompServCo™



Macdraft™ is a software drafting template used with Apple's MacDraw to produce professional Engineering Drawings. A typical package consists of 6 sheets (8.5"x11" to 34"x44") in 5 scales (30 documents) & a MacDrafter Toolkit. Each document has a page border with a title block and can be linked (via the Scrapbook) to a compliment of drafting symbols drawn to scale. The MacDrafter Toolkit is included in each package or may be purchased separately. Use MacDraft™ with other available software and the HP 7475 Plotter to produce one piece drawings up to 34" x 44". Purchase each of the 12 packages separately or save by purchasing either 6 package set. Packages priced: $30-$80. Call or write for information.

The MacCAD™ Set	The MacDrafter™ Set
1. THE HOUSE DESIGNER	1. THE MACDRAFTER TOOLKIT
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3. OFFICE AND STORE PLANNER	3. SINGLE LINE ORTHOGRAPHIC PIPING
4. GENERAL MECHANICAL	4. TWO LINE ORTHOGRAPHIC PIPING
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■ *Rune Software*

80 Eureka Square #214
Pacifica, CA 94044
415/355-4848

Complete Accounts

An accounting program for small to medium-size companies. All business transactions are recorded by one of the program's five specialized journals and posted to a general ledger, which is used to create three financial statements: Income Statement, Balance Sheet, and Statement of Owner's Equity. The program's journals are the Sales Journal (Accounts Receivable), which incorporates invoicing and monthly statement generation; the General Journal, which handles transactions that are outside the limits of the other journals; the Purchases Journal (Accounts Payable), which keeps track of current and aged accounts payable, generates purchase orders, provides information on discount terms and accounting status, and includes check-writing facilities; Cash Receipts; and Cash Disbursements. *Complete Accounts* allows you to customize the format and headings of reports, invoices, and statements. List price: $349.

■ *Sea-Ess Graphics Co.*

P.O. Box 451
Olathe, KS 66061

DecoWriter Fonts

A disk containing 13 decorative character sets, available both in individual font files for manipulation with the Font Mover and in a fully operational "System Folder" for access to the entire font collection. Emphasis is on ornamental alphabets designed for labels, headings, titles, and other graphics applications. List price: $24, with *DecoWriter Letters* $40, with *DecoWriter Letters* by direct mail $35.

DecoWriter Letters

A series of *MacPaint* files containing two complete sets of roman and gothic letters in outlined and shadowed styles, approximately 1½ to 1¾ inches tall. *Letters* includes an assortment of 52 detailed rectangular backgrounds that can be used with or without the letters. The resulting clip art resembles elements of illuminated manuscripts. List price: $24, with *DecoWriter Fonts* $40, with *DecoWriter Fonts* by direct mail $35.

ReadySetGo, Manhattan Graphics

■ *SMK*

5760 S. Blackstone Ave.
Chicago, IL 60637
312/947-9157

GreekKeys
A program that enables you to type ancient or modern Greek text from the Macintosh keyboard. *GreekKeys* is compatible with *MacWrite* and *Microsoft Word* and allows you to combine Greek and English text. The program has 11 dead keys, arranged in a logical order—one key for each diacritical mark or combination of marks. You type the diacritical mark first, then type the desired letter; the diacritical mark is then located directly over lowercase vowels and ρ. The disk contains two fonts, Sparta and Salamis, designed to be aesthetically compatible with the Mac's Geneva and Seattle fonts; both fonts are available in 10- and 20-point sizes. List price: $25.

■ *State of the Art*

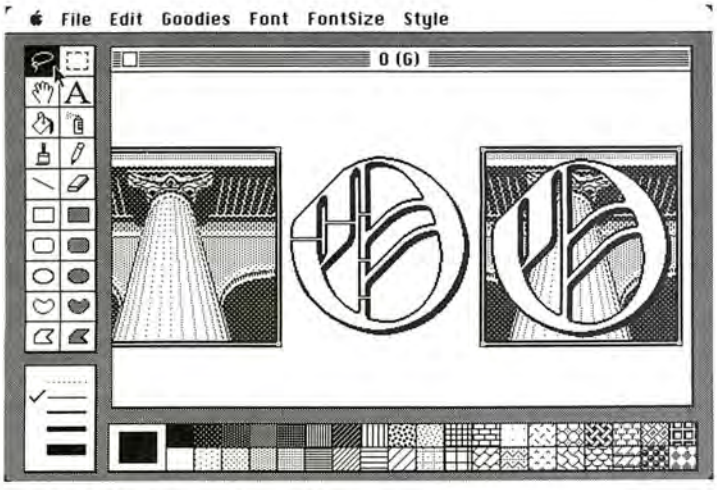
3191-C Airport Loop Dr.
Costa Mesa, CA 92626
714/850-0111

Electric Checkbook
A bill-oriented checkbook program that enables you to set up and record bills on a one-time or recurring basis. The program also generates reports listing cash requirements for the next week or month based on upcoming bills. *Electric Checkbook* handles multiple bank accounts (up to five per disk on a 128K Mac or ten on a 512K Mac); permits you to define categories for income, expenses, assets, and liabilities; provides analysis of all checks by financial category; generates a list of all tax-deductible expenses; performs automatic bank reconciliation; handles both handwritten and computer-printed checks; and produces financial statements. All checkbook activities are immediately updated in the check register and automatically result in a detailed analysis by category. In addition, checkbook activity such as deposits and withdrawals can be viewed immediately on the screen. List price: $79.95.

■ *Symposium*

914 Silver Spring Ave. #103
Silver Spring, MD 20910
301/587-6381

General Ledger
A double-entry accounting system that provides financial reporting, including balance sheets and income statements. Reports can be generated at summary and detail levels, for



DecoWriter Letters, Sea-Ess Graphics

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Your Macintosh teamed with Hewlett-Packard's LaserJet. A combination designed to deliver—super speed, ultra quiet—spectacular graphics and laser quality text, perfect to the letter. All you need is LASERSTART software for a LaserJet marriage made in paradise.

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VIDEO PROJECTION SYSTEM
Clearly reproduces any Mac display including fine text and high-res graphics onto screens up to 20 feet wide. An image as sharp as your Mac's. Controls for brightness and contrast adjust for room lighting conditions. Weighing only 22 lbs, it's easy to take on the road. Includes everything you need: projector, PDS External Video Card, 25' video cable, and complete instructions.
COMPLETE SYSTEM $4,495.00

BIG MAC MONITOR™
Delivers 23" of sharp high resolution black and white display, enclosed in a durable, attractive Apple-beige cabinet. Will clearly reproduce any Mac screen image, including fine text and high-res graphics. Several can be connected in series where multiple displays are required. Includes everything you need: the Monitor, a PDS External Video Card for the Mac, 25' video cable, and complete instructions.
COMPLETE SYSTEM $1,995.00

FREE EXTERNAL VIDEO CARD INCLUDED:
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The C compilers for the Macintosh™

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Powerful, expandable, yet affordable:

- A friendly, integrated environment complete with a screen editor, full K&R C compiler, linker, source-level debugger, tutorial, standard C library, and structure definition files.
- Access to over 400 Toolbox routines.
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- Over 200 pages of documentation and many sample programs.
- Upgradable to Hippo-C Level 2 for $250.00.
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- **$149.95**

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Professional C development system:

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- No royalties or license fees.
- You may obtain a non-copy protected disk by signing and returning a form along with $25.00 to Hippopotamus.
- **$399.95**

HIPPO-LOCK™

The Hippo Business Data Security System

- Encrypts all of your important Macintosh files to protect them from curious eyes. Encrypts MacWrite documents, MacPaint pictures, data bases, spreadsheets, data files, application programs, etc.
- Useful for protecting confidential information such as business plans, payroll information, sales projections, employee reviews, management proposals, grades, etc....
- Choose between three levels of security.
- Uses the NBS DES Data Encryption Standard, used widely by major corporations and the U.S. Government.
- **$119.95**

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1250 Oakmead Parkway Suite 210
Sunnyvale, CA 94086

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Circle 40 on reader service card

current month, for year to date, and with comparisons to previous month and previous year. *General Ledger* features an audit trail, inventory adjustment, and the ability to report transaction details for up to one year. List price: $199.95.

■ *Triple Play*

P.O. Box 6354A
Lafayette, IN 47903
317/742-5369

Game Disk #1

A disk containing three games: Backgammon, Deduce, and Mancala (Pits and Stones). In Backgammon you can set up the board in any configuration, allowing you to practice games from books. Deduce presents a number of symbols and provides feedback that enables you to gradually deduce a pattern. Mancala pits you against the Mac in a mathematical board game. You can save games at any point and return to them later. Each game offers several levels of difficulty. List price: $39.50.

■ *Tronsoft*

P.O. Box 23202
Santa Barbara, CA 93121
805/965-7517, 805/962-0587

RE-Pro 1

A real estate investment program used with *Microsoft Multiplan*. *RE-Pro 1* allows you to analyze commercial or residential properties in a variety of ways, including cash flow projections, loan analysis, depreciation evaluation, income and sales analysis, syndication options, and buy/sell computations. The program can calculate returns for individuals or partnerships. *RE-Pro 1* prints out an eight-page comprehensive report to insert into a loan application. Included with the program is a 200-page interest table and a manual explaining each step in an investment analysis. List price: $145 plus $5 shipping.

Hardware

■ *Dayna Communications*

50 S. Main St. #530
Salt Lake City, UT 84144
801/531-0600

MacCharlie

A coprocessing device that enables you to run IBM PC software on the Macintosh. MacCharlie consists of a 5¼-inch disk drive and a keyboard extension that includes ten function keys and a numeric keypad. The Mac rests on top of the L-shaped disk-drive housing, and the Mac's keyboard slides into MacCharlie's keyboard extension. The drive provides 320K or 360K of memory, depending on which version of PC-DOS you use, as well as 256K of RAM; you can add a second drive to provide 640K of memory. After connecting MacCharlie to the Mac with a cable, you can switch between using the Mac as a standard Macintosh and using it to run IBM PC programs. You can also connect the Mac to IBM PC serial networks and IBM PC-compatible printers. Many Macintosh features, such as desk accessories and the Clipboard, will work when the Mac is in IBM PC mode. List price: $985.

■ *Iomega Corp.*

1821 West 4000 South
Roy, UT 84067
801/776-7330

Bernoulli Box

A cartridge-based mass storage system with a 5-megabyte capacity that allows you to store large amounts of data. The box uses one cartridge at a time. The removable cartridges are high-capacity flexible disks in a hard casing; their portability and design provide both privacy and data security. Applications include primary use,

backups, and archival storage. The high capacity of each cartridge allows loading of multiple programs, reducing the need to change floppy disks containing new programs. List price: $1995, each cartridge $59.

■ *Summagraphics Corp.*

777 State St. Extension
Fairfield, CT 06430
203/384-1344

MacTablet
A graphics tablet and stylus that you can use to create freehand drawings or to trace artwork into *MacPaint* or *MacDraw* documents. The 6- by 9-inch tablet connects to the Mac's modem or printer port; you need not disconnect the mouse to use MacTablet. You draw using the stylus, which is slightly larger than a ball-point pen, instead of the mouse. The stylus has a switch that performs the same functions as the mouse button (clicking, dragging, and so on). MacTablet includes software that enables you to use the stylus as an input device. List price: $495.

Accessories

■ *ABA Systems/USA*

P.O. Box 24086
Nashville, TN 37202
615/242-9634

Locking Disk Case
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Ribbon cartridges for the Imagewriter printer are available in the following colors: red, blue, green, brown, yellow, and purple. The ribbons use a lubricated ink that minimizes ink buildup on the printhead. Each cartridge contains 14 yards of ribbon with a twist in the ribbon that enables you to use both sides. List price: $9.95.

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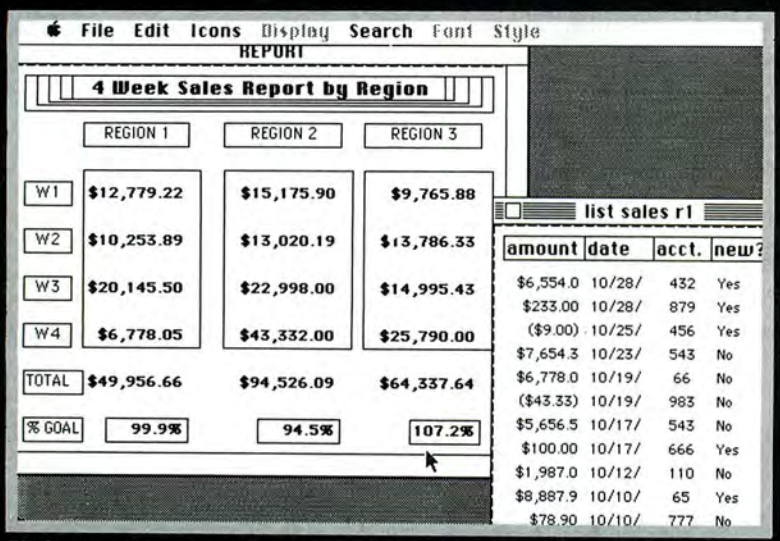
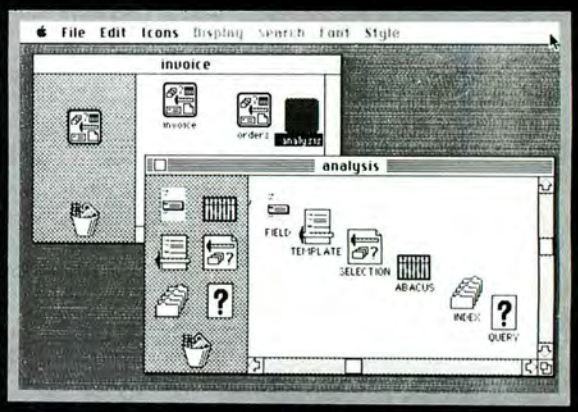
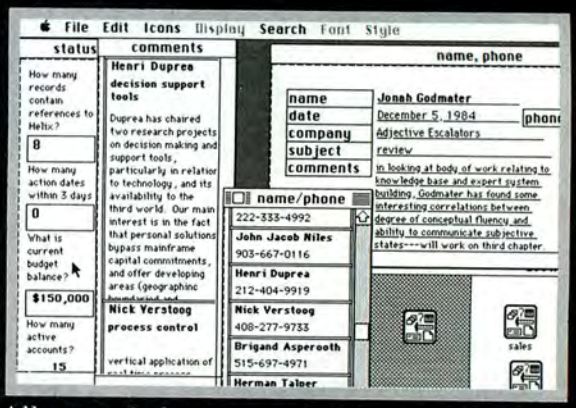


Helix is a data-based system, so that once you enter information you can use it for anything – reports, lists, analyses, mail merge printouts, or even relational look-ups to other data-bases within Helix.



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.

Requires: an external drive or hard disk
Runs on: 512K Macintosh ▪ Lisa with MacWorks
Supports: Hard disks ▪ Keypad ▪ 15" Imagewriter
Includes: Helix Program disk ▪ Helix Guided Tour disk ▪ Helix Resource/Work disk ▪ User Manual ▪ 18-ring project binder ▪ Reference pad for custom documentation ▪ Registration card for support & updates
Offers: Modeless input, interactive query, editing, & report generation ▪ Text-formatting ▪ Calculations between fields & across records ▪ Object-oriented, icon-based design ▪ Relational Look-ups ▪ List management ▪ Mail merge ▪ Clipboard & ASCII file transfer ▪ Special Template tools for form design ▪ User defined, automatically updated Indexes ▪ Unrestricted length & number of fields ▪ Complete printing options ▪ Vertical and horizontal autoscroll ▪ Visual building blocks for arithmetic, date, text & Boolean operators, functions, & values.

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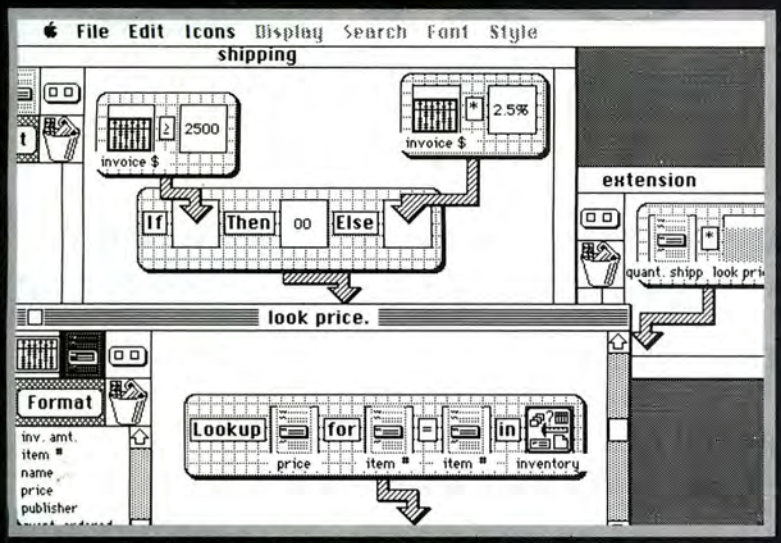
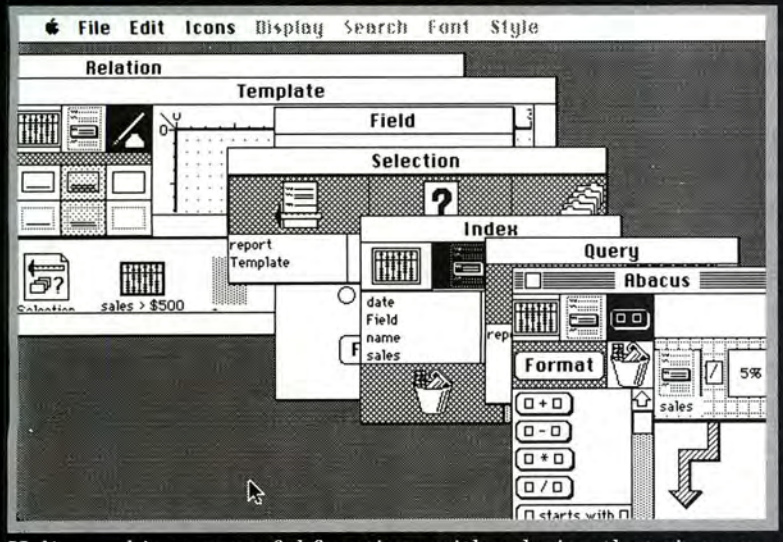
Odesta, 3186 Doolittle Drive Northbrook, IL 60062 USA
(800)323-5423 in Illinois (312)498-5615

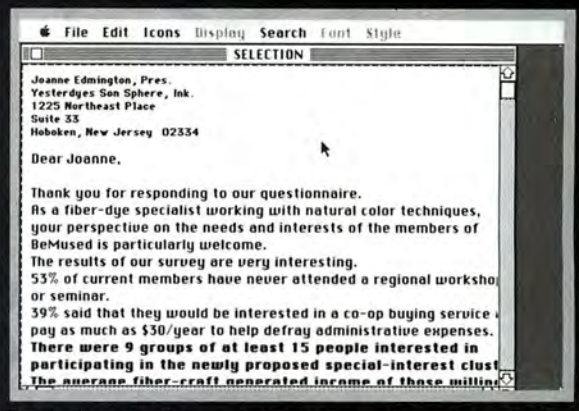
Odesta Helix opens the door.



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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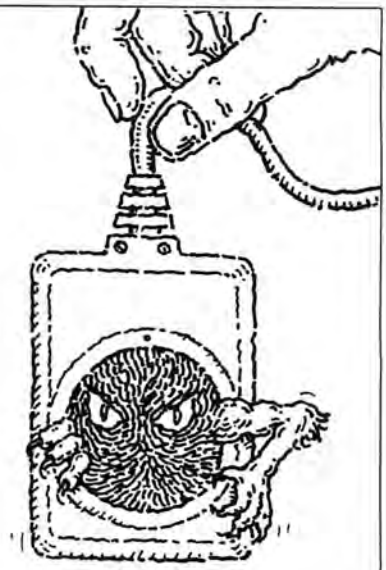

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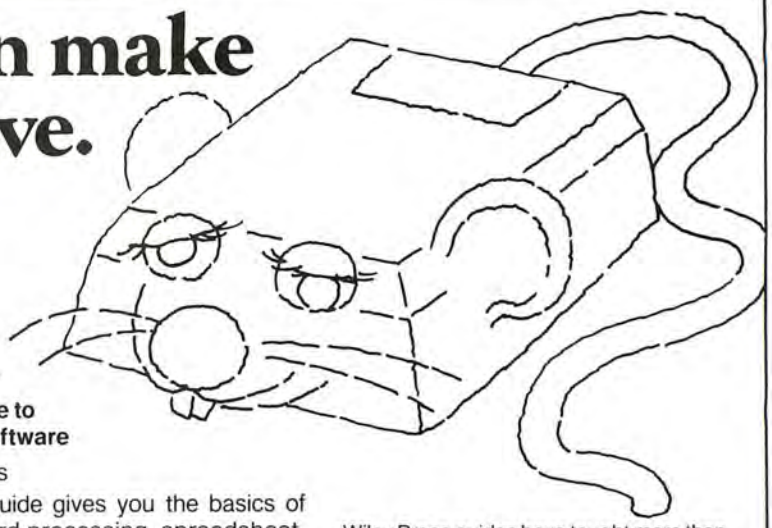

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Combing the Electronic Archives

Jeremy Joan Hewes

Like vast electronic libraries, commercial database services hold billions of citations, abstracts, and numbers. In many cases databases duplicate the information found in conventional libraries. However, many on-line libraries contain information so specialized or obscure that you might find it only in the most prestigious university collections. Yet anyone with a Macintosh, a modem, and a communications program can browse through an electronic library, locate all the references to a chosen topic, and obtain a copy of the relevant information within minutes.

The advantages of on-line information retrieval are obvious. Whether you're a student researching a microbiology paper or a business executive looking for an assessment of the steel industry, you can consult thousands of books, journals, theses, and other publications without leaving your keyboard. You can define precisely the topics you're looking for. In most cases you can save the data on disk and order printed copies of the items cited in your search. Of course commercial database services charge for access to their electronic libraries, but in general the information is well worth the cost. With a little preparation you can make your searching dollars go a long way.

Database Basics

Electronic data banks fall into two major groups. Consumer-oriented information services–often called information utilities–such as CompuServe and The Source, comprise one group (see "Into the Mouth of the MAUG," *Macworld,* December 1984 and "Backstreets of the MAUG," *Macworld,* January 1985). Commercial database services such as Dialog, Nexis, and BRS (Bibliographic Retrieval Service) are in the other group. Information services are generally easy to use, with many levels of menus and extensive documentation. Commercial database services are more comprehensive and contain more information than the information utilities do but require you to learn fairly sophisticated commands before you can locate specific items within their voluminous resources. Commercial services are true electronic libraries, and learning to search their "shelves" can be satisfying, profitable, and possibly essential when you need to investigate a topic quickly.

Each of the major services offers a collection of databases compiled by independent producers. A service provides access to the mainframe computers on which the data is stored and manipulated, as well as to highly specialized software that subscribers use to search the databases (see "The Principal Database Services").

Although costs vary, you generally pay a modest charge for network access to the service (typically $8 to $11 per hour for Telenet, Tymnet, or Uninet), a separate charge for the time spent using an individual database (these fees, which range from $15 to $300

```
Display 1/L/1
1083906  EET8411087-3
  Macintosh Encounters Delays in Software.
  Doherty, R.
  Electronic Engineering Times No.296, Sept. 10, 1984, P.
87,88.
  Country of Publication: U.S.A.  Language: English
  CODEN: EETIDQ  ISSN: 0192-1541
  Availability: Available from Management Contents
  Document Type: Tabloid  Article Type: Industry News
  There is a shortage of software packages for the Apple
Macintosh computer system. As a result, retailers are cutting
the price of the Mac. The introduction of a Lisa 2 system
designed for Mac software development has been delayed. Also
delayed is an interactive PASCAL language designed for Macintosh
software development. Software developers comment on their
attempts to write Macintosh software programs.
  Product Name: Macintosh , , Apple Computer Inc., Personal
Computers
  Company Name: Apple Computer Inc. , Products ,  ,  ,
Computer Industry  D-U-N-S No.: 06-070-4780
  Descriptors: Personal Computers; Software Packages; Software
Publishers; Software Design; Shortage; Software Engineering
```

Figure 1

A complete record from the Knowledge Index located during a search for Macintosh engineering software. The top line shows the command format, which in this case tells the Knowledge Index to display record number 1 in long form from the first set of records.

per hour, are set by the independent database producers), and perhaps an additional fee for the service itself (typically $12 to $35 per hour). Using a database service can be compared to a trip to the amusement park; you pay to get there, you pay to get in, and you pay to get on the rides. Two low-cost services, Knowledge Index and After Dark, combine all charges in one per-hour fee ($24 on Knowledge Index and $6 to $41 on After Dark), but access is limited to evenings and weekends. The services offer fewer databases than their round-the-clock counterparts.

Just as costs differ among the database services, so do the search commands and user interfaces. If you need to make extensive searches, you should study each database service thoroughly, assess its offerings and costs, and take a training course provided by the service that you select. Sample searches give you an idea of how databases are organized, what you can expect during an on-line search, and how to make efficient use of your communications time and money.

I made sample searches on Knowledge Index to demonstrate the basic principles of on-line research. Knowledge Index is an ideal place to begin because it is easy to use, and the charges are lower than for other services. It also contains 26 databases divided into 15 subject categories ranging from business and computers to education and psychology.

A Simple Search

With a communications program, a modem, a Macintosh, and a Knowledge Index subscription, you can begin by studying the commands and examples provided in the manual, which is supplied with every subscription. In addition to sections explaining the basic principles of on-line searching, the documentation contains a four-page digest on each database. The digest details any special features or commands associated with the database and includes additional search examples.

Initiating a Knowledge Index search is simple. Type the command **begin** (or the abbreviation **b**) and the name of the database. To designate your search terms, type the command **find** (or **f**) and add the words you want to locate. To see the references (also called records or citations) located in a search, you type **display** (or **d**) followed by a formula, which is the only tricky part of the process.

The formula begins with the number of the set of records from which you want to display items, continues with a slash and the format of the record (**s**, **m**, or **l**, for short, medium, or long, respectively), and ends with another slash and the number of the desired record (see the first line in Figure 1). If you are uncertain about using any command, you can type **help** and the command name to get an explanation of that command.

The Principal Database Services

Most large-scale databases are marketed through one or more of the commercial database services. In some cases on-line access to an individual database is available through its compiler, but the more common—and generally more economical—method of tapping these databases is through the commercial services.

For a comprehensive introduction to independent databases and a comparative discussion of the major database services, consult the book *Answers Online,* by Barbara Newlin (Osborne/McGraw-Hill, 1984). This excellent reference provides basic information on searching techniques, types of databases, and criteria for selecting services and individual databases.

The services listed below are the major vendors available to Macintosh users. These services actively seek new subscribers and will respond promptly to requests for additional information.

■ *Bibliographic Retrieval Service*

1200 Route 7
Latham, NY 12110
800/833-4707, 800/553-5566
in New York, 518/783-1161

After Dark
After Dark features more than 40 databases, as well as access to MCI Mail at hourly rates lower than those charged by its parent service, BRS.

BRS
A database service offering more than 70 databases and an on-line bulletin board for subscribers.

■ *Dialog Information Services*

3460 Hillview Ave.
Palo Alto, CA 94304
800/227-1927, 800/982-5838
in California,
415/858-3785

Dialog
The largest commercial service, offering more than 200 databases.

Knowledge Index
A low-cost service featuring 26 databases.

■ *NewsNet*

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800/345-1301, 215/527-8030
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A service featuring more than 70 databases, including several not available from any other commercial service.

One of Knowledge Index's strong points is its coverage of computer-related literature. The service offers four databases in this category; three of them focus on personal computers and software. In an effort to locate engineering software for the Macintosh, I searched the four databases using **Macintosh and engineer?** The question mark designates *engineer* as a root word and assures that any words including that root are located. I didn't use *software* as a search word because I wanted the initial results to have as broad a scope as possible.

I searched each database separately; Table 1 compares the results. Surprisingly the Microcomputer Index, which has the on-line label Comp3, had no references to *Macintosh and engineer.* The Computer Database (Comp4) and International Software (Comp2), two other databases likely to have references to the Mac, didn't disappoint. The largest of the four databases, INSPEC, which includes the contents of some 2300 journals, yielded no references in the search.

Database	Search Results
INSPEC	74 Macintosh
	52838 Engineer?
	0 Macintosh and engineer?
International Software	172 Macintosh
	1770 Engineer?
	1 Macintosh and engineer?
The Microcomputer Index	164 Macintosh
	258 Engineer?
	0 Macintosh and engineer?
The Computer Database	648 Macintosh
	3255 Engineer?
	9 Macintosh and engineer?

Table 1

The results of searching four Knowledge Index databases separately for the number of references to the term Macintosh *and the root word* engineer. *The four databases are referred to on screen only as Comp1 through Comp4.*

Like most computer programs, Knowledge Index software follows your instructions literally, locating every citation with *Macintosh* and *engineer,* even when the content of a reference isn't directly related to the subject. For example, the search yielded a citation from an electronic engineering journal with a general report on early software development for the Macintosh that didn't discuss specific programs (see Figure 1).

Narrowing the Focus

My second search through Knowledge Index databases demonstrates the effectiveness of a more precise strategy, with more variables in locating items, than the first search example. The objective of the second search was to identify places where people can see sea otters. I had to consider carefully which words I could combine with *sea otter* to find the appropriate references. Searching for all mentions of *sea otter* might yield hundreds of references, and checking each one would be time-consuming and expensive.

With specialized words known as Boolean operators, you can qualify which references you want. Boolean operators, such as AND, OR, and NOT, allow you to designate terms that must be included in or excluded from a search. Because Boolean operators are commonly used in database searching, you cannot search for *and, or,* or *not* unless the database's software provides a way to differentiate the word from its Boolean sense. Of course you would probably never need to find references to *not* and *and.*

In the search for sea otter habitats, I used the command **find sea otter and (zoo or aquarium or refuge or preserve)**. The parentheses are a Boolean convention (see Figure 2). The search yielded citations that included *sea otter, zoo, aquarium, refuge,* or *preserve* separately and *sea otter* with any of the others. Including related items in the search increases your chances of uncovering the references that you want.

With the Boolean operators, the search turned up two citations that had information on where you could observe sea otters. As in the *Macintosh and engineer* search, however, don't be surprised if even your most carefully planned search yields irrelevant citations. One reference located in the sea otter habitat search was a study of a type of crab, and another was on an environment that provided refuge for a certain plant. In those citations sea otters and the other search criteria were barely referred to.

One Last Search

A third Knowledge Index search I made illustrates how most databases are arranged and shows two ways to narrow a search after an initial query. Recently the Internal Revenue Service (IRS) ruled that taxpayers who wish to deduct some or all of the cost of a personal computer may have to verify that they use the computer for business purposes. The Knowledge Index databases seemed like a promising place for a search on the personal computer as an income tax deduction. But there are easily thousands of references to taxes and computers. To narrow the field I used three search terms: *income tax, computer,* and the root word *deduct.*

Saving Search Time and Money

With practice, or with special training for the complex database services, you can locate and retrieve precise information in a matter of moments. Here are some tips to help you find the information you need while saving the time and money you spend using electronic libraries.

- Choose a database carefully before you begin a search. Knowledge Index and other commercial services provide a description of each database's contents, including the approximate number of records and the years covered.
- Plan your search. Write out the sequence of commands and the list of databases you intend to search. Check off each step you take as you do your search or change your search strategy. You waste time and connect charges by repeating search commands or searching the same database.
- Always save your search on disk. An electronic copy you can study and edit proves convenient if you decide to cite portions of a search in your work.
- Check the cost of your search often while you are on line. Even when using the relatively inexpensive services, you can easily lose track of time. Most services provide a simple command, such as Cost, which brings you a summary of current charges (see "Cost Summary").
- Be sure you know the proper command for logging off the service before you log on. Although you can turn off the modem if you can't remember how to log off, some services do not recognize the disconnection and will continue to charge your account for up to 15 additional minutes. If you are using a high-priced database, that quarter hour could be costly indeed.

Cost of three searches in Knowledge Index

Macintosh and engineer?	$ 3.84
Sea otter	$ 4.97
Income tax	$ 4.61
Total	$13.42

Cost Summary

Every minute you spend searching is not only time but money. The costs in the figure are for the three searches carried out in the article.

```
?f sea otter and (zoo or aquarium  or refuge or preserve)

        33 SEA OTTER
      2747 ZOO
       270 AQUARIUM
       170 REFUGE
       520 PRESERVE
S1      1  SEA OTTER AND (ZOO OR AQUARIUM OR REFUGE OR PRESERVE)
```

Figure 2

The results of a search for likely places to view sea otters. The command line shows the use of Boolean operators AND and OR to find references to sea otter *that are associated with any of four likely habitats.*

```
?d 1/s/1

        Display 1/S/1
1973542
 Home office deductions; sales taxation of computer software.

?d 1/m/1

        Display 1/M/1
1973542
 Home office deductions; sales taxation of computer software.
 Fitzgerald, Robert E., Jr.
 J. Mo. B.  40  47-48  Jan-Feb  1984
```

Figure 3

The short and medium forms of the same record. Note that you must request the record's medium form to see the publication date of the reference contained in the record.

Even with three interdependent terms, the search produced a fair selection of references. When a search yields more items than you can quickly scan through, I suggest that you display a few of the records to see if they actually contain the information for which you're looking.

Viewing some of the records located in a search is one method of narrowing the search. In my search for information about deducting the cost of a computer, I used this technique to eliminate inappropriate citations. Like most database services, the Knowledge Index presents search results with the most recent item first and continues in reverse chronological order. Because the IRS ruling was issued in 1984, items dated before that year were not relevant to the search. So I displayed the items sequentially until I saw the first 1983 record and excluded that and earlier references from my search. To speed this chronological review process, you can specify that the records be displayed in short or medium form (see Figure 3).

Another way to narrow a search is to qualify the criteria using Boolean operators for a search through the citations already located. In this case I added the years 1984 and 1985 to the search criteria. The second search located a smaller number of records but turned out to be too narrow. The term *1984* or *1985* has to be in the record itself–not merely be its publication date–to be located by this method. In this instance, simply viewing the records was more effective.

These three searches of various Knowledge Index databases provide some examples of commands, terminology, and strategy. With a reasonable amount of preparation, you can reap a harvest of information that will prove far more valuable than the cost or effort of searching the commercial databases (see "Saving Search Time and Money" for tips to maximize your search efficiency). Virtually every source of information is available to you by computer, modem, and telephone line, just waiting to be tapped. □

Jeremy Joan Hewes is coauthor of Writing in the Computer Age *(Doubleday, 1983) and* Word Processing with the IBM PC *(John Wiley, forthcoming).*

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Open Window

An exchange of Macintosh discoveries

Edited by Jim Heid

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 performance comparison of several Macintosh programming languages that lets you see how they stack up against their IBM PC and Apple II counterparts. For chart makers we provide instructions on how to use *MacDraw* to spruce up charts created with *Microsoft Chart*. Our readers' ongoing search for undocumented program features uncovers a handy *MacWrite* tip that lets you insert "hard" spaces that the program does not break and a time-saving Microsoft BASIC (MBASIC) 2.0 feature that allows two-keystroke entry of keywords. We've also included an MBASIC program that animates *MacPaint* graphics and an explanation of how to produce diacritical marks on the Mac.

Mac Wins by a Length

How powerful is the Macintosh? It's a tough question, since the Mac does so many things that other computers don't. One way to answer the question is by benchmarking—running an identical task on different computers and timing each machine's performance.

A complication of benchmarking is that the same task programmed in different languages on the same computer takes widely differing times to run. Furthermore, a benchmark test measures a computer's performance in a specific area. The test tells nothing about the machine's ease of use, graphics quality, reliability, or portability—other factors that go into choosing a computer.

Some time before the Mac was introduced, *BYTE* magazine compared hundreds of computers and programming languages. The benchmark test was to run a program that determined the first 1899 prime numbers using an algorithm called the Sieve of Eratosthenes. This test measures primarily a computer's speed of integer arithmetic and array handling. It does not measure other important performance parameters, such as string manipulation, screen accessing, or disk input/output.

I ran this test on my 512K Macintosh with all the programming languages I have.

Language	Macintosh	IBM PC	Apple II
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Pascal	1270.00 *(Apple)*	*(N/A)*	516.00 *(UCSD)*

* *using Computer Innovations "C" package*
N/A indicates results not available

Mac Performance
This table shows how several Macintosh programming languages stack up against their IBM PC and Apple II counterparts. The benchmark program used the Sieve of Eratosthenes algorithm to determine the first 1899 prime numbers. All times are in seconds.

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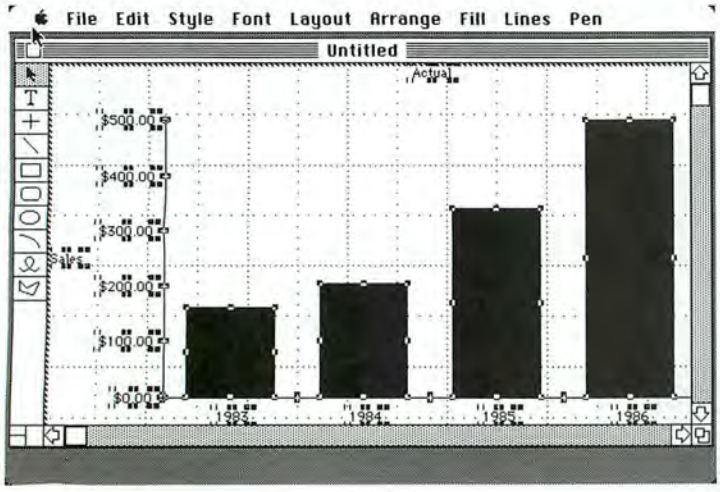
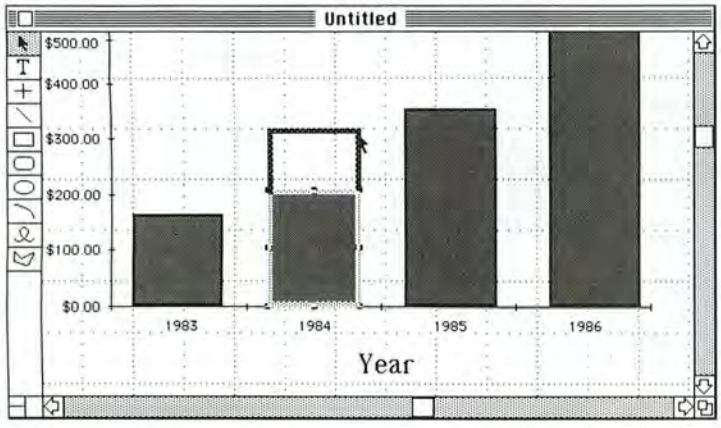


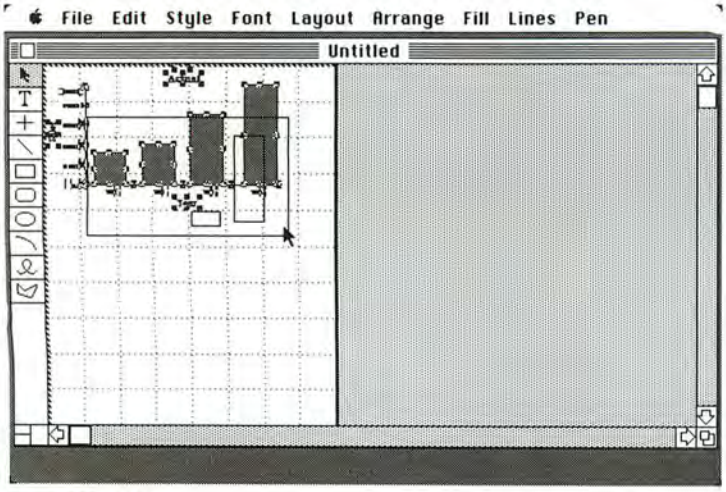
Draw Chart 1

When you paste a chart created with Microsoft Chart *into* MacDraw, *every graphic element in the chart is selected. Click anywhere in the white portion of the easel to undo the selection.*



Draw Chart 2

To change the size of a graphic element in MacDraw, *select and drag it. For precise alterations, disable the Grid function first.*



Draw Chart 3

To reposition a chart, choose MacDraw's *Reduce to Fit command on the Layout menu, and select and drag the graph.*

The results are listed, along with comparative figures from the *BYTE* article, in the table "Mac Performance."

Ira Jay Rampil
San Francisco, California

The Graphic Duo

For most graphics work, *Microsoft Chart* can serve you well. Combining *Chart* and *MacDraw,* however, gives you greater versatility and speed. *MacDraw* lets you change fonts, font sizes, and styles; resize or rescale graphs; and alter fill patterns. While *Chart* offers many of those features, *MacDraw* performs them faster and more efficiently.

Forming a *Chart-MacDraw* alliance is simple. Use *Chart* to create a graph. Keep the graph simple; leave alterations to *MacDraw.* To copy the graph into *MacDraw,* choose the Copy Chart command from the Edit menu. A dialog box appears asking if you want to copy the graph in the size shown on the screen or in the size when printed. Choose the As Shown When Printed option to produce a large graph that is easy to modify in *MacDraw.*

Next quit *Chart* and start *MacDraw.* Once you're in *MacDraw,* choose the Paste command from the Edit menu to paste the graph into the *MacDraw* easel (see the figure "Draw Chart 1"). Every element of the graph—down to the small *X* and *Y* axis marks—is automatically selected. Click on any white area of the easel to undo the selection.

Now you can manipulate the graphic elements. If you want to change the pattern in one of the bars, for example, click the bar, then choose a pattern from the Fill menu. To change the pattern in all the bars, click each one while holding down the Shift key and then choose the new pattern.

To alter the weight of borders, tick marks, grid lines, and other graphic elements, click the element you want to change and choose a thickness from the Lines menu. To change the texture of the element, select an appropriate pattern from the Pen menu.

MacDraw also lets you resize and reshape objects. If you need to change the height of a bar, for example, select and then drag the top to its new height (see "Draw Chart 2"). You can resize the bar more freely by selecting Turn Grid Off on the Layout menu.

You can also embellish the titles, labels, and annotations on the graph. Select the text you want to alter, and then change the font, size, or style as desired. *Chart* limits you to the Chicago, Geneva, and New York fonts, but *MacDraw* lets you choose any font residing in the System file of your disk. Parts of the characters may be lost when you use a large size. If they are, select the text and resize the text box to accommodate the new font size.

MacDraw allows you to rotate labels or change their positions on the graph. Text is imported from *Chart* into *MacDraw* in two parts: the foreground of actual characters and the opaque white background. Clicking the text directly selects only the foreground. To select both background and foreground, drag a selection rectangle over the text. When both are selected, the background follows as you drag or rotate the text. Selecting the foreground and background and choosing the Group command on the Ar-

range menu groups the two parts together so that when you click the foreground text, the background is automatically included.

Position the graph where it looks best on the page. Choose the Reduce to Fit command on the Layout menu, select the entire graph, and drag the chart to a new location (see "Draw Chart 3").

You can save the finished graph on disk or print it. Since the graph is in *MacDraw,* you can use a plotter driver that is compatible with *MacDraw* to print the graph with a pen plotter.

If you're sprucing up several graphs in one sitting, store the graphs you create with *Chart* in the Scrapbook. Once in *MacDraw,* you can retrieve them as needed. *MacDraw* lets you work with up to four separate documents at once, as well as documents up to 4 by 8 feet in size. This feature is helpful if you want to make the same changes to several graphs at once.

Gordon McComb
Carlsbad, California

MBASIC Keyboard Shortcuts

I was writing a program in MBASIC version 2.0 in which I had to use the value of *pi.* I typed Option-P in the List window, and the π symbol appeared. When I pressed Return, however, the symbol changed into the STRING$ keyword.

Curiosity took over, and the table "MBASIC 2.0 Shortcuts" is the result. Using this Option key technique saves many keystrokes when you're typing a lengthy program. For easy reference you could take a "snapshot" of the Key Caps desk accessory, print two copies, and write each keyword on its corresponding key.

Randy Bisig
Fulton, Missouri

Hard MacWrite Spaces

Many word processors let you insert a hard space, which isn't considered a place for a line break during word wrap or reformatting. I've discovered a simple way to create a hard space in *MacWrite:* hold down the Option key while you press the space bar. Hard spaces are useful when you want to keep two or more words on the same line. You can select words separated with hard spaces by double-clicking any one.

Roger Hart
Merrimack, New Hampshire

Diacritical Observations

This tip may be hidden somewhere in the *MacWrite* manual, but if it is, I can't find it. Although the Key Caps option on the Apple menu shows several diacritical marks, it takes experimentation to figure out how to type them. Here's how. First look at the Key Caps keyboard to see where the various marks are located; you see them displayed when you press the Option key. To place a diacritical mark over a letter, hold down the Option key and press the key that produces the mark you want, for example, Option-U for an umlaut. Release both keys, type the letter that needs the mark, and voilà! Both the letter and its diacritical mark appear.

Rhonda Smith
Berkeley, California

This information can be found in Apple's Macintosh manual (page 87), but we're printing your tip since not everyone thinks to look in the manual.–Ed.

Key	*Option Display*	*BASIC Word*	*Option-Shift Display*	*BASIC Word*
	–	–	–	–
1	–	–	–	–
2	™	ON	–	–
3	£	LOG	–	–
4	¢	LOF	–	–
5	∞	RETURN	–	–
6	§	LSET	–	–
7	¶	MKD$	–	–
8	•	MID$	°	LOC
9	–	–	–	–
0	º	VAL	–	–
-	–	–	–	–
=	≠	PUT	±	RIGHT$
q	–	–	–	–
w	Σ	SQR	□	STATIC
e	´	OPEN	□	USING
r	®	MKS$	□	TO
t	–	–	□	THEN
y	¥	SGN	□	NOT
u	¨	PRINT	□	' (single quote)
i	ˆ	ˆ	□	>
o	ø	WRITE	Ø	REM
p	π	STRING$	Ø	STR$
[	–	–	–	–
]	–	–	–	–
\	–	–	–	–
a	å	CVS	Å	ASC
s	ß	MKI$	□	=
d	∂	SPACE$	□	<
f	–	–	□	+
g	©	NEXT	□	–
h	–	–	□	*
j	–	–	□	/
k	–	–	□	ˆ
l	–	–	□	AND
;	–	–	□	OR
'	æ	WHILE	Æ	READ
z	Ω	WEND	□	HOR
x	–	–	□	EQV
c	ç	DATA	Ç	ATN
v	–	–	–	–
b	∫	TAN	□	IMP
n	–	–	□	MOD
m	µ	SIN	□	/
, (comma)	≤	RND	–	–
. (period)	≥	RSET	–	–
/	–	–	–	–

MBASIC 2.0 Shortcuts

You can enter many BASIC keywords with only two keystrokes each by holding down the Option key or Option-Shift keys while typing the key that corresponds to the desired keyword.

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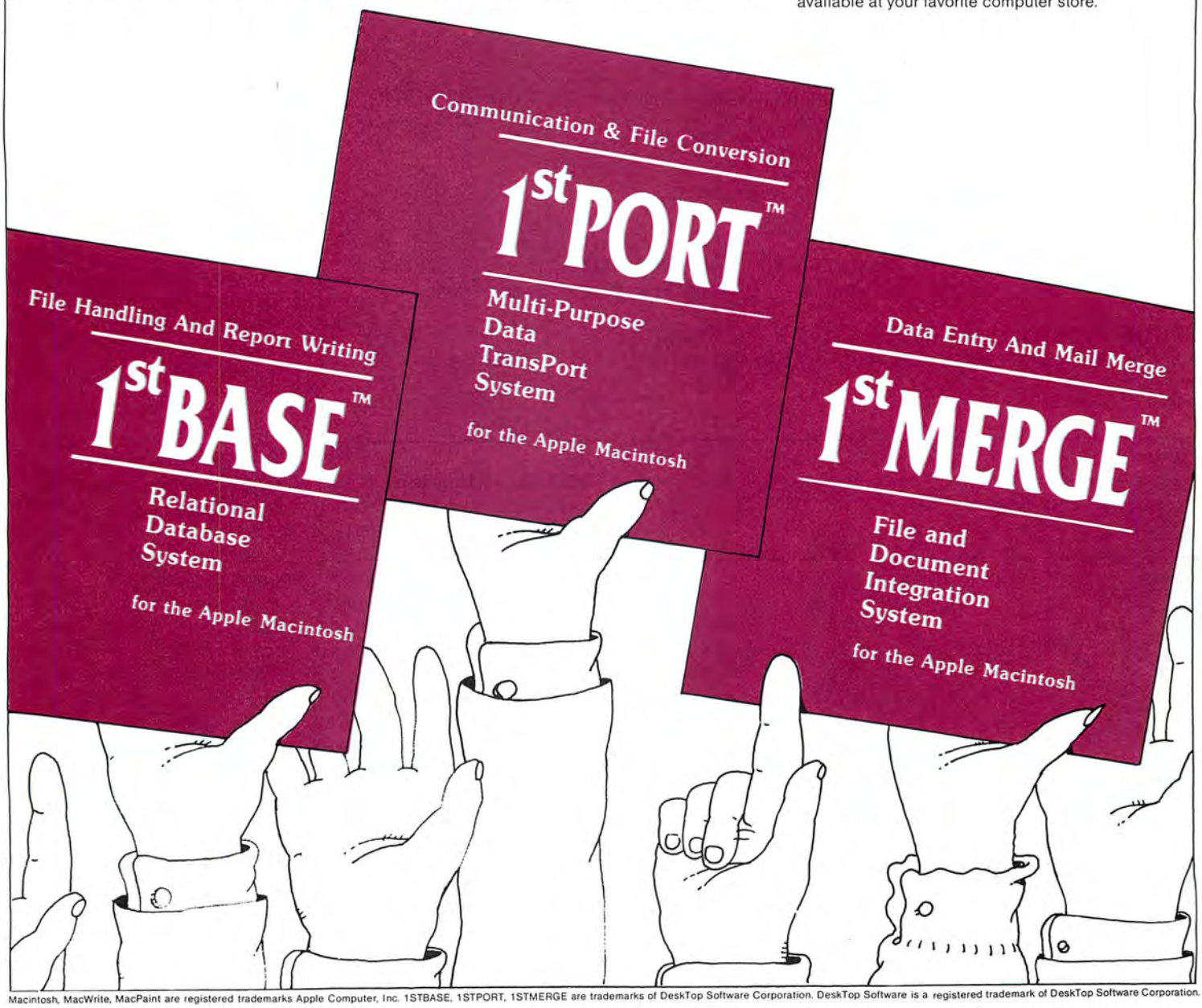

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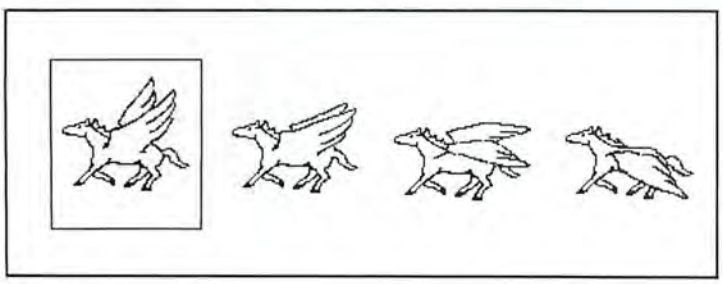
```
PRINT"Please make a selection from the AniMac Options window."
'AniMac by L. A. Liotta
MENU 1,0,1,"AniMac Options"
MENU 1,1,1,"SAVE AN ANIMATION FRAME COPIED TO THE CLIPBOARD"
MENU 1,2,1,"DISPLAY AN ANIMATION SERIES FROM THE FILE"
m=24:DIM w$(m):xp=30:yp=30
ON MENU GOSUB mcheck: MENU ON
id1:GOTO id1

mcheck:choice=MENU(1):ON choice GOSUB snapshot,display
snapshot:MENU RESET
INPUT"What is the name of the animation series?",a$
INPUT"What is the number of the animation frame?",f
OPEN "clip:picture" FOR INPUT AS #1
pic$=INPUT$(LOF(1),1)
CLOSE #1:CLS:PICTURE (30,30),pic$
PICTURE ON:PICTURE,pic$:PICTURE OFF
OPEN a$+STR$(f) FOR OUTPUT AS 1
PRINT#1,PICTURE$:PRINT "The clipboard picture shown is now saved as frame :" a$+STR$(f)
CLOSE #1:MENU RESET:END

display:MENU RESET:CLS
INPUT "What is the name of the animation file series?",a$
INPUT "What is the number of frames in the series?",m

FOR i=1 TO m:OPEN a$+STR$(i) FOR INPUT AS 1:w$(i)=INPUT$ (LOF(1),1)
CLOSE 1:NEXT i:CLS:PRINT "Use the mouse for changing the location of the animation.
anim:
FOR i=1 TO m:PICTURE (xp,yp)-(xp+480,yp+320),w$(i):NEXT i
IF MOUSE(0)=1 THEN CLS:xp=MOUSE(1):yp=MOUSE(2)
GOTO anim
```

AniMac

This MBASIC program allows you to create animated graphics using a series of frames created with MacPaint.



Pegasus

You can create the animation series in FatBits. Each frame must be separately cut to the Clipboard and saved in the AniMac program. The second and third drawings were used twice for a total of six animation frames.

Enter and save the program AniMac (see the listing) in MBASIC 2.0. To create animation, start up *MacPaint* and draw a frame of an animation series using FatBits (see the figure "Pegasus"). Choose Copy from the Edit menu to transfer the drawing to the Clipboard. Next load AniMac and select Save an Animation Frame from the Options menu. Type in a name for the animation series and a number for the frame in the order you want it to be shown. To add the next frame in the series, go back to *MacPaint,* draw the next picture, and copy it to the Clipboard. Now run Animac and save the new Clipboard picture as the next frame in the series. After you save all the animation frames, you can display the animation on screen. Run AniMac and select Display an Animation. The location and size of the animation can be altered by changing the coordinates in the Picture command under the subroutine Anim:.

Lance A. Liotta
Bethesda, Maryland

MBASIC Animation

One of the most exciting aspects of MBASIC version 2.0 is that you can draw a picture in *MacPaint* and use the picture as a graphics element in your own programs. Rob Dickerson raises this possibility in his article "The Voyage of Sonar Sub" [*Macworld,* December 1984]. His suggestion prompted me to write a short utility program for graphics animation. A picture drawn with *MacPaint* is stored as an animation frame. After a series of successive frames has been stored, they can be called up in order with the STR$ function and displayed on the screen with the Picture command to produce an animated figure.

Perhaps you've come up with a nifty routine, gained some insight into how the Mac or an application program works, or even written a short program that performs a useful function or creates an interesting diversion. Tell us about it, and we'll pass your discovery along. We'll also pay $25 to $100 for each Open Window *item published. Please send your Macintosh discoveries on disk (which we will return) to* Open Window, Macworld, *555 De Haro St., San Francisco, CA 94107, or electronically to CompuServe 74055,412 or The Source STE908.* □

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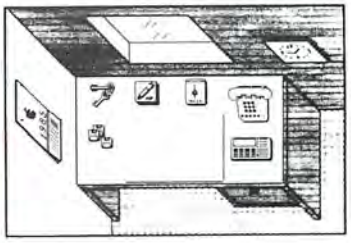

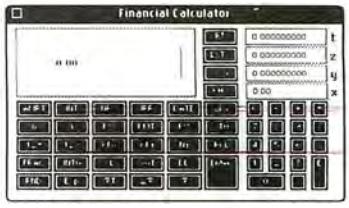

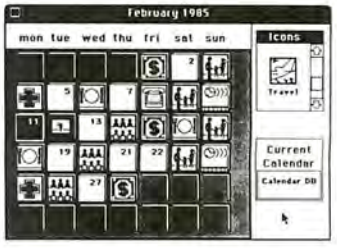

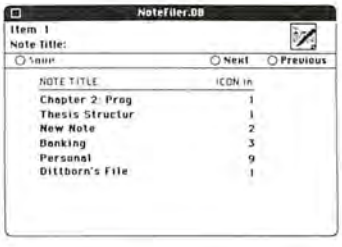

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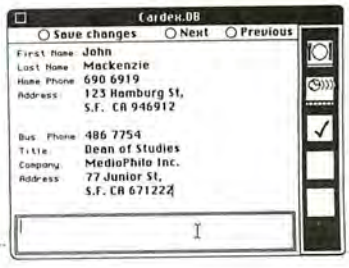

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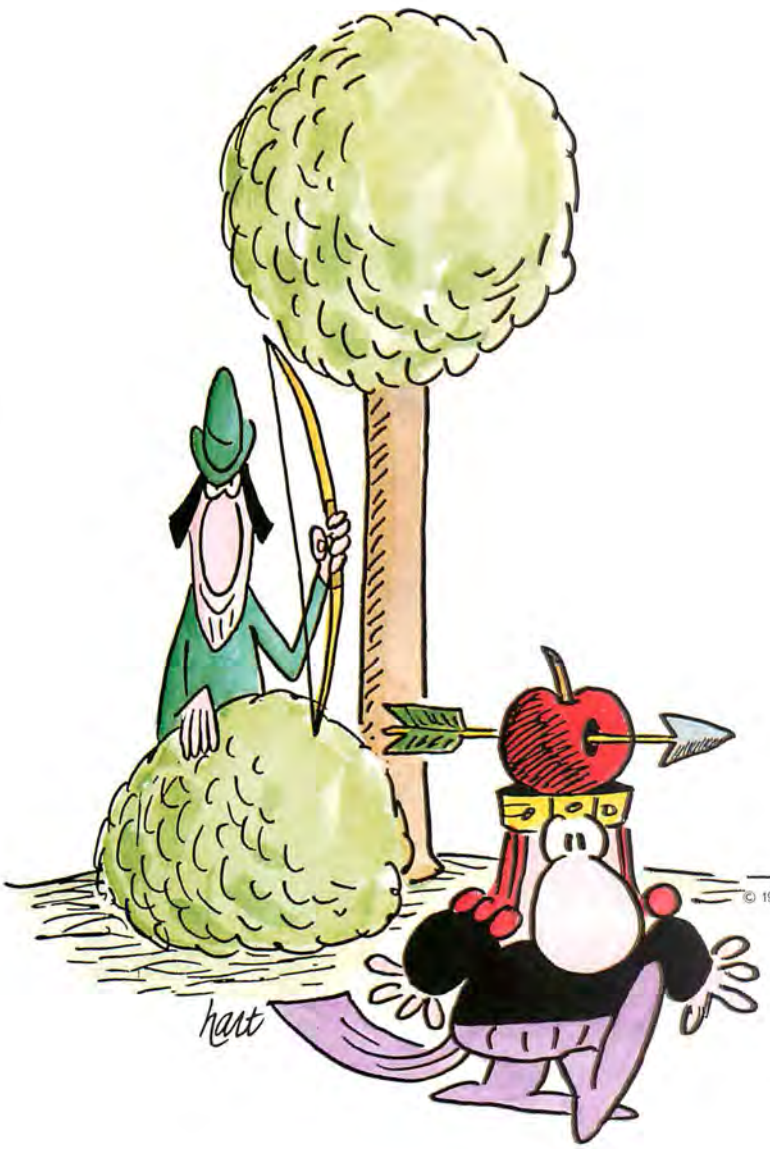

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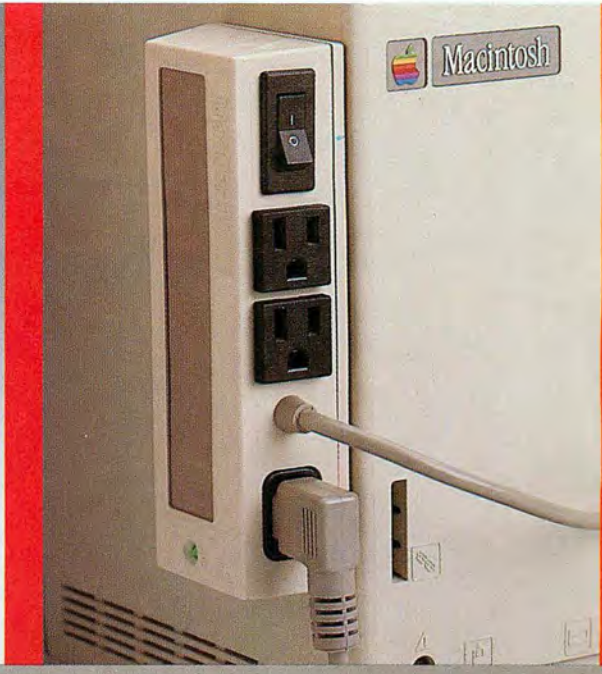

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Over 50% of all hardware and software complaints received by manufacturers have nothing at all to do with product quality. To the contrary, most damage reported is caused by surges in household or business current.

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Another common danger to the computer, its peripherals and software, is static electricity. Few people realize that their bodies can carry as much as 30,000 volts of static.

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The Faulty Ground

In addition to operator safety, a properly grounded computer is better able to drain off charges that would otherwise create dangerous voltage levels between the computer's chassis and microcircuitry. Again, the operator is typically not aware of whether the outlet is properly grounded and therefore risks both the operator's safety and hardware damage.

RFI Can Play Havoc With Your Image

While RFI (Radio Frequency Interference) is not a source of damage to computer or operator, it can play havoc with the monitor image and to software. RFI is caused by nearby radio stations, the operator's own radio or television, as well as other electrical devices. RFI shows up on the monitor as a scrambled image and may also appear as data that has been garbled while in memory. If for no other reason, the computer operator should guard against RFI simply because its effect can nullify the time saving benefits provided by the computer.

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MacGard provides the serious user with a complete series of protection benefits.

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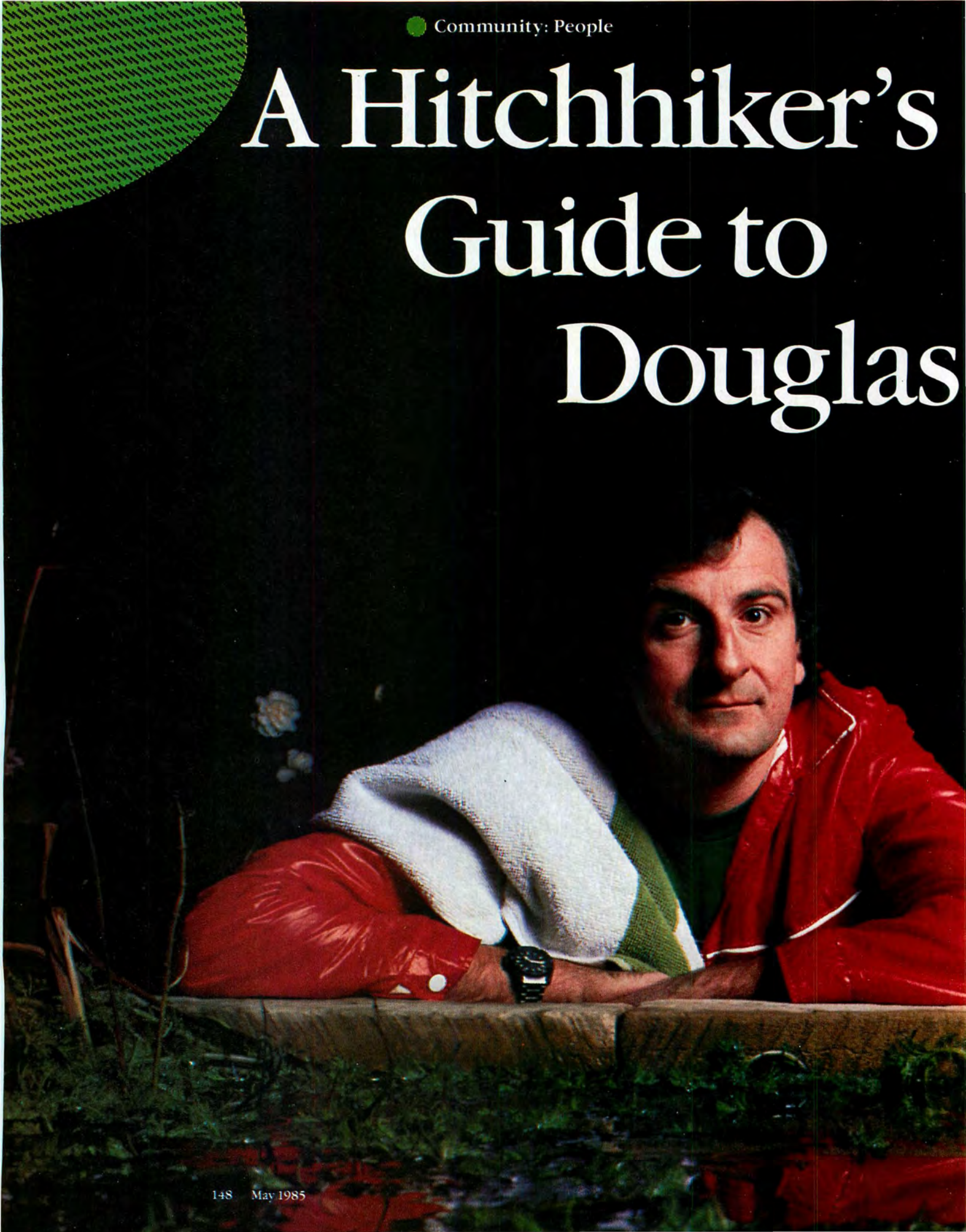
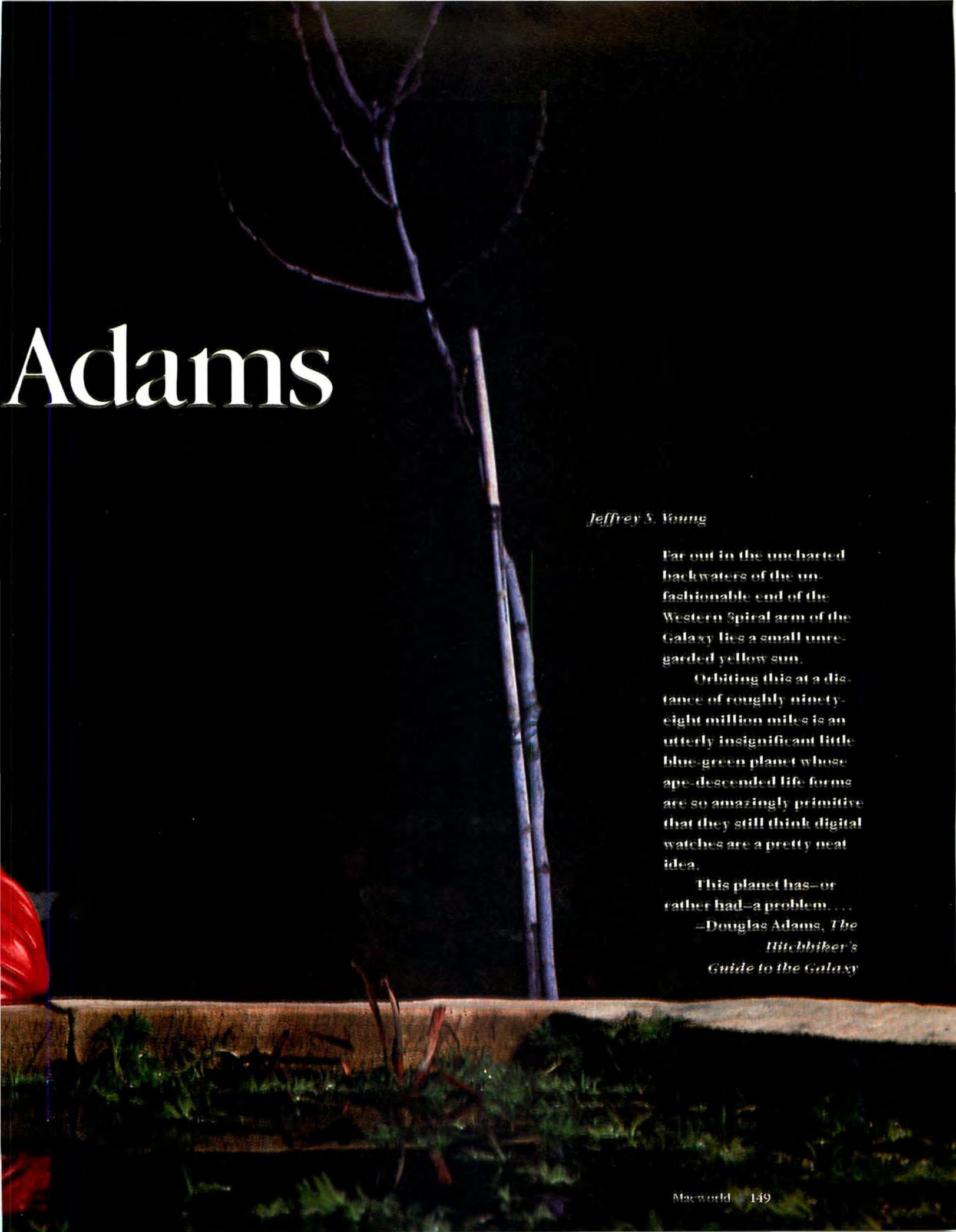
A Hitchhiker's Guide to Douglas



Adams



Jeffrey S. Young

Far out in the uncharted backwaters of the unfashionable end of the Western Spiral arm of the Galaxy lies a small unregarded yellow sun.

Orbiting this at a distance of roughly ninety-eight million miles is an utterly insignificant little blue-green planet whose ape-descended life forms are so amazingly primitive that they still think digital watches are a pretty neat idea.

This planet has—or rather had—a problem. . . .

—Douglas Adams, *The Hitchhiker's Guide to the Galaxy*

Macworld *sent Contributing Editor Jeffrey S. Young hitchhiking to the Islington district of London in search of Douglas Adams, author of the radio show, book, stage play, phonograph record, television show, and—most recently—Macintosh interactive fiction game called* The Hitchhiker's Guide to the Galaxy. *When Young found Adams, they settled into a conversation that ranged over four days, three dinners, two cities astride one ocean, and innumerable discussions on the Macintosh, music, and the meaning of life in this arm of the galaxy.*

Tucked away in a narrow, twisting cobblestone alley, up three flights of stairs, and past a comfortable but by no means opulent flat is an office as crowded and eclectic as I expected from the tall, witty man who wrote a few small books with characters named Slartibartfast, Grunthos the Flatulent, and Wowbagger the Infinitely Prolonged. The books have sold 7 million copies worldwide, give or take a few thousand. The author is the youngest recipient of the Pan award, which is to British paperback publishing what a platinum album is to the recording industry, signifying over a million copies sold. Only Anne Frank, who was awarded the Pan posthumously, would have been younger.

What seemed to be a few thousand books filled the shelves: the complete works of Dickens, Tolstoy, Hesse, Kurt Vonnegut, John Le Carré, P. G. Wodehouse, and G. B. Trudeau and travel guides to all corners of the earth as well as parts of the known universe. Games were stacked one on top of the other, including Scrabble, Monopoly, Big Boggle, Beatlemania, and the American and British versions of Trivial Pursuit. Sheet music and audio cassettes occupied any nook or cranny that might have been empty.

A small newspaper clipping, yellow with age, hung framed on the wall. It was the best-seller list from the *New York Times* dated Sunday, December 26, 1982. Three titles were circled in red pencil: the hard covers *Life, the Universe and Everything* and *The Restaurant at the End of the Universe* and the paperback *The Hitchhiker's Guide to the Galaxy*. All three were written by Douglas Adams.

"As far as I know," Adams told me, "the last British writer to have three on the lists at the same time was Ian Fleming. What does that say about the quality of my books?"

His office is cramped and cluttered; Adams probably never straightened up his room as a child. The floor is covered with more books, papers, games, telephones, cables, used coffee cups, an electric guitar plugged into an amplifier that is always on, and a copious assortment of software manuals and disks.

"A writer has a built-in protection against b.s.: there's always the next sheet of paper," Adams said. "The most frustrating thing is that because of my writing style everybody thinks it's somehow incredibly easy, that I sit down and it all flows out perfectly. My first, second, and third drafts are usually hopeless. Maybe by the twentieth there's a glimmer of hope."

"Look, sorry, are we talking about the little white furry things with the cheese fixation and women standing on tables screaming in early sixties sitcoms?"

Slartibartfast coughed politely. "Earthman," he said, "it is sometimes hard to follow your mode of speech."

"The hardest part of writing for me is making it simple," Adams said. "In a certain way having written *Hitchhiker's* originally for radio was instrumental in developing my particular style. It was always meant to be read out loud. I always listen to the sound of my words as I write them. On radio an idea can't last more than a page or two, so you start by throwing in lots of ideas and then cutting . . . and cutting . . . and cutting maniacally. You cut the piece back, crumple the words, force them together by gravitational collapse so that whole new shades of meaning become apparent. The language becomes richer and richer as you compact it.

"One of the problems of being a best-selling author is that publishers are locked into deadlines and schedules," Adams said, talking about pressures that many writers would commit violent acts to have. "With *So Long and Thanks for All the Fish* I got so far behind that I had to go to a hotel in Devon and lock myself away to get it done.

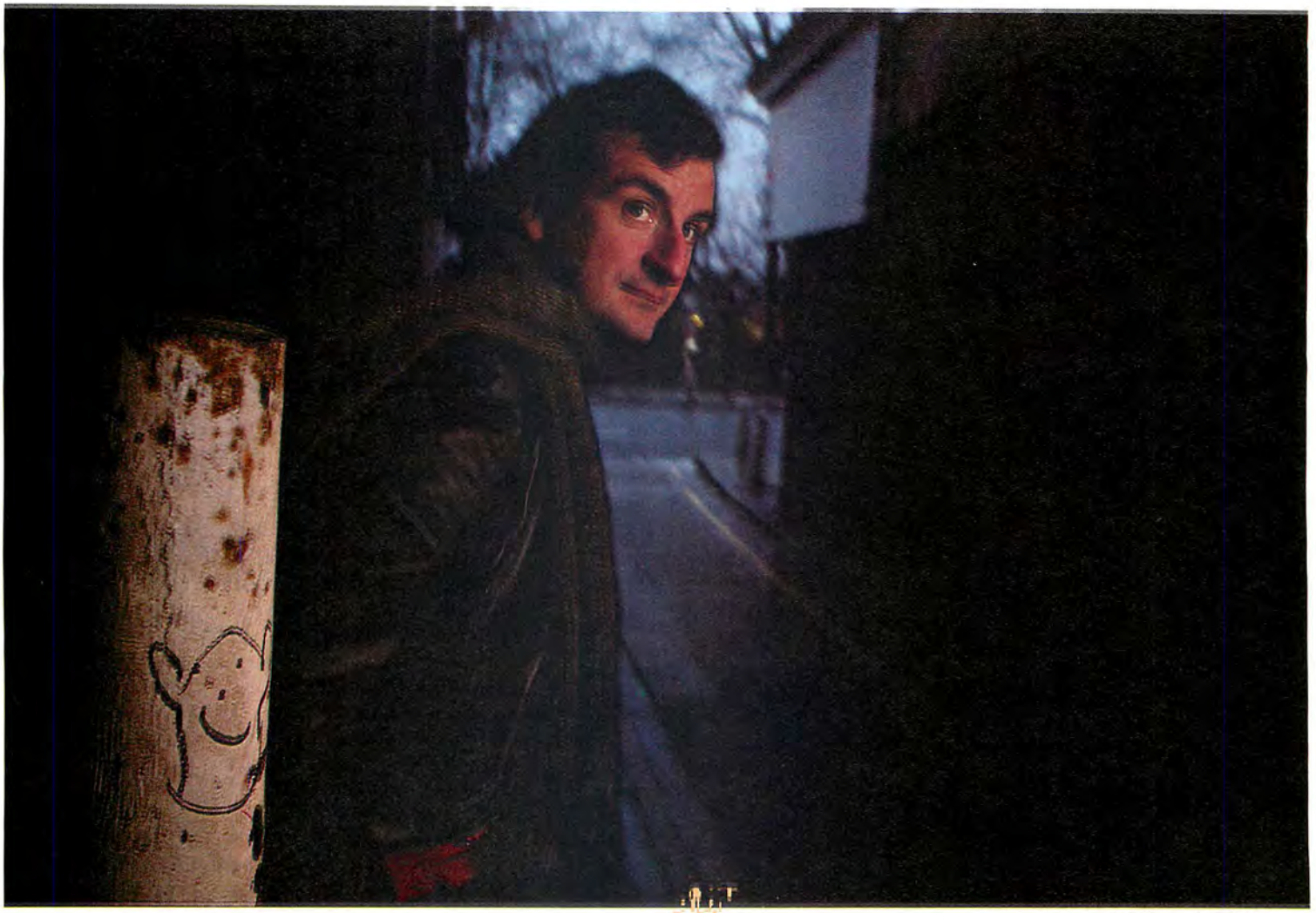
"Maybe it's a zen problem. Or maybe I've about run out of steam with Arthur Dent, Ford Prefect, Marvin the Paranoid Android, and Zaphrod Beeblebrox. I won't say I'll never do another *Hitchhiker* book, but certainly not for a while."

Suddenly Marvin stopped, and held up a hand.

"You know what's happened now, of course?"

"No, what?" said Arthur, who didn't want to know.

"We've arrived at another of those doors."



"Interactive fiction isn't really respectable yet so there aren't any rules."

But writing aside, music is definitely a passion and a lifeline for Douglas Adams. The first evening I talked with him I noticed the powered-up Fender propped in a corner but said nothing about it. As darkness fell with the peculiar hazy halogen night-light that illuminates London's evening, he said that he would have to leave in a few minutes for a radio interview. He added, "I've got to play a few chords to loosen up before I go."

The house erupted with a medley of Beatles songs, played at ear-splitting volume and, if not flawlessly, at least with a kind of grand passion. Guitars are everywhere—electric upstairs, acoustic downstairs. Adams will suddenly rip off a few chords in the middle of a conversation or become totally engrossed in transcribing a Bach fugue onto *Musicworks*.

Adams prides himself on having an exhaustive knowledge of Beatles trivia and has an impressive collection of opening verses in his mind. Unfortunately, he told me, "beyond the first chorus my mind is rather like a hard disk that has lost its directory. I know the words are in there somewhere; I just can't figure out how to find them any longer."

Marvin eyed it suspiciously.

"Well?" said Ford impatiently. "Do we go through?"

"Do we go through?" mimicked Marvin. "Yes. This is the entrance to the bridge."

The obsession with words and music that is so evident in both his books and his life has carried over to computers. Douglas Adams's workroom has a collection of three Macintoshes, plus mice, keyboards, disk drives, a 90-megabyte Sunol hard disk, a DEC Rainbow, and a couple of printers. Timelessly, an old Hermes manual typewriter remains amidst the electronic gadgets.

"I use it when I get stuck," he pointed out. "There's something wonderfully fundamental about hitting the keys and watching them strike the page–something a word processor will never entirely replace." The computers were on constantly. Adams hunched over in front of them, chin resting in one hand. With the other, he pecked at the keyboard or guided the mouse.

Adams's fascination with computers is no idle pursuit. When I visited him, he was creating a complex three-dimensional crossword puzzle, written in BASIC, that ran a bit buggily on his DEC Rainbow. He was madly reading up on MacFORTH for better graphics than BASIC allowed him.

"Discovering computers last year while I was in Los Angeles," Adams said, "got me interested in things again. I was bored–a spoiled kid asking mommy what to do next. I didn't have any direction; I had run out of steam. Now I'm filled with ideas again. I've taught myself a little bit about programming, and I'm excited, bubbling over with projects."

Asked about the Macintosh, Adams ventured, "It's clearly the product of a lot of imagination. Whereas IBM's end is to do business–the company identifies how to best create and then pursue a market–at Apple they're just a bunch of fanatics out to change the world in their own peculiar way.

"I think the Mac is the kind of machine that Ford Prefect would own. When I started the whole *Hitchhiker's* saga, I was reacting to the serious science fiction typified by the British television show *Dr. Who.* My original concept behind Ford Prefect was that if presented with the choice of saving the planet or going to a good party, Ford would choose the party. Wouldn't a fellow like that have a Mac?"

"Slowly, with great loathing, he stepped toward the door, like a hunter stalking his prey. Suddenly it slid open.

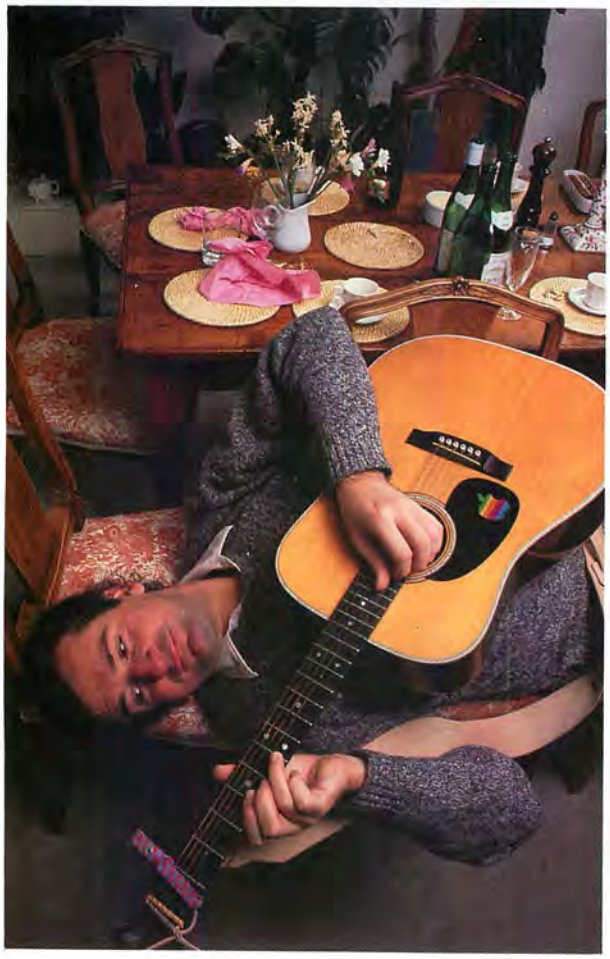
"Thank you," it said, "for making a simple door very happy."

In his novel *The Hitchhiker's Guide to the Galaxy,* Douglas Adams tells of a supercomputer called Deep Thought, which, when asked the meaning of "life, the universe, and everything," answers "Forty-two."

While the Mac must be nearly the opposite of Deep Thought, it nonetheless has inspired Douglas Adams in a way even he never anticipated. When it was first suggested that he turn *Hitchhiker's* into an interactive fiction game (see ">Wake Up to Adventure" in this issue), Adams was less than enthused. "All I could think of were those games where you're forever shooting down rockets," he said. "So I thought, no thanks."

But then he played a few of Infocom's interactive fiction games and reconsidered. After all, Adams is an author whose cross-media skills are about as sharp as they get. The idea of transferring what was originally a radio show and then a novel onto a magnetic disk–after everything else *Hitchhiker's* has been translated into–was too challenging to ignore. So in early 1984 he teamed up with Steve Meretzky, who was responsible for the Infocom games *Planetfall* and *Sorcerer,* to create *The Hitchhiker's Guide to the Galaxy*–the computer game.

"I enjoyed writing the game because the interactive fiction medium is such a young field," Adams told me, "that everything you do is new. It must be rather like what working in the movie business was at the turn of the century. Interactive fiction isn't really respectable yet so there aren't any rules about what can and can't be done.



"I think the Mac is the kind of machine that Ford Prefect would own."

"For instance, I believe this is the first program that deliberately lies to you, tells you one thing and eventually admits, if you keep asking, that it has misled you."

As Adams wrote text in his London office, Meretzky wrote the program in Boston. They communicated via electronic mail on a commercial electronic bulletin board service.

"We started by developing a kind of horizontal and vertical branching network," Adams explained. "It would have been pointless to do a linear trot through the book. The idea we came up with was to make the process something like figuring out how to go through the neck of a bottle. Once you start to think in the strange logic we set up, you can begin to negotiate your way around the game pretty easily. But until you do, you'll have a tough time. There's no necessarily correct answer at any point, and all your previous choices influence what you can do. So not only is there no absolutely correct route, there is no way that you will follow the same path twice." The coauthors eventually sweated out a conclusion while pounding up and down a beach in Devon, Adams said.

The program was written in a subset of LISP and makes extensive use of a parser written at Infocom. According to Adams, the parser "sort of understands complicated sentences. The parser takes a player's input and translates it into a form that the program can answer." That may be true, but I found a number of *Hitchhiker's* answers incomprehensible, which is probably just as Ford Prefect and Douglas Adams intended. Judging from the messages on the Game section of The Source, I wasn't alone.

"Such subtlety . . . " said Slartibartfast, "one has to admire it."

"What?" said Arthur.

"How better to disguise their real natures, and how better to guide your thinking. Suddenly running down a maze the wrong way, eating the wrong bit of cheese, unexpectedly dropping dead of myxomatosis. If it's finely calculated the cumulative effect is enormous."

He paused for effect.

One afternoon during my visit Adams tapped into The Source in Virginia, where it was morning, and we took a look at the messages about his game. I asked if he ever identified himself and answered some poor bloke's plea for help.

"I've tried it a few times," he said with a smile, "but nobody believes that it's me."

That day The Source carried confused messages aplenty from *Hitchhiker's* players in various stages of exasperation. As we scrolled through the messages, Adams laughed gleefully. Echoing a baffled bulletin boarder, I asked him what the point of the game is.

"The object of the game is to find out what the object of the game is."

"That's for you to find out," he said. "The object of the game is to find out what the object of the game is. But I will tell you that your score is an index not just of how far you've gone along the adventure, but also of how happy you should be at that point.

"For instance, if you enjoy the beer when you drink it, you'll get more points. Believe me—if you get far enough inside the game, you'll need all the points you can get!"

So is he happy with the game? "As happy as I ever am with anything I do. I mean, I can always see ways to make something better once it's finished. In this case I think the whole experience only shows me the possibilities.

"I think software development right now is something like the recording industry would be if recording engineers were the only ones making records. Any artist can make music without knowing how to wire mixing boards or understanding how recording heads work because the technology has been simplified and made accessible. I think the Mac demonstrates how simple operating and programming a computer will eventually become. When that happens, writers and artists will create their own programs, and you'll see software available like records and tapes are today."

By that time Douglas Adams will have a few more clippings framed on his wall, showing one or two of his programs in software's Top 40. □

● ● ● ● ● ● ● ● ● ● *Jeffrey S. Young is a Contributing Editor of* Macworld.

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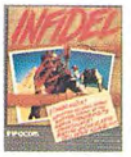

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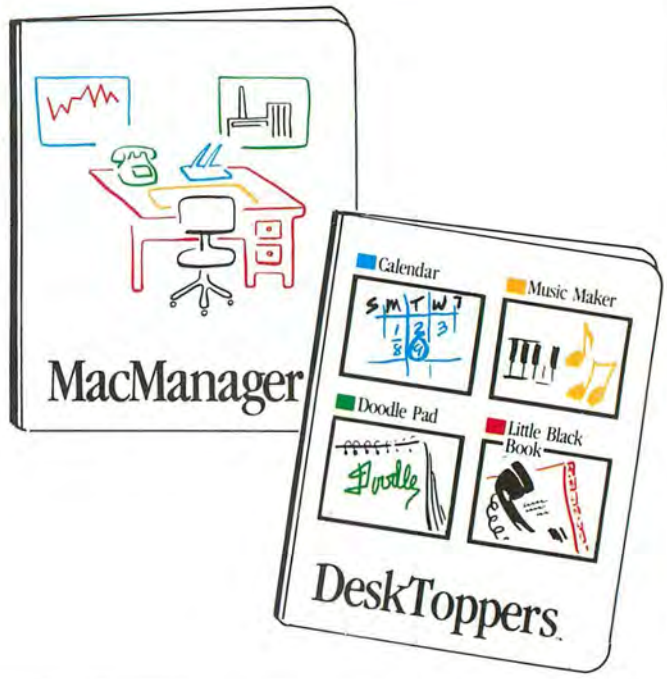

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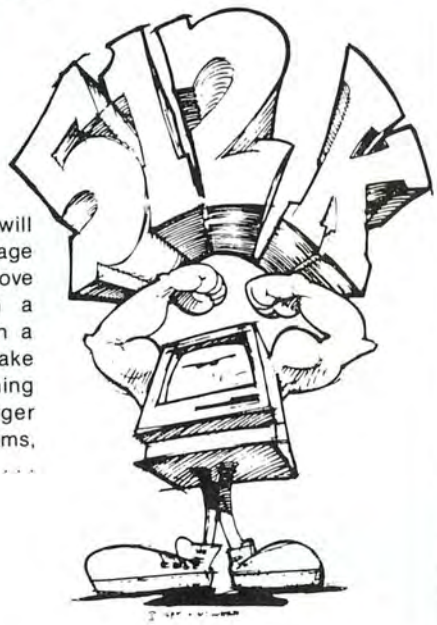

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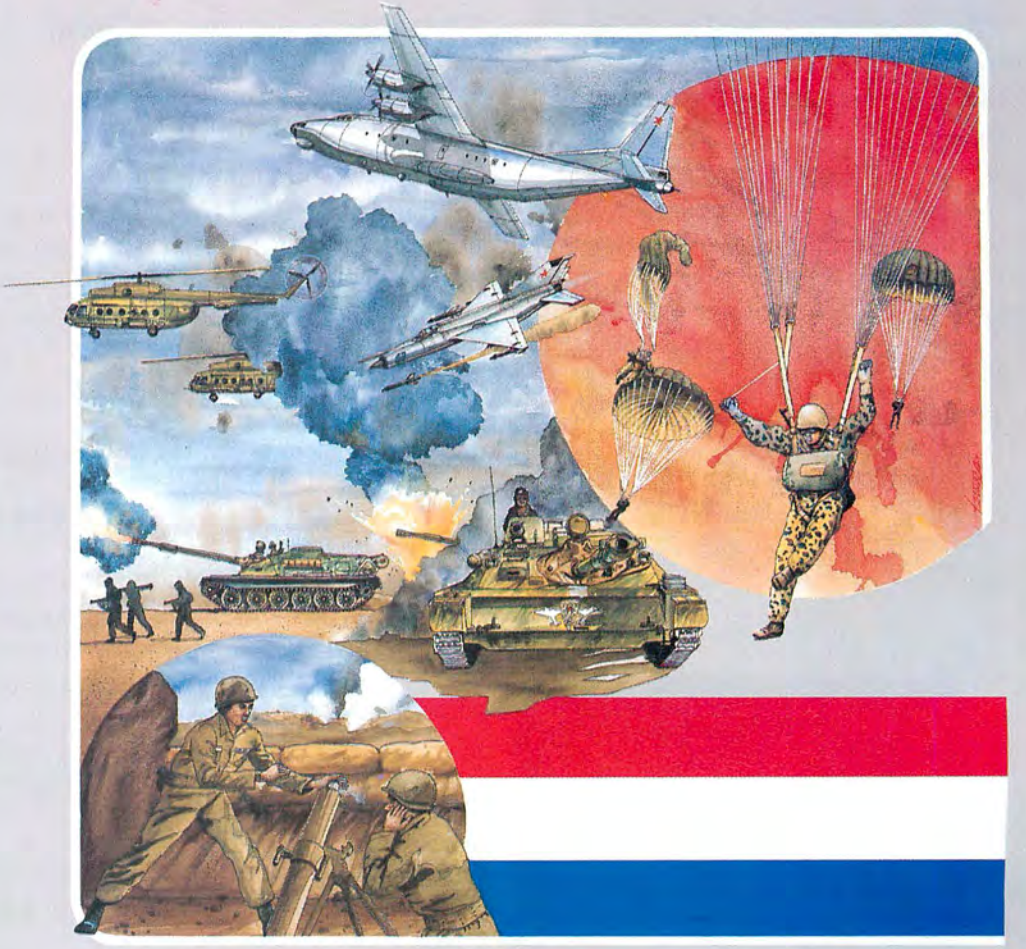

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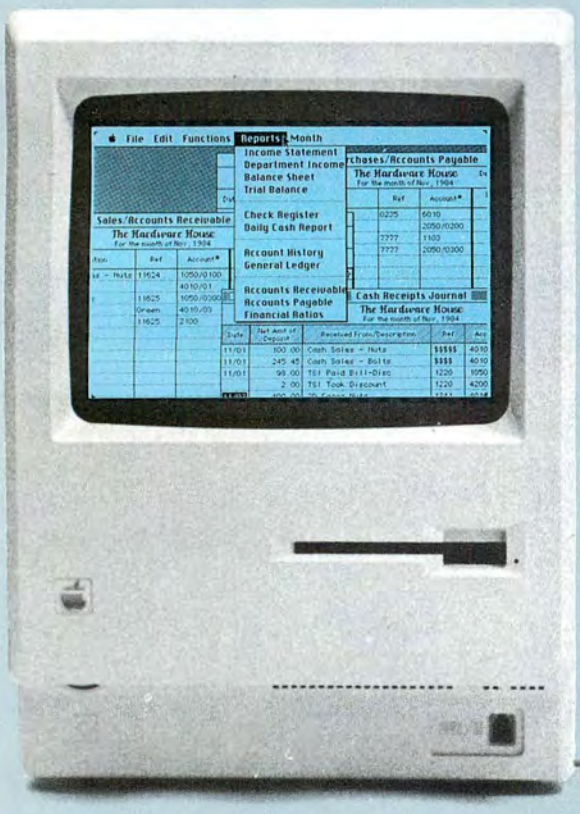

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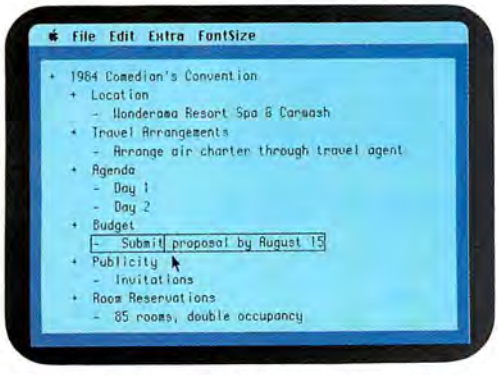

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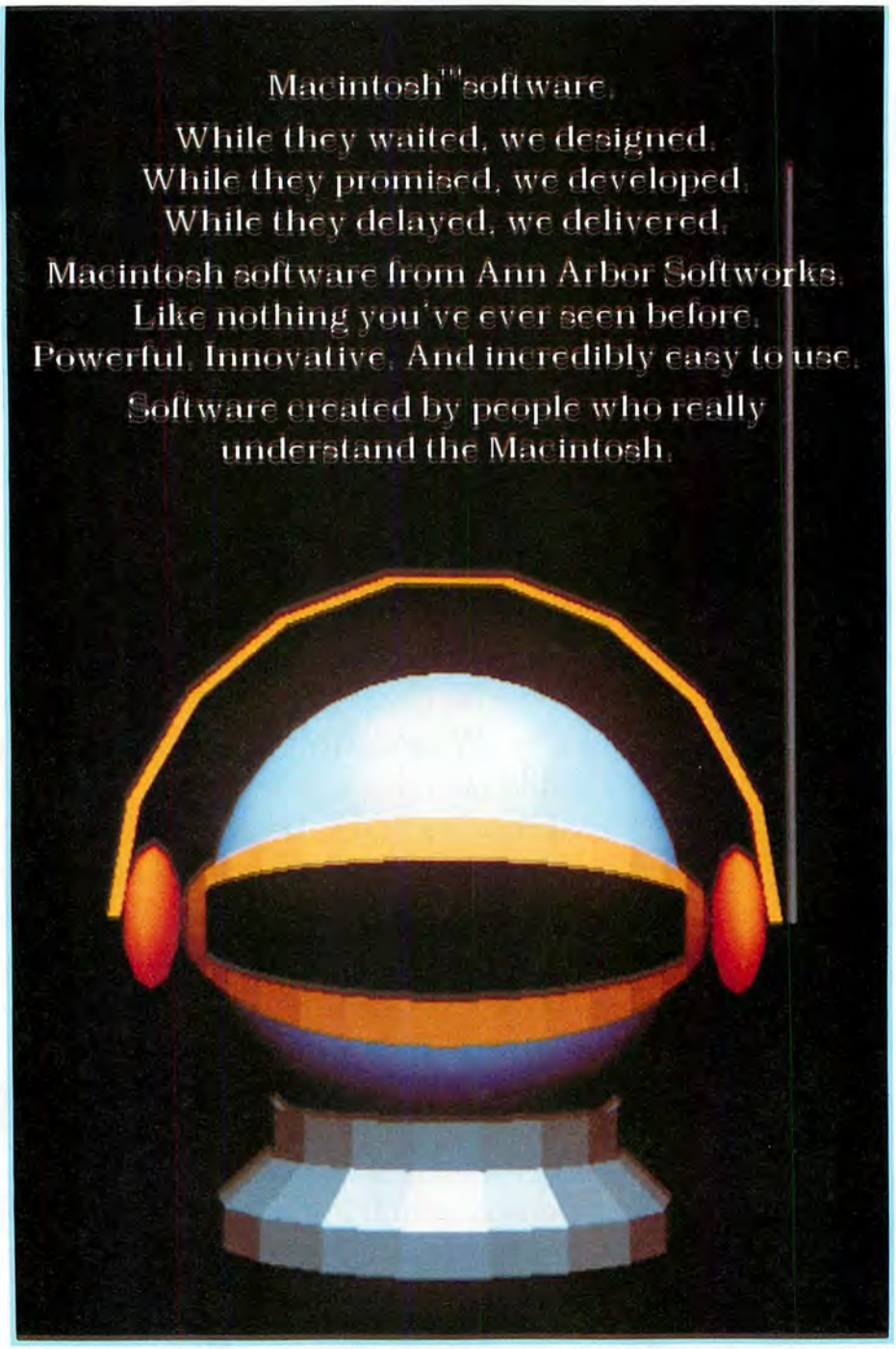

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Macworld Gallery

An exhibition of Macintosh graphics

Edited by Erfert Nielson

Each month Macworld Gallery *presents three winners of the Macworld Art Contest, as well as several other selected drawings. We try to exhibit drawings that display a range of techniques and styles, by both artists and nonartists. Contest winners are awarded prizes of $500 (first place) and $250 (two runners-up). Regular* Gallery *exhibitors are awarded $25. In addition to the aforementioned cash prizes, first-place contest winners in the next six issues, beginning this month, will receive a MacTablet graphics tablet and stylus from Summagraphics Corporation. All drawings submitted to* Macworld Gallery *are eligible for the art contest.*

Ghost Image

■ *$500–First Prize*

Ghost Image

I started with a contour drawing of my husband and daughter. I filled in the sketch using various patterns and brush sizes, then cut it to the Clipboard. I put in a background, pasted in the picture, and copied it to create the double image. The fact that *MacPaint* would let me revert to an earlier version of the drawing gave me the courage to experiment.

Cathy Sanders
Ponca City, Oklahoma

$250–Second Prize

Close-up

I am a junior in high school and have been using the Macintosh to create illustrations for the school literary magazine. This drawing is the third that I have attempted on the Mac. I began by rapidly outlining the shape of the head with a thick brush in black. To add gray to the face and hair, I used the "transparent paint" feature, which you get by pressing the ⌘ key while applying paint. Finally I used a small paintbrush for the short strokes on the face. I didn't use FatBits at all but rather concentrated on making quick, bold strokes.

Richard Wang
Great Neck, New York

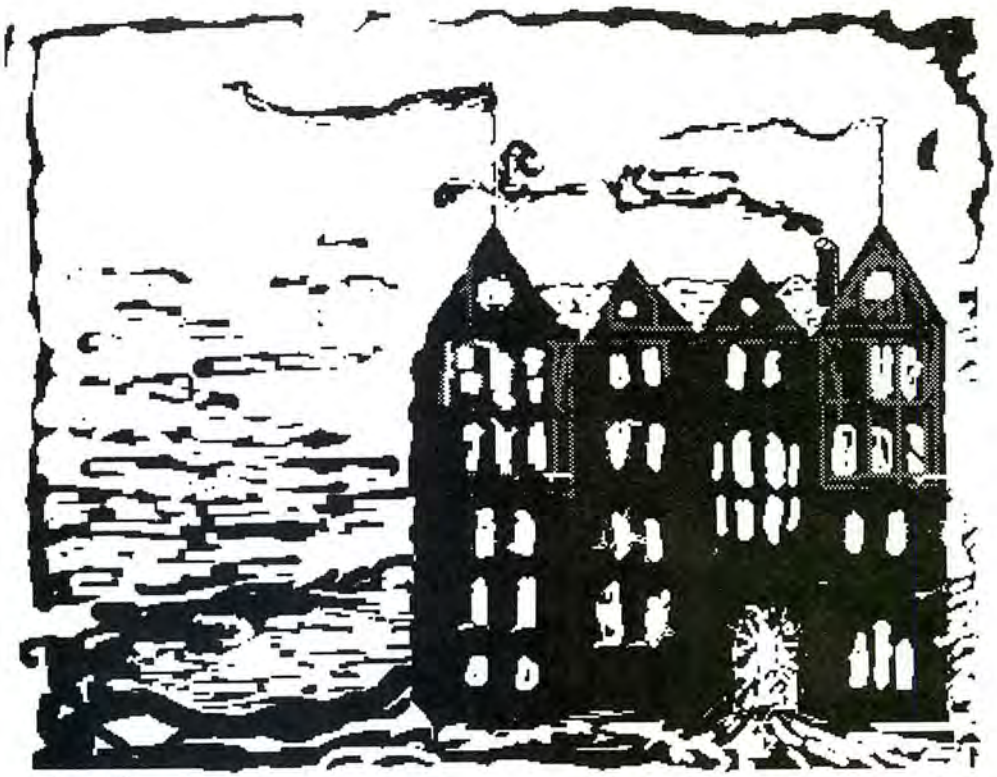
Close-up

$250–Second Prize

Tudor Hall

I made some greeting cards using my Macintosh and decided to use my unusual apartment building, which is in the Tudor style, as the basis for a design. I wanted the drawing to have an antiquated feel to it, much like a woodcut. First I roughed in the general shape of the building in black. Then I used round and square brushes in white to "cut away" the black. As a final touch, I added patterned lines around the upper windows to suggest wooden beams.

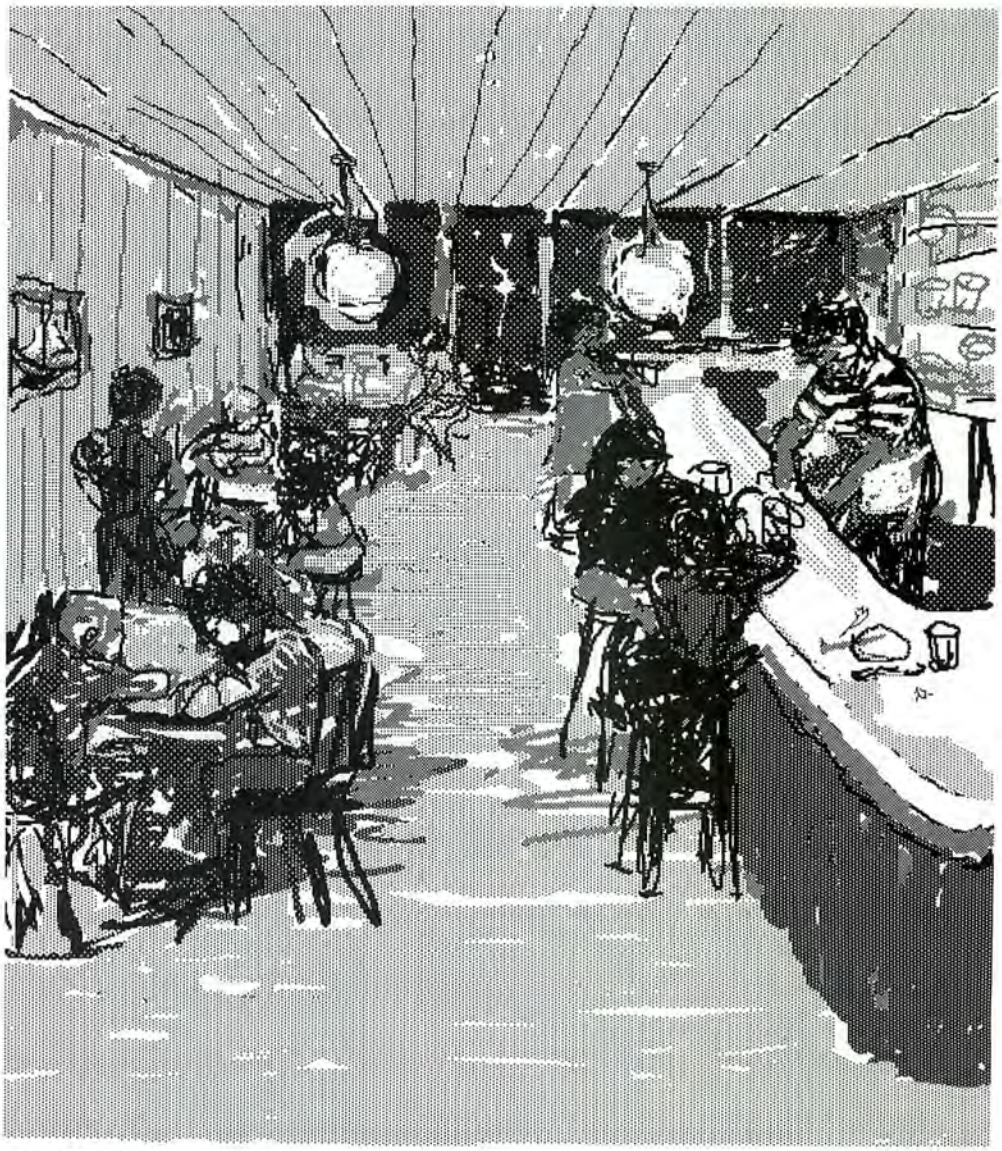
Matthew Seigel
Oakland, California



Tudor Hall

Knox Street Pub
I used only the paintbrush to create this picture. I started by roughing in the general areas of the room—the wall, the ceiling, and the floor—in a medium gray pattern. I used five brush tips and four patterns to provide a variety of lines and tones. The single-dot brush was useful in defining the planks in the wall and the ceiling.

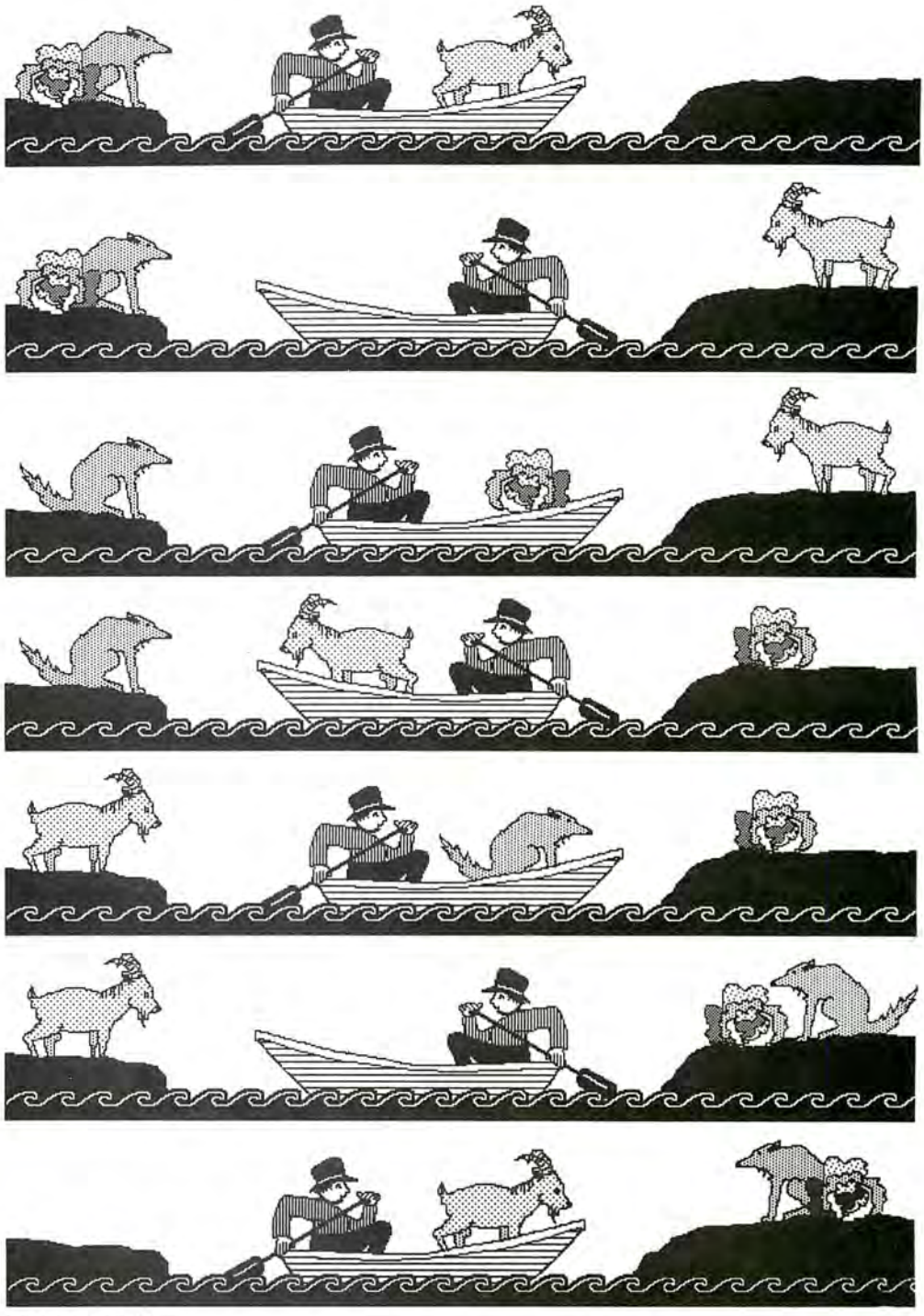
Pat Prueitt
Denton, Texas



Knox Street Pub

Wolf, Goat, Cabbage
This drawing shows the solution to a well-known riddle: You must ferry a wolf, a goat, and a cabbage across a river. Your boat can hold only one of them at a time. You can't leave the goat alone with the cabbage or the wolf alone with the goat. How do you get all three across the river? *MacPaint* is ideal for this type of drawing. I drew the background, made six copies, and used *MacPaint*'s capabilities to copy and flip the various figures.

Jerry McGregor
Kamuela, Hawaii



Wolf, Goat, Cabbage

The Range
I sketched the initial version of this drawing with the pencil, then refined the shapes in FatBits. I added patterns to the sky, the trail, and the fence post with the paint bucket and a paintbrush. I gave the mountains a light pattern with the spray can and used Trace Edges and Invert for some unusual effects.

Leonard Hutchinson
Athens, Georgia □

The Range

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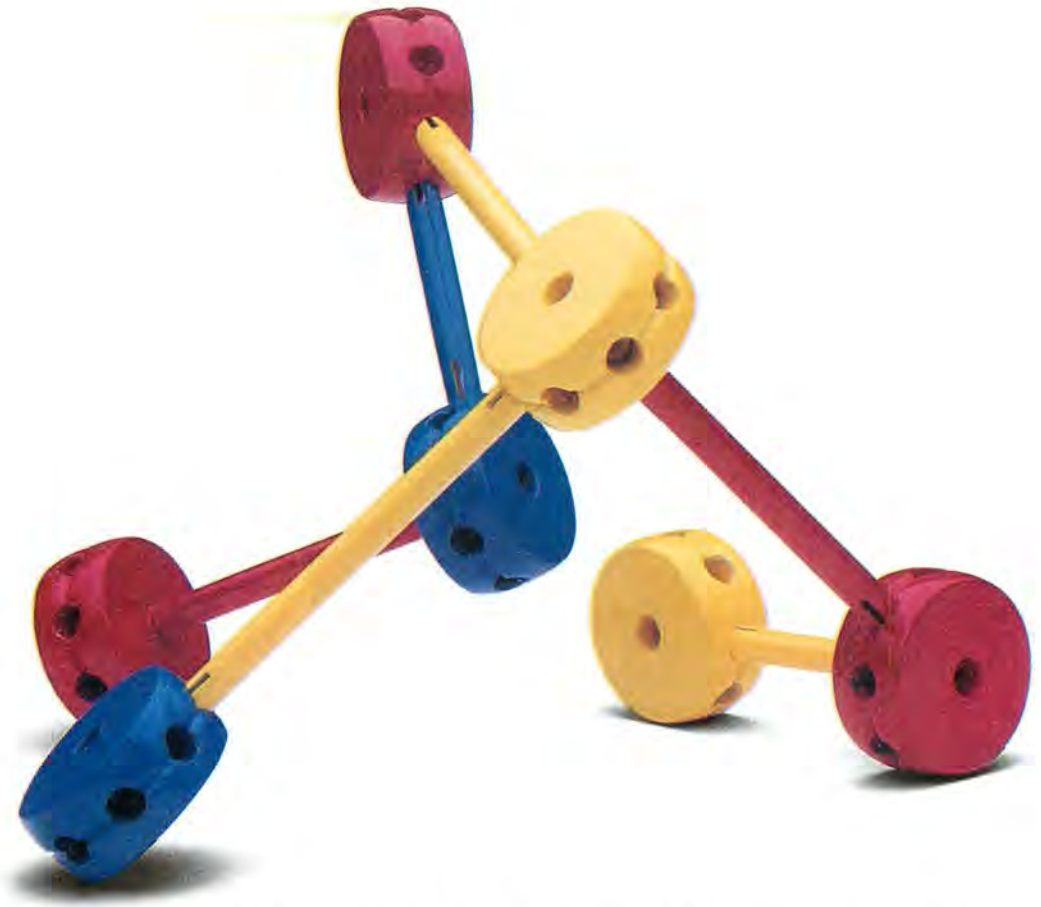

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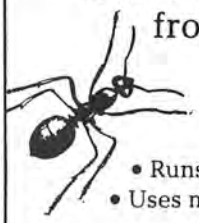

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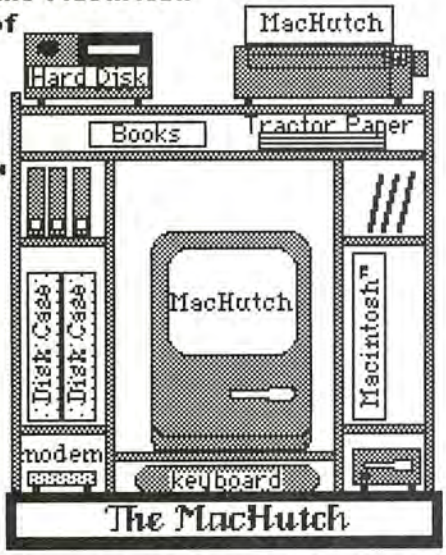

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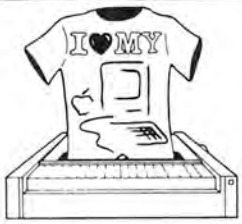
INTRODUCING *Draw 'n Wear™*



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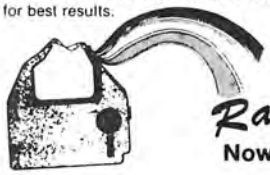

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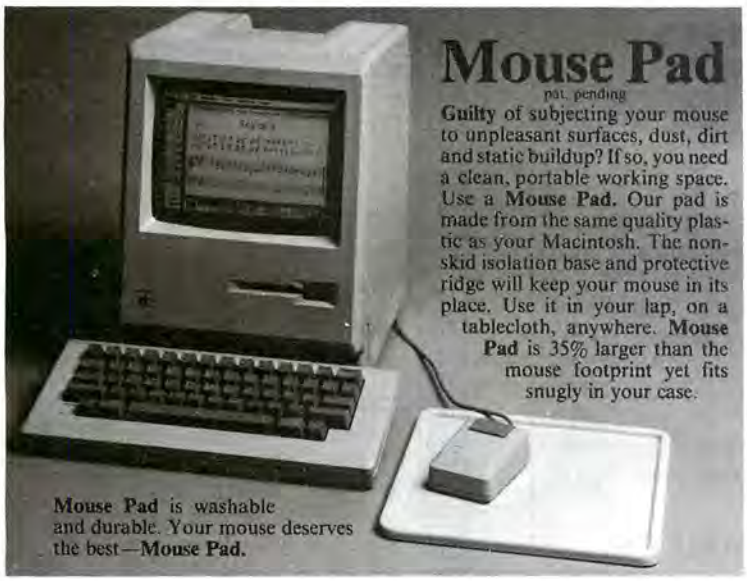

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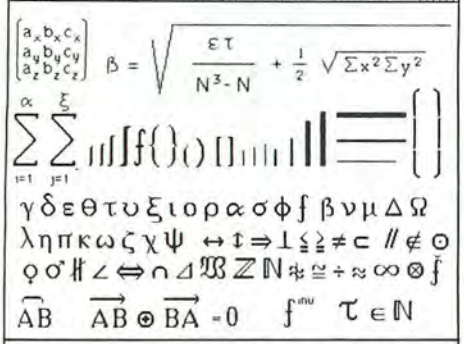

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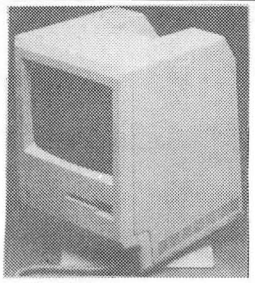

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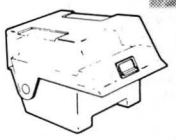

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