MACWORLD

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The Macintosh™ Magazine

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MACWORLD

September 1985 *The Macintosh™ Magazine*

Getting Started

72 What Is Integration?
Danny Goodman
Catch the cresting wave of multifunctional software for the Macintosh; examine the framework of integrated programs and consider the alternatives to packaged integrated products.

Review

78 All That Jazz
Gordon McComb
This quintet of applications finally hits the scene, with dynamic integration and convenient design. But sometimes its sound is too big for the Mac's memory.

86 The Excel Numbers Game
Lon Poole
Marshal figures and facts with this powerhouse that combines a spreadsheet and a database manager with graphics good enough for presentation.

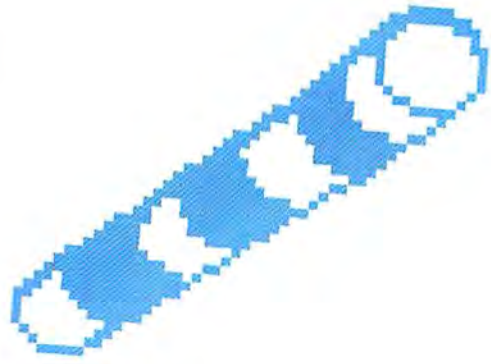
92 The Multimillion-Cell Promise
Bill Grout
Icons in *Crunch* make this three-in-one spreadsheet easy to use, but the 512K Mac can't push it to the limit.

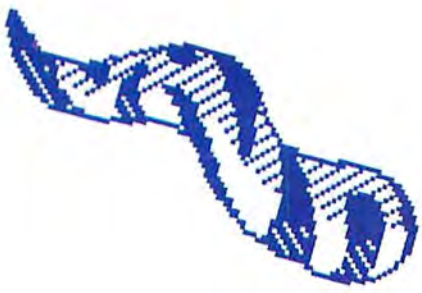
Hands On

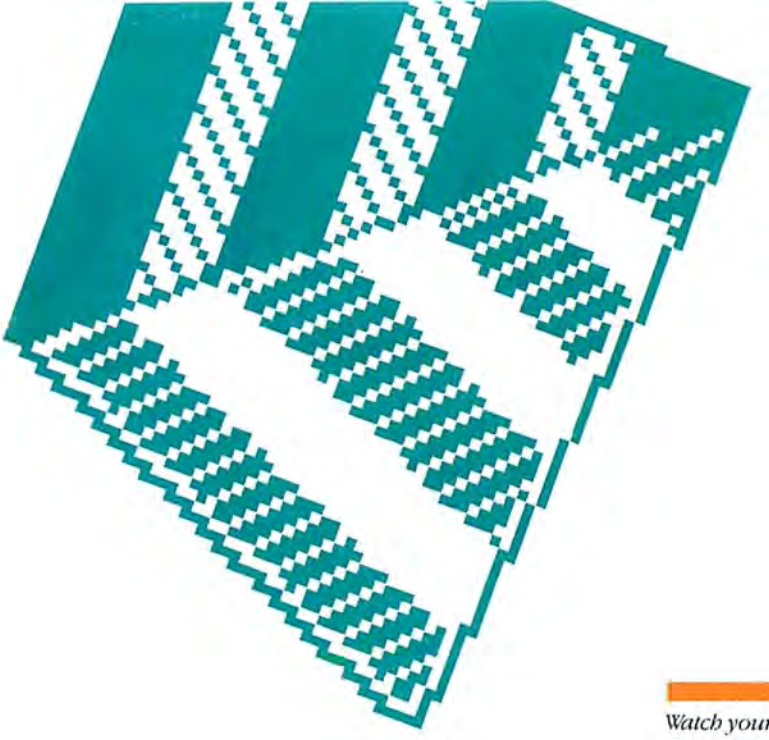
98 The Spreadsheet Choice
Adrian Mello
Take your seat for the great matchup–*Excel* versus *Jazz*. While you're weighing the alternatives, see how each measures up and how a third contender fares against the others.

Community

104 The Jazz Singer
105 Pushing to Excel
Edited by J. E. Arcellana and David Ushijima
Mitch Kapor of Lotus and Bill Gates of Microsoft talk about their new products for the Macintosh in a matched set of *Macworld* interviews.







Watch your music take shape with SongPainter, *one of five products reviewed in* Macware Reviews *starting on page 109.*

Columns

9 **Jazz Is Hot, So Is Excel**
David Bunnell

17 **Note Pad**
Larry Tesler
An Apple veteran lays to rest the Macintosh's honorable predecessor.

27 **Letters**

39 **Macworld View**
Edited by Herschel Schmedick
Joining the *Star Wars* crew, getting a toehold in the typesetting business, and other news and notes for the Macintosh community.

47 **Get Info**
Lon Poole
Macworld's tutor answers questions about worn mice, memory upgrades, typeface techniques, and other Mac matters.

Departments

109 **Macware Reviews**
Edited by Erfert Nielson
Short but straight-shooting assessments of *SongPainter*, *Airborne!*, ClickOn Worksheet, *Personal Accountant*, and the ThinkJet printer.

145 **Open Window**
Edited by Jim Heid
Surviving a disk crash, selecting in *Word*, and more Macintosh discoveries.

163 **Macworld Gallery**
Edited by Erfert Nielson
An exhibition of Macintosh graphics.

171 **Macworld Directory**

Indexes

175 **Products**
176 **Advertisers**

Photo/illustration credits
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September 1985
Volume 2, Number 9

Macworld™ (ISSN 0741-8647) is published monthly by PC World Communications, Inc., 555 De Haro St., San Francisco, CA 94107. Subscription rates for the U.S. and Canada are $30 for 12 issues, $50 for 24 issues, and $70 for 36 issues. Canadian orders must be prepaid in U.S. funds. Outside the U.S. and Canada subscriptions must be prepaid in U.S. funds with additional postage at $12 per year for surface mail or $60 per year for airmail. For subscriber service questions call 800/247-5470 (in Iowa 800/532-1272) or write: Subscriber Services, P.O. Box 20300, Bergenfield, NJ 07621. Application to mail at Second Class pending at San Francisco. POSTMASTER: Send address changes to *Macworld*, P.O. Box 20300, Bergenfield, NJ 07621.
Editorial and business offices: 555 De Haro St., San Francisco, CA 94107, 415/861-3861.
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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.

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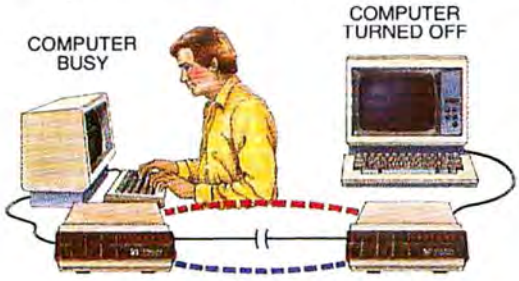

Even though you're gone, or your computer is busy or turned off, ProModem 1200 will answer the phone, collect messages, send out electronic mail and display time, date and 24 status and help messages.

The communications is in the modem, and electronic mail becomes a background function, where it belongs.

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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 XMODEM 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.

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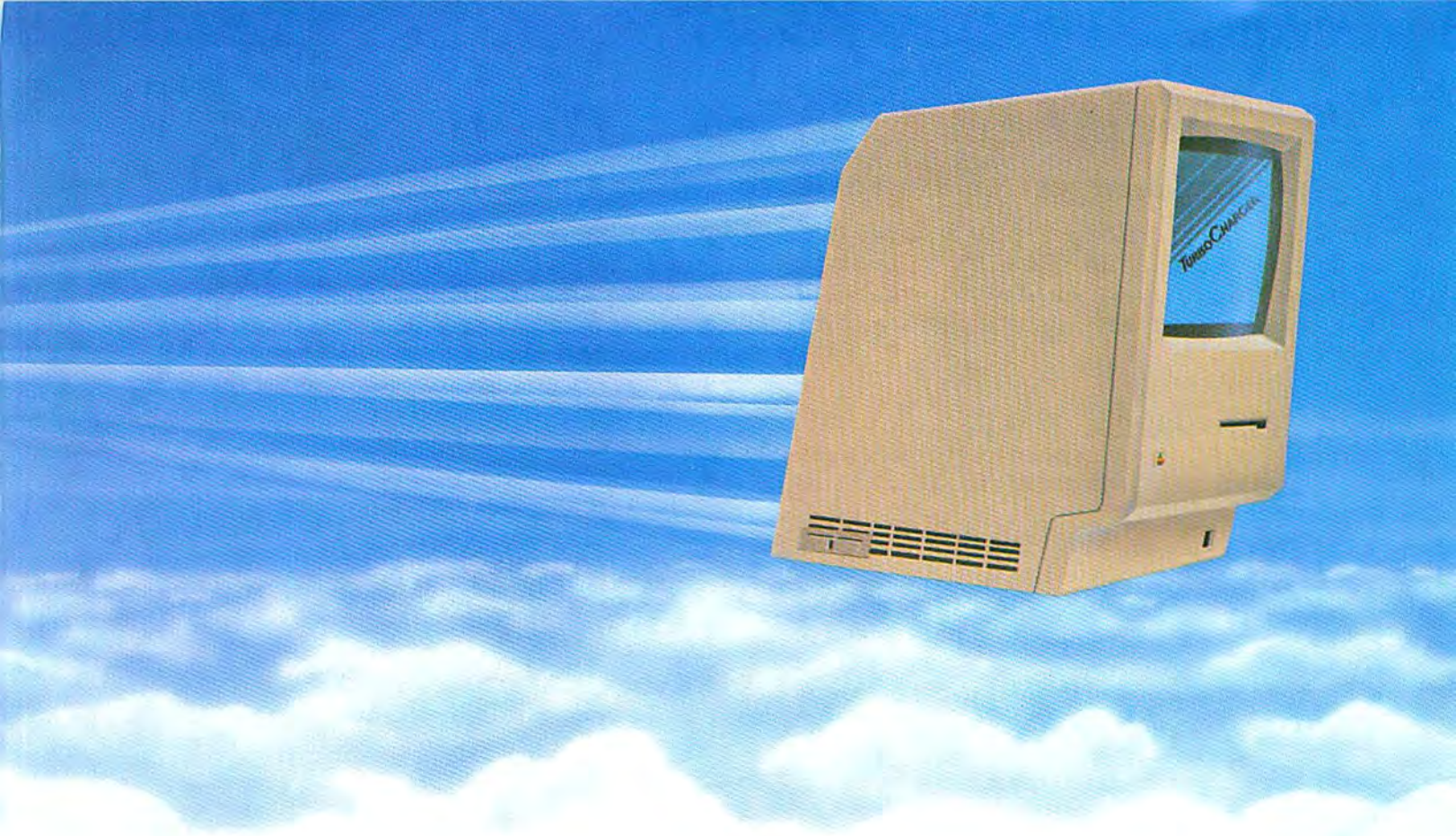

Now you can make your Macintosh 512 up to 1,000% faster for less than $100. TurboCharger™ software improves the performance of your Macintosh 512 dramatically. Common tasks such as searching a database or loading a program often happen 300% faster, with peak performance over 1,000% faster. Guaranteed.†

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- 400 accounts on one 400K disc.

Retail price: $145

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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.
- 300 accounts on one 400K disk.

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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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- Controls stock levels. Reorder Report shows quantities below your specified minimums.
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The new Financial Series from Palantir does more than just help you run your business. It helps you manage it, for growth and profitability.

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PALANTIR SOFTWARE

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David Bunnell

Jazz Is Hot, So Is Excel

A theory in personal computing holds that hit programs are what really sells computers

Proponents of the software-sells-the-hardware theory claim that the first spreadsheet, *VisiCalc,* was responsible for the phenomenal success of the Apple II, that Lotus *1-2-3* made the IBM PC, and, if you want to stretch it a bit, that *WordStar* was responsible for the success of computers running the CP/M operating system, including the Osborne One.

You can argue that there are lots of Apple IIs in school that don't use *VisiCalc* and that the PC would have been successful without *1-2-3,* but there is little doubt that great software and great computers go together.

Lotus's *Jazz* and Microsoft's *Excel* are both capable of doing for the Macintosh what *1-2-3, VisiCalc,* and *WordStar* did for their respective buddies.

Never before have two super programs appeared almost simultaneously for the same computer. *Jazz* redefines the notion of an easy-to-use integrated program, while *Excel* redefines both the power and the presentation capability of spreadsheets.

And as if *Jazz* and *Excel* weren't enough, we are witnessing a deluge of other solid business software such as *Crunch, OverVUE, Microsoft Chart,* and *Habadex.* Macintosh users, some of them waiting a long time for software that shows off the real elegance and power of this machine, are entering a new era of embarrassing riches.

Suddenly, software for the Macintosh is not only easier to use but more powerful and more versatile than software for the IBM PC.

In *Macworld*'s August issue I said that the Macintosh would be successful despite Apple's bungled attempts to market it. Unless the rules of the personal computer game have changed, software is the reason my prediction of success will be proven correct.

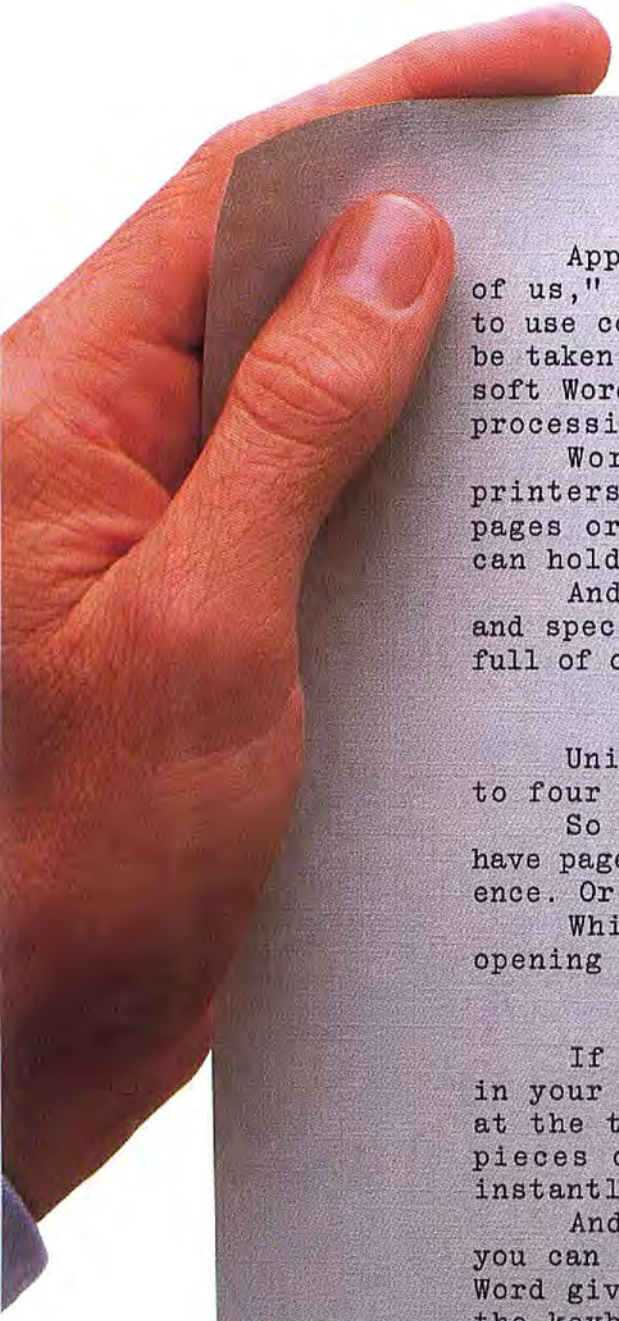
If I were in charge of Apple's advertising budget, I would be tempted to give away at least the television portion to Lotus and Microsoft. *Jazz* advertising has given the Macintosh a fresh, usable look and greatly boosted the computer's visibility when Apple needed exposure most.

Apple seems to have lost its PR touch. For several months we heard nothing but bad news. The company seems to know how to hype itself when there's something great to shout about, but it's far less experienced in handling bad news. The biggest nightmare has been the Steve Jobs affair. When Don Estridge was removed as head honcho of IBM's Personal Computer division last March, the company announced that he got a big promotion to IBM headquarters in Armonk, New York, and that the employees gave him standing ovations when he made farewell rounds of the PC division buildings. When Jobs left it seemed more like an assassination.

The barrage of bad press shatters any hopes of selling Macs in the Fortune 500 market. Corporate buyers aren't likely to turn their backs on the IBM standard as long as the Ap-

(continues on page 12)

Now the
can do some



Apple's Macintosh, "the computer for the rest of us," is probably the most advanced and easiest to use computer on earth. But until now, Mac couldn't be taken seriously for word processing. Enter Microsoft Word for the Macintosh. Mac's professional word processing program.

Word runs the most popular letter quality printers. It doesn't limit your manuscripts to 10 pages or even 50 pages. Because one Word document can hold as many pages as you can fit on a disk.

And Word not only sets up footnotes, columns and special formats in a flash, it has a whole disk full of other features to make your writing go faster.

Word does windows.

Unique to Word is its ability to "window" up to four pieces of work on the screen at once.

So while you're typing one document, you can have pages from three others on the screen for reference. Or to cut and paste between documents quickly.

Which can save a lot of the time you'd spend opening and closing files.

Key phrases at a keystroke.

If you have a lot of stock paragraphs you use in your writing, Word's glossary feature puts them at the tip of your typing fingers. Just store the pieces of text you need and you can recall them instantly.

And if you want an alternative to mouse work, you can run your Mac the old fashioned way. Because Word gives you the option to execute commands from the keyboard.

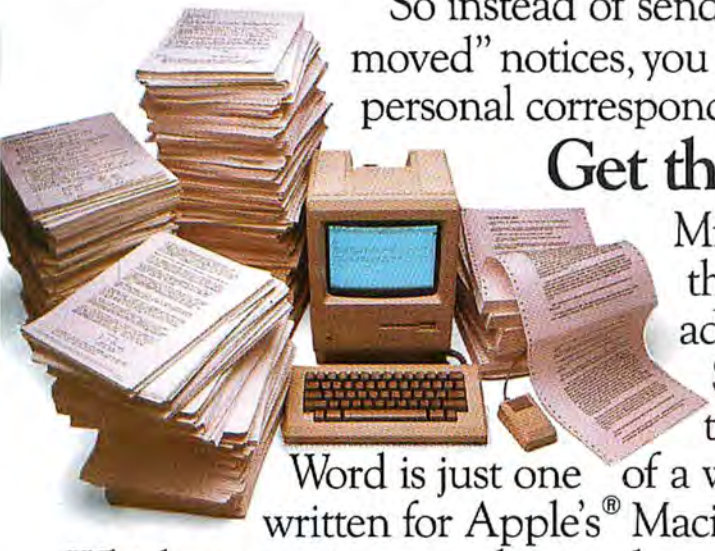
By the way, you don't have to write off your MacWrite documents to convert to Word. It'll run them all right off the bat.

rest of us serious writing.

Reader-friendly form letters.

With Microsoft® Word, you also get a sophisticated "conditional" text merging feature that lets you make customized form letters and documents.

So instead of sending out 800 "Dear Client, we've moved" notices, you can mail a letter that will read like personal correspondence.



Get the max out of Mac.

Microsoft Word has scores of features that have all been designed to take full advantage of Mac's easy operating style.

So you don't have to be a professional to use it.

Word is just one of a whole family of programs we've written for Apple's® Macintosh.™

Which means it can exchange data with Microsoft Multiplan,® Microsoft Chart, and Microsoft File. And because our programs work alike, if you learn one, you're well on your way to learning the rest.

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(continued from page 9)

ple shakeup gives people the impression that the company is teetering on the brink of disaster.

But there is good news from Cupertino, too. Apple has agreed to let Macintosh users install HyperDrive hard disks in their computers without voiding the warranty. And the expected announcement of an Apple hard disk will also help the Mac out.

If the company is sincere about opening up the Mac to peripheral manufacturers and to software publishers, overall Mac sales will improve, and Mac users will have more choices.

The Macintosh will be with us for a long time, and we are yet at the beginning of its software cycle. Five years from now the Macintosh software library will be a monument to our creativity. The Apple II and IBM PC libraries will look mundane and unimaginative in comparison.

One thing the Mac does far better than any other personal computer is package its printed output. Documents created on the Mac look so much better that they are better.

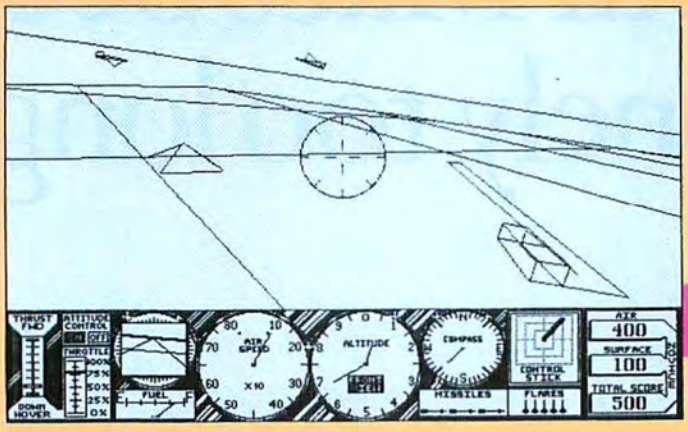
The Macintosh is so great, and its early users so enthusiastic, that it has to succeed. Otherwise something must be wrong. □

Whaddaya mean you never heard uva Flying Mouse?

HARRIER STRIKE MISSION

Ya see there's this island off the coast somewhere . . .The Harrier Jump Jet, one of the world's most sophisticated technological marvels, combines the ability to take off and land vertically like a helicopter with the speed and punch of the latest in modern jet armament. Your mission, should you decide to accept it, is to pilot your Harrier from the deck of an aircraft carrier, take out enemy aircraft, locate and destroy enemy headquarters & fuel depot, and safely land on the deck of your aircraft carrier.

Simple isn't it? Hardly! Facing you will be some of the world's nastiest enemy fighter planes launching heat seeking missiles. The good news is that you have 3 Sidewinder missiles, two 30mm Aden cannon pods and the ability to maneuver like no other jet in history!



The bad news is you have only one plane between five enemy aircraft and your carrier.

Now wipe that sweat off your brow, don your helmet and gloves, strap yourself into your seat and GOOD LUCK! Nuff said, it's CLOBBERIN' time! Harrier Strike Mission—a 3-Dimensional Flight Combat Simulator for your 128K or 512K Macintosh. The first in a series of new projective 3-D simulations from MILES COMPUTING, INC. (those great folks that brought you MacAttack! and Mac the Knife!)

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Makers of Mac the Knife™ MAC ATTACK

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for the MAC.

Your Mac's been lonely too long.

(Advertisement)

You just found the right hard-disk subsystem for your MAC... Check out the Paradise MAC 10.

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Nice To Have Around: Just 3.5" wide and no deeper than the MAC, the MAC 10 has a smaller footprint than any other external MAC hard drive subsystem. Nice to carry around too... Only 5 pounds.

The Right Breeding: Paradise Systems is known for innovative engineering. The MAC 10 is the latest in a line of ground breaking micro computer peripheral products from Paradise.

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Do Your MAC A Favor: Go see your Apple dealer and look at a MAC 10 or call us toll free at (800) 822-2020 (CA.) or (800) 527-7977 (outside CA.). It will be the beginning of a wonderful relationship.

Specifications:

CAPACITY:
12.75 mb unformatted
10mb formatted

DISK DRIVE SEEK TIMES:
Adjacent track ..... 18 ms
Average ..... 85 ms
Maximum ..... 180 ms

ROTATIONAL SPEED:
3600 RPM

POWER REQUIREMENTS:
110/220 Volts AC, 50/60hz,
50 watts max.

DIMENSIONS:
Height ..... 5.5 inches
Width ..... 3.5 inches
Depth ..... 10.8 inches

WEIGHT:
Approx. 5 lbs.

INTERFACE:
Connects to your MAC via the modem or printer port. Printer connector and integral print spooler provided on MAC-10.

**See retailer for details.*

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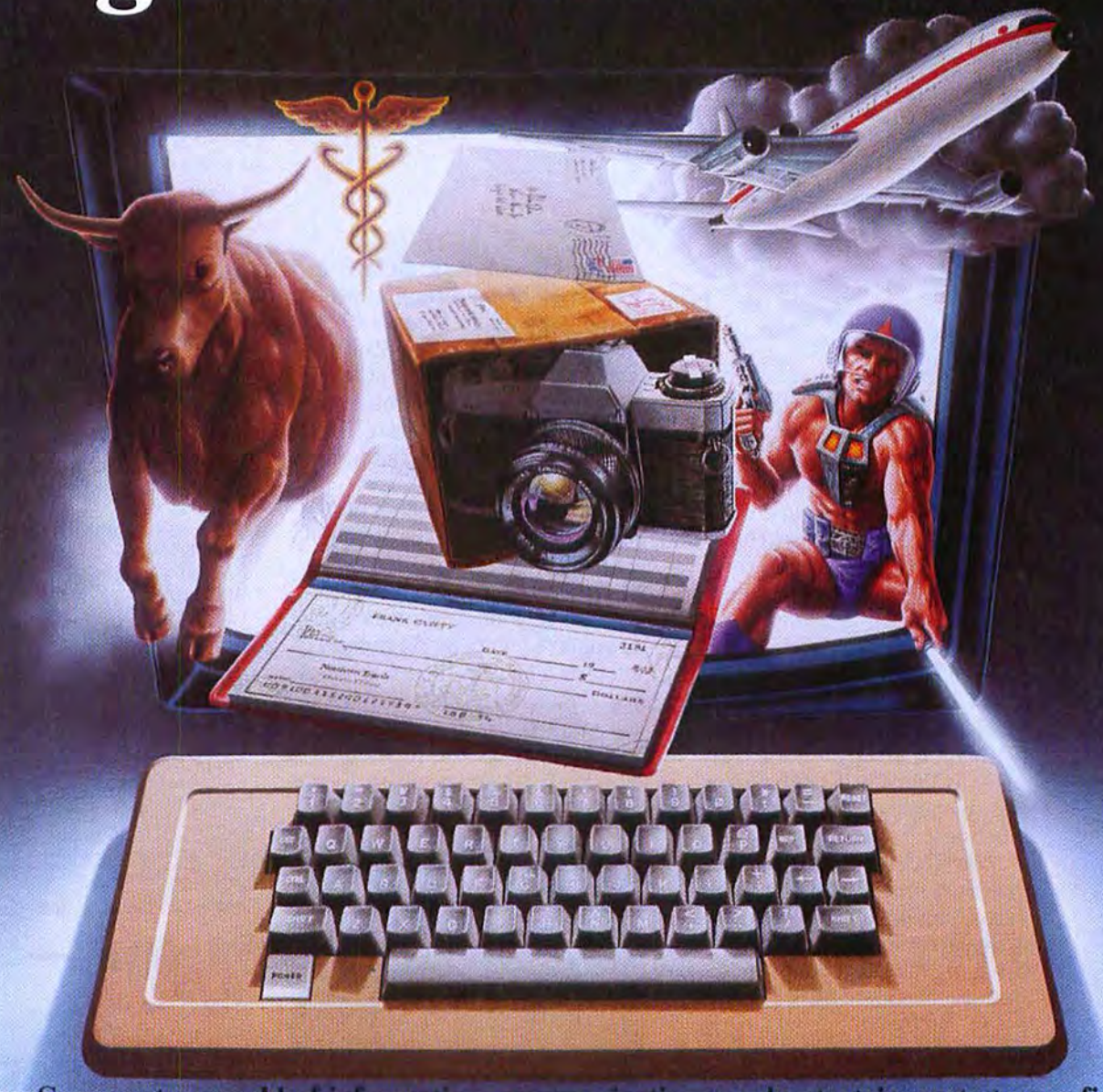

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The Legacy of the Lisa

A member of the Lisa development team reflects on how the Lisa changed personal computing

On April 29 Apple announced that it would cease production of the Macintosh XL computer, formerly known as the Lisa. As a member of the group that helped create the Lisa, I couldn't help but feel a pang when I heard the news. Yet my overriding feeling is one of gratification. In its brief product cycle, the Lisa changed people's expectations of a personal computer. Among Apple products, the Lisa spawned not only the Macintosh but also the MouseText option on the Apple II (see "The Lisa's Influence"). Even IBM PC products were heavily influenced by the technology, including VisiCorp's *Visi On, Microsoft Windows,* Digital Research's *GEM,* Ashton Tate's *Framework,* and IBM's *TopView.*

The user interface was the most publicized characteristic of the Lisa. It introduced a host of ideas that have been widely emulated, ranging from how columns are widened in a spreadsheet to how people are notified of mistakes and problems. When the Lisa development team designed the user interface, we borrowed good ideas from wherever we could find them. For example, the Lisa borrowed pop-up menus and overlapping windows from Smalltalk, status lines from *VisiCalc,* and automatic removal of extra spaces after text deletion from Douglas Engelbart's research at SRI International.

But the Lisa user interface was not a copy of any that preceded it; it was distinctive. It was the first to feature the now-familiar menu bar, the one-button mouse, the Clipboard, and the Trash can. Although the Xerox Star had icons, the Lisa was the first product to let you drag them with the mouse, open them by double-clicking, and watch them zoom into overlapping windows.

To minimize the time it would take people to learn to use the Lisa, Apple technical writers, programmers, and marketers struggled for two years to find suitable terminology to appear in menus, dialogs, alerts, and manuals. Our foreign-language translators spent months more choosing the corresponding terms in French, Italian, German, Spanish, and other languages.

It may come as a surprise that terms like *Revert, Plain Text, Align Left, Clipboard,* and *Panel* were difficult to coin and even more difficult to agree upon. When we studied *VisiCalc,* we discovered that people had trouble interpreting the term *General Format,* which means that a number typed into a spreadsheet cell is right justified, while text is left justified. After extensive brainstorming and testing of *LisaCalc,* we chose *Words left, numbers right,* which was self-explanatory if a bit verbose.

Much has been made of the high cost and five-year development time of the Lisa. True, the development was expensive, but it did not take five years. The first Lisa was shipped in May 1983. Five years earlier, in 1978, Apple had launched a project code-named "Lisa," but that project's goal was quite different from what the Lisa eventually became. In early 1980, after Apple's senior staff visited Xerox's Palo Alto Research Center (PARC) to see a demonstration of Smalltalk, the goal was completely redefined. Only the code name, some of the hardware components, and a few of the staff members stayed the same.

I was the PARC employee who gave Apple the Smalltalk demonstration. Impressed by the perspicacity of the visiting Apple staff members, I resolved to join their company, which I did in July 1980. Rich Page had just built the first Lisa prototype incorporating a sample 68000

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ClickArt Effects Picks Up Where MacPaint Left Off

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Works Right Within MacPaint

Effects gives you four new tools—rotate, slant, distort and perspective—which work directly from within MacPaint.

One click installs Effects onto your MacPaint disk. Then, whenever you need one of the new tools, simply reach under the apple icon and select ClickArt Effects. The four Effects tools temporarily replace the standard MacPaint tools—ready for you to use just like any you're already familiar with. Another click instantly brings back the standard tools—it's that easy!

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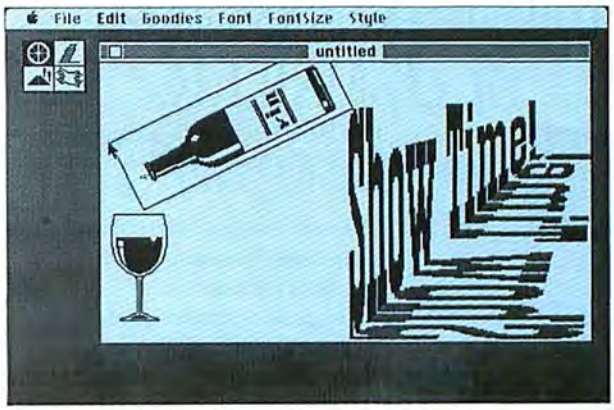
Really Special Effects

These tools are great simply for their stated purpose. But the included tips manual will give you some ideas for even wilder effects. You can use the tools to create unusual patterns, to generate a gradual gradation, to create shadows and monument effects, and much more.

It's like discovering MacPaint all over again.



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microprocessor from Motorola. Apple's small but energetic Lisa development team was debating the relative merits of one-, two-, and three-button mice. No software had been designed except a tiny prototype of *LisaWrite* written on an Apple II. Some thought had been given to the user interface, but there was no menu bar, no icons, and only one scroll bar on the left side of each window.

In the summer of 1980, a group headed by Bill Atkinson and myself defined the ground rules of the user interface. Today those rules are familiar to anyone who uses a Macintosh or a Lisa. Bill prototyped pull-down menus and a one-button mouse, along with alternatives to this scheme. I had a number of people use the prototypes to compare the relative merits of those designs.

That autumn Bruce Daniels hired most of the Software Group. Although the majority had never seen a mouse before, they plunged into the design of the operating system, the Window Manager, QuickDraw, *LisaCalc, LisaDraw, LisaGraph, LisaList,* and the Desktop Manager (Finder).

As manager of the 20-person Applications Software Group, I was pressured constantly for schedules and priorities. My associate, Peggie Stanford, tried a number of project scheduling

The Lisa's Influence

The Lisa affected the design of many personal computers. Listed here are Lisa innovations that were incorporated into the Macintosh.

Hardware
— Mouse design
— Imagewriter printer

User Interface
— Menu bar, pull-down menus, keyboard-activated menu commands
— Printing dialog boxes
— Appearance, structure, and operation of windows and scroll bars
— Ability to move windows and icons by dragging them with the mouse
— Windows that zoom to open and close
— Dialog and alert boxes with buttons and check boxes for selecting choices

Individual Software Packages
— QuickDraw graphics are identical on the Lisa and the Macintosh.
— *LisaProject* was converted for Macintosh to become *MacProject.*
— *LisaDraw* was converted for Macintosh to become *MacDraw.*
— *LisaTerminal, LisaWrite, LisaCalc, LisaGraph,* and *LisaList* influenced the design of Macintosh applications.
— The Lisa Desktop Manager influenced the design of the Macintosh Finder.
— The Lisa printing software heavily influenced the Macintosh printer-driver equivalent.
— Lisa Pascal is still the principal language used to develop software for the Macintosh.

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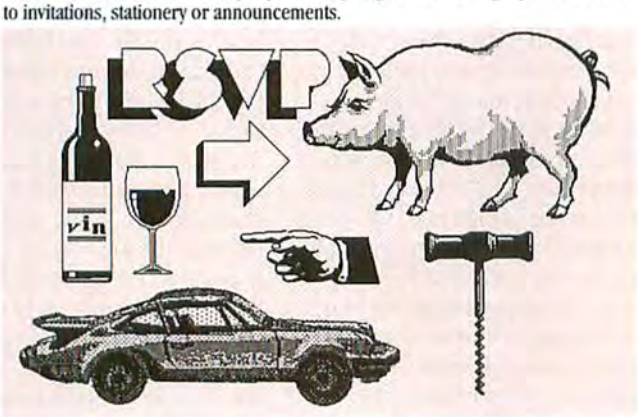
Personal Graphics is a disk-full of contemporary images from small dingbats to full-screen portraits. Images include Einstein, Michelangelo's David, animals, cartoons, cars, wine bottle, city skyline. They're great for adding a personal touch to invitations, stationery or announcements.



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programs, but none were satisfactory. One day, at a meeting of my staff, I described my dream scheduling system. Steve Young mentioned the concept to his wife, Debbie Willrett. She promptly quit her job at another computer company and in a few incredible weeks created the first prototype of *LisaProject*. We relied heavily on that program throughout the remainder of the development period. The marketing department was impressed by its utility and decided to make it a product.

One story that was exaggerated in books and articles was the tension between the Lisa and Macintosh teams. As in any friendly rivalry, some individuals took the competition too seriously. By and large, the teams gave each other both moral and technical support. Half the Macintosh programmers came from the Lisa group, and most of those were working on both Lisa and Macintosh tasks at the same time. We were saddened when the merger of our divisions forced the elimination of many duplicate and obsolete jobs, but most of the displaced employees found positions elsewhere in the company, and the rest discovered that Lisa developers are well-regarded in Silicon Valley.

Newspapers and magazines like to feature stars, and as a result a few members of the Lisa team received the lion's share of the publicity and credit for the product. Everyone who worked on the Lisa knows that it was a team endeavor. My most lasting memory will be of how much everybody cared about the quality of the product. Every 80-hour workweek, every canceled vacation, every hot debate, and every wrenching management decision was motivated by one common driving force: we wanted our product to be the best.

By my reckoning the Lisa engineering effort took three years from product definition and first prototype to full production. In the end we had produced the first multitasking windowing system for a personal computer. In my opinion the Lisa Office System still outclasses its IBM PC imitators more than two years after its first public demonstration.

I am sure that every former member of the Lisa Development Team is proud of our accomplishment. We put our hearts, minds, and lives into fulfilling a dream. Its role in the product line will be filled by the 512K Macintosh with a 20-megabyte hard disk and integrated applications. The Lisa manufacturing line may be closed, but the accomplishment lives on in the lower-cost, higher-performance Macintosh.

Larry Tesler continues at Apple Computer as manager of a group exploring software development methodology. □

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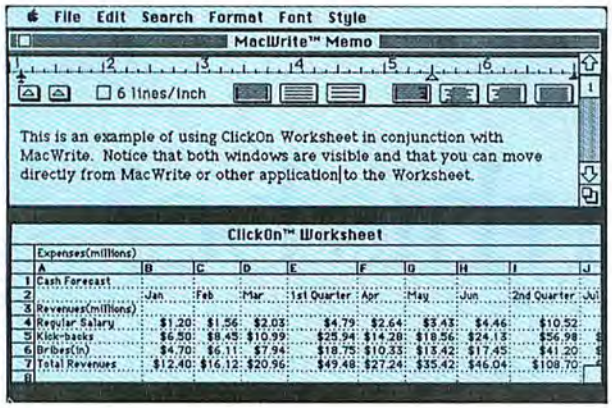

MacWrite Memo and ClickOn Worksheet

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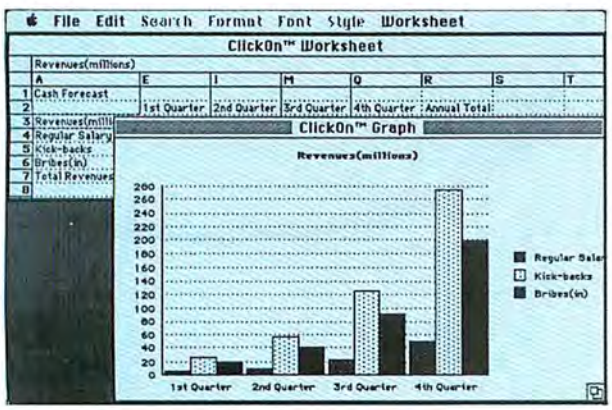

Bar graph created directly from spreadsheet

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MacWrite Memo

This is an example of using ClickOn Worksheet in conjunction with MacWrite. Notice that both windows are visible and that you can move directly from MacWrite or other application to the Worksheet.

Cash Forecast

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Revenues(millions)				
Regular Salary	$4.79	$10.52	$23.11	$50.77
Kick-backs	$25.94	$56.98	$125.18	$275.03
Bribes(in)	$18.75	$41.20	$90.52	$198.87
Total Revenues	$49.48	$108.70	$238.81	$524.67

We have copied and pasted the spreadsheet into this MacWrite memo. Once copied into MacWrite, it is possible to change the font or font style of the spreadsheet. The spreadsheet shows revenues and expenses by month with quarterly summaries. We used the "folding" ability of the Worksheet to copy and graph only the quarterly results instead of the entire spreadsheet.

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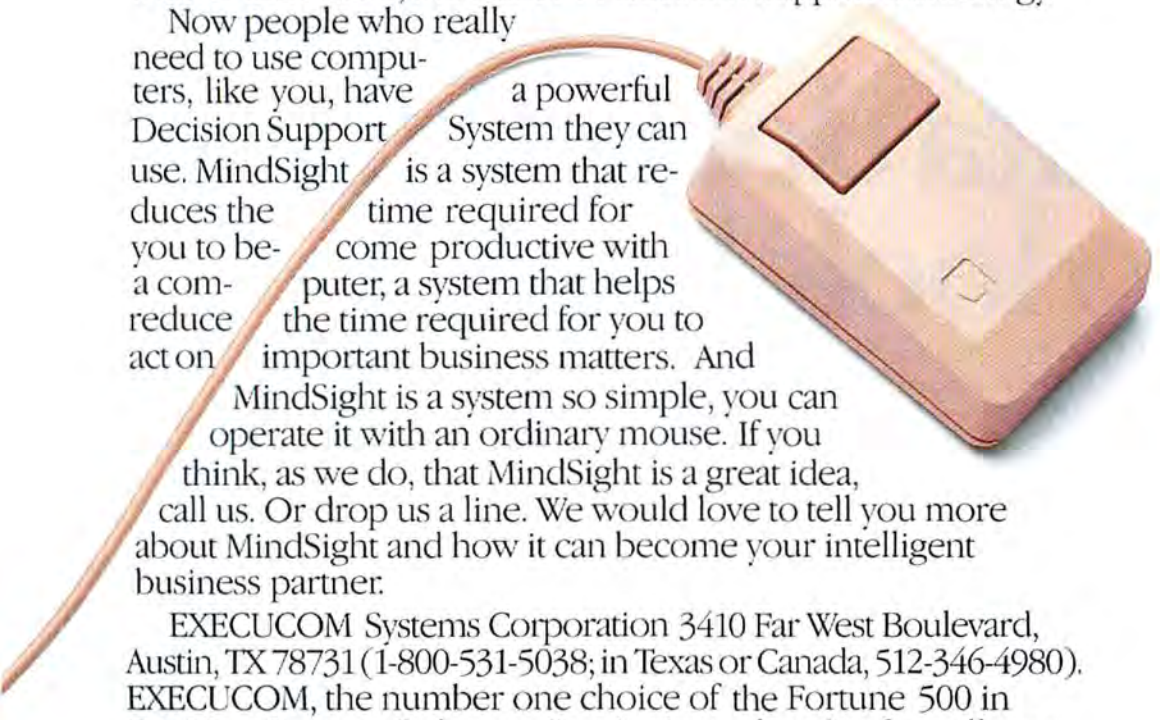

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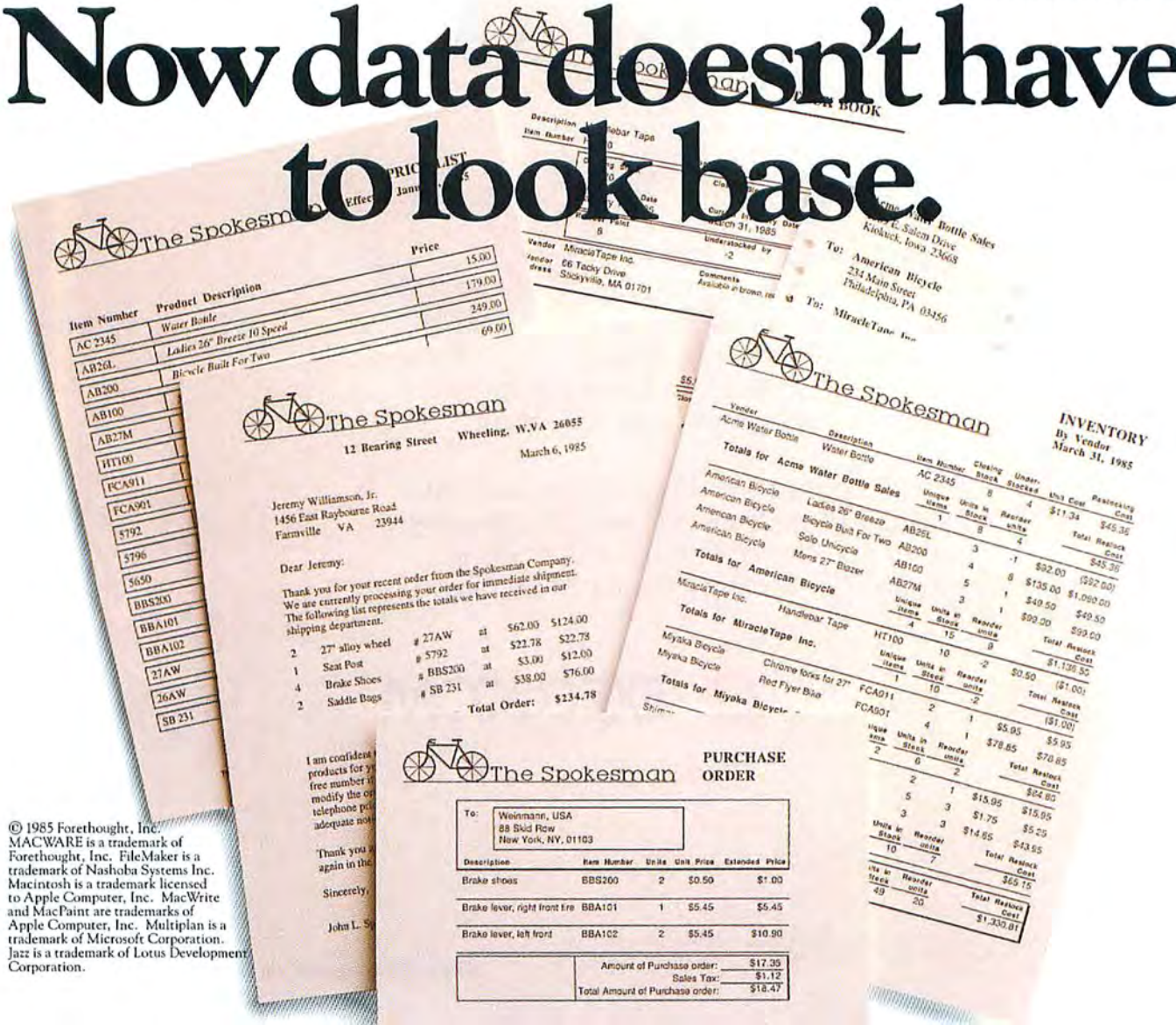

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Letters

Sighting the Possibilities

Thousands of blind people could be helped by a reading system built around the Macintosh. Omni-Reader, the hardware accessory that "reads" typewritten text into the Macintosh, combined with a speech synthesis module could make the Mac an inexpensive Kurzweil-type reading machine. In case you are not familiar with it, the Kurzweil reading machine, which sells for about $10,000, creates audible output from printed text.

The Kurzweil machine has some features that a Mac system would not, such as automatic scanning and page turning. With the Omni-Reader you have to scan each line manually, which I'm sure wouldn't be a problem for a blind reader with feedback from the computer and a little practice.

The system that I envision would utilize a multiregion screen. Tones would let a blind reader know where the pointer is on screen. By clicking on a particular region, the reader could choose to enter a new file, listen to an old one, or perhaps choose some other option. The person would touch-type to enter file names to be read back or stored.

The center of a Macintosh system dedicated to blind people would be an echo capability, which would echo the pull-down menu items and other options using a speech synthesis module. It should also be possible to echo keystrokes—making possible a touch-typing tutorial for the blind—and dialog boxes.

Andrew Shalit
Cambridge, Massachusetts

Fortune Fifth Column

In "Can the Mac Save Apple?" [*Macworld,* June 1985], David Bunnell questions the need for Apple to be overly concerned about the office network concept in its quest for sales among the Fortune 1000 companies.

Most people don't understand that a company, like the one I work for, is really hundreds of relatively small organizations working within the large structure. At our company, individuals within the small organizations, who need to accomplish tasks quickly and at low cost, are beginning to buy Macintoshes, either by special-request purchase through the company or with their own funds. They are the network that Apple should be developing.

Our corporate systems people deal with those computer companies that deliver mainframe and communications systems, such as IBM, Digital Equipment Corporation, and Hewlett-Packard. Not surprisingly, the company encourages employees to buy personal computers from those companies and not from Apple.

However, in an innovative, competitive company, productivity and performance still carry the day. In the last few weeks, I have seen evidence of Mac purchases in our company's labs and among its sales representatives. People like us who are using the Mac in the Fortune 1000 companies are Apple's best chance to dramatically increase its share of that market.

The key is for Apple to serve the individuals who are proving to management that the Mac is a valuable business tool. Apple needs to communicate with Mac owners who are employees of large corporations, whether through the mail or through a company user group. Apple should offer incentives such as upgrades or other improvements as a reward to those who assist in the sale of Macs to other employees or who share ideas and experiences in using the Mac for company business. Management looks for evidence of increased productivity but likes to be shown by its own people.

A recent *Wall Street Journal* article suggested that Apple was retreating from the Fortune 1000 market. I'm betting that Apple will keep on improving the Macintosh and will begin to spend more of its promotional dollars to get Mac owners to help sell more Macs. The question is, can Apple save the Mac without paying more astute attention to Mac owners?

William M. Odum
Atlanta, Georgia

(continues on page 30)

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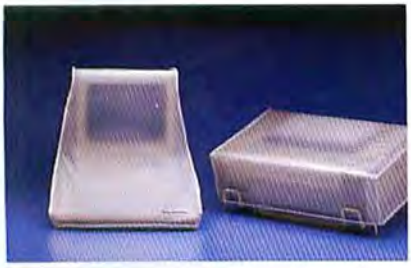

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(continued from page 27)

Keyboard Commando

I agree with Nicholas Lavroff's critical remarks regarding *Lode Runner* ["The Galactic Commando Rides Again," *Macware Reviews, Macworld,* August 1985]. Using the mouse to play a round or two of the game is a genuine exercise in frustration, and I am sure that implementing his suggestions would improve the feel of the game.

While waiting for the improvements to be made, however, I recommend that all eager galactic commandos simply use the Keyboard Play option on the Options menu, which your reviewer neglected to mention. The Keyboard Play option is sufficient to maneuver our heroic commando through all 150 levels of the Bungeling Empire's treasury. Pointer problems notwithstanding, *Lode Runner* is an excellent little addition to the Macintosh software library.

I would like to address one question to the people at Brøderbund. How soon can we expect a Mac version of the strategy game *The Ancient Art of War?* The mouse would probably work well with this unique game.

M. Brio
San Luis Obispo, California

The Apple of His Red Eye

I recently got over my fear of computers and finally discovered how incredibly easy they are to use. I flirted with the IIe and the IIc, but when a friendly salesperson showed me the Mac, I couldn't believe what I was seeing. It was as if I'd been stranded in a foreign country for years and finally met someone I could talk to. Even with its considerable price tag, my wife wouldn't let me leave the store without a Mac after she saw the excitement in my eyes. Your magazine is great, too. Now if I can only get some sleep.

Ronald Lerner
Milledgeville, Georgia

Time Is Money

I have read letters in your magazine from pioneering Macintosh buyers complaining about how much they paid for their Macs. However, they fail to consider the benefits they obtained from having a Mac earlier than subsequent buyers. In my humble opinion, the early increase in productivity in many cases more than compensates for the higher price paid for the Mac.

For example, in June of last year I decided to write a book. I started writing it using my old method; that is, I wrote the first draft by hand, gave it to my secretary for typing, corrected and revised the results, returned the manuscript to the secretary for typing, and so on. I soon realized that this method, which worked well for short articles, would never do for a book that I had committed to finish in three months. Consequently, I started looking for a computer.

I had never used a computer; in fact, I had an unconscious animosity toward the mysterious machines. However, I knew I needed one to finish the book in time. I went to a computer store and started playing with a Mac. I liked it right away. Within 3 hours of unpacking that incredible machine, I was writing my book. Sure I made

(continues on page 34)

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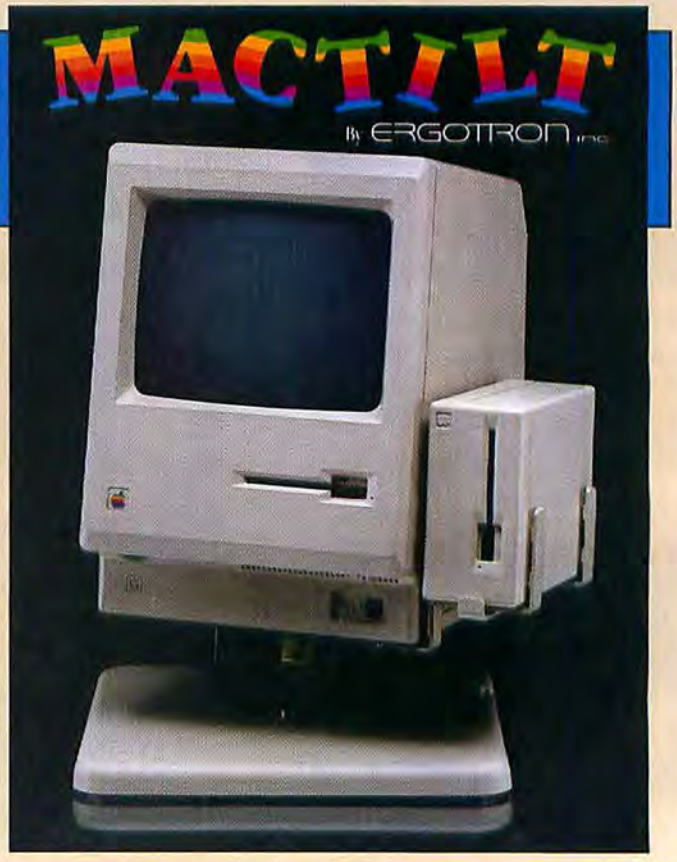

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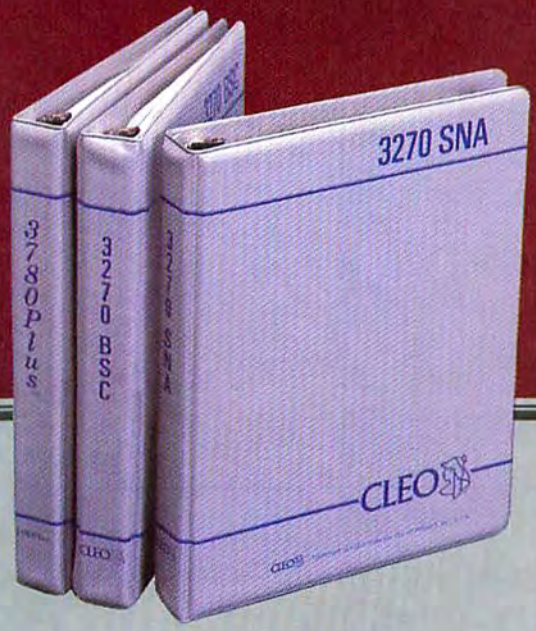

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(continued from page 30)

mistakes and even lost a document or two, but I was using a computer and liking it thoroughly.

I went on to finish the book, which, incidentally, became a best-seller in Panama. I could never have finished it in the required time without the Mac.

It's true that when I bought the Mac, I paid $1000 more than I would pay now, but what I have achieved with it since then more than compensates for the additional cost.

I might never have entered the world of computers if the Mac had not been invented.

Raúl Arias de Para
Panama City, Panama

Putting Up with Genius

All those reasons David Bunnell mentioned for owning a Mac ["Does the Mac Mean Business?" *Macworld,* March 1985] can easily be justified, but I doubt more and more whether the Mac truly has a professional use. Apple would like to give a business image to an egg-laying wool milk-sow, a computer that has always leaned toward the artistic. I remember when the first Macs appeared here a little over a year ago; you had to fight through seven layers of small boys to get a look at the screen. I wouldn't have bought one then exclusively for business use, and knowing the machine better now, I wouldn't do so yet.

Professionals will not put up with the Mac's shuffling and other idiosyncrasies. The Mac is a great little machine, but patient indulgence is often required to put up with its genius.

Hansjörg W. Zeller
Zurich, Switzerland

The Early Word Catches the Bugs

Word is typical untested Microsoft software. Among the 15 bugs and seven shortcomings that I have written to Microsoft about, the following are the most troublesome.

The program abandons the Macintosh's what-you-see-is-what-you-get capability. The only way to check header and footer placement, for instance, is to print the document. Even the Apple II could show page breaks, page numbers, headers, footers, and footnotes on screen.

Since *Word* underlines carriage returns, you cannot simply select a line or a paragraph and underline it. You must select the text by dragging from the first character to the last character.

The program lacks macros. Deleting 1586 carriage returns from an imported document took hours. On my trusty Apple II, it would have taken a couple of minutes with macros. Along the same line, the only way to add carriage returns for an upload to CompuServe is to insert them by hand because *Word*

doesn't have a print-to-disk option, which most word processors have.

Microsoft must know that *Word* is slow to the point of being unusable on a 128K Mac. Sometimes it accepts a typed character only once every 5 seconds, even in Screen Draft mode. It prints only four pages per hour in high-resolution mode.

In summary, I think *Word* is a second-rate word processor that Microsoft released too soon and that the company needs to fix with a version 1.1.

Russ Coffman
Dunwoody, Georgia

Discouraging Word

One of *Word*'s worst problems is its inability to handle documents wider than the Macintosh screen. Trying to set up the margins for a 7-inch-wide document was an exercise in frustration; the method for using the ruler is neither self-explanatory nor well documented. The secret seems to be in setting the left and right margins so that they total 2.5 inches. You can print a 7-inch document by setting a left margin of 0.8 inch and a right margin of 1.7 inches; it doesn't seem to matter that the total width of 9.5 inches is an inch wider than your paper. The document prints out with a left margin of 0.8 inch and a right margin of 0.7 inch.

In addition, horizontal scrolling is very slow; you save time by typing the document the width of the screen and–when you're finished–selecting the text and moving the margins.

Another *Word* bug crawls out when you add footnotes to a document that is in a 10-point font. Whenever you return to your document from the footnote, the program converts font size from 10-point to 12-point. The only simple solution is to type the document in 12-point type and change it to 10-point when you're done.

Now that *MacWrite* has been improved, I'm not sure that it's as weak as critics say. In many ways I prefer it to *Word*.

Please keep up the excellent quality of your magazine. Without it my Mac would not be half the fun.

Peter Yudkin
Somerton Park, South Australia
Australia

A reliable source has tipped us about another Word *oddity. The LaserWriter prints out boldface text in a* Word *document with unsightly extra space between words. Effectively, this quirk means that you have to change boldface type to plain or italic when preparing* Word *text for LaserWriter printing.–Ed.*

Letters should be sent to Letters, Macworld, *555 De Haro St., San Francisco, CA 94107, or sent electronically to CompuServe 70370,702 or The Source BCW440.* □

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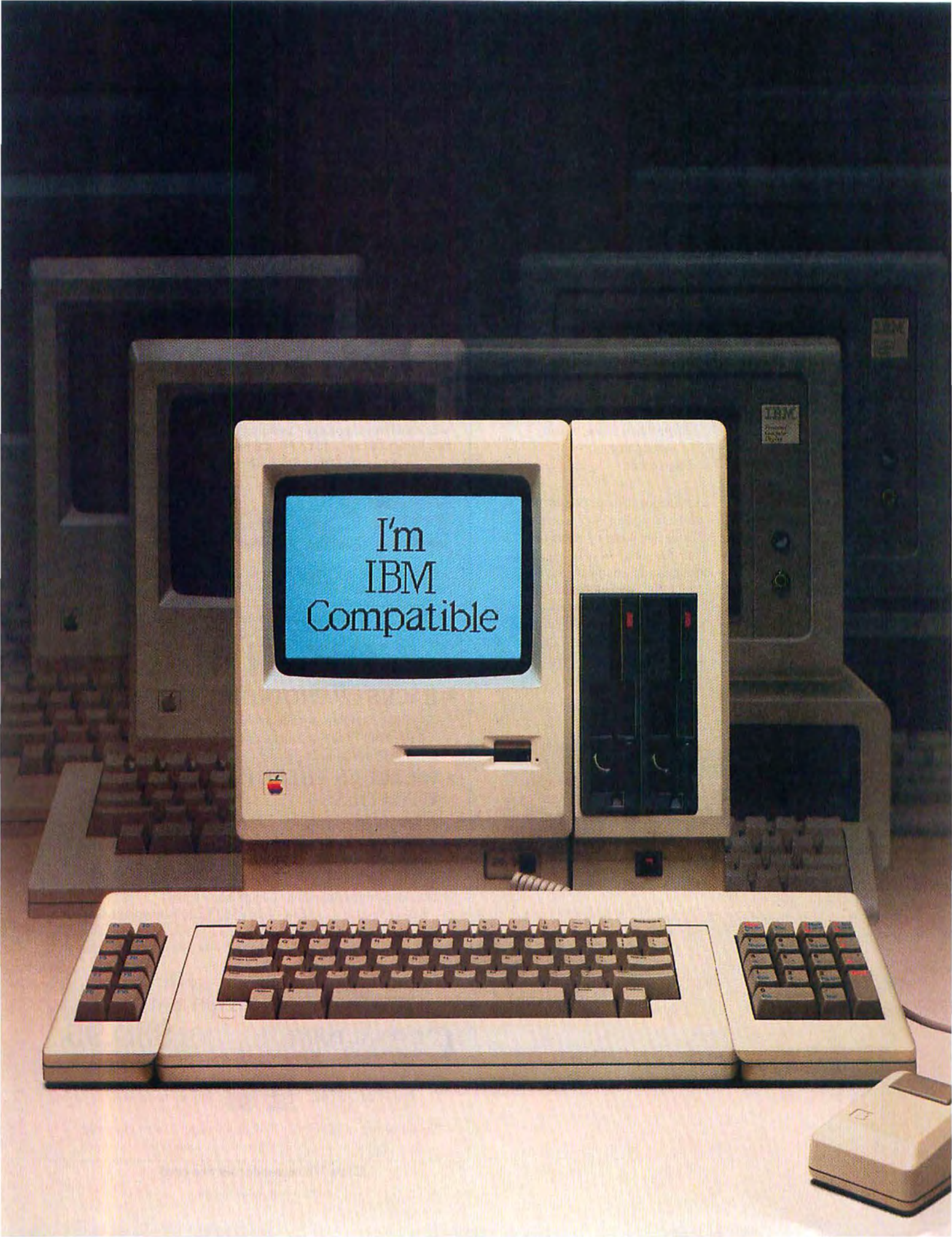
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Macworld View

Macintosh typesetting shops, public-domain utilities, a world atlas at the click of a mouse, and more

Edited by Herschel Schmedick

The news this month suggests that the 512K Macintosh, the LaserWriter, and high-powered integrated software have picked up the baton from the original frontrunning hardware and software.

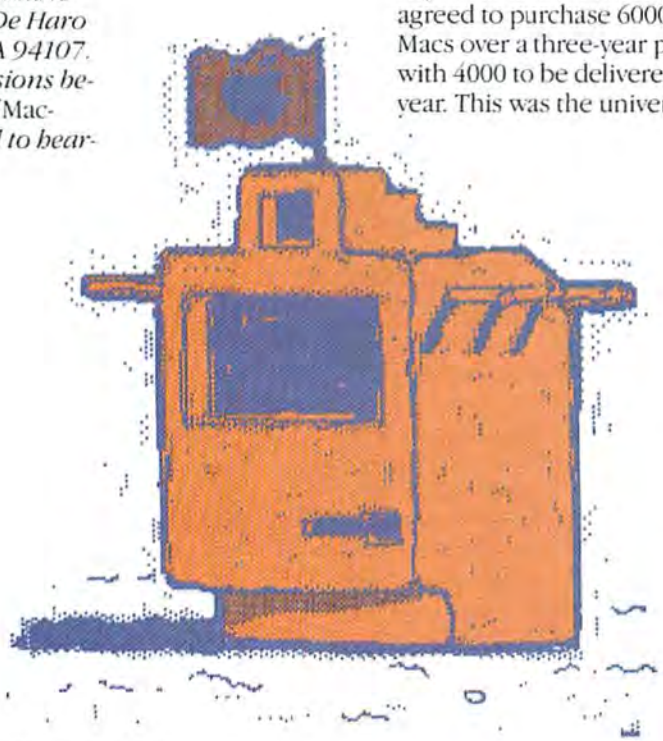
LaserWriters are showing up next to copy machines at copy centers, Latin American universities have purchased 6000 512K Macs, Mac music programs are hooking up with synthesizers, and people are finding new ways to express themselves with their machines.

Your contributions are welcome. Macworld *pays up to $50 for each item published. Send your contributions to* Macworld View, *555 De Haro St., San Francisco, CA 94107. All published submissions become the property of* Macworld. *I look forward to hearing from you.*

South of the Border

Apple's University Consortium Program is gaining momentum south of the border. The Latin American consortium consists of schools in Mexico, Puerto Rico, Venezuela, Chile, Peru, and Colombia. As in Europe and North America, Apple is offering selected schools in those countries discount pricing, technical support, and the slickest personal computer in the west. Metropolitan University in Caracas, Venezuela, agreed to purchase 6000 512K Macs over a three-year period, with 4000 to be delivered this year. This was the university's first purchase of personal computers, and school officials did extensive evaluation of other computer systems, including IBM and Hewlett-Packard, before choosing the Mac. As with the other consortium universities in North America and Europe, students and faculty receive about a 40 percent discount. Besides the Macs, the university ordered some Macintosh XLs, and 75 percent of the machines will come equipped with an Imagewriter and an external disk drive. Each student and instructor will have a Mac at home.

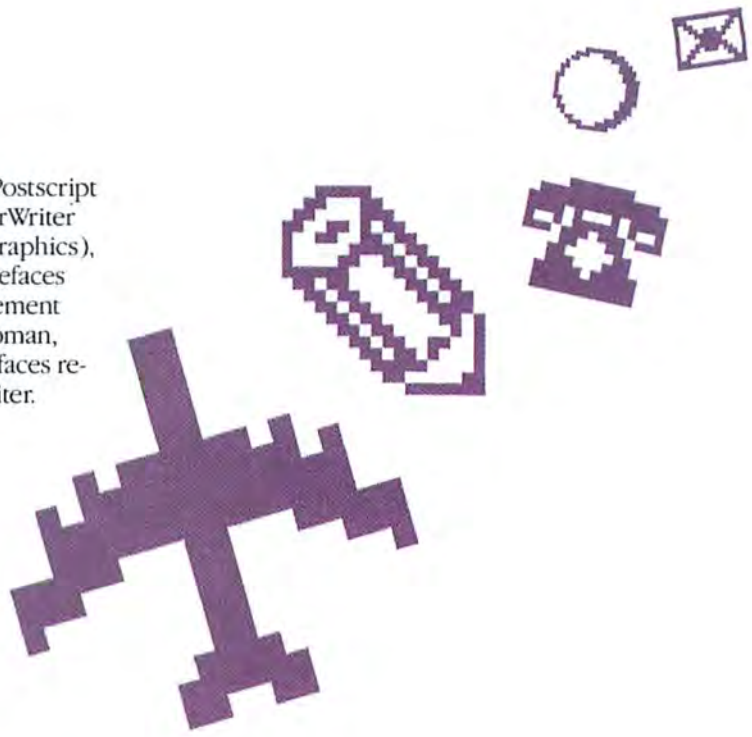
In addition the Monterrey Institute of Technology in Mexico City, which previously used Apple IIs, has committed funds to buy 1000 Macs, and the Catholic University of Chile will purchase 1000 machines over a three-year period. The choice of the Mac by these schools indicates that Apple is winning converts worldwide.



New Laser Fonts

The LaserWriter is edging closer to becoming a real typesetting machine with the addition of several new typefaces to the printer's font library. By the end of the year Palatino, Optima, ITC Bookman, ITC Avant-Garde Gothic, ITC Zapf Chancery, American Typewriter, Century Schoolbook, ITC Souvenir, Glypha, and ITC Zapf Dingbat will be available for the LaserWriter. Each of these typefaces will have an equivalent screen typeface for the Mac in five sizes.

Liz Bond, marketing manager of Adobe Systems, the company that created Postscript (the language the LaserWriter uses to print text and graphics), explains that these typefaces were chosen to complement Helvetica and Times Roman, the original set of typefaces released for the LaserWriter.



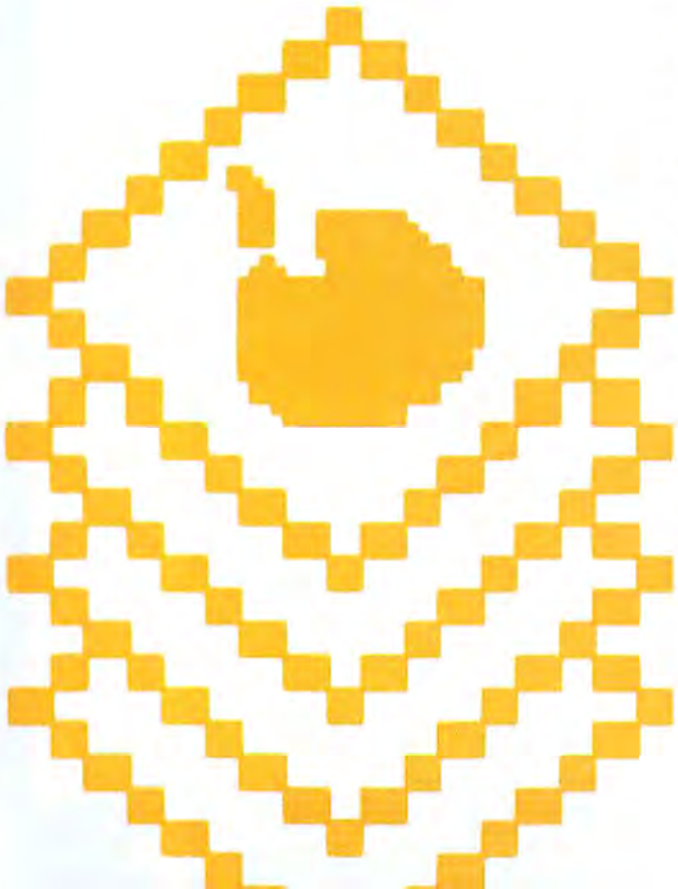
In the Public Domain

In the old days utilities were necessities provided by uncaring monopolies. Now, in the computer age, utilities are small but appreciated programs, usually produced on a shoestring budget, that make computing more convenient. Many useful utilities are available from user groups and MicroNet Apple User's Group (MAUG) on CompuServe. A good example is Bill Atkinson's Screen Maker, found in MAUG's Data Library 5 as SCRMAK.HEX. The program lets you replace the startup screen ("Welcome to Macintosh") with one of your own design.

Another program, Menu Editor (MENUED.HCX in Data Library 5 of MAUG), by Andy Hertzfeld, lets you assign ⌘-key equivalents to menu options. Two suggestions: always have the Menu Editor on the same disk as the program you are customizing, and always select Save from the File menu before quitting the program if you want to preserve your modifications.

While many helpful desk accessory utilities are available, two in particular are worth mentioning. Transfer, TRANS2.HCX in Data Library 4, passes you from one application to another without going back to the Finder. The time saved is significant, to say the least. David Dunham's DiskInfo desk accessory, DSKIDA.HCX or DSKINF.DOC in Data Library 3, allows you to check the amount of free RAM and disk space, the size of every file, and other information. Best of all, you can delete files from within an application to free up disk space or just to clean house. With Transfer and DiskInfo in the Apple menu, you can avoid unnecessary trips to the Finder.

–Robert C. Eckhardt



Industrial Light and Macintosh

Would Luke Skywalker use a Mac? Of course, and the Empire's starships would be fully equipped Macintosh offices, complete with laser printers for sending finely printed documents throughout the galaxy. As for Chewbacca, how could that hairy fellow possibly operate a computer unless he laid his paw on a mouse? If the entire cast of *Star Wars* is potential Mac partisans, what about the folks at Lucasfilm, who created those characters? Scattered throughout the Marin County, California, facilities of George Lucas's entertainment empire are numerous Macs, now being used for word processing, storyboarding, and other business tasks. At Industrial Light and Magic, the special effects arm of the company, programmer Craig Hosoda has begun to work up a system that can be run from a Mac with *MacTerminal* to control motion of the special effects cameras and scale models.

Craig Hosoda

The Lucasfilm games division is not currently developing home video games for the Macintosh, but according to programmer David Levine, that's primarily because there are "not enough Macs out in the market to make it feasible. I hope that the Mac really takes off, but on the other hand, as a game designer, the lack of dedicated processors for graphics, sound, and faster input and output on the Mac makes it difficult to do the kinds of real-time simulation games we do. Getting all that stuff working with one 68000 processor is pretty tough." Levine thinks that the best games on the Mac will be interactive games in which several players participate on a network.

"We have one big disadvantage when it comes to creating new software. Hundreds of movie theaters around the world show our boss's state-of-the-art software, so every game we produce has to be pretty sensational."—*Jeffrey S. Young*

Electronic Atlas

Software Concepts of Wallingford, Connecticut, has come up with the electronic equivalent of a world atlas. Instead of spinning a globe or hunting through the vast index of a 10-pound atlas of the world, you can look up maps of countries, states, and cities by typing in a name and zooming in on sections of a map. You can magnify portions of the map up to five times. The maps are linked to a database of fact sheets on 2500 cities. Distances between cities or countries can be calculated automatically in miles, nautical miles, or kilometers.

An interesting aspect of this product is the Phoenix Plan, a unique marketing concept. The company's president, William J. Tobin, devised a clever way to let people sample a special version of the product in their homes or offices. You can use the program on three occasions for 30-minute sessions to help you decide if you want to purchase *Atlas*. The fourth time you try to run the program, it refuses to start up. You can obtain the trial version by sending $6.95 to Software Concepts, P.O. Box 3323, Wallingford, CT 06494, or check with your local Macintosh dealer. If you like the program, you call the company, purchase the program via credit card, and get the code to unlock the program. If you decide not to buy the program, you can reformat the disk for your own use.
—*Janet McCandless*

Laser Copia

It looks like the LaserWriter has spawned a new subspecies of business: inexpensive typesetting shops. Two copy centers in Berkeley, California, may foreshadow two of the forms this new enterprise could take.

Krishna Copy aims its LaserWriter services at students, small-business owners, and graphic artists who occasionally need to print out a thesis, a business proposal, or camera-ready art. The shop has two 512K Macs, a LaserWriter, and a ThunderScan digitizer. Krishna charges $6 per hour for the Macs, which can be used to prepare files for the LaserWriter, and 30 cents per page for printing. The store provides the necessary software, a program that installs the LaserWriter fonts and printer driver on disk, to alter customers' word processing programs to work with the LaserWriter. It also has an IBM PC and translation software that enables PC owners to use the LaserWriter. Translation costs $35 per hour; a 20-page paper takes about 15 minutes to convert, according to Krishna staff.

On the other side of town, Cleo's Duplication Service pursues a different tack: "Our LaserWriter business is focused toward commercial accounts," says David Marshall, Cleo's operations manager, who's a graduate student in computer science at the University of California. Cleo's is going head to head against typesetting operations, courting large, mostly computer-related companies that in the past have brought their typesetting business–documentation, newsletters, forms–to the type shops.

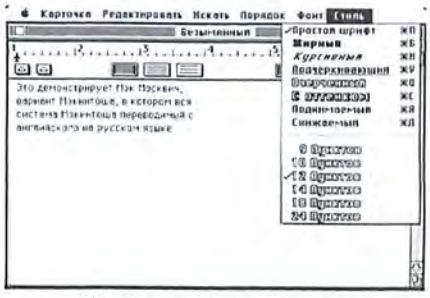
Cleo's prices favor people who print large documents: $3.50 per page for 1 page, $1.80 per page for 2 to 3 pages, $1.35 per page for 4 to 7 pages, on down to 45 cents per page for 500 pages or more. To induce customers to use the store's photocopying facilities for printing, Cleo's gives rebates of up to 80 cents of free copying for each dollar spent on typesetting. Cleo's lends Macs free of charge to its larger customers, and the company is installing three data lines to enable customers to phone in their work.

As David Marshall explains, "Right now the LaserWriter is a boon for small print shops. The typesetting industry is losing some of its work, and it'll have to get up and start running to try to match our setup." No doubt it will. And no doubt we've seen only the merest beginning of some of the ideas entrepreneurs will come up with for putting LaserWriter technology to work.

–J. Van Norden

Sanjay Sakhuja of Krishna Copy hopes to create a personalized publishing center where customers keep dozens of Macintoshes, LaserWriters, and copy machines busy.

Moscow Macintosh



The Soviet Union has not signed a contract with Apple to purchase Macs, but Professor Tom J. Lewis of Louisiana Tech University in Ruston, Louisiana, is Russifying the Mac for his comrades. Using the Apple's Font Editor, Lewis created four Cyrillic fonts–Moscow, Gorky, Kazan, and Odessa–in various sizes. With the Resource Editor and Screen Maker utilities, Lewis created a Russian-language version of *MacWrite* and the Macintosh System and Finder files. Moscow and Gorky replace Geneva and New York as the system fonts, and all menus, dialog boxes, and alert boxes are displayed in Russian. Lewis is considering converting other applications to Russian, and he is extending his font development to more arcane languages. He is currently designing a font based on Mayan hieroglyphics. The Font Editor, the Resource Editor, and Screen Maker are all available on CompuServe or from user groups.

New Music

While the current batch of music programs for the Macintosh gives you the equivalent of word processing for music composition, creating music with a mouse and a computer keyboard leaves much to be desired. Occasionally you might find a Mac performing in public, but most serious musicians agree that the Mac's four-voice sound reproduction capabilities are limited. The key to overcoming the Mac's limitations is a small box called the musical instrument digital interface (MIDI). By attaching a MIDI box to one of the Mac's serial ports, you can send and receive encoded musical messages to and from an instrument connected to the MIDI box.

Several companies are actively working on MIDI products for the Mac, including Macromind, the originator of Hayden Software's *MusicWorks;* Mark of the Unicorn, developer of *Professional Composer;* Electronic Arts, creator of *Music Construction Set;* and Musicworks, not to be confused with the program of the same name.

The MIDI products enter your compositions from a synthesizer keyboard and store them on the Mac as well as play back creations, using up to 16 tracks of synthesizer output. Just play on and let the Mac commit your creations to memory. □

Macworld's Top 10 Best-Selling Business Software

Months on chart	Last month	This month	Product
2	2	1	*Microsoft Word,* Microsoft
2	1	2	*Microsoft Multiplan,* Microsoft
1	4	3	*Microsoft File,* Microsoft
2	8	4	*Dollars and Sense,* Monogram
2	5	5	*pfs:file,* Software Publishing
2	3	6	*Microsoft Chart,* Microsoft
2	7	7	*MacTerminal,* Software Publishing
2	6	8	*pfs:report,* Software Publishing
2	9	9	*MacProject,* Apple Computer
0	–	10	*ThinkTank,* Living Videotext

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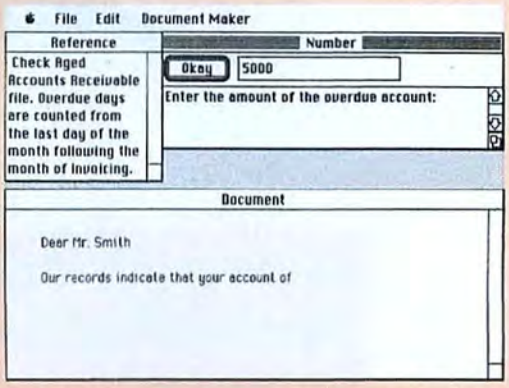
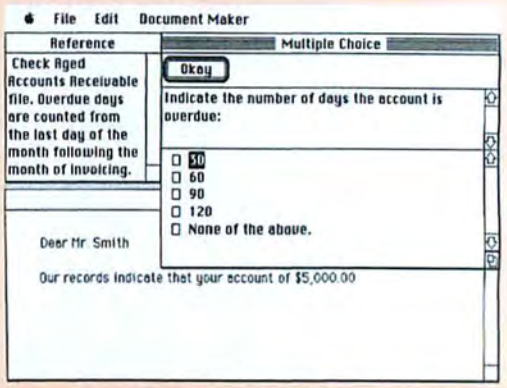
Its ancestry. The Document Modeler might well be termed revolutionary; there's certainly nothing like it. However, "revolutionary" implies throwing over the traces completely and the Document Modeler does owe its origins to earlier marvels of the computer age.

Such as word processing – although it goes way beyond word processing (see example).

The Document Modeler is also more than a spreadsheet. It can calculate, recalculate and format numbers with the best of them. But it goes further – fluently molding and manipulating words, sentences and paragraphs as well. Producing impeccable documents with words and figures mixed – exactly how you want them mixed. Nothing else will do as much.





All kinds of documents, big or small, are a breeze. Collection letters, for example. (No doubt you'll have different needs, but the principle's the same). After creating the model, the credit manager turns over the job to a worker bee. As the simple prompts are answered ***(screens # 1 and # 2)*** *the letter is composed a block at a time. The reference section warns of potential pitfalls and gives*

The Document Modeler is also much like an expert system. Except that it's "just plain folks" – a professor going for a beer with the boys. More street smart and flexible than an expert system, it allows for the umpteen variables of the business world and doesn't demand fluency in a cryptic computer language.

How it works. As an expert in your field, the Document Modeler makes it easy for you to write a script that allows for all the eventualities in a typical document. You don't need to know anything about programming: Learn a few simple procedures and you can create model documents – once and for all.

For ever after, that particular family of documents can be delegated to somebody less senior, less experienced, less qualified – and less expensive.

Basically, all they have to do is answer a series of prompts such as YES or NO, or make some multiple-choice selections, or just type in the particulars requested – all the while using guidelines and suggestions that appear on the screen just when they're most useful. All of them set out by you.

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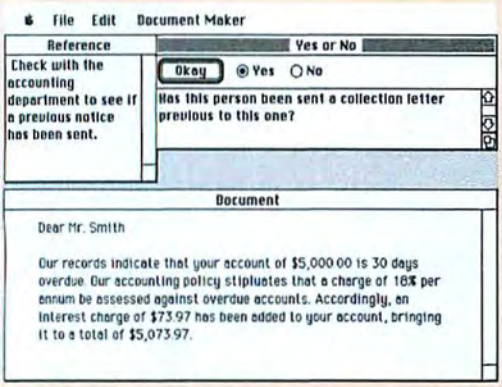

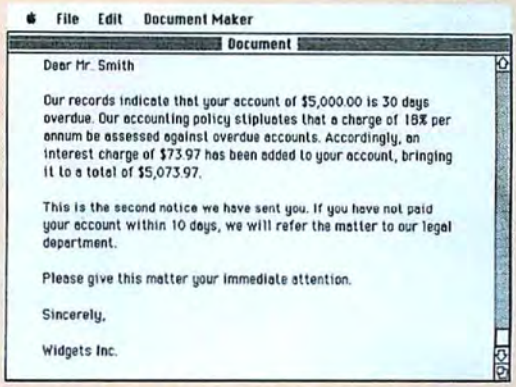

expert advice along the way. The built-in math power eliminates errors. ***Screen # 3:*** *Is the letter a friendly reminder, or are you starting to talk tough?* ***Screen # 4:*** *Voilà! The finished, customized letter. Elapsed time? About half an hour to write the script. How long for the letter? Don't blink. You'd miss it. How long to generate a complex mortgage agreement, including the math? A few minutes.*

last comma and the last decimal point.

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Call to arms. The Document Modeler consists of two programs (one to make the model, the other to make documents) which together cost $299 U.S. – and which will almost certainly save you this much or more in the first application. (Note: The price is as modest as it is primarily because we're only selling "direct from the maker" as they say, and because we're Canadian; the U.S. dollar is worth about 37 per cent more up here.)

To obtain the Document Modeler, or for more information, contact us, The Model Office Company, developers of advanced modeling tools for business – and only for business.

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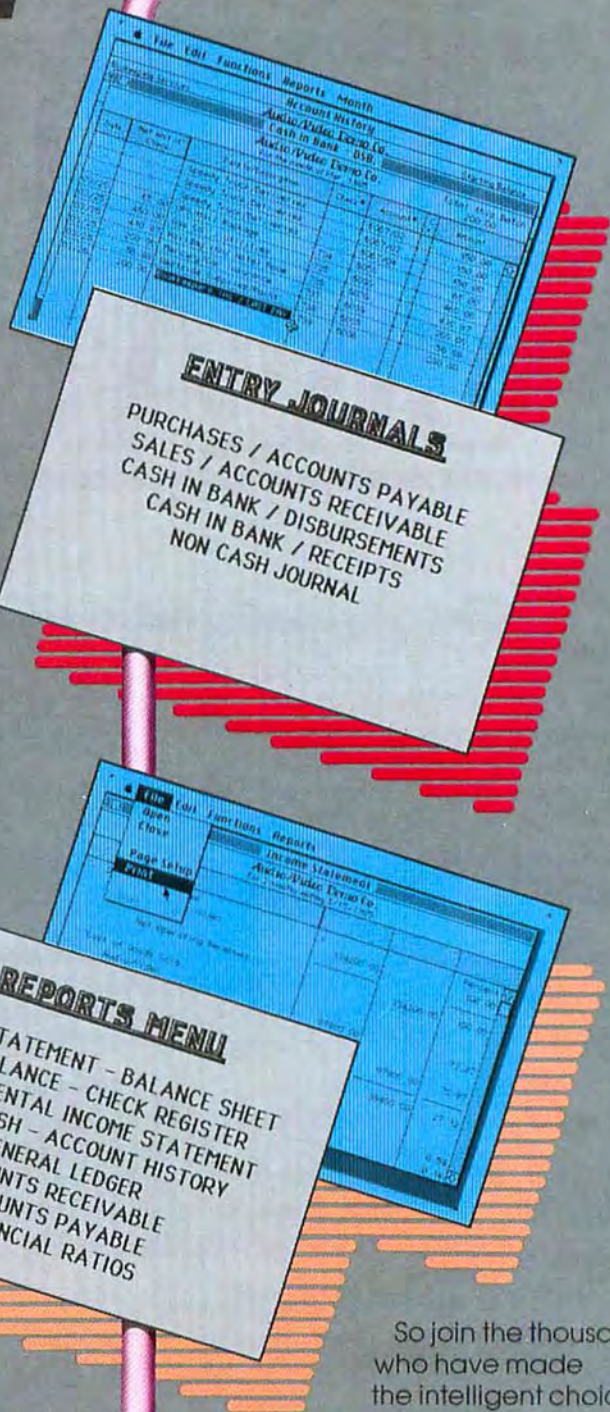

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Get Info

Macworld's tutor answers questions about talking to modems, tired mice, and obese Macs

Lon Poole

This month I take an early look at memory upgrades beyond 512K. A Microsoft BASIC programmer needs help controlling his modem from his specialized communications program. Another reader sends a word of caution for Mac users who don't have grounded electrical outlets. And a number of long-time mouse pushers have worn out the feet of their mice and wonder about replacements.

Some *MacPaint*ers discuss fine points of the program. Two readers present their methods for pasting text into *MacPaint* while preserving special attributes like bold or italic. Several users want to know why *MacWrite* can't print high-quality pictures like *MacPaint* does. Finally, a *MacPaint* user wants to save the special patterns he makes to reuse them with other documents.

Modem Control with MBASIC 2.0

Q. I am writing a bulletin board service (BBS) program in Microsoft BASIC (MBASIC) 2.0. How can I make the program sense that the phone is ringing and answer it? How can I make the program hang up the phone? How can I keep it from printing input such as a password?
Mike Durler
San Diego, California

A. First, your BBS program must set up the serial port for the proper communications protocol, including baud rate, parity, data bits, stop bits, buffers, and handshake as described in *Inside Macintosh*. Then the program must wait for input from the modem through the serial port. The waiting can be accomplished by an INPUT$( ) function inside a WHILE . . . WEND loop.

When the phone rings, the modem sends a result code—typically the word RING—to the serial port. Since the program is waiting for input from the serial port, it will pick up the result code. When it recognizes that the phone is ringing, it can send the modem a command to answer the phone and try to establish a connection with the remote modem. The command ATA works with modems that respond to Hayes commands. However, the command to answer the phone is not required if your modem is set up to answer the phone automatically. In that case the program can ignore the RING result code; the modem will automatically answer and try to connect with the remote modem.

When your modem successfully connects with the remote modem, your modem sends the program another result code—typically the word CONNECT—through the serial port. If the modem cannot make a connection, it sends the program a different result code, such as NO CARRIER. When the program concludes that the modem has connected with the remote modem, it can begin interactive communications, perhaps by asking you for an account number and a password.

The terminal program on the remote computer should have its local echo feature turned off so the computer displays only what you send it. Unlike a regular terminal program, a BBS program should send the characters it receives from the remote computer back to the remote computer. Input from the remote keyboard gets sent to you but isn't displayed on the remote screen unless you send it back. Anytime you want the person at the remote computer to "type blind," as is the case with passwords, you don't send back the characters you receive.

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The program hangs up the phone by sending the modem another command–ATH for Hayes-equivalent modems. However, once your modem has connected with a remote modem, it stops listening for commands from your program. To get its attention before sending it the hang-up command, your program must wait 1 second, send +++ (three plus signs in a row), and wait another second.

Unfortunately, there isn't room here to show an example program. I suggest you study *MacTep,* a public-domain terminal program written in MBASIC by Dennis Brothers, available from CompuServe or a user group. For the specific result codes and commands that apply to your modem, consult its manual.

You can obtain *Inside Macintosh* from Apple Computer, 467 Saratoga Ave., #621, San Jose, CA 95129, 408/988-6009. The "phone book" edition costs $28.

Worn-Out Mouse Feet

Q. I've owned my Macintosh for six months, and now the two "feet" that support the front of the mouse–the shallow dots embossed on either side of "Apple Computer, Inc."–have begun to wear down. Other Mac owners I know have experienced similar problems. This wear hampers operation of the mouse because it no longer rests smoothly on three pivot points.

My dealer says I need to replace the entire mouse, at a cost of $100. Replacement of the mouse's base plate seems the ideal solution for this problem.
Eric Bailey
Grinnell, Iowa

A. According to Apple Computer's Barbara Knaster, the whole mouse is available as a service part, but the base plate is not. Since the mouse has no official price, I suggest you check with other Apple dealers; their prices might differ from that of the dealer you contacted first.

To keep the mouse feet from wearing further, get a mouse pad. You can buy one or make one from a piece of the nylon-covered neoprene used for wet suits. Use the type called Nylon I, with nylon on one side only; place it nylon side up, rubber side down. A piece 4 by 6 inches is adequate; 8 by 10 inches is ample.

Fatter Macs

Q. I've been using the Switcher and have found it very useful. However, I want to put *Jazz, MacPaint,* and *MacDraw* in the Switcher, and there isn't enough room. Is there any way to get more than 512K of memory for my Mac?
Laura Kuffel
Scottsdale, Arizona

A. Gordon McComb answers: The 512K Fat Mac has become the standard machine, but independent companies offer memory upgrades that double or quadruple random access memory (RAM).

Beck-Tech, of Berkeley, California, is shipping MacMegabytes, a plug-in circuit board with 512K of additional RAM. In order to mount Beck-Tech's board, four chips must be removed and replaced with a two-way connector that allows the Beck-Tech board to be piggybacked onto the existing digital board. According to Beck-Tech president Stephen Beck, the extra memory chips won't overheat the machine. The price to upgrade, including RAM disk software, is $549 from 512K to 1024K and $849 from 128K to 1024K. For $150 less you can do your own installation. Beck notes that not all applications can take advantage of the extra memory. The company provides a 90-day limited warranty on its products.

If a Macintosh with 512K of RAM has been nicknamed a "Fat Mac," and 1024K a "MegaMac," what would you call a Macintosh with 2 megabytes of RAM? Levco Enterprises, a San Diego startup firm specializing in memory upgrades for the Mac, has named its new 2-megabyte Mac upgrade MonsterMac. Rather than some grotesque beast that wanders the streets at night looking for disks to rob and files to corrupt, a MonsterMac is an everyday 512K Macintosh with an extra 1½ megabytes of RAM tucked away inside.

According to Doug Gilbert, a design engineer at Levco, the MonsterMac upgrade consists of a single printed circuit board 6 inches square, filled to the brim with 48 256K RAM chips. The board, which fits in the space behind the internal disk drive, connects to the Mac via a thick cable that plugs into the digital board and the 68000 microprocessor. Since the 68000 is permanently soldered in place on the Mac's digital board, the chip has to be cut out and replaced. The new chip plugs into a two-way connector. The MonsterMac upgrade costs $974 installed. The MonsterMac board without memory chips costs $499. Installation of the board only is $100. Levco extends a 90-day warranty for its product.

I tested a Mac that had been given the Levco Frankenstein treatment with Apple's Switcher. With the Switcher, I was able to load three 512K applications–Lotus's *Jazz,* Aldus' *PageMaker,* and Megahaus's *MegaForm*–and still had plenty of room to spare. I then loaded three more 128K applications: *MacWrite, MacPaint,* and the public-domain robot game *Daleks.* I was able to switch among all six with no problem. I had similar good luck with RAM disks.

Are there any caveats to upgrading a Macintosh to 2 megabytes? Yes. First, the extra 48 RAM chips create a lot of heat, which can damage the computer. Fortunately, Levco has addressed this problem and installs a small piezoelectric fan inside the Mac at the time of the upgrade. Because of the way the fan works, it makes no sound.

The second problem is one of sufficient power. Apple didn't intentionally design the Mac's power supply to support an extra 1½ megabytes of RAM. Yet the power supply of most Macs can take the extra drain anyway, so it's not a serious problem for all Mac owners. However, according to Gilbert some of the earlier Macs were given a "marginal" power supply at birth and may not be able to support the upgrade. The result: blown fuses or damage to the analog board. Levco is working on a test to determine if the power supply on a given Macintosh is strong enough to handle the MonsterMac upgrade.

Want to hear a demonstration of Hewlett-Packard's ThinkJet Printer?

The third problem is that upgrading to a MonsterMac voids your original Apple warranty or extended service warranty. Generally, having any company other than Apple upgrade a Mac, even to 512K, voids the warranty. Apple has not yet come out with an official policy regarding hardware changes made by unauthorized dealers, so you may have a difficult time getting Apple to service your Mac or give you a warranty on a future Apple upgrade in your customized machine. If your Apple warranty has expired, you want some serious memory at a reasonable price, and you are willing to take a chance on the wings of a new company, go for it.

Picture-Perfect Printing in MacWrite

Q. *MacPaint* graphics inserted into *MacWrite* text appear to be printed in standard quality even if I specify high quality for printing. The inserted graphics also seem to be stretched vertically. Consequently, what I see in *MacPaint* is not what I get in *MacWrite*. Any suggestions?
Tom Moench
Seattle, Washington

A. The discrepancies you noticed occur because *MacWrite* and *MacPaint* use different programming for preparing the image of a page for the printer. *MacWrite* uses standard instructions from the Imagewriter file, usually located on disk in the System Folder, and the QuickDraw procedures built into the Mac's Toolbox ROM (see "The Imagewriter and Beyond," *Macworld*, September/October 1984). When you choose high-quality printing for a *MacWrite* document, the darker, more refined characters are formed by making a 50 percent reduction of a font twice the displayed point size. That is, if you write a document using 12-point New York, the 24-point New York font is used for high-quality printing. However, embedded graphics must always be printed as is, because they have no double-size version to reduce by 50 percent.

In contrast *MacPaint* has its own special programming that smooths and enhances the image when you choose Print Final. Since the programming is part of *MacPaint*, not the QuickDraw procedures or the Imagewriter file, it is not available to another application such as *MacWrite*.

You can, however, make correctly proportioned pictures in a printed *MacWrite* document. Before printing, choose Page Setup from the File menu and select Tall Adjusted orientation in the dialog box that appears. The normal Tall orientation results in a horizontal dot density of 80 dots per inch. The Tall Adjusted orientation results in 72 dots per inch, the same as *MacPaint*.

Tall Adjusted does have some side effects, however. The whole document, text as well as pictures, widens about 13 percent on the printed page. For example, text that was supposed to take 5¾ inches will take 6½ inches instead. The expanded letters that result from selecting Tall Adjusted orientation are somewhat lower in quality than the normal letters

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you get with Tall orientation. The degree of difference in printing quality depends on the font, font size, and printing quality (high or standard) you choose. By the way, Wide orientation has the same proportions as Tall Adjusted.

Saving Custom Patterns in MacPaint

Q. I was working on my brand new Mac, customizing the patterns in *MacPaint,* and spent 2 hours making even shades from black to gray to white. Then I quit *MacPaint.* When I came back to it later, all of my custom patterns were gone. Is there any way to permanently change the preprogrammed patterns so when I start a new document, my patterns will be there?
Dale Meyer
Arnold, Missouri

A. You cannot permanently change *MacPaint*'s standard patterns, but you can still achieve your goal by creating a template document. Whenever you choose Save or Save As from *MacPaint*'s File menu, you save the current pattern palette–including any changes you have made–along with the document. The next time you open that document, *MacPaint* uses the pattern palette last saved with the document.

To create a blank template document with a custom pattern palette, start a new, untitled *MacPaint* document and modify the pattern palette as you like. You can also change the standard Font and Style menu settings; they're saved with each document too. Then save the document using a descriptive name, perhaps Gray Scale in your case. As a safeguard, quit *MacPaint* and select from the desktop the document you just saved, choose

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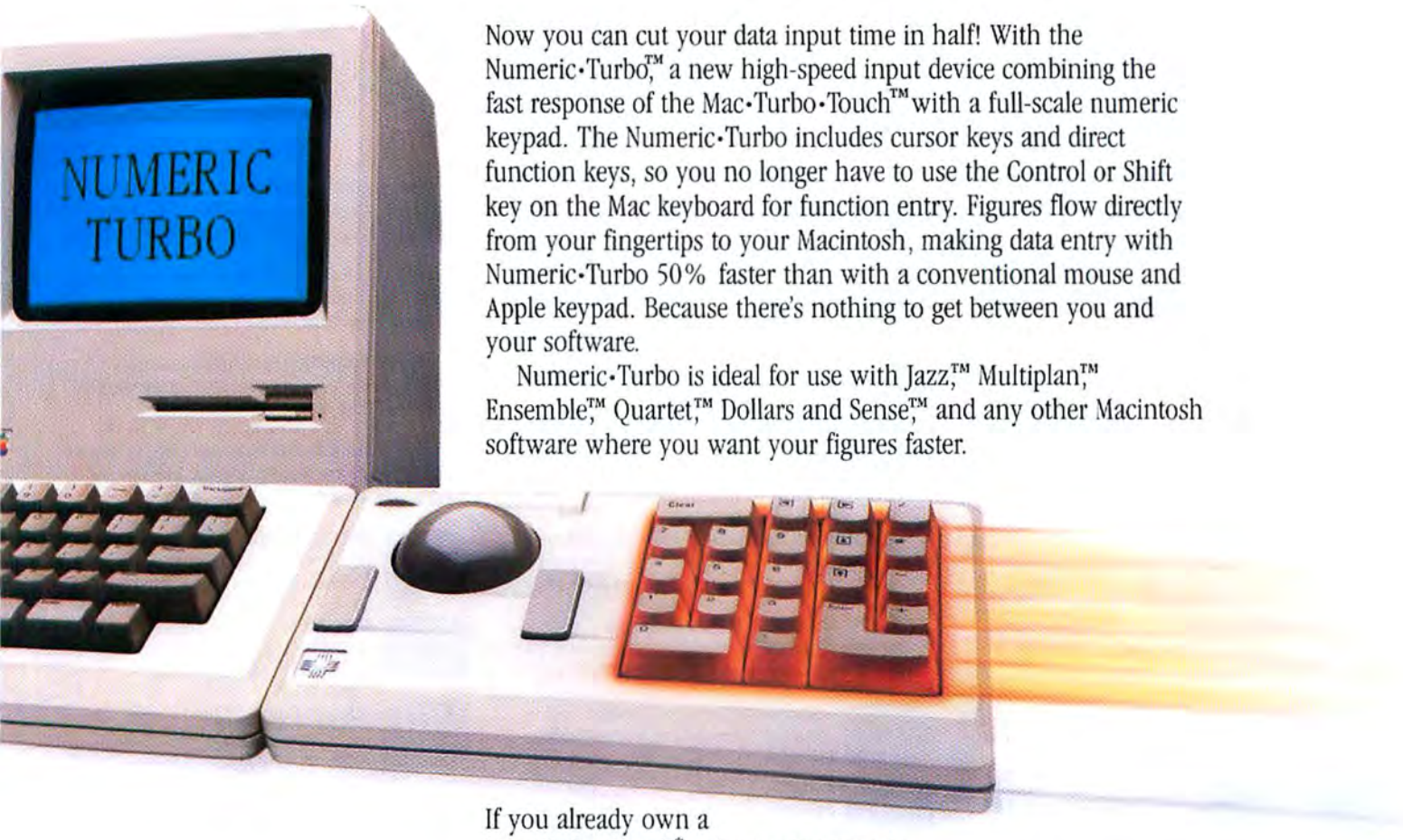

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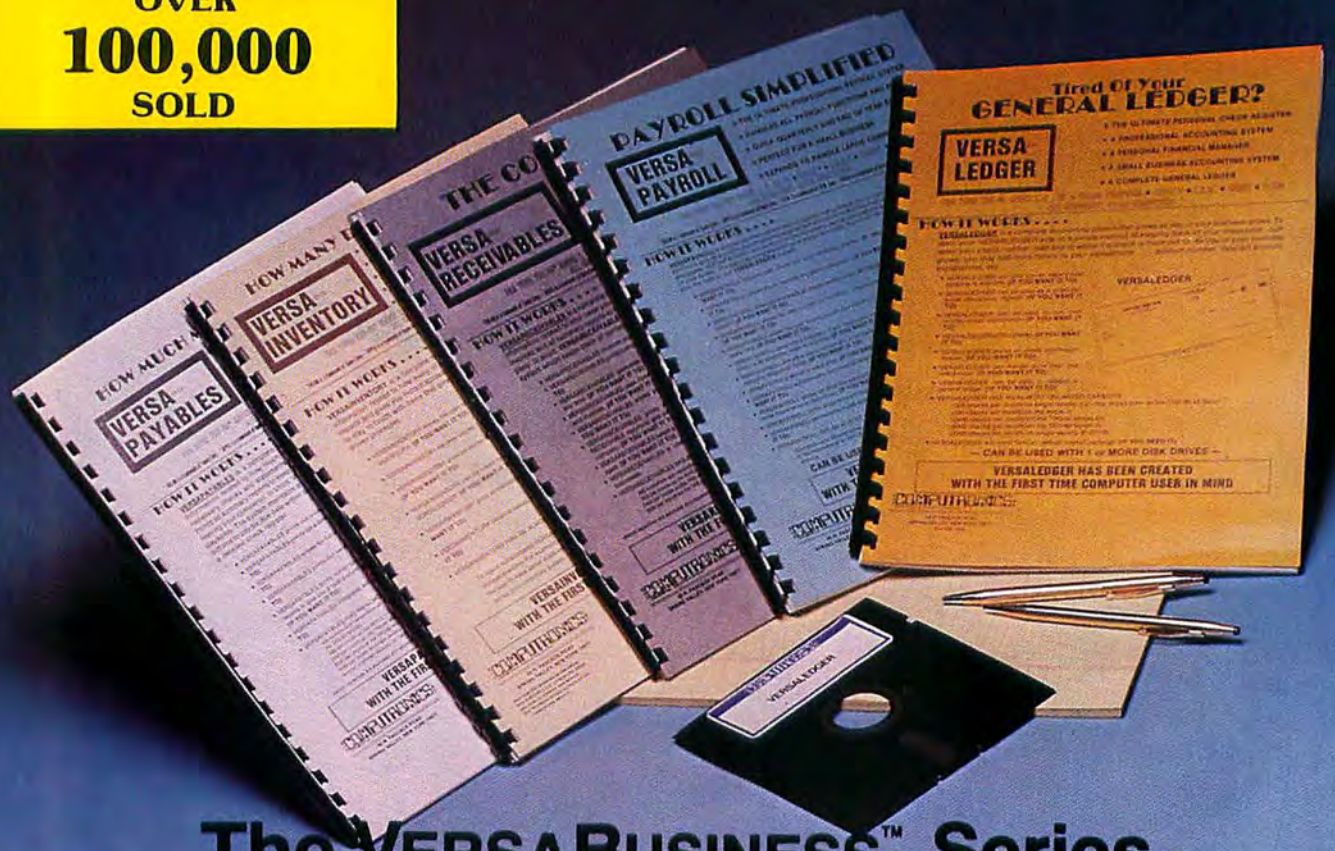

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Get Info from the File menu, click the Locked box, and close the window. That final step prevents accidentally saving another document on top of the template.

To start a new document with the gray scale patterns, make a copy of the template document and save the copy under a new name.

Grounding Feedback

Q. In April you told people whose homes have no grounded electrical outlets to ground their computers to a cold water pipe. I recommend that before they do so, they test the cold water pipe with a volt and amp meter. You would not believe the number of homes—especially older apartments—that have faulty wiring leaking electrical current across the ground, which is usually the cold water system. I work for a water company; I have been knocked down more than once when removing the water meter to install a replacement. The amount of current in the line can be amazing. Incidentally, utility companies routinely remove meters every few years to check their accuracy, and while the meter is removed, the electrical ground may be interrupted. Also, to combat the disintegration of the water supply pipes caused by electrolysis from faulty wiring, many utilities are installing insulators or using plastic piping. This interferes with grounding too. I would hate to see someone end up with a baked Apple after going to the trouble of trying to ground it.

If a computer owner is that concerned about grounding the computer, I recommend they consider connecting di-

(continues on page 67)

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ThunderScan

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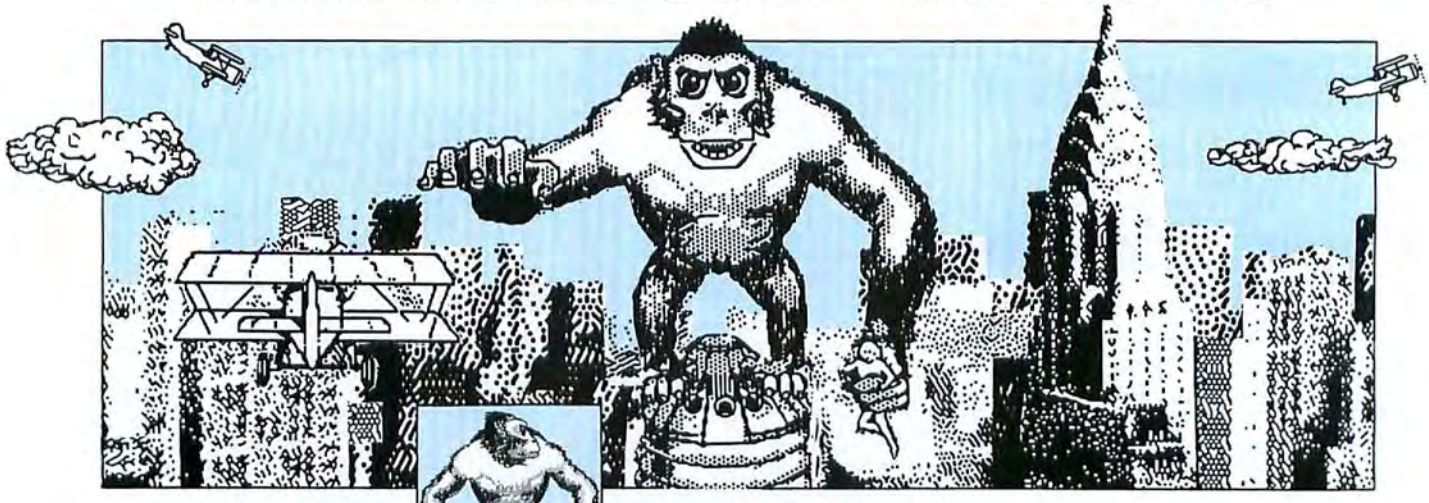

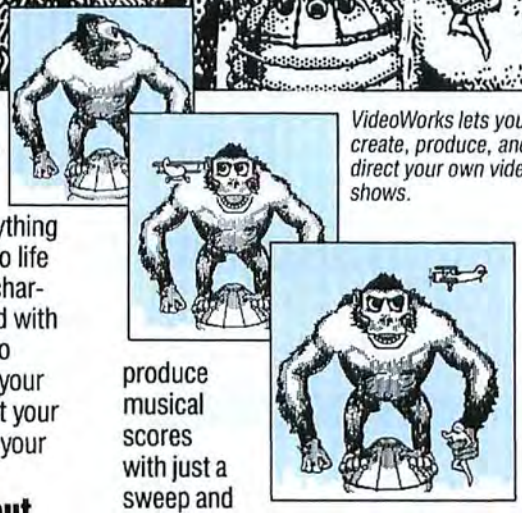

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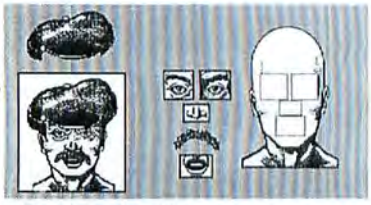

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rectly to a ground rod or at least connecting the cold water pipe to a ground rod ahead of the water meter. Also, be sure the ground rod is deep enough. Typically the rod is 8 feet long, but it ought to reach down into the water table to be sure it will function as desired.
Keith E. Morgan
Lincoln, Illinois

A. Thanks for the additional information.

Copying Text to MacPaint with Style

Q. As you said in April, if you copy a selection from *MacWrite* onto the Clipboard and then paste it into *MacPaint,* it arrives in *MacPaint*'s standard font, style, and size. While the transplanted text is still highlighted, however, you can easily change any of those text attributes. Using the mouse, choose the font, style, and size you desire from the *MacPaint* menus. You can also change the text's alignment, using the Align Left, Align Center, and Align Right commands in the Style menu.

David A. Alden
Cincinnati, Ohio

A. You're right. *MacPaint* recognizes text from the Clipboard as text and lets you change its attributes and formatting until you deselect it, at which time it loses its identity as text and becomes part of the picture. The dimensions of the marquee into which you paste the text from the Clipboard determine the left, right, top, and bottom margins. If the text from the Clipboard is too wide or long for the marquee at the font, size, and style you select, *MacPaint* discards the excess, though you can retrieve it by choosing a smaller size or by stretching the marquee.

Of course, since the text attributes you choose in *MacPaint* affect all the selected text, you can't mix fonts, sizes, and styles in the same selection. Also, it is difficult to duplicate *MacWrite*'s margin, indentation, and tab formatting by adjusting the size of the marquee. If you want to copy elaborately formatted text, you have to resort to the more cumbersome procedure suggested in the next letter.

More Style

Q. You can get text from *MacWrite* to *MacPaint* without losing the formatting by pressing ⌘-Shift-3 to take a snapshot of the screen. The snapshot is saved as a *MacPaint* document on the same disk as the application program–*MacWrite*–under the name Screen 0.
Stephen V. Overton
Normal, Illinois

A. Right, and use *MacPaint* to select the text you need from the Screen 0 document, cut the selection to the Clipboard, and paste it into the final *MacPaint* document. If the formatted text is too long to fit on a single screen, you can take additional snapshots after scrolling the appropriate text into view. Each time you press ⌘-Shift-3, another *MacPaint* document is recorded, named Screen 1, Screen 2, and so on. A beep when you press ⌘-Shift-3 means the disk is too full to record another snapshot.

Etch-A-Screen?

Q. If the Macintosh is left on unattended for long periods, is etching of the screen or burn-in a possibility? How hard would it be to control dimming of the screen with software?
Joe Hannan
Kingman, Arizona

A. A stationary image, such as the Mac's menu bar, displayed continuously for weeks or months may etch the screen's phosphor, leaving a shadow. The Macintosh owner manual suggests dimming the screen with the brightness control, located at the front of the Mac on the overhang under the Apple logo, whenever you leave the machine on and unattended for a long time.

You can also use the *Desk Accessory Mover* program to install the ScreenSave desk accessory in your System files. Once activated, ScreenSave automatically paints the entire screen black after a period of no keyboard or mouse button activity, leaving only a ghostly pointer visible to remind you the Mac is still switched on. A click of the mouse brings the screen back to life. You choose the delay period: 2, 5, or 10 minutes.

The *Desk Accessory Mover* is available from CE Software, 801 73rd St., Des Moines, IA 50312, 515/224-1995. Its list price is $15 (on approval). You can obtain ScreenSave from John R. Dance, 471 East 500 North #1, Provo, UT 84601. It is also available through MAUG on CompuServe.

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Lon Poole is a Contributing Editor of Macworld. □

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ThinkTank 128k ..... 77.
ThinkTank 512k ..... 129.

Magnum
McPic - Volume I ..... 31.
McPic - Volume II ..... 31.
The Slide Show Magician ..... 38.

Manhattan Graphics
Ready Set Go *(requires 512k)* ..... 89.

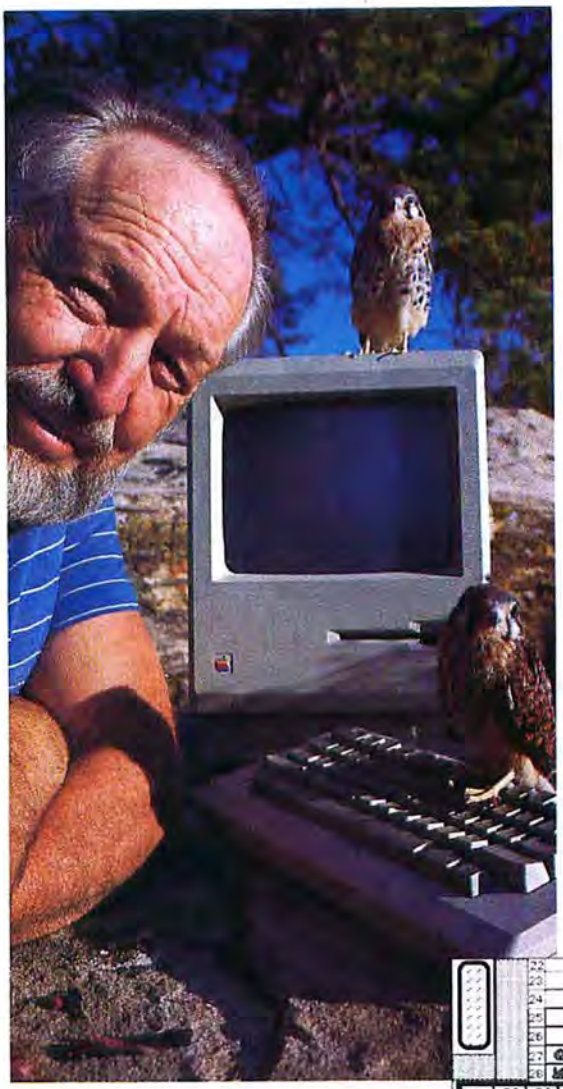
Mark of the Unicorn
Professional Composer *(requires 512k)* 289.

Microsoft
Entrepreneur ..... 32.
Learning Multiplan and Chart ..... 42.
Chart ..... 75.
Logo ..... 89.
Basic *(version 2.0)* ..... 92.
Multiplan ..... 107.
File ..... 117.
Word ..... 117.
Business Pack ..... 357.
Includes Word, File, Chart, and Multiplan.

Mac to nature.

WALK ON THE WILD SIDE.
When Bob Davison says he's going out, don't be surprised if he ends up spending the night filming a wild cougar giving birth. His choice of co-pilots for a cross-country lecture tour was a bear named Coco. And his housepets include coyotes, mule deer, pelicans, and bobcats.

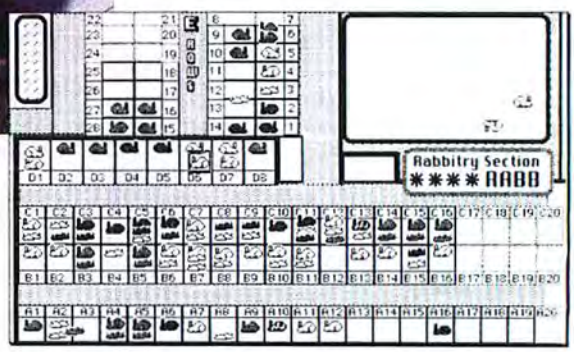
Bob's philosophy is pretty straightforward—"to live in genuine good fellowship with all creatures." His business, for the last twenty odd years, has been managing and photographing wild animals for shows like Wild Kingdom, Profiles of Nature, and Audubon Theater. He's establishing an organization, Nature-On-Cue, Inc. to help him keep up with the demand for wild animals who can act.



Bob's computer? One guess. His Connection? MacConnection—that wild mail order house in the untamed New Hampshire hills.

WHAT'S MAC GOT TO DO, GOT TO DO WITH IT?
Bob's as resourceful and inventive with his Mac as he is with his animals. His Filevision program for keeping track of his incessantly breeding rabbits won a 1st prize from Filevision for unique applications (and an article in InfoWorld). He also uses the Mac to keep accounts, and to write articles and a newsletter.

The newsletter, *Call of the Wild,* is vintage Mac, replete with illustrations of coyotes, dogs, alligators, and even a butterfly. Its purpose is to attract others whom Bob feels might be qualified to handle or photograph wild North American animals.



Bob has found that, "more and more people are finding reassurance and peace of mind in companionship beyond the boundaries of humanity." A sentiment all our customers can appreciate. No doubt.

My Connection.
MacConnection™

14 Mill Street, Marlow, NH 03456 1-800/Mac&Lisa or 603/446-7711

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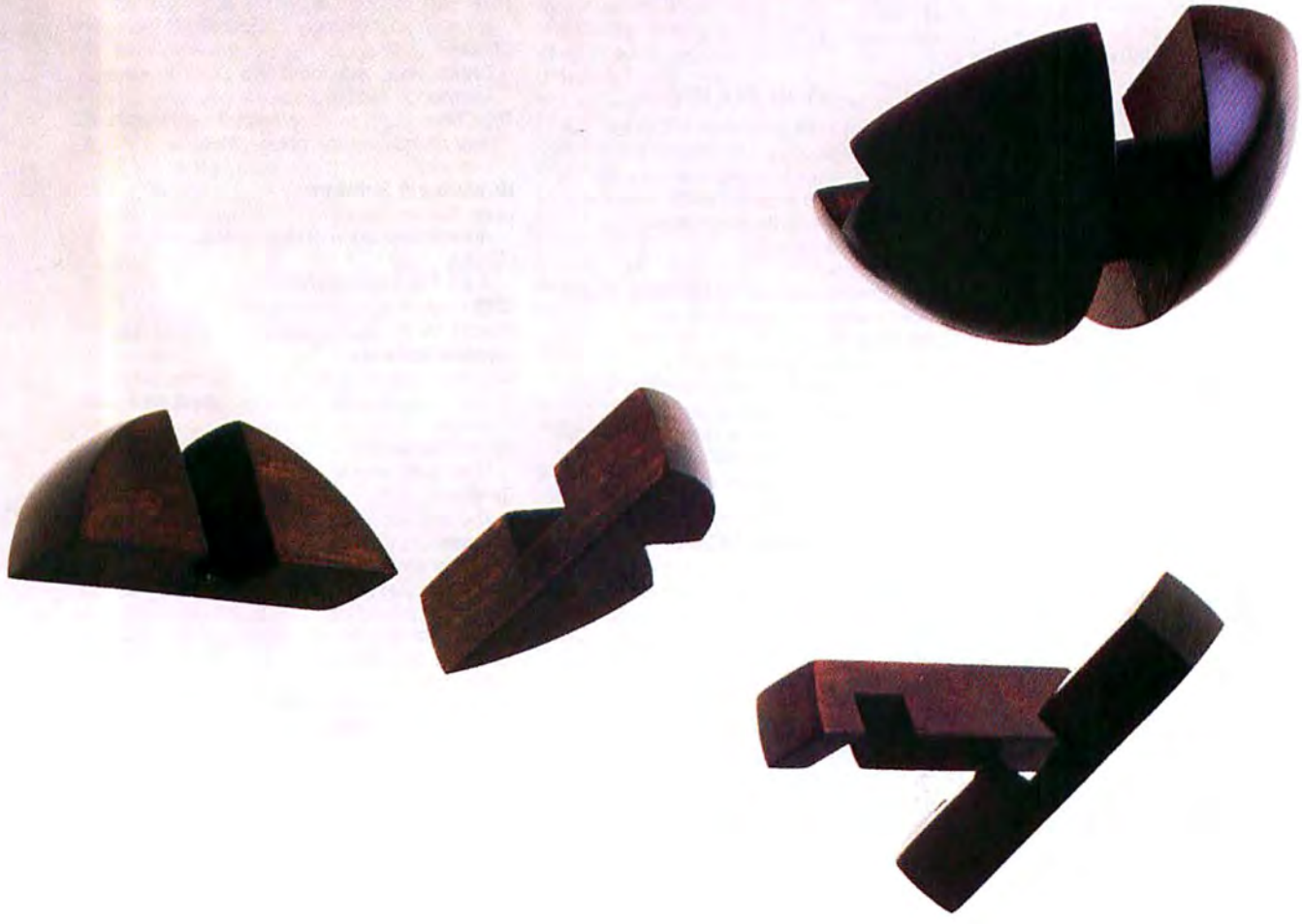
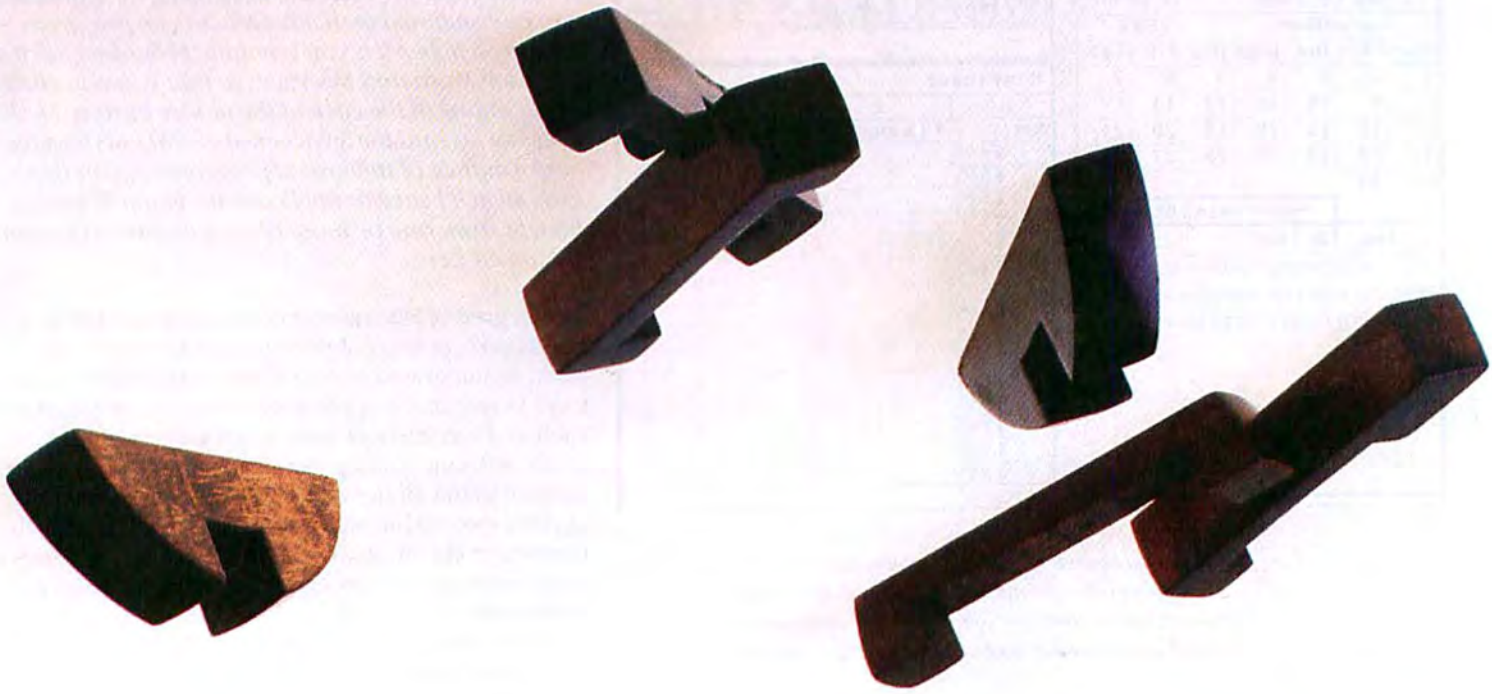
Circle 4 on reader service card

What Is Integration?





Danny Goodman

Among the latest products to vie for space on dealers' shelves is a new breed of Macintosh software: integrated programs. These programs, including Jazz, Excel, Crunch, Quartet, *and* Ensemble, *are the Swiss Army knives of Mac software; instead of combining blades, scissors, screwdrivers, and a corkscrew in one unit, they combine two or more applications, such as spreadsheet, graphics, word processing, database, or communications, within a single program. Because an integrated program lets you share data among applications without quitting the application you're running, you can significantly reduce the time you spend working in front of the Mac.*

Packaged integrated programs, however, are not the only route to integration. You can assemble a system that

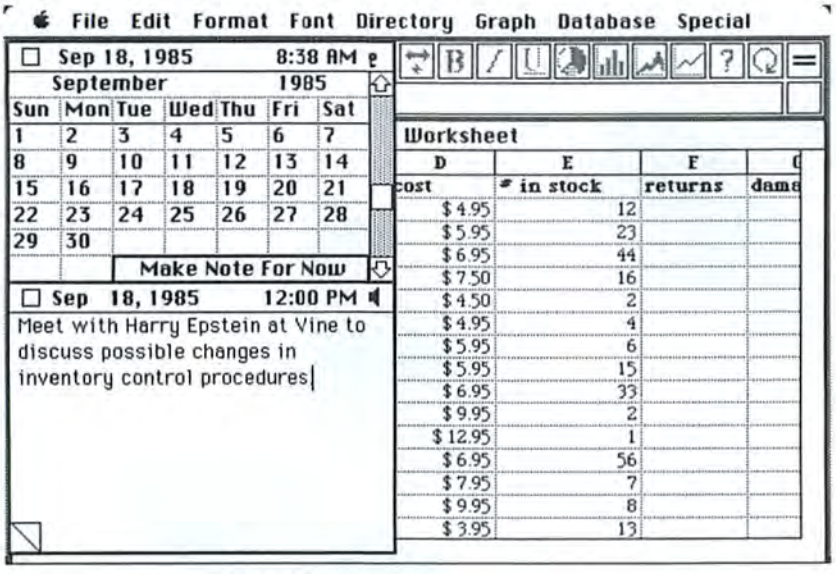


Figure 1

You can achieve a measure of integration by including desk accessories on your startup disk. If you are working on a Crunch *spreadsheet, for example, you can bring out your appointment calendar without leaving the spreadsheet.*

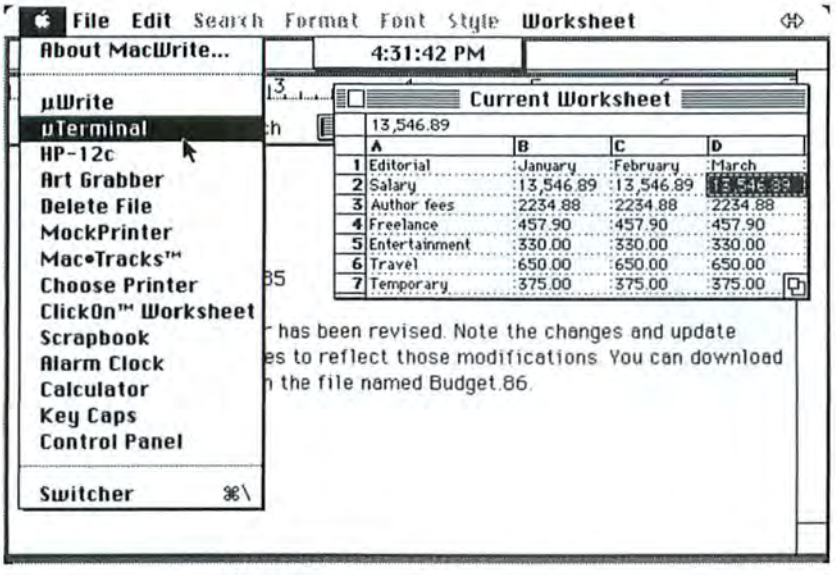


Figure 2

Desk accessories range from calculators and alarm clocks to applications like ClickOn Worksheet and MockTerminal. By loading the System file with desk accessories and using the Switcher, you can create an efficient integrated system.

blends several elements. Desk accessories like MockTerminal or ClickOn Worksheet, for example, can be combined with most Macintosh programs. Apple's Switcher lets you combine programs, such as Microsoft Word *and* MacPaint, *so that you can change applications at the click of the mouse button. Desk accessories and the Switcher also can enhance the performance of integrated programs. If you regularly switch between applications, you will likely benefit from one or more of the integration systems discussed here.*

The degree of Macintosh integration you achieve depends on how you combine programs. At the very least, an integrated system allows you to flip back and forth between the applications that you use together–such as a spreadsheet and a word processing program–without quitting the current application and returning to the Finder or the MiniFinder. The applications within an integrated system also usually have the ability to share data, and they have features in common with each other, such as similar menus and commands.

On computers other than the Macintosh, a common set of commands is a tall order, especially if you attempt to join programs from different publishers. Each program has a unique approach to sending instructions, even for basic tasks such as opening files and saving data. Macintosh programs, on the other hand, share a common set of commands; in fact, once you have worked with one Mac program, you know how to open files, edit text, save work, and exit in nearly all Mac programs.

Sharing data among programs means that you can put the information from a document in one application into a document in another application. Although not all applications can exchange data–for example, most database programs cannot accept *MacPaint* pictures–almost every Macintosh application uses the Mac's cut and paste commands to transfer data via the Clipboard. For example, you can copy the data in spreadsheet cells into the Clipboard and paste the data into a word processing document. With most programs, unfortunately, if the information in the spreadsheet changes and you want to update the word processing document, you have to recopy the data from the spreadsheet to the Clipboard and paste it again into the word processing document.

Programs like *Jazz, Excel,* and *Crunch,* however, utilize a data-sharing technique that circumvents the Mac's Clipboard (see the "Review" section of this issue). If you create a chart based on data from a spreadsheet, for example, and later alter the spreadsheet data, the chart is updated automatically. In effect, the information in both documents is dynamically linked; as you change the data in one document, its duplicate in the other document is similarly updated.

Desk Accessories

If you've ever selected the Calculator from the Apple menu to add numbers while typing a letter in *MacWrite* or *Microsoft Word,* you've had a taste of how desk accessories can build a rudimentary integrated system.

Desk accessories are miniature programs that can be opened from within a Macintosh application, even an integrated program like *Jazz* (see "Decking Out the Mac's Desktop," *Macworld,* March 1985). Some applications allow you to keep several desk accessories open simultaneously. Because desk accessories are limited in size, they often perform minor tasks like calculating simple equations or keeping the date and the time. The larger desk accessories, however, are scaled-down versions of complete applications.

If you need to integrate graphics into a word processing document, for example, Hayden's Art Grabber desk accessory lets you open a *MacPaint* document in a window atop the current application. You can then copy up to one screen-sized picture into the Clipboard for subsequent pasting into a document.

Some desk accessories, like Videx's MacCalendar, combine a notepad, a calendar, an alarm clock, and an appointment book in one accessory. Whether you are working on a spreadsheet in *Crunch* or writing a report in *MacWrite,* you can keep your appointment calendar and notes close at hand (see Figure 1). For people who need a simple spreadsheet with modest graphics, T/Maker's ClickOn Worksheet desk accessory gives you a worksheet of up to 1000 cells, depending on available memory, plus bar, line, and pie charts (see Figure 2).

The Switcher

Another way to integrate single-function applications is with the Switcher. Designed for the 512K Macintosh, the Switcher allows you to load two or more applications into a portion of the Mac's memory. The Switcher lets you go between applications almost instantaneously. However, the performance of applications and how many you can install in the Switcher depend on how much memory you allocate for each one. *MacWrite,* for instance, performs well in 128K, but *Microsoft Word* generally requires more memory to run smoothly.

The Switcher is a natural integration tool if you already use single-function applications like *MacPaint, Word, Filevision, Desk Organizer, FactFinder,* or *OverVUE* and have stored large amounts of data. Applications loaded into the Switcher must use the Clipboard to share data with other applications.

Primary Program Integration

Most integrated programs combine two or three applications, but their functions revolve around a primary application such as a spreadsheet. *Excel, Crunch,* and Haba Systems' *Quartet* are primarily spreadsheets, while Hayden Software's *Ensemble* is primarily a database. In some cases the secondary ap-

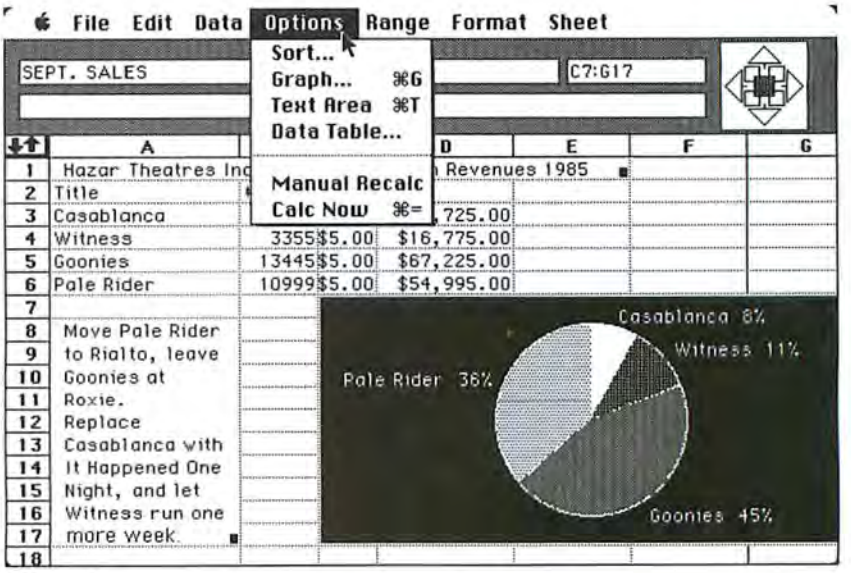


Figure 3

Most integrated programs combine two or three applications, but one application usually dominates. Quartet *is primarily a spreadsheet; its graphics, text editing, and database modules function within the column-and-row format.*

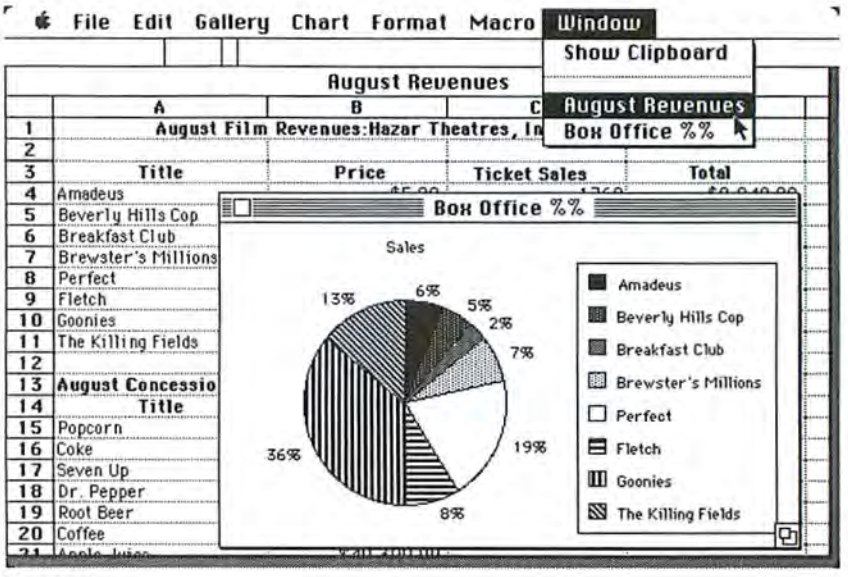


Figure 4

Integrated programs allow you to link documents from different applications. Data in Excel's *spreadsheet, for example, can be linked to a chart. Unlike most integrated programs,* Excel *has two primary applications: spreadsheet and graphics.*

Products for Macintosh Integration

Ensemble
Hayden Software Co.
600 Suffolk St.
Lowell, MA 01854
800/343-1218
List price: $299.95

Quartet
Haba Systems
15154 Stagg St.
Van Nuys, CA 91405-1025
818/989-5822
List price: $199.95

Excel
Microsoft Corp.
10700 Northup Way,
Box 97200
Bellevue, WA 98009
206/828-8080
List price: $395

Crunch
Paladin Software Corp.
2895 Zanker Rd.
San Jose, CA 95134
List price: $295

Jazz
Lotus Development Corp.
55 Cambridge Pkwy.
Cambridge, MA 02142
617/577-8500
List price: $595

ClickOn Worksheet
T/Maker Graphics
2115 Landings Dr.
Mountain View, CA 94043
415/962-0195
List price: $79.95

MockTerminal
CE Software
801 73rd St.
Des Moines, IA 50312
515/224-1995
List price: $30 (includes MockWrite and MockPrinter)

Art Grabber
Hayden Software Co.
600 Suffolk St.
Lowell, MA 01854
List price: $49.95

Switcher
Apple Computer, Inc.
20525 Mariani Ave.
Cupertino, CA 95014
800/538-9696, 800/662-9238 in California

plications are well-executed extensions of the primary program; in most cases, however, the secondary programs are like square pegs crudely whittled down to fit into the primary program's round holes.

Quartet's on-screen structure, for example, is a spreadsheet, which makes assembling numbers, graphs, and words into a multipage printed report difficult (see Figure 3). The other applications–graphics, text editing, and database–function inside the structure of the spreadsheet.

Ensemble has spreadsheet, graphics, and text-editing capabilities, but the database form serves as the primary program. You create a spreadsheet as a form with columns and rows of fields; each field can accept a number or perform a calculation on numbers in other cells. *Ensemble*'s text-editing capability is limited to printing merged database reports, such as form letters and invoices. With the exception of its charting feature, *Ensemble* is no more integrated than a single-function database program such as *Helix*.

In general, the secondary applications in integrated programs are less powerful than their single-function counterparts. One exception, however, is *Excel*'s prodigious graphics capabilities, which are based on *Microsoft Chart* (see Figure 4).

Jazz Integration

So far, Lotus's *Jazz* is the only Macintosh program that combines five applications in one (see Figure 5). Each application–spreadsheet, graphics, data management, communications, and word processing–has its own menu bar and control panel, yet the applications are similar enough to prevent confusion when you switch among them. With *Jazz,* data can be shared among the documents of different applications. Spreadsheet data, for example, can be linked to a

graph or a word processing document. Database information can be linked to a graph or merged into a word processing document. The communications program can transfer data received from another computer into a *Jazz* document, such as a spreadsheet.

Unfortunately, *Jazz*'s dynamic data sharing among documents from its different applications doesn't flow in all directions. I wanted to design a template in *Jazz* that would allow me to generate a spreadsheet and graphs from financial information that was entered automatically into the computer via database-type forms. However, *Jazz*'s dynamic data-sharing feature does not operate in that direction; information that originates in the database must be copied to the Clipboard to transfer it to a spreadsheet.

The integrated system that *Jazz* offers is not the right one for everyone. While the modules of *Jazz* can indeed be used successfully as individual applications, they lack the depth of single-function competitors. Fitting five applications into one 512K program means compromises. You can accomplish much more with Microsoft's *Multiplan, Chart, Word,* and *File* and *MacTerminal* than with *Jazz*'s five modules, though you may miss *Jazz*'s data sharing and ease of use. You have to judge, for example, whether *Jazz*'s spreadsheet is large enough for your work and whether you need power, such as *Excel*'s ability to automatically calculate data tables.

Integrated Choices

Nearly every Macintosh owner can benefit from some kind of integration. The type of integrated system you choose is important because you commit yourself to programs and data-storage formats that you will work with for some time.

If your work revolves around one application, then your best bet is a single-function program. For power users the limitations built into the components of an integrated program may prove frustrating. However, the primary applications of integrated programs like *Excel* and *Crunch* are designed for power users. Remember, though, that the program's secondary applications may waste disk space and memory, not to mention the extra cost you pay for functions you seldom use.

It is also important to analyze how the data is shared among applications. If your primary job is to analyze rapidly changing financial data in a spreadsheet, generate related business graphics, and combine the data and graphics into a word processed report, then *Jazz* would be a boon to your work. But if you want to create a database and perform minor graphic analyses of the data, *Ensemble* would be the appropriate choice.

Integrating applications with the Switcher is practical when the applications you use are not part of an integrated program. Installing *MacDraw* in a Switcher sequence with *MacPaint* and *Word,* for example, makes an impressive integrated system for people in the graphic arts business.

If spreadsheets are your major application and you find that you occasionally need another program—say, you need the depth of an *Excel* spreadsheet but write only simple reports about the data once in a while—then I would put *Excel* and *MacWrite* or *Word* in the Switcher. On the other hand, if you use primarily a word processor, then load up the System file on your *Microsoft Word* program disk with desk accessories like Art Grabber, MockTerminal, Mac Spell Right, and MacCalendar.

In your search for the ideal integrated system, follow this guiding principle: each element should streamline your work. That is what integration is all about. □

■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ *Danny Goodman is a Contributing Editor of* Macworld.

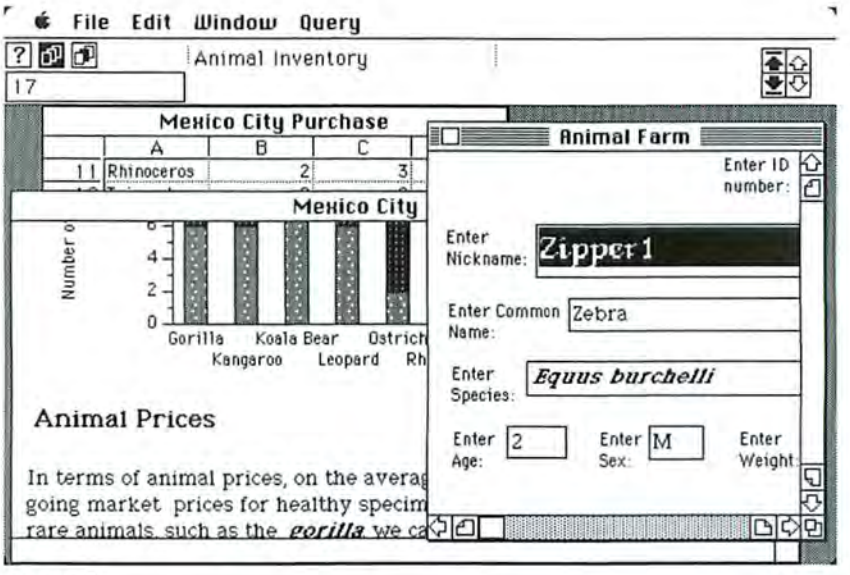


Figure 5

Jazz integrates five applications in one program. Although the individual applications have fewer features than their non-integrated counterparts, Jazz's simplicity and data-sharing capability make it an attractive integrated system.

All That Jazz

Gordon McComb

In the ballyhoo that surrounded the introduction of Lotus Development Corporation's integrated spreadsheet for the Macintosh, Jazz *was looked to as the answer to every Mac owner's prayers: a serious productivity tool that would outshine all others. My overall impression is positive, but weigh the pros and cons before you decide if the program is right for you.*

Like a small band, *Jazz* has five players that make a big sound. The *Jazz* quintet—spreadsheet, graphics, database management, communications, and word processing—is grouped together to let you work on a single stage. Because of the way the five applications share commands and data, creating a whole that is in some respects greater than the parts, it is best to consider *Jazz* as one program that carries out five functions.

At $595, you pay for the all-in-one personality of *Jazz*. Furthermore, to take advantage of the program's unique features, you need a 512K Macintosh and an external disk drive. A well-designed spreadsheet stands at *Jazz*'s center, although the word processor is the star of the show because of its strength as a presentation tool. The applications, as might be expected, are not quite as powerful as their single-function counterparts. The word processor, for example, is not as flexible as *MacWrite* nor as powerful as *Microsoft Word*, while the graphics application lacks some of the features of *Microsoft Chart*.

Scrutinizing *Jazz* only by the features of each application, however, misses the point. *Jazz* reveals its power in ease of use and integration—the ability to share data created by one application with the others. *Jazz* has two types of integration: dynamic and cut-and-paste. With dynamic integration, *Jazz* establishes a pipeline between the source and the destination application. If you change a number in the spreadsheet, for example, *Jazz* automatically updates the graph. When you no longer want the updates made, you can usually sever the link with the Freeze command.

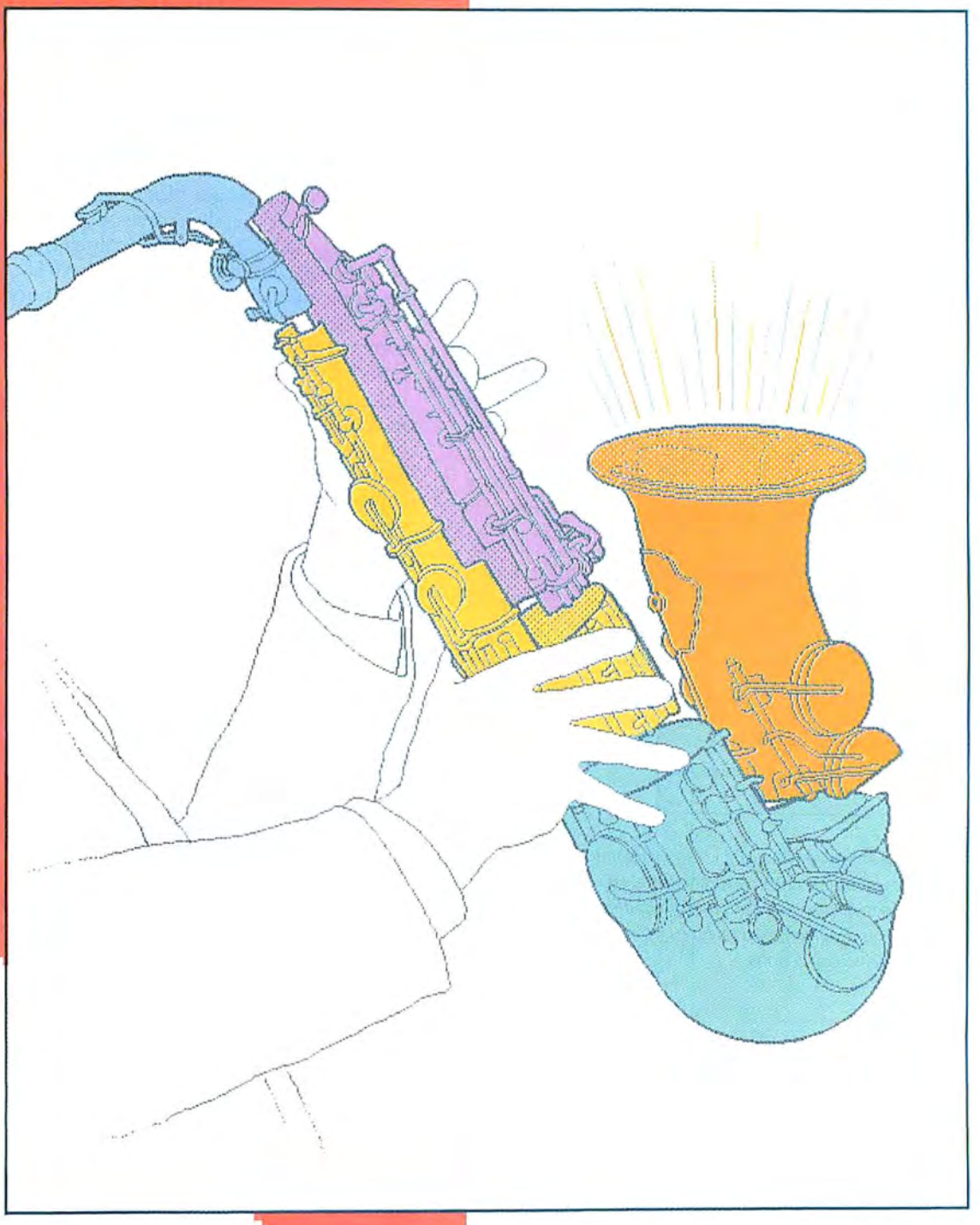
Jazz's dynamic integration transfers data more efficiently than cutting and pasting. The dynamic data sharing paths, however, don't work in all directions (see Figure 1). For instance, the spreadsheet and the database can be linked dynamically to the graphics, but you can't link the spreadsheet and the database. Since the word processor can be linked to all other *Jazz* applications, the word processing application is where *Jazz* is most integrated. To make connections between *Jazz* applications that lack dynamic links, the program falls back on the cut-and-paste method used to transfer information between other Macintosh programs.

The Big Band

Jazz comes with four disks—tutorial, startup, program, and backup—and impressive documentation. Crammed on the program disk is *Jazz* itself, all 380K of it. The startup disk contains the System Folder, a 12K conversion utility, and a file that allows you to update the System files of startup disks with code related to *Jazz*'s communications application. *Jazz* comes with version 1.1 of the Finder but works with version 4.1, which opens and closes documents faster than the earlier version.

You can move the conversion utility and the System update file to another disk, leaving about 160K free on the startup disk. Lotus recommends that you store data on copies of the startup disk. Because of the limited amount of available space on a startup disk, I strongly recommend using a hard disk with *Jazz*.

You can copy the *Jazz* program disk but must insert the original disk at startup. After the program loads, you can eject the original and insert a copy. Although I successfully copied *Jazz* to several hard



disks, including a HyperDrive and a MacDrive, I recommend that you thoroughly test compatibility between the program and any hard disk you own or plan to purchase.

When you start the program, you're greeted with the *Jazz* desktop, which contains four menus: Apple, File, Edit, and Window. All the applications have those menus as well as others specific to the application.

To create a new document, you choose New from the File menu, and a dialog box appears that allows you to choose the type of document you want to create. To open an existing file, you choose the Open command and select from the files listed in a dialog box (see Figure 2).

When you open a document, it appears in a window approximately two-thirds the size of the screen. You can resize and move the window or make it full size with the Zoom Up command on the Window menu.

The 512K Barrier

Jazz can keep up to eight windows open at once. But because *Jazz* keeps the contents of open documents in RAM, the maximum number actually depends on which applications you have open and how much data you have stored in the documents. For example, you may receive out-of-memory messages when you try to add information to a spreadsheet, a chart, or a double-spaced, 15-page word processing document—all of which are linked. The way *Jazz* uses memory also restricts the size of individual documents. If you have one large spreadsheet with formulas in the cells, you are again likely to run into the 512K memory barrier.

Jazz makes the problem worse by sometimes allowing you to get into a situation that causes you to lose a document. Several times I received an out-of-memory message from which there was no escape. I tried a number of techniques to reclaim memory, including reducing the size of the document, but whenever I issued a command, the out-of-memory message reappeared, like a tiger blocking every exit from a dungeon. I was unable to save or quit the document and finally had to restart the computer. To avoid losing documents, routinely check the About Jazz option on the Apple menu to see how much memory is available.

The way *Jazz* limits the number and size of documents to available memory is the program's most serious limitation, one that you should carefully consider before purchasing *Jazz* or, for that matter, any other memory-based program. *Jazz*'s strength is the way its design lets you share information among several applications, but memory management problems severely restrict the number and size of documents you can work with at once. If, like most people, you tend to produce modest-sized documents, such as a brief report with one or two charts and a one-page selection from a small database, *Jazz* is adequate. But if you expect to work with a single large document or with two or more fairly large documents at once, *Jazz* may not be a good choice.

In fact, the way *Jazz* uses memory makes it seem like it was designed for a Macintosh with more than 512K of memory. Perhaps with the advent of 1- or 2-megabyte Macs, *Jazz* can dress in a suit it doesn't outgrow so quickly.

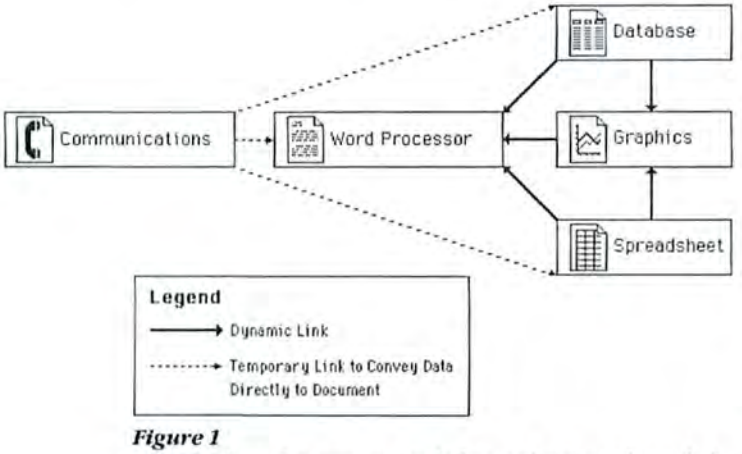


Figure 1

You can share data among Jazz's five applications through dynamic linking or cutting and pasting. Dynamic linking, however, doesn't work between all applications or in all directions. This diagram shows which applications can be linked and in which directions.

Rationing Memory

Until you upgrade to a 1- or 2-megabyte Macintosh, you can stretch available memory in several ways. You gain memory by turning off the program's Undo feature to save the space normally allocated to the Undo buffer, but you then have no way of restoring deleted or changed information. You can also keep the Clipboard empty when it's not being used. Also, if you have finished making changes to a document, you can save memory by freezing that document and any associated documents that you don't plan to update. For example, if you have a database that is linked to a chart that, in turn, is linked to a word processing document, you can choose Freeze All on the word processor's HotView menu to save the memory used to dynamically link the three documents. If you want to continue updating the documents, be careful to sever only those links you no longer need. Keep in mind

that when a document includes data that is linked to documents in other applications, those applications are active and using memory even if the documents themselves do not appear on screen.

Each *Jazz* application has its own menu bar; the menu bar changes to match the application in the active window. You can switch between documents by clicking the appropriate window or by selecting the document name from the list on the Window menu. The Window menu also contains a Reference Board option, which allows you to display the name of the last *Jazz* document you used, in case you get lost among the windows.

Though it's easy to switch between applications, the switch isn't always instantaneous. If several modules and document windows are open, you may have to wait as long as 10 seconds. Also, if a few applications are open and you're near the Macintosh's memory limit, you notice a slowdown in such tasks as formatting or entering information.

The Bass Line

Jazz's foundation is its spreadsheet, which is designed to accommodate 8192 rows by 256 columns of data. However, it's impossible to reach that theoretical maximum on a 512K Macintosh. Apart from this limitation, the spreadsheet's number-crunching capabilities compare to any spreadsheet available for the IBM PC.

With a full-sized window, the spreadsheet displays 6 columns by 16 rows, or 96 cells. You can display more columns and rows by selecting a smaller font. Any font, size, or style selection applies to the entire spreadsheet.

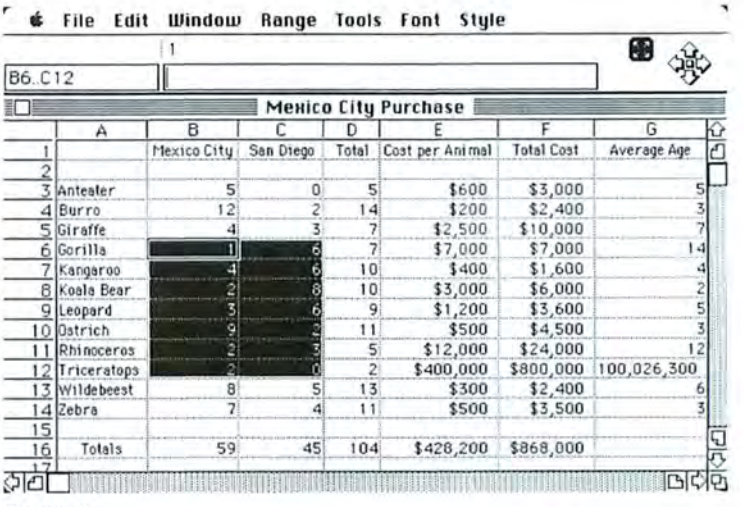
Figure 2

Jazz lets you open documents from its own desktop or directly from the Macintosh desktop. When you choose Open from Jazz's File menu, a dialog box appears showing a list of existing documents. You click All Types or one of the six application icons to view the document names in the selected application.

Each cell can accept one of three types of data: numbers, text, and formulas. As you'd expect from a Macintosh spreadsheet, you select cells by dragging or clicking. You move to adjacent cells with the Tab, Return, or Shift keys. You use either the navigator icons in the upper-right corner of the spreadsheet console or the scroll bars to display other parts of the spreadsheet (see Figure 3).

Jazz has nearly 100 functions for financial, database, mathematical, or statistical calculations. The functions, shortcuts to creating complex formulas, resemble those found in *1-2-3*, *Symphony*, and *Excel*. *Jazz* lets you use a function either by typing it or by choosing it from a list in a dialog box. You have to scroll through the long list of functions to find the one you want. I wish the program could automatically scroll to the approximate location of a desired function when you type its first letter.

Jazz provides features found in most spreadsheet programs, including cell protection, variable column width, range names, absolute and relative cell addresses, logical operators in formulas, and several text and number formats. The spreadsheet sorts cell entries alphabetically or numerically with up to three sort keys and finds the frequency distribution in a set of values.



	A	B	C	D	E	F	G
1		Mexico City	San Diego	Total	Cost per Animal	Total Cost	Average Age
2							
3	Anteater	5	0	5	$600	$3,000	5
4	Burro	12	2	14	$200	$2,400	3
5	Giraffe	4	3	7	$2,500	$10,000	7
6	Gorilla	1	6	7	$7,000	$7,000	14
7	Kangaroo	4	6	10	$400	$1,600	4
8	Koala Bear	2	8	10	$3,000	$6,000	2
9	Leopard	3	6	9	$1,200	$3,600	5
10	Ostrich	9	2	11	$500	$4,500	3
11	Rhinoceros	2	3	5	$12,000	$24,000	12
12	Triceratops	2	0	2	$400,000	$800,000	100,026,300
13	Wildebeest	8	5	13	$300	$2,400	6
14	Zebra	7	4	11	$500	$3,500	3
15							
16	Totals	59	45	104	$428,200	$868,000	

Figure 3

You can move around a selected spreadsheet range with the corner navigator, the small four-headed arrow icon highlighted in the upper right of the screen. The large symbol is the end navigator, which displays the cell at the end of the spreadsheet in the direction of the arrow that you click.

Like *Excel*, *Jazz* lets you calculate a range of numerical possibilities based on one or two variables with "what-if" tables. The tables help with tasks such as creating loan schedules and making business projections.

Missing Features

Lotus disappointed many would-be *Jazz* owners when it disclosed that the program would not provide macros. Macros save you time and effort by letting you assign a sequence of commonly used commands to a single key so that the program performs the sequence when you press the assigned key. I think most people would have preferred macros in the program over, say, the communications facility.

You can create a rough substitute for macros with Assimilation's Mac Tracks, which lets you record and "play back" a series of mouse movements and command selections. If you want to save a set of movements and commands, however, you need the storage space of a hard disk.

The *Jazz* spreadsheet also lacks split windows, a feature that lets you view two parts of a large spreadsheet at once. Split windows let you see the impact of entering a set of numbers in one part of the spreadsheet on another part without scrolling back and forth.

You can effect a split window by copying a range of cells from a spreadsheet into a word processing document and linking the two documents. Arrange the two windows so you can see both documents on screen. However, you can amend the spreadsheet only in its own application, not in the word processing document.

The spreadsheet's most serious shortcoming, however, is that it can't link spreadsheet documents. Linking spreadsheets allows you to see the effect of changes made in one spreadsheet on another. This capability is valuable, for example, if you want to see how adjustments to departmental budgets affect the division's bottom line.

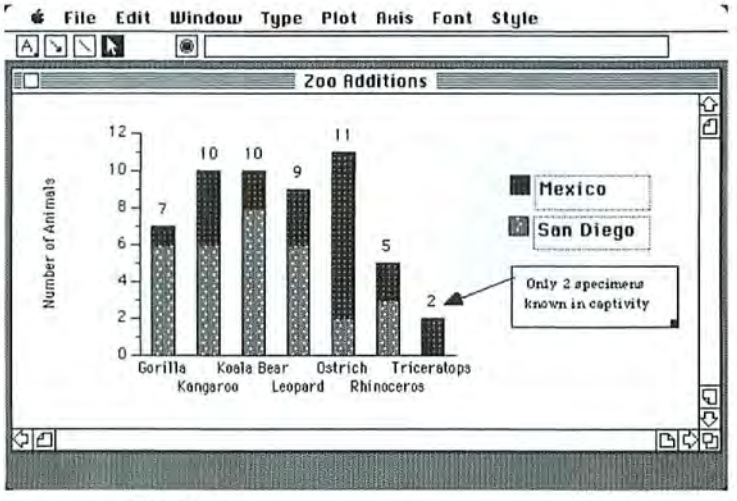


Figure 4

You create a chart from selected information in the spreadsheet by opening a new graphics document and choosing a chart type from the Plot menu. This stacked-bar chart was created from data selected in the spreadsheet in Figure 3. The boxes around the legend and labels permit you to type new text and change font and style.

Musical Bars

After the spreadsheet, *Jazz*'s strongest component is its graphics application. *Jazz* has a surprising number of graphics features for a program that has four other applications. You can create pie, bar, overlapped bar, stacked bar, line, stock marker (hi-lo), area, and scatter charts. You can mix and match chart types in one graph—a line chart superimposed over a bar chart, for instance.

To make a chart, you first select the data in a spreadsheet or a database that forms the basis of the chart. Then you open a graph document and choose a chart type from the Type and Plot menus. In a matter of seconds, the chart appears on screen. You can make an overlay chart by repeating the process. You can instantly change the chart type by clicking the graph and changing the Type and Plot menu selections. If you change a pertinent value in the spreadsheet or the database, *Jazz* automatically updates the graph.

Although the graphics module is dynamically linked to the spreadsheet and database manager, you can't freeze a graphics document so that it remains unaffected by changes to the spreadsheet or the database. The *Jazz* word processor has this important feature, and its absence in the graphics application is an oversight.

Jazzing Up Charts

Jazz gives you a lot of creative control over a chart's final appearance. You can transfer labels from the spreadsheet or the database to the graph or type in your own. You can also specify and position a title and a legend (see Figure 4). *Jazz* lets you add a subtitle or an annotation anywhere on the chart.

You can embellish charts by adding tick marks and grids; altering the patterns in bar, area, and pie charts; and picking new symbols for line charts. You can draw straight lines and arrows and change the font, style, and size of text in a chart.

Jazz's graphics module lacks built-in data analysis for drawing trend lines and moving averages and plotting a mean. This capability would help take the menial math out of creating statistical graphs.

JazzBase

Jazz's database manager doesn't match sophisticated single-function programs like *OverVUE* or *Helix*. Its strength lies in its ability to share data with other program components. Like the *Jazz* spreadsheet, the database manager can be linked dynamically to the graphics and the word processor. As previously described, you can create charts instantly from information in the database. You can merge names, addresses, and other data in a memo or a report created with the word processing application.

Theoretically, a *Jazz* database can store several thousand records, each composed of 100 fields. However, the size of files in *Jazz* is limited by available memory. *Jazz* provides several numeric and text formats. The program lets you enter information of any kind or, if you want, restricts the type of information you can enter to a selected format. You can also define formula fields, which calculate a specific entry based on information from other fields, or define an initial value so you don't have to retype information that remains the same throughout a field.

You determine the viewing width of the field column on screen, but regardless of what you see, *Jazz* stores a maximum of 254 characters per field. You add and complete records in any order, and you can leave fields blank.

A Database with Two Views

You can enter information in two ways: on a spreadsheetlike grid, in which each row is a record and each column is a field, or on a form you design yourself using *Jazz*'s form designer. With the form designer, you make a template to position fields of a specified length and type. You can choose type font, size, and style for each field (see Figure 5). As you type information into the custom form, the data is backed up automatically in the database grid. You can edit, add, or delete records and fields on either the custom form or the grid.

You can sort entered data to reorganize the information or search to find specific data. Like the spreadsheet, the database manager can sort up to three fields in either ascending or descending order.

You can search for exact or partial matches. When searching for partial matches, you use wild-card symbols such as an asterisk (*) or a question mark (?) to represent variable characters.

Jazz lets you define sorts and searches in the database with the logical operators also found in the spreadsheet, such as equal to, not equal to, greater than, and less than. You can also correlate information in two or more fields by using the AND or OR Boolean operator. You might use the AND statement, for example, to find all records with the same city and state, while you could use the OR statement to find all records of employees in the same department or job position.

Reports

The database manager also generates reports of the outcome of your sorts and searches. The report generator, however, is harder to understand and use than other *Jazz* tools. You create a report by using the commands in the Report menu and by filling out a Report Definition that tells *Jazz* which fields to include. You can add headers and footers to the report and print summaries, which can show totals, averages, or other information.

The database manager and the form designer are adequate for simple databases, such as lists of business contacts that you want to merge with letters, or records of sales revenues that you want to present graphically. I felt the real power and convenience of *Jazz* when I worked in the database manager, creating forms, reports, and graphs with ease. But people who create large and complex databases should purchase a single-function database program.

JazzTalk

Jazz lets you communicate with other computers. Since you can transmit *Jazz* documents and text files, you can, for example, send a report to a business associate who also uses *Jazz*. The communications facility also lets you connect to electronic bulletin boards or time-sharing services such as The Source. It also allows you to operate the Macintosh as a DEC (Digital Equipment Corporation) VT-100 or VT-52 terminal and

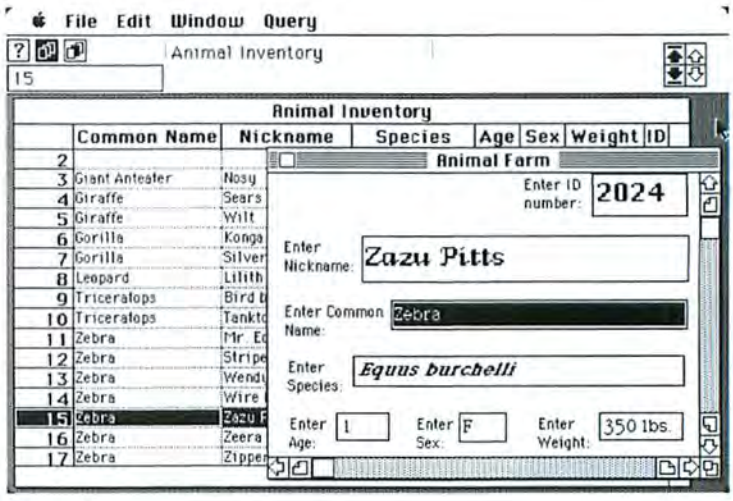


Figure 5

The database manager lets you look at information in two ways. The example shows a database grid entitled Animal Inventory in the background and a form called Animal Farm in the foreground. The form lets you enter or view records one at a time. You can place fields anywhere on the form and mix fonts and styles.

tap a DEC mainframe. You can search large databases, use programs, or send electronic mail using the mainframe.

The program's most valuable communications feature is that it provides a temporary link between incoming data and *Jazz* spreadsheet, database, or word processing documents, enabling the documents to receive data directly, without cutting and pasting.

The communications application also lets you specify how incoming data is *parsed*–broken down into chunks that *Jazz* can interpret and use. The parser allows you to control the interpretation of blank characters, carriage returns, tabs, commas, and other specialized characters. For example, the parsing feature lets you convert the columnar format of data from the Dow Jones News/Retrieval service so that *Jazz* automatically enters the information into cells for use with the spreadsheet or the database manager. If you want to avoid on-line service charges, you can receive data as a text file and later use the parser to transfer the text file into a spreadsheet or a database.

The communications application works with any modem, though its automatic answering and dialing functions work only with Apple, Hayes, or Hayes-compatible modems. You can store the telephone number and other communications settings, such as baud rate, by saving them with a communications document. The communications application can't automatically redial busy telephone numbers. *Jazz* also lacks communications macros, which let you automate the tedious log-on procedures of information services such as Dow Jones or CompuServe.

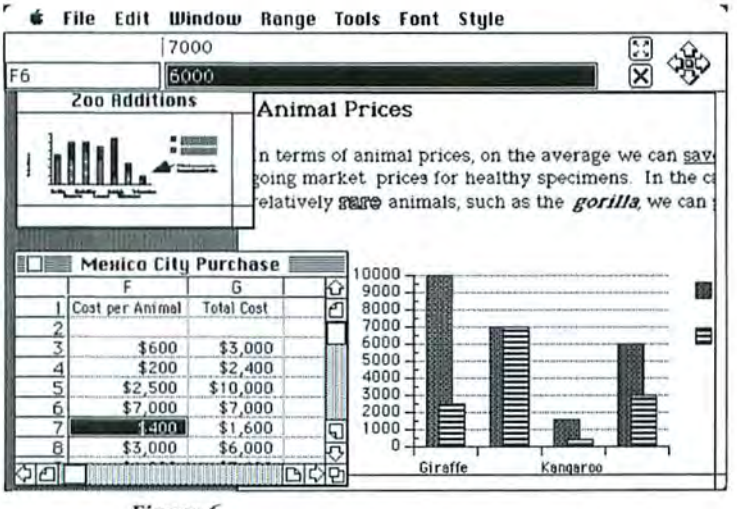


Figure 6

When you use a dynamic link to include information from other applications in a word processing document, changes in the original application automatically update the word processing document. The example shows a selected cell that is about to be changed in the spreadsheet. Because the spreadsheet is linked to a graphics document (shown in a miniature window in the upper left of the screen), which is also included in the word processsing document, the bar graph in both documents automatically reflects the new value.

Tying It All Together

Jazz's spreadsheet forms the basis of the program, but the integration of all five functions is greatest in the word processor. The word processor allows you to tie together in one document all the information you need from the assorted *Jazz* applications. As a result, the word processor makes an excellent reporting and presentation tool.

You can establish a dynamic link to a word processing document from any *Jazz* application except the communications module. To establish a link, you select the information you want to transfer, such as a chart. You open the word processing document in which you want to put the selected data and choose the Include command from the word processor's HotView menu. Once the information is included, any change to data in the original document automatically updates the word processing document (see Figure 6). If you do not want information in the word processing document to change, you sever the link by selecting the Freeze command from the HotView menu. Once the link is severed, it cannot be reestablished.

The *Jazz* word processor is comparable in performance and features to the original *MacWrite*. You can create headers and footers, insert formatting rulers, search and replace text, and control the font, size, and style of any character in the document. But the word processor can't set up multiple columns or allow superscripts and subscripts.

Still, the *Jazz* word processor has a few extra features over *MacWrite*. It lets you merge data from a database with a word processing template. The word processor also allows you to create documents up to 14 inches wide (the document window scrolls as you type). You can also set top and bottom page margins from the Page Setup dialog box.

Jazz takes a considerably longer time than *MacWrite* to open an existing word processing document. I measured the amount of time *Jazz* took to open a six-page, single-spaced document. The result: 51 seconds, compared with less than 8 seconds for a similar *MacWrite* document. A hard disk would reduce the wait.

Once again, because all *Jazz*'s applications are RAM based, available memory limits the size of word processing documents. In my tests, with no other applications open, I was able to write a 17-page, single-spaced document before I started getting out-of-memory messages. If you write long documents or reports and were annoyed by the length restrictions of early versions of *MacWrite*, avoid *Jazz* as a primary writing tool. However, for business correspondence and brief reports, the flexibility of the word processor and its

Reconcilable Differences

Jazz's capabilities take care of the most common computing tasks, but you may still want to use *Jazz* with other programs. Fortunately, *Jazz* has a high level of compatibility with other software. I tried *Jazz* with *MacWrite, MacPaint, Multiplan,* and other programs. In all cases I could cut and paste data between programs.

Jazz reads files created by *Microsoft Word* or *MacWrite,* but in text format only. It also reads *Multiplan* files if they are saved as SYLK files (SYLK is Microsoft's Symbolic Link format). *Jazz* translates all data from a *Multiplan* spreadsheet, including formulas and notation, except union ranges and the Show Formula and Link features.

In addition to converting Macintosh *Multiplan* files, *Jazz* also reads *Multiplan* files created on the IBM Personal Computer. You must first transfer all files to the Mac from the IBM PC before you convert them into *Jazz* format. You can complete the transfer of files between the Mac and the IBM PC with specialized software, such as *MacLink,* or over a network such as the one from Sunol Systems.

You can transfer Lotus *1-2-3* and *Symphony* files to the Mac from the IBM PC and convert them to *Jazz* files with a process similar to the one used to convert SYLK files. However, *Jazz* disregards window settings, macros, graph and query settings, and window splits. For the present, the reverse process–from *Jazz* to *Multiplan, Symphony,* or *1-2-3*–is not available, but a spokesperson from Lotus claims that new *Jazz*-compatible versions of *1-2-3* and *Symphony* will be available by the end of the year.

You might also want to use another application program, such as *MacPaint,* with *Jazz* to embellish charts and word processing documents. You can place both programs in the Switcher, but the size of the *Jazz* program and the way it uses memory leave little, if any, room to open a document.

ability to share data dynamically with *Jazz*'s other applications is more important than length limitations. But remember that the more applications you have active, the less memory you have to work with.

Overall Impressions

Jazz is not the Macintosh equivalent of the philosopher's stone. It is well thought out but has both strong and weak points. If you've already invested in other business-oriented Macintosh applications, like *Microsoft Word, Crunch,* or *Multiplan, Jazz* shouldn't force your expensive Mac software into early retirement. With the exception of the spreadsheet, the individual *Jazz* applications don't offer much over single-function programs. Furthermore, *Jazz*'s applications are restricted by the way the program manages memory. When you begin to attempt ambitious projects with *Jazz,* you may find yourself planning a 1- or 2-megabyte memory upgrade for the Mac.

Jazz is a good choice if you regularly exchange data between applications but don't want to fool with the Switcher. The way *Jazz* integrates tools for managing numbers and marshaling data with tools for creating reports is impressive. People who gather figures for presentation should seriously investigate *Jazz.*

Once you've considered *Jazz*'s strengths and weaknesses, deciding whether the program is for you is ultimately a question of cost and convenience. *Jazz* plays a new tune in software integration, creating an elegant environment that is easy to use and relatively simple to learn. And after all, simplicity and ease characterize the Macintosh spirit. □

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

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Jazz
Lotus Development Corp.
161 First St.
Cambridge, MA 02142
617/253-9150
List price: $595

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

The Excel Numbers Game

Lon Poole

Spreadsheet programs have a history of forming symbiotic relationships with personal computers. VisiCalc *and the Apple II helped sell each other starting in 1979;* 1-2-3 *and the IBM PC have done the same since 1983. Microsoft undoubtedly hopes* Excel *and the Macintosh will do the same starting now.*

Microsoft's *Excel* combines an advanced spreadsheet with presentation-quality graphics, a limited database manager, and macro capabilities. Microsoft's concept of "appropriate integration" contrasts markedly with the approach taken by manufacturers of other integrated products, which offer word processing, forms generation, communications, or a better database at the expense of advanced spreadsheet functions, graphics, and macros. If you want to integrate *Excel* with a word processor or another application, you need to use Apple's Switcher program, which is included on the *Excel* disk.

This preview is based on a prerelease version of *Excel* in which all of the commands and most of the convenience features were in their final form. However, it was impossible to conclusively evaluate the program's performance or reliability. Performance of the prerelease version, coupled with Microsoft's newly developed techniques for minimizing worksheet recalculation time, suggests the final version will be fast. The reliability question is less certain. Naturally, the prerelease version was not bulletproof. Microsoft's track record for reliability is mixed; some of its products have been free of serious errors upon release, but others have had problems.

Memory and Storage

The size of an *Excel* worksheet is limited by the amount of memory available. When *Excel* runs low on memory, it appropriates program memory for documents. Performance suffers because parts of the program must be copied from disk to memory more frequently. *Excel* can use up to 1 megabyte (1024K) of memory, although you cannot save a single worksheet that large on a 400K disk.

If you're a masochist, you can use *Excel* with one disk drive, but two drives are a practical minimum. The program is too large to fit on one 400K disk with the System file. Chances are you'll need one disk for the program, one for the System file and the Finder, and another for your documents. Using three disks requires disk swapping, even with two drives.

One way to eliminate the disk swapping is to use a hard disk. Its shorter access times improve program performance, too, especially when you're working with spreadsheets that fill up memory. Also, a hard disk has enough capacity to store any document you create, regardless of size. If you work extensively with spreadsheets, you'll find a hard disk indispensable.

Excel's Desktop

In a typical *Excel* scenario, several document windows are open simultaneously, showing different charts and worksheets (see Figure 1). Several windows can provide different views of the same worksheet. Only the amount of available memory restricts the number of documents and windows you can have open at the same time.

Worksheet and macro sheet windows can be split vertically or horizontally into two or four panes. Each pane can provide a different view of the same document, but the panes are semidependent because each one scrolls in unison with the pane above or beside it. Chart windows cannot be split.

To activate a window, point to it and click—if you can find it. On a cluttered desktop you could spend several minutes looking for a window buried beneath layers of full-sized windows. Fortunately, *Excel* has a Windows menu that lets you activate a window by choosing from a list of up to 18 window names; desk accessory windows are not listed.

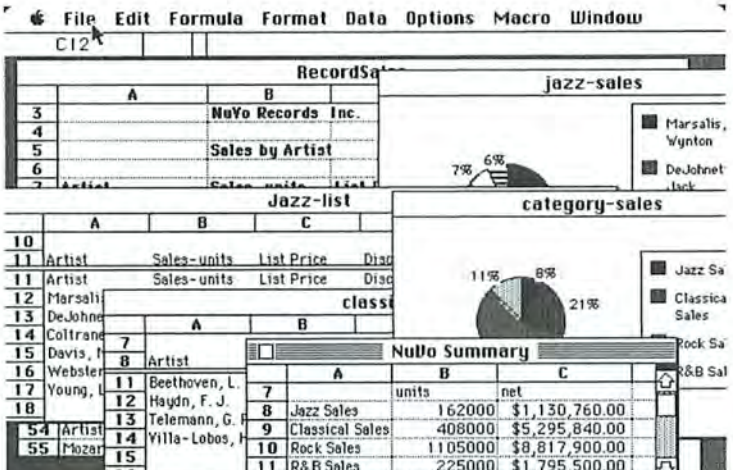

Figure 1

A sample Excel *work environment.* Excel *allows you to open as many worksheets and charts as will fit in memory. You can display different worksheets as well as multiple views of the same worksheet.*

Excel Worksheets

An *Excel* worksheet nominally has 256 columns and 16,384 rows—over 4 million cells. But in fact, you can create a worksheet that spans at most 10,000 to 45,000 cells in 512K of memory. With the prerelease version, I found that a 15,000-cell spreadsheet consisting of a simple mix of formulas and constant data pushed *Excel* to the limits of the Macintosh's memory. The more complex the worksheet and the more windows that are open at once, the fewer cells *Excel* can handle.

A cell can contain text, a number, a date, a time, or a true or false value. Instead of a specific value, a cell can also contain a formula. The formula can contain text, numbers, cell references, dates, true or false values, names, other formulas, and the operators that specify how to combine the elements of the formula. *Excel* has three cell-reference operators for producing a range, union, or intersection of cells in addition to the usual arithmetic, text, and comparison operators.

You can put together formulas using any of *Excel*'s 93 predefined functions, or you can define your own functions using *Excel*'s macro language. The range of predefined functions is wide, spanning mathematical, trigonometric, statistical, database, logical, text, financial, date, and special-purpose functions.

One of *Excel*'s unique capabilities lets you create formulas that include references to cell ranges, called *arrays.* For example, computing the total value of a stock portfolio without arrays requires a separate formula for each stock—value equals number of shares times price—and one formula to sum the values. With arrays, you can do the whole calculation with one formula.

If you're experienced with *Multiplan* or *1-2-3,* you'll appreciate the fact that *Excel* uses either *1-2-3*'s A1 or *Multiplan*'s R1C1 style of referencing cells in formulas. You can change conventions by choosing a menu option. Regardless of the convention you choose, you can use relative or absolute references, or you can mix the two.

Editing Worksheets

Excel offers the usual editing commands to use with the Macintosh Clipboard: Undo, Cut, Copy, and Paste. When you use Cut or Copy and Paste to move cells, *Excel* moves both the contents and the formats of the cells. With the Paste Special command, you can paste just formulas, just values, or just formats from the Clipboard to cells you have selected on any worksheet. Paste Special also lets you use arithmetic operations—addition, subtraction, multiplication, and division—to combine values copied to the Clipboard with the selected cells on the worksheet.

Excel has two Fill commands that are indispensable when you want to propagate formulas throughout the columns or rows of a worksheet. The Fill Right

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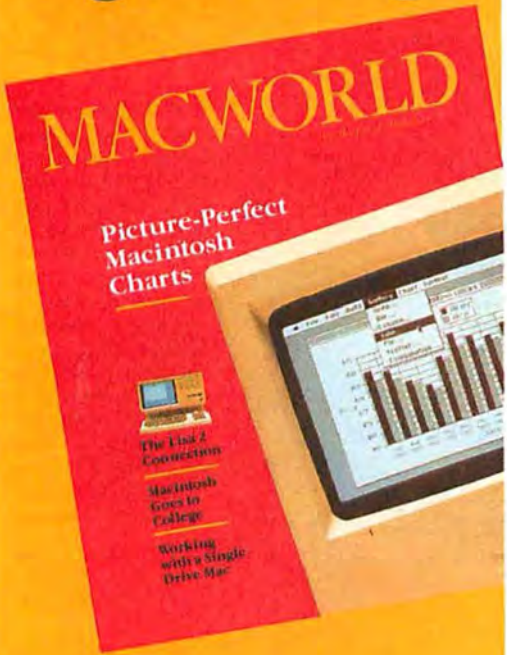

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command allows you to propagate the contents and formats of cells at the left edge of a selection across the rows to the right edge of the selection. The Fill Down command works from top to bottom. You can also set up a "data series" in a row or a column, wherein *Excel* adds (or subtracts) a constant value to each succeeding cell. Values in the series can increase or decrease linearly or geometrically or, if they are dates, by day, weekday, month, or year.

With *Excel* you can create a table from a set of formulas and a list of values for one variable; for example, you can construct a table of shipping charges from a list of weights and formulas for different shipping methods. You can also construct a table from one formula and lists of values for two variables; an example would be a table of monthly payments on a loan using lists of data for the interest rates and number of payments.

Worksheet Formatting

No other spreadsheet program matches *Excel*'s worksheet formatting flexibility, and for that reason, none matches its formatting complexity. You can show or hide grid lines; show or hide row and column headings; select any font and size for the whole worksheet; choose a normal, italic, bold, or bold italic type style for individual cells; align values within a cell; draw borders completely or partly around a cell or a group of cells; adjust column widths; and hide columns (but not rows). And though the display options are numerous, all are easy to use.

Formatting numbers, however, takes more practice. *Excel* uses pictorial templates to format numbers, a method that sounds intuitive but isn't. To format a number, you must arrange symbols, such as a pound sign or a zero, which act as place holders for digits. Then you must insert other symbols, such as a period or a comma, to indicate things like a decimal point or thousands punctuation. You can, however, avoid the symbols by choosing from 19 standard formats or by editing an existing format.

Linking, Printing, and Protecting Worksheets

Many spreadsheet programs let you link cells on one worksheet to cells on another. If a linked cell on the supporting worksheet changes, so does the linked cell on the dependent worksheet. *Excel* goes beyond other spreadsheets, allowing you to refer to external cells directly in formulas. This linking within formulas enables you to consolidate worksheets so that the formulas on a summary worksheet can refer directly to cells on the supporting worksheets.

Printing is another area where *Excel* goes beyond other integrated spreadsheets. You can print 50 percent reductions, preview a printed page easily, add headers and footers, and even configure the program for different printers.

For people concerned about security, *Excel* provides password protection. Worksheet cells can be individually locked, have their formulas hidden, or both. Access to a protected worksheet can be controlled with a password that you provide. However, the password is displayed when you type it, and anyone can read it over your shoulder unless you turn the screen brightness down.

Database Features

Excel allows you to designate any part of a worksheet as a database by selecting a block of cells and choosing Set Database from the Data menu. The first row of the database contains the names of the fields. Each succeeding row constitutes a different record, and each column a different field.

Excel's database is limited compared to a single-function database program and might better be termed a *list processor*. *Excel* can find, extract, or delete records from a database according to criteria you designate. You set up the criteria in any unused part of the worksheet or in a separate window (see Figure 2).

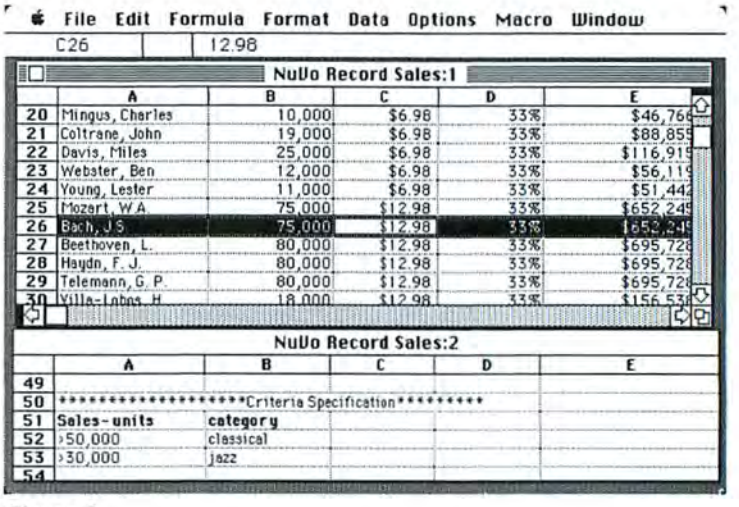


Figure 2

You can search a database by specifying a set of values, or criteria, in a particular field or fields. Here the criteria are defined in a separate window. When you select Find from the Data menu, the first entry meeting the criteria is highlighted.

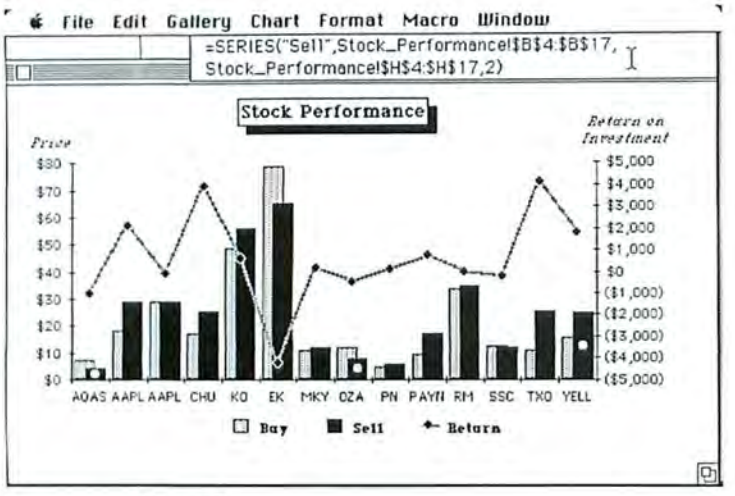
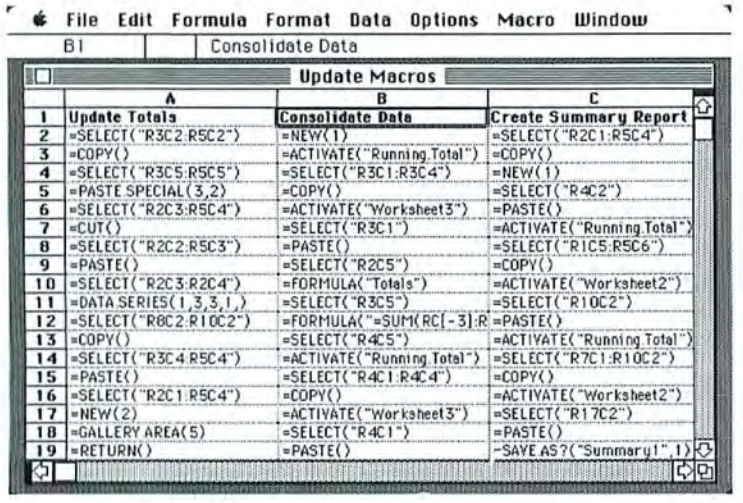


Figure 3

A combination chart. Here a line chart is overlaid on a column chart. Excel *allows you to add text, an arrow, and a legend. You also have control over the orientation and labeling of the axes and the tick marks.*



	A	B	C
1	Update Totals	Consolidate Data	Create Summary Report
2	=SELECT("R3C2:R5C2")	=NEW(1)	=SELECT("R2C1:R5C4")
3	=COPY()	=ACTIVATE("Running.Total")	=COPY()
4	=SELECT("R3C5:R5C5")	=SELECT("R3C1:R3C4")	=NEW(1)
5	=PASTE.SPECIAL(3,2)	=COPY()	=SELECT("R4C2")
6	=SELECT("R2C3:R5C4")	=ACTIVATE("Worksheet3")	=PASTE()
7	=CUT()	=SELECT("R3C1")	=ACTIVATE("Running.Total")
8	=SELECT("R2C2:R5C3")	=PASTE()	=SELECT("R1C5:R5C6")
9	=PASTE()	=SELECT("R2C5")	=COPY()
10	=SELECT("R2C3:R2C4")	=FORMULA("Totals")	=ACTIVATE("Worksheet2")
11	=DATA.SERIES(1,3,3,1,)	=SELECT("R3C5")	=SELECT("R1OC2")
12	=SELECT("R8C2:R1OC2")	=FORMULA("=SUM(RC[-3]:R	=PASTE()
13	=COPY()	=SELECT("R4C5")	=ACTIVATE("Running.Total")
14	=SELECT("R3C4:R5C4")	=ACTIVATE("Running.Total")	=SELECT("R7C1:R1OC2")
15	=PASTE()	=SELECT("R4C1:R4C4")	=COPY()
16	=SELECT("R2C1:R5C4")	=COPY()	=ACTIVATE("Worksheet2")
17	=NEW(2)	=ACTIVATE("Worksheet3")	=SELECT("R17C2")
18	=GALLERY AREA(5)	=SELECT("R4C1")	=PASTE()
19	=RETURN()	=PASTE()	=SAVE.AS?("Summary1",1)

Figure 4

A macro worksheet. When you select Start Recorder from the Macro menu, your actions are translated into Excel's *macro language and recorded on a macro worksheet. You execute the macro by selecting Run or pressing a ⌘-key sequence if one was assigned.*

Your criteria can include requests for records that have a specific value in a field or that have a value that bears a desired relationship to a stated value–for example, greater than, less than, or not equal to. Criteria can also be computed from formulas, since *Excel* evaluates the formulas when it inspects each record.

When you tell *Excel* to find the records that meet your criteria, the first matching record is highlighted. Clicking on the up or down arrow displays the next matching record in the corresponding direction.

The *Excel* database also lets you delete records or place copies in other parts of the worksheet. This feature comes in handy when you need to extract information for summaries and reports. You specify which fields you want copied and whether you want all, part, or even more than one copy of a field.

Sorting a selected block of cells by row or column is another task for which the database is well suited. You designate up to three key rows or columns and indicate whether each should be sorted in ascending or descending order.

Charts Excel

One of *Excel's* strengths is charting. The program incorporates nearly all the features of *Microsoft Chart*. You have a choice of 42 predefined chart formats, organized by type: area, bar, column, line, pie, scatter, and combination. You choose a type and then pick one of the standard formats from samples presented in a dialog box. You can customize any of the standard formats as well as reposition or eliminate the axes, the tick marks, the grid lines, and the tick mark labels.

For clarity, you can attach a pattern legend at the top, the corner, the side, or the bottom of a chart. If you want to label the chart with text, you can attach a title, an additional description of either axis, or a description of a single data point or a whole data series. You can select the style, the font, and the size of any text selection. You can also type unattached text and drag it anywhere in the chart window. However, I found that *Excel* gave me a limited choice of orientation, alignment, and position for unattached text.

If you need to point out a particular area of a chart, *Excel* allows you to draw arrows. You can move, resize, or change the direction of any arrow or assemble your own arrows by choosing from three sizes of shafts and 27 combinations of heads.

In addition to offering the formatting flexibility already described, the program lets you change the patterns of data markers, axes, the chart background, the plot area background, and arrows. You can change the pattern and weight of borders for the chart area, the plot area, the legend, the title, data markers, or text se-

lections. You can even add a shadow border to the chart area, the plot area, the legend, the title, or text selections.

One of *Excel*'s most advanced charting features allows you to overlay one chart on another (see Figure 3). The two charts may be different types and may even have different axes. For example, you might overlay a trend line on a column chart of actual sales figures.

Macros

A macro is a set of instructions that tell a program how to carry out a procedure or calculate a value. Once you set up a macro, you can execute the procedure or calculation with a few keystrokes or mouse clicks. Macros save you time when you perform repetitive tasks and allow you to create your own functions. The concept has proved immensely popular with users of *1-2-3* and other advanced spreadsheets whose macros are nowhere near as powerful or easy to use as the macros in *Excel*.

The ease with which you can create macros is another of *Excel*'s strengths. Many macros can be set up simply by carrying out the function you want the macro to do. Although you must carefully plan a macro in advance, *Excel*'s macro recorder eliminates the drudgery of typing instructions to carry out a particular calculation.

Excel can record your every working move. Your actions—selecting cells, entering formulas, and choosing from menus and dialog boxes—are translated into a sequence of formulas and stored on a macro sheet (see Figure 4). Most macro formulas use functions from *Excel*'s macro language. Some macro functions duplicate *Excel* menu commands. Others carry out actions that aren't accessible from a menu, such as selecting cells. Some functions ask for information using *Excel* dialog boxes or dialog boxes that you create. *Excel*'s macro language also includes functions for branches, loops, and subroutines, all of which control the order of macro instruction execution.

The macro recorder works well for basic calculations, but if you want to do something complex, such as automatically generating custom worksheets that prompt you for required information, you must write a program with *Excel*'s macro language.

Compatibility

With *Excel* you can exchange information with other application programs via the Clipboard. Cell values can be cut or copied as tabular text and pasted into a word processing document. Also, a worksheet selection or a whole chart can be copied as a fully formatted *MacPaint*-style picture.

If you need to work with spreadsheets created by other programs, *Excel* is extremely accommodating. You can open and save worksheets in *Multiplan*'s SYLK format and in *1-2-3*'s WKS format. You can also open, but not save, worksheets in *Multiplan*'s internal format and charts in *Microsoft Chart*'s internal format.

Documentation

Excel comes with two manuals, a quick reference guide, and on-screen help. The first manual has three sections: a tutorial, a how-to guide, and a reference manual. The second manual covers arrays, functions, and macros. The preliminary manuals are mostly clear, concise, thorough, and, not surprisingly, lengthy—about 400 pages, not including the reference section. You probably won't understand *Excel*'s more exotic features after a quick read of the manuals. Plan on several hours of study and experimentation to learn how to create a table, set up criteria for finding database records, use macros, and so on. The on-screen help, which you reach through the About Excel dialog box, was not included in the prerelease version of *Excel,* so I was unable to evaluate it.

In Conclusion

Excel is unquestionably the most powerful spreadsheet program available on any personal computer. Its closest competitor, the 4-megabyte (4096K) IBM PC version of Lotus Development's *1-2-3,* can create larger spreadsheets but has considerably fewer features and is far more difficult to use than *Excel*. *Crunch* is probably *Excel*'s main competition for Macintosh power spreadsheet users (see "The Multimillion-Cell Promise" in this issue). While *Crunch* has enough advanced features to make it interesting, *Excel* has so many more that it's worth the few dollars extra.

Less demanding spreadsheet users should not rule out *Excel*. Although the program's complexity makes it more difficult to learn than the other Macintosh spreadsheet programs, its convenience compensates for the handicap. Microsoft has built in an amazing number of useful double-click and keyboard shortcuts. Besides, the ability to open many windows concurrently, to split the windows, to make individual cells bold or italic, and to create first-rate charts make *Excel* a good choice even if you never use custom number formats, database features, arrays, or macros. □

▲▲▲▲▲▲▲▲▲▲▲ *Lon Poole is a Contributing Editor of* Macworld.

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Excel
Microsoft Corp.
10700 Northup Way
Bellevue, WA 98004
206/828-8080
List price: $395

The Multimillion-Cell Promise

Bill Grout

This integrated spreadsheet won't turn your Macintosh into a number-crunching powerhouse, but it is flexible and easy to use

The name *Crunch* implies a monster spreadsheet with mainframe number-crunching power. The program is a promising spreadsheet, but it makes a few promises it can't keep. You could potentially create a 2½-million-cell model with *Crunch* that would physically occupy a 20-by 208-foot ledger sheet. However, spreadsheets that large are well beyond the memory capacity of a 512K Macintosh, which can hold models of only about 11,000 cells—enough cells to create a desktop-sized spreadsheet about 4½ feet square. So *Crunch* keeps less than 1 percent of its multimillion-cell promise. If you're time conscious, consider that a Macintosh disk drive runs steadily for more than 5½ minutes to load a *Crunch* spreadsheet containing 11,000 cells. At that rate the Mac couldn't load a million-cell spreadsheet in less than 8 hours.

Yet *Crunch* has excellent features. It promises to be an excellent integrated spreadsheet if one or two performance shortcomings are eliminated in future releases.

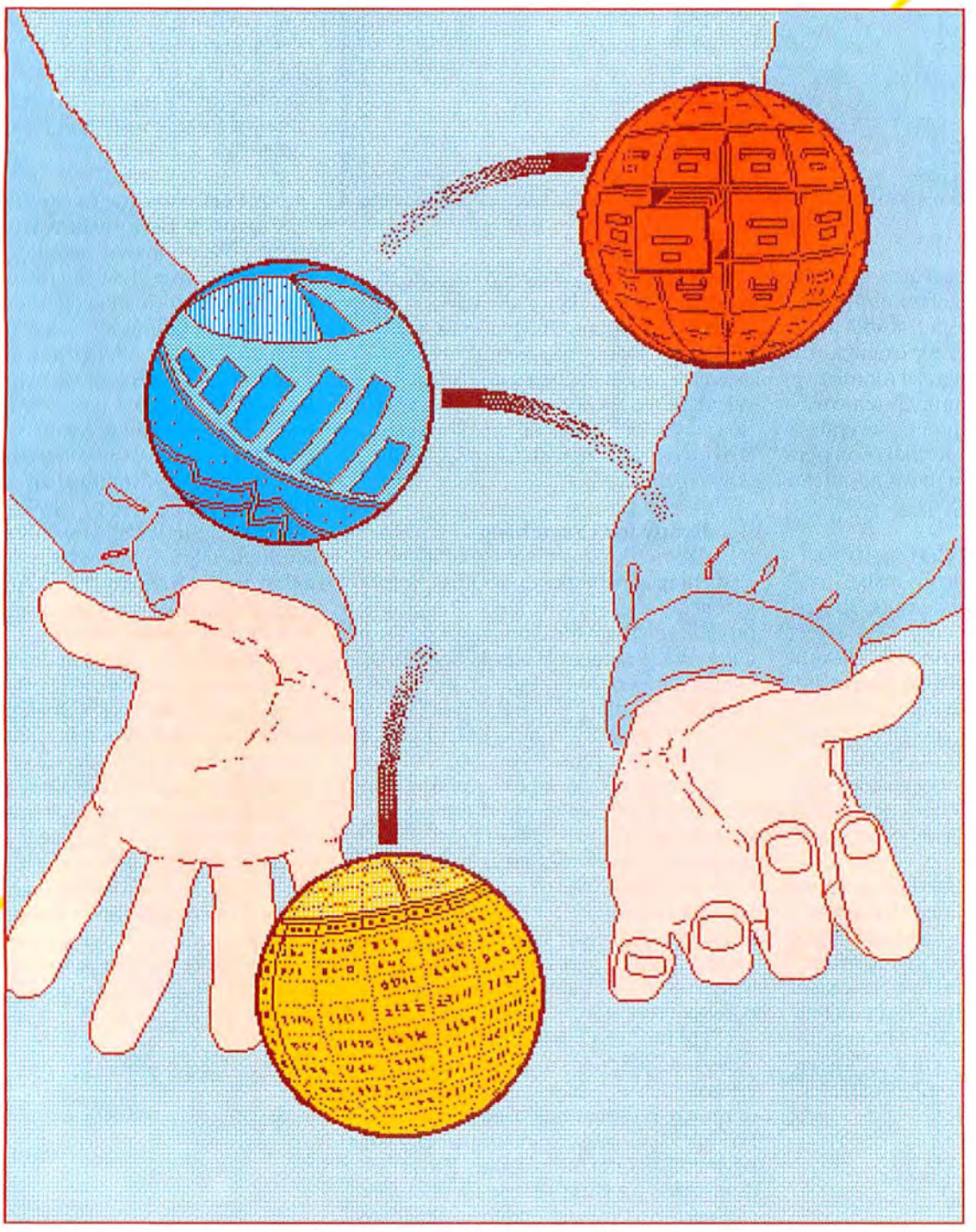
One Good Icon Deserves Another

On screen, *Crunch* looks like a spreadsheet wearing an Indian headband (see Figure 1). Just below the menu bar appears a bar of 21 icons. Each icon provides push-button access to spreadsheet options such as changing column widths or formatting cells to display dollar amounts. Although I intuitively understood the function of only half the icons on first sight, I quickly learned them all and used them constantly. The icon bar is *Crunch*'s most outstanding feature, providing an efficient and easy-to-use means of building spreadsheets.

Clicking the first icon on the left erases the icon bar, yielding more room to view the spreadsheet on screen. Clicking the second icon brings up a print menu, from which you can elect to print an entire worksheet, a selected section of a spreadsheet, graphs associated with the sheet, or notes describing a model. You can also print a directory of spreadsheet cell references, links to other spreadsheets, and graphs. Spreadsheets can be printed with the Imagewriter or the LaserWriter, and a printing option lets you reduce a spreadsheet's printed size by 50 percent.

Crunch's eraser icon deletes cells from the sheet and also gives you an inkling of the program's main strength: ease of use. After clicking on a cell and dragging until a block of cells is selected, you effortlessly complete a deletion by clicking the eraser icon. *Crunch* takes about 3 seconds to erase 300 cells—an adequate speed for a task that Lotus's *1-2-3* completes in 1 second on the IBM PC.

Crunch's fourth and fifth icons represent useful fill commands that automatically copy text, numbers, or formulas into ranges of rows or columns. *Crunch*'s fill functions can even produce sequences of numbers or names of the months in cell ranges. A common spreadsheet task is placing month names across or down the side of a model. With *Crunch* you can enter a starting month in a cell and automatically fill neighboring cells with consecutive month labels. With the Fill command or the similar Append command, you can also



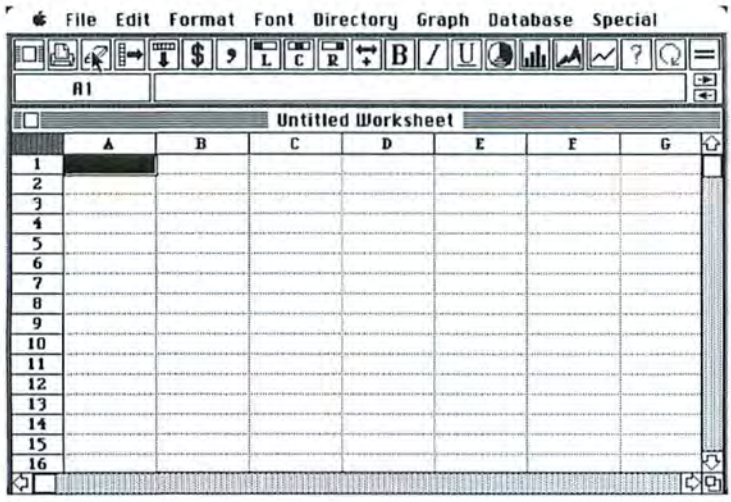


Figure 1
Crunch *provides 21 icons that enhance the program's ease of use. The icons provide easy access to common spreadsheet functions such as graphing, printing, cell formatting, and database searching.*

create number sequences. A growth factor increases or decreases the figures in each cell according to an amount you specify. In a forecasting spreadsheet, for example, the Append command's growth factor might be employed to predict future profits by extending present profit figures several months into the future. A formula or a percentage of estimated growth would spread the figures into adjacent cells.

The Well-Dressed Cell

Crunch's next nine icons make spreadsheet formatting a pleasure. To perform any of the icons' functions, you select a group of cells for formatting and click the desired icon. Two icons display figures as dollar amounts or with dividing commas. Three adjacent icons display cell contents centered or left or right justified. An icon sporting a two-headed arrow enables you to increase column width one character at a time for quick fixes when labels or figures don't fit in a cell.

Cells can also be dressed up to display boldface, italic, or underlined characters. You choose outlined and shadowed characters by using the formatting menu, which also lets you display figures as percentages, in scientific notation, with a fixed number of decimal places, or as units of thousands or millions. You can also format cells to automatically fill with a repeating character, such as a minus sign.

The icon bar also lets you create four types of charts and provides two icons for database functions. The bar's last icon, an equal sign, forces the spreadsheet to recalculate a model when automatic recalculation is turned off. For those who don't favor icons, all icon functions can also be carried out with *Crunch*'s pull-down menus.

Ready for Crunching

Crunch's assortment of number-crunching capabilities compares favorably to that of other spreadsheets. The program provides mathematical functions that sum and average ranges of cells. In addition, complex functions find square roots and exponential values, solve polynomials, round off numbers, compute factorials, and calculate logarithms.

Crunch provides 12 logical functions that compare values and perform calculations based on the results of the comparisons. *Crunch* also has 11 special functions that enable you to set up tables or lists of values to use for reference. For example, you can enter schedules for income tax withholding and sales commissions to which the model can refer when it prepares payroll reports.

For business applications *Crunch* provides nine functions to determine financial criteria such as loan payments, internal rate of return, present value of an annuity, net present value, present and future value of a payment, and net future value. The program also provides five date functions that can perform time-dependent calculations.

For research or scientific applications, *Crunch* provides 13 statistical functions for finding values such as the maximum, minimum, mode, and median values of a range, standard deviations, variance, random numbers, weighted averages of a range, and the highest- and lowest-ranked values in a list. Eight trigonometric functions can calculate values such as sine, cosine, tangent, arccosine, and arcsine. One function represents pi carried out to 15 decimal places. With such financial, mathematical, statistical, and logical functions, *Crunch* is on equal footing with most sophisticated spreadsheets.

A Performance Crunch

Crunch's performance as a spreadsheet is disappointing. Scrolling by one row or column is slow, and the more cells that display information on screen, the slower the scrolling speed. I eventually avoided scrolling whenever possible. I also found *Crunch*'s vertical scroll bar irksome. Because *Crunch* is set up to scroll 9999 rows, small movements of the scroll bar box jump a view of the spreadsheet hundreds of rows. Frustrating hairbreadth adjustments are needed to scroll within 50 rows of a desired cell. The only satisfactory scrolling function I found was clicking on either side of the scroll box to move one screen's worth of rows at a time—with a tediously slow screen refresh.

Crunch also occasionally mismanages the Macintosh's memory, displaying out-of-memory error messages when memory is not entirely filled. When I created a spreadsheet that took up 88 percent of the Mac's memory, *Crunch* did not allow me to use its Fill function because not enough room was available to load and execute it. After saving the spreadsheet on disk and reloading it, I discovered that 30 percent of memory had been freed, and I could then execute Fill commands. Saving and reloading a spreadsheet is an important technique to remember if you get in a jam for memory space.

Although the program is no speed demon, I found that *Crunch*'s execution of long recalculations was comparable to execution of identical recalculations with *1-2-3* on the PC. As spreadsheet sizes near the Mac's memory limit, however, the time required to enter numbers in cells slows. I found I could type the contents of a cell and press Enter and not see the results until about 2 seconds later.

Of the performance problems mentioned in this article, *Crunch*'s slow scrolling speed most hampers what I feel is an otherwise satisfactory spreadsheet. You should test *Crunch*'s scrolling before buying the first release. If you balance the program's performance against the ease of use afforded by the icon bar, *Crunch* is adequate for the spreadsheet needs of most users, but I don't recommend it if you expect your spreadsheets to fill large amounts of memory.

One-Button Graphs

Crunch produces graphs with the ease of taking Polaroid pictures: you click a button and watch a graph develop instantly on screen. You can produce a pie chart by selecting a row of cells and clicking the pie chart icon. Up pops a fully sliced pie on screen, complete with a legend and percentage comparisons (see Figure 2). For creating charts *Crunch* provides a much simpler method than do spreadsheets such as *1-2-3* and *Symphony*.

Crunch also lets you create bar, area, and line graphs. Labels and legends are automatically taken from the row and column that hold the text labels nearest the data range to be plotted. Graphs are drawn in three sizes: full screen, half screen, and matchbox size. A spreadsheet and a graph can share the screen, and you can plug values into the spreadsheet and watch the chart update immediately. Double-clicking on a graph brings up a menu for changing chart size and legends and for choosing whether a chart plots in column or row orientation. You can also title a graph, change its contrasting patterns, label the *X* and *Y* axes, and respecify the tick mark intervals along an axis.

Crunch's menus and automatic labeling work well most of the time. Some inflexibility crops up, of course, in the preset sizes and look of graphs. Axis labels sometimes overlap and become unreadable in small graphs. Also, to create charts that compare the data in two rows or columns that are not contiguous, you have to move the data together in the spreadsheet. But overall, *Crunch* has simplified the process of creating charts to selecting a range of data and clicking an icon. *Crunch*'s charts can also be transferred easily through the Clipboard to other programs like *MacPaint* and *MacWrite*.

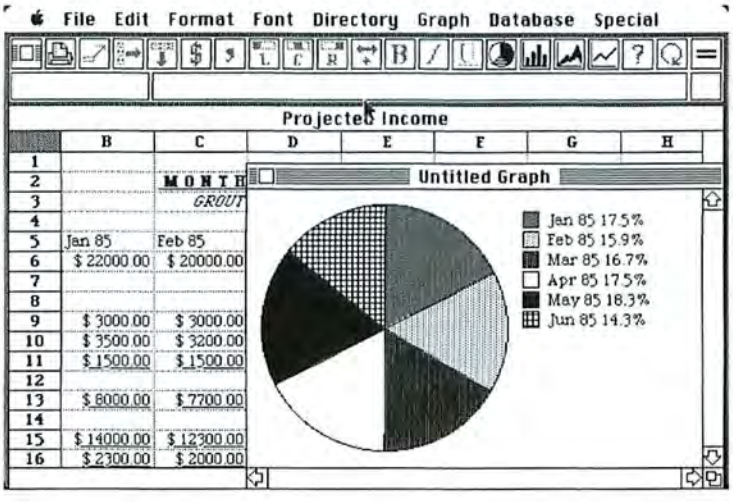


Figure 2
One of Crunch's *handiest features is the ability to create graphs, such as this pie chart, easily. You select a range of data and click on the pie chart icon. Charts are automatically labeled.*

A Database behind Venetian Blinds

Crunch's database capability is straightforward. It's easy to specify a range of cells as a database and query the database to find specific records. Sorting is swift and effective.

Database records are stored one per spreadsheet row. You specify a database by selecting a range of rows and making a menu selection that marks the database range. Since *Crunch* does not provide data entry screens and does not let you create your own, you always view records row by row.

You carry out a search by placing criteria in an empty cell above a database. For example, when you place the formula *?=1000* in a column, you initiate a search for any cell in the column that contains the value 1000. Searches can be made with several criteria for one or several columns of a database. You click the question mark icon to begin the search.

Records that don't match the criteria you set are masked from view, as if a venetian blind with missing slats were pulled to shield the view of the database. Records that match the criteria shine through. You review the results of the search by scrolling the database or clicking on the Next Match icon. *Crunch* also provides easy-to-use functions that delete records or copy records found during a search to a new location in the spreadsheet for examination or processing. A query function searches databases and makes mathematical calculations based on the search results. *Crunch*'s method of searching and displaying records is awkward compared to that of programs like *Symphony* that use data entry screens to simplify scanning and retrieving individual records. Searching a *Crunch* database, however, does not require setting up complex and sometimes confusing ranges, such as the criteria and output ranges needed for *1-2-3*.

Crunch's sorting runs quickly and smoothly. A database can be sorted on one key field in ascending or descending order. I specified a database of 300 records, each composed of five fields. One field held text, and four held numbers (not formulas). Sorting the database took only 3 seconds, whereas *1-2-3* sorted the same 300-record database in 8 seconds.

A Touch of Class

Crunch offers a number of classy special features. Up to six windows can be displayed and easily resized for compartmentalized views of spreadsheets. A zoom feature instantly enlarges a selected window to fill the screen. You can set spreadsheet labels to remain constantly in view as references during scrolling. Cells and ranges of cells can be named and used in easy-to-understand formulas. You might use cell names such as *Sales* and *Costs,* for example, to produce a formula like *Sales-Costs* instead of using less understandable cell references such as *B12-G55*. A spreadsheet can be displayed in a choice of fonts and type sizes, although you can't mix different fonts on one spreadsheet.

Additional features let you hide confidential information from view, protect cells from accidental changes, display and print spreadsheets without grid lines, assign passwords to spreadsheets to prevent unauthorized use, and record up to 2½ pages of text as notes for each spreadsheet. Although *Crunch*'s note taker is not a full-fledged word processor, it lets you enter and edit text, and notes can be transferred to other word processors through the Clipboard.

You can avoid squeezing large spreadsheets into limited memory space, since *Crunch* enables you to link spreadsheets so that one provides another with information. A central spreadsheet, for example, with links to several other spreadsheets saved on disk, automatically updates by using information gathered from the donor spreadsheets. Since linking consolidates several spreadsheets, you don't have to limit models to a size that fits the computer's memory.

If you frequently use functions or formulas specific to your business, *Crunch* lets you create formulas that you name and store in the program directory. Once you store the formulas, you can apply them to a spreadsheet model by invoking a directory name, which eliminates the need to type the same formula repeatedly.

With such sophisticated features, *Crunch* would be an excellent choice as a spreadsheet program if it weren't for the flawed scrolling ability. I recommend that until the problem is fixed, you request a demonstration of *Crunch* before buying.

Computer novices and people who do not require large, complex spreadsheets will welcome *Crunch*'s ease of use. I appreciated the program's simplicity when it came to creating charts and working with databases. Despite *Crunch* not meeting its multimillion-cell promise, it has excellent potential as an effective, easy-to-use program. ❑

▲▲▲▲▲▲▲▲▲▲ *Bill Grout is the author of* MultiMate and More! *from Addison-Wesley and* Symphony for Your Business *from Hayden Book Company.*

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Crunch
Paladin Software Corp.
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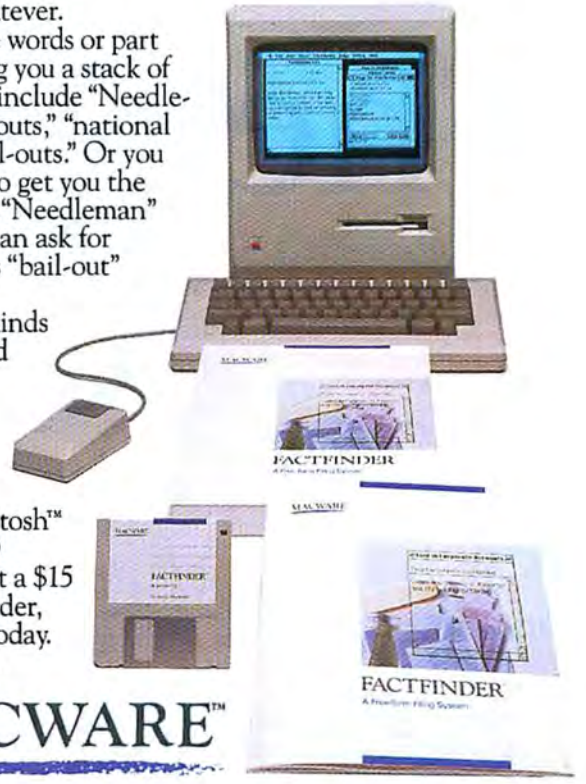

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The Spreadsheet Choice

Adrian Mello

Before the modern age, battles began with great ceremony. Opposing armies deployed across from each other in formations so well ordered as to be geometric. Once positioned, the forces awaited the fanfare that signaled the commencement of battle.

On the battlefield of Macintosh integrated software the fanfare has sounded loudly, but conflict between the two major contenders is unlikely to follow. It's as if the two would-be combatants marched onto the field only to discover battle lines so well drawn that actual conflict seemed unnecessary.

Both *Jazz* and *Excel* are designed for people who work with numbers—people, for example, who create and monitor departmental budgets or who calculate profits in relation to expenses. But *Jazz* and *Excel* have distinct identities. Both programs manipulate the same type of information, but each places a different emphasis on how the information is used. *Excel* is equipped for analyzing large and complex groups of numbers, while *Jazz* is the better tool if you want to share the significance of numbers with other people.

All for One or One for All?

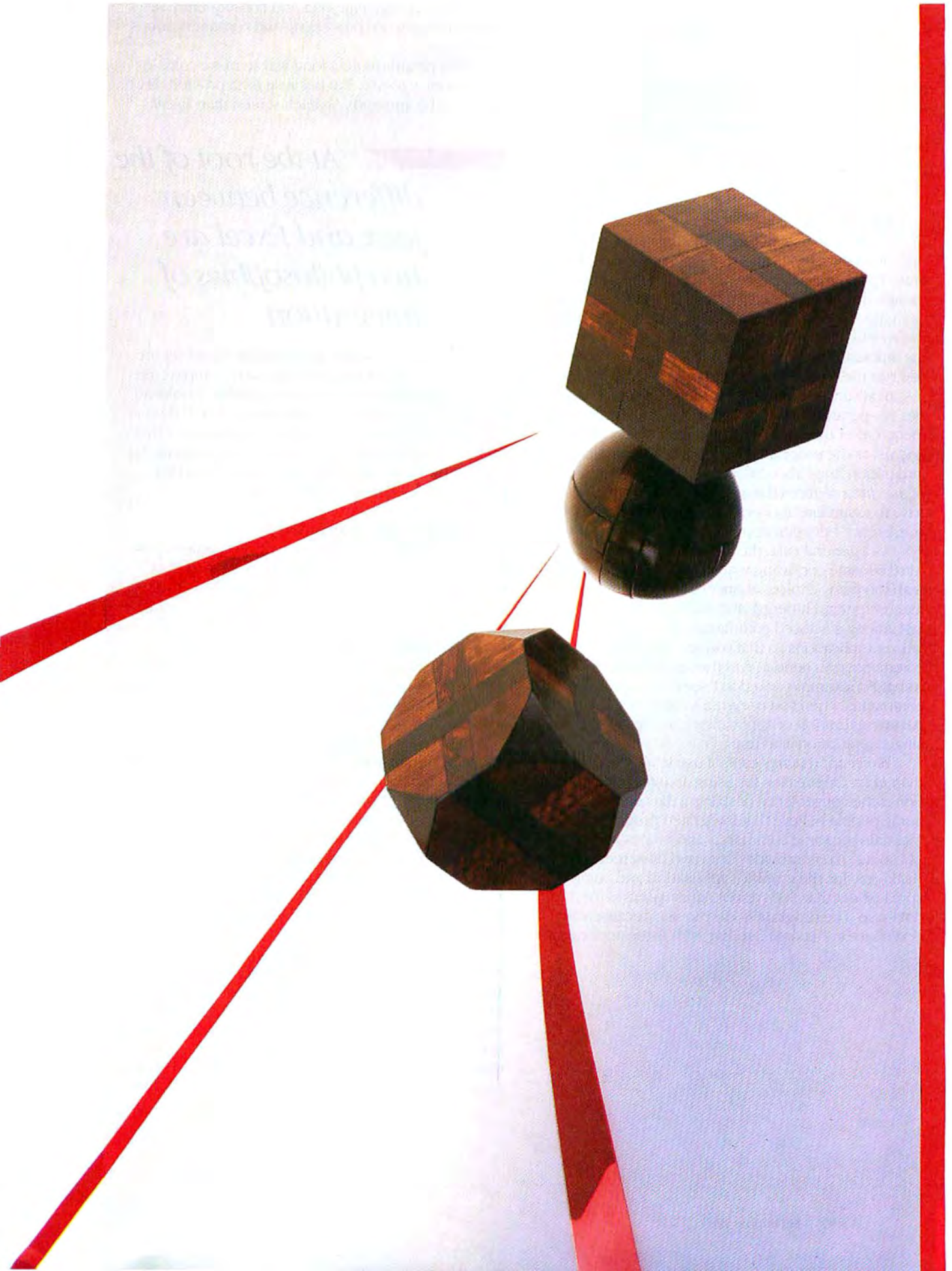
At the root of the difference between *Jazz* and *Excel* are two philosophies of integration. *Excel* combines a spreadsheet, which can double as a database, with graphics. *Jazz* integrates five distinct applications: spreadsheet, database, graphics, word processing, and communications.

Critics of the *Jazz* approach say that when people work, they tend to focus their efforts on one basic task, such as working with numbers. They believe that providing several applications only dilutes a program's effectiveness for the single task at hand.

Excel's single-purpose design represents a reformed approach to integration by emphasizing the analysis of numeric information. *Excel* is a good choice if, for example, you're a financial analyst who makes projections to investigate the impact of complex investment opportunities on profitability. *Excel* can handle large amounts of numeric information. The program has macros and user-definable functions to help automate a complex spreadsheet. The program also lets you create split windows to help you see how calculations in one portion of a large spreadsheet's landscape affect numbers in a remote section.

Jazz, on the other hand, is designed for people who regularly share numbers and other data with business associates. Although it has fewer features for analyzing numbers than *Excel*, *Jazz* is a more powerful tool for creating reports.

Jazz lets you combine all the information you create with the program, including numbers, data, and charts, into a word processing document. Once you include information from another application, such as the spreadsheet, you can embellish the otherwise plain appearance of that information with the many font and style options available to the word processor. The word processor also lets you see immediately the impact of any change to figures, data, and graphics from the perspective of the person reading the report. Furthermore, the way *Jazz* lets you organize numbers and data and then show them in well-designed graphs and reports encourages you to be creative with the in-



formation you present. Say you're creating a financial report that includes one graph showing quarterly earnings and another graph showing quarterly expenses. When you see the expenses graph in the word processing document, it strikes you that the bars are too short. You recall that this year's expenses are considerably lower than last year's as a result of a cost-cutting plan you implemented. So you decide to mention your achievement in the report and reinforce the point by creating a stacked-bar chart comparing both years' expenses.

Ease of Use

You might suspect that with applications and features linked together under one software roof, integrated programs would be difficult to learn. Even though they are complex, both *Jazz* and *Excel* benefit from the Macintosh user interface. The two programs use menus, dialog boxes, and the mouse to minimize the amount of information you have to remember as you run the software. For example, *Excel* makes macros, an advanced feature, easy to use; you record a series of operations by choosing a command from a menu rather than programming from the keyboard. But just as the programs have different approaches to integration, they also differ in the way they create ease of use. *Jazz* reduces the amount of information you have to assimilate at once, whereas *Excel* emphasizes consistency between applications.

As a general rule, the features of integrated software become confusing when they present people with too many choices at once. When this happens, menus appear cluttered, and simple commands get lost among advanced commands. *Jazz* compartmentalizes applications so that you see only the menus and commands you need to run the application you're using. For example, you don't see communications commands when you use *Jazz*'s database. The compartmentalization of applications also lets you learn a single application at a time.

Excel approaches ease of use in a different way than *Jazz*. One reason for using an integrated application is the convenience of sharing data and commands. Some people believe that integrated programs should maintain the same commands and menus for all applications. *Excel* provides only two on-screen formats—one for the graphics application and one for the spreadsheet that does double duty as a grid for the database. The program is easy to use because you don't have to become familiar with three applications and sets of menus. Of course, *Excel* joins together fewer applications than *Jazz* and consequently lacks *Jazz*'s built-in word processing and communications capabilities.

Both programs go a long way to make complex software easy to use. But because *Jazz* provides fewer menus and commands on each screen than *Excel* does, it is easier to learn. In fact, *Jazz* would set the standard for ease of use in the arena of complex integrated programs except for one problem. To take advantage of the program's convenience on a 512K Mac requires an awareness of memory management that contradicts the program's fluidity. Understanding the way the program uses memory is something that should not be expected of beginners.

At the root of the difference between Jazz and Excel are two philosophies of integration.

The Crunch Alternative

Jazz and *Excel* provide a pair of complementary alternatives for Macintosh owners, but the field of choices is even richer. People who chiefly analyze numbers and want to save a little money may want to investigate a third integrated spreadsheet called *Crunch*. *Crunch* provides a compromise between *Jazz*'s ease of use and *Excel*'s number-crunching capabilities. Unlike *Jazz*, *Crunch*'s first release has split windows and user-definable functions but lacks *Excel*'s macros.

Many people will find that *Crunch*'s icons for menu functions make the program easy to use. However, *Crunch* has annoying scrolling habits and the most limited graphics capability of the three spreadsheets. It has the fewest chart types, patterns, and fonts but may suffice for people who require simple graphics. *Crunch*'s most serious limitation is that it can't share data files with other spreadsheet programs. This limitation prevents you from updating spreadsheets you've already created with another program, such as *Multiplan*.

The best reason to choose *Crunch* over *Jazz* or *Excel* is that the program leaves free a reasonable amount of storage space on a Macintosh with floppy disk drives. *Jazz* and *Excel* use so much disk space that they monopolize a single floppy disk. This means that the System Folder must be stored on a second disk, usurping most of the space used for documents. As a result, both *Jazz* and *Excel* need a hard disk to

meet most people's storage requirements. In contrast, *Crunch* fits on a single disk with the System Folder, albeit with no room for desk accessories, leaving a second floppy disk entirely free for document storage.

Trials and Comparisons

Before deciding on the basis of design alone, check whether the program you're leaning toward has the features you require (see "Vital Statistics" on the following pages). Taking features at face value, however, can be misleading. For example, although the figure for maximum spreadsheet size indicates that all three programs can create huge spreadsheets, Macintosh systems currently available can't approach the maximums. To provide a more realistic comparison, I created a model spreadsheet with three columns of constant figures and two columns of formulas that average and sum the three columns of constants. I used the model to test the memory capacity of each program with the following results: *Excel,* 15,000 cells; *Crunch,* 7000 cells; and *Jazz,* 5700 cells (see Figure 1).

The same model tested the relative speed that the three programs took to complete a sample calculation. I changed a constant that triggered the recalculation of three columns of cells in a 1500-cell spreadsheet. *Jazz* and *Crunch* took 3 seconds to complete the calculations, and *Excel* took 4 seconds (see Figure 2). In *Excel's* case the timing comparison is not a completely fair test because I was working with a prerelease copy of the program. The release version of *Excel* should be at least as fast as the other two programs.

Also, as each program approaches the Mac's memory limits, performance tends to slow. However, because of the different way each program uses memory, performance problems depend on the program. For example, *Excel* works comfortably within the Mac's 512K of memory, but *Jazz* manages memory in a way that makes 512K barely adequate.

With the release of the three programs, the Macintosh has been blessed with powerful integrated software to fill out the application repertoire. These spreadsheets offer ease of use and power unprecedented on any personal computer. You must first decide whether an integrated program is right for you. But if you can benefit from the convenience and power of joining different tools in a single program, *Jazz, Excel,* and *Crunch* create powerful new possibilities for tailoring computers to your work. □

Adrian Mello is an Assistant Editor of Macworld.

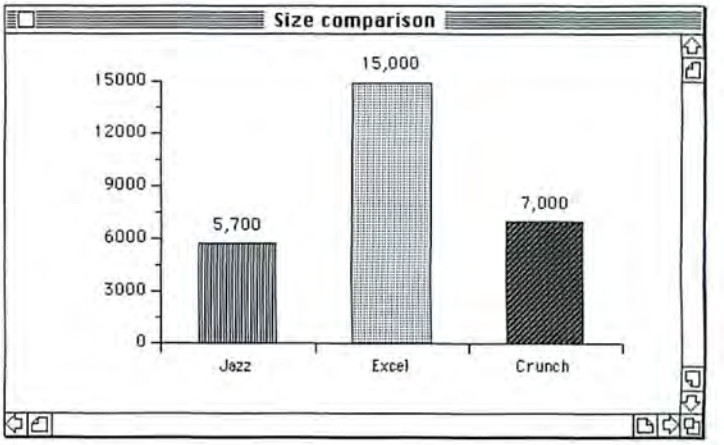


Figure 1

Although Jazz, Excel, *and* Crunch *can theoretically create huge spreadsheets, their size actually depends on the type and the quantity of information entered. This graph shows the results of a test comparing spreadsheet sizes when a model spreadsheet that included values and formulas was entered in the spreadsheet application of each program.*

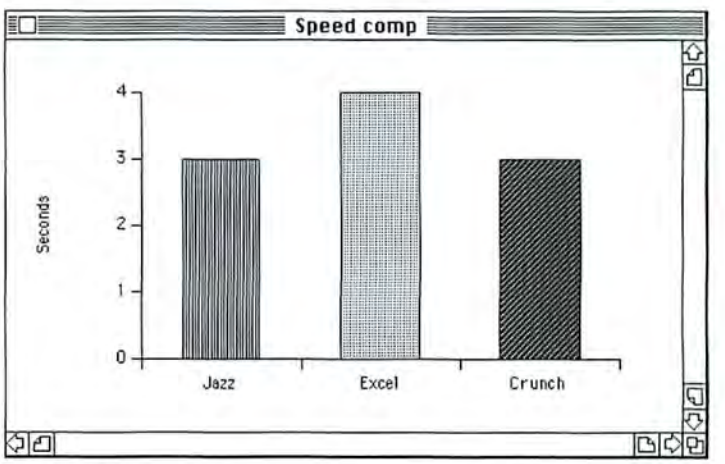


Figure 2

This graph illustrates the results of a test comparing how quickly the three spreadsheets could recalculate a sample change. We tested a prerelease version of Excel, *which should operate more quickly in its release version. The performance of all three programs varies depending on the complexity of a calculation and the amount of available memory.*

Vital Statistics

A comparison of the features and capabilities of Jazz, Crunch, *and* Excel *reveals the overall strengths and weaknesses of the programs. Based on the table,* Excel *offers more number-crunching power than its competitors.* Jazz *appears to be best at creating reports and sharing data, while* Crunch *is less powerful but easier to use than* Excel. *However, the vital statistics don't always provide the full picture–see "The Spreadsheet Choice" for an in-depth comparison.*

Vital Statistics

	Jazz	Crunch	Excel
Spreadsheet Features			
Maximum worksheet size[1] (rows × columns)	8192 × 256	9999 × 250	16,384 × 256
Worksheet linking	no	yes	yes
Cell protection	yes	yes	yes
Predefined functions			
Math	26	24	18
Statistical	7	13	18
Logical	18	12	10
Date and Time	11	5	10
Financial	5	9	8
String manipulation	17	0	7
Other	12	11	13
Total predefined functions	*96*	*74*	*84*
User-definable functions	no	yes	yes
Perform arithmetic on dates	yes	yes	yes
Cell naming	yes	yes	yes
Macros	no	no	yes
Macintosh fonts	yes	yes	yes
Mix fonts within worksheet	no	no	no
Mix styles within worksheet	yes	yes	yes
Ability to split windows	no	yes	yes
Graphics Features			
Chart types available	10	4	42
Graphs linked to worksheets	yes	yes	yes
Manual scaling permitted	yes	yes	yes
Combine chart styles	yes	no	yes
Patterns available	24	10	15
Fonts available	any	1	any
Ability to create arrows	yes	no	yes
Database Features			
Maximum number of records	8000[2]	9999	16,384
Maximum field length (characters)	254	125	255
Maximum number of fields	100[2]	250	256
Number of sorting levels	3	1	3
Form design capability	yes	no	no
Entry checking	yes	no	no
Computed fields	yes	yes	yes
Preset field contents[3]	yes	no	no

	Jazz	Crunch	Excel
'ord Processing Features			
aximum document length (single-spaced)	17-20[4] pages	2½ pages	n/a
earch and replace	yes	no	n/a
eaders and footers	yes	no	n/a
hangeable type styles	yes	no	n/a
ıclude graphics in document	yes	no	n/a
ata Interchange Features			
ıve as Lotus *1-2-3* document (IBM PC)	no	no	yes
pen Lotus *1-2-3* documents (IBM PC)	yes	no	yes
ıve as *Jazz* document	yes	no	no
pen *Jazz* documents	yes	no	no
ıve as Microsoft SYLK document	no	no	yes
pen SYLK documents	yes	no	yes
ıve as Macintosh *Multiplan* document	no	no	yes
pen *Multiplan* documents	no	no	yes
ommunications			
rminal emulation	yes	n/a	n/a
le conversion	yes	n/a	n/a
modem	yes	n/a	n/a
ıto-dial	yes	n/a	n/a
rinting			
deways printing (Imagewriter)	yes	yes	yes
5-inch Imagewriter	yes	yes	yes
ıserWriter	yes	yes	yes
onvenience Features			
hange column widths by dragging	yes	no	yes
ndo command	yes	no	yes
n-screen help	no	yes	yes
umber of windows opened at once[5]	8	6	unlimited
'indow menu for switching between open documents	yes	no	yes
ons for common commands	no	yes	no
witcher compatible[6]	yes	yes	yes

[1] The listed figures represent each program's actual limits. The maximum size of a worksheet depends on its design and on how much data from other portions of the program is in memory.

[2] Because *Jazz* stores all information in memory, the actual number of records and fields permitted varies depending on the size of the fields and on the amount of memory used by other open documents.

[3] While *Crunch* and *Excel* provide no specific field preset feature, you can obtain a field preset by typing the information in the appropriate field of the first record and using the Fill Down command to copy the information to subsequent records.

[4] Because an entire document is stored in memory, its maximum length depends on the amount of memory used by other active documents.

[5] The actual number of windows you can have open at once depends on available memory.

[6] You can load both *Jazz* and *Crunch* into the Switcher, but because of memory limits imposed by the programs, you cannot work with another application.

The Jazz Singer

Edited by
J. E. Arcellana and
David Ushijima

The long-promised release of Lotus Development Corporation's Jazz *prompted* Macworld *Publisher David Bunnell and Editor Kearney Rietmann to discuss the integrated program with Mitchell D. Kapor, chairman and chief executive officer of Lotus.* 1-2-3, *a spreadsheet program with database and graphics capabilities developed by Kapor and Jonathan Sachs for the IBM PC, took Lotus to the top of the software industry. For an encore the company developed* Symphony, *a five-function integrated program also for the PC.* Jazz, *which is only Lotus's third software product, marks the company's entry into the Macintosh market (see "All That Jazz" in this issue).*

Mitch Kapor has a B.A. from Yale University and an M.A. in psychology. Before helping launch Lotus, he authored the programs VisiPlot *and* VisiTrend *and was a product manager at Personal Software, which later became VisiCorp.*

In the interview, Kapor seemed to mean more than he was willing to say. "I was searching for my standard answer," he said to explain his tentativeness at one point. And when asked about a statement Apple chairman Steve Jobs was reported to have made that Lotus and Microsoft are in a software war, Kapor replied, "When I read statements like that, I remember what my parents taught me about manners." Excerpts from the interview follow.

Macworld: Jazz seems to depart from the approach that Lotus took with* 1-2-3. *How did* Jazz *evolve?

Kapor: We actually put together the effort to do *Jazz* in October 1983, before the Macintosh came out. We were impressed with the Mac and recognized two things right away. First, a successful business program would not work at 128K; we knew it just wouldn't fit. We understood that Apple would probably do a 512K Mac when the chips became available. So we weren't under time pressure; there was no machine to run the program yet.

Second, for *Jazz* to be what we wanted it to be, it would have to be completely written around the Macintosh user interface so that anyone who knows how to use *MacPaint* already knows how to use a lot of *Jazz*.

It didn't make sense to recreate a *Symphony* for the Mac except for a few concepts, such as the choice of the five functions for the integrated package. We also borrowed practically all of the worksheet internals, how the memory is organized in cells, and the original worksheet specification. That's it. Everything else is new, especially HotView, which is how *Jazz* shares data between functions.

Jazz is a much more general-purpose tool than, say, *1-2-3,* which appeals to people who work with numbers because of the quality of its spreadsheet and the way it increases productivity. We haven't targeted *Jazz* at power spreadsheet users who are heavily involved with *1-2-3* and *Symphony.* There are no macros in *Jazz,* for one thing. For another, the screen update on the Mac doesn't have the instantaneous zippiness of the IBM PC AT, though it's more than adequate for normal use. And there is no hard disk from Apple yet, though there will be shortly. So *Jazz* just doesn't have a power-user configuration.

But there are different kinds of power users. The vast majority of people will find *Jazz* more than adequate, and they would only be confused if they were

continued

Pushing to Excel

Edited by
J. E. Arcellana and
David Ushijima

Soon after the unexpected announcement of Microsoft Corporation's "multifunctional" Excel, Macworld *Publisher David Bunnell and Editor Kearney Rietmann had lunch with William H. Gates, chairman and cofounder of Microsoft.* Excel *represents a turning point of sorts for the Seattle-based company, which has distinguished itself as a developer and purveyor of stand-alone programs (see "The Excel Numbers Game" in this issue).*

As a Seattle high school student, Bill Gates teamed up with Paul Allen to start a company that used computers to analyze traffic patterns. Years later, while Gates was attempting to complete a Harvard education, he and Allen developed the first BASIC for personal computers and founded Microsoft to develop and market personal computer software.

Over lunch Gates was relaxed and informal, as freely associative in his humor as he was analytical about Microsoft's programs compared to others. In many ways he did not seem at all like the head of the second largest personal computer software company, using expressions like "Gimme a break" to punctuate a discussion of the vagaries of the software marketplace and a disclaiming, "No, I was just kidding–don't print that" after making a hyperbolic aside about certain software entrepreneurs. He deemed Steve Jobs's forecast of war clouds between Lotus and Microsoft "totally false," although he ventured, as both a non sequitur and an apology, that he talked longer than Mitch Kapor because Microsoft has more products.

***Macworld: What was your goal when you began work on* Excel?**

Gates: We've been working on this thing for two years now. We set out to set the state of the art in numbers tools, which really meant taking the standard set by *1-2-3* on the IBM PC and going one step beyond that. So *Excel* has incredible depth and amazing spreadsheet features, including the way it recalculates a sheet. *Excel* doesn't recalculate all the cells. The way it lets you work with and consolidate multiple sheets is totally different, and it offers simple things, like the ability to make a cell bold or italic, that *Jazz* doesn't.

Macworld: With features like a macro capability and the ability to link several spreadsheets, is* Excel *meant for the power spreadsheet user?

Gates: Yes, but *power* makes it sound like you have to pay a price to get those features. Being able to make a cell bold or to put sales data on one sheet and cost data on another sheet–those features don't make *Excel* a power sheet; they're just useful to people who get lost using large spreadsheets. People don't know where they put their data; their data crowds into each other. I think spreadsheets are super intimidating, so I'd say that anybody who works with numbers would use *Excel*–not just a power user.

In fact, the main thing people who're serious about working with numbers will have to decide is, do they buy an IBM PC with *1-2-3*, or do they say, hey–the Mac with *Excel* and the LaserWriter is a generation beyond–and make that choice.

I know people who have been very frustrated using *1-2-3*. There's this phenomenon in the computer market that if something's popular enough, everyone forgets it's hard to use. Because it's so damned popular, and there're so many books about it, and so many people use it, and you're stupid if you don't learn it, and everyone thinks it's going to be around–so why talk about the fact that it's hard to use? It's like traffic jams or something.

continued

told that it's not for power users. No product is a panacea. No product solves everybody's problems 100 percent. With *Jazz* we are trying to reach people in business, not just big business, who have general productivity needs and want a powerful program that is easy to learn and use.

Macworld: Is Jazz meant for beginners then, for those who aren't familiar with spreadsheets?

Kapor: It's for beginners, and it's for other people as well. *Jazz* isn't an underpowered product; it has substantial functionality. It's far more sophisticated than most people would ever want it to be. I think people will start using it, like it, and keep using it. *Jazz* is just such a pleasure to use.

Macworld: It doesn't offer the pleasures of a macro capability, though.

Kapor: Macros in *Jazz* would only scare people. And like I said, we've learned not to try to be everything to everybody with our programs, not to put in features that aren't expressly for our target population—features that would just wind up confusing everybody—which is not to say we could not do a power user's spreadsheet with macros based on *Jazz* technology. We certainly could, and the Macintosh could certainly handle it.

Macworld: Jazz integrates spreadsheet, database, graphics, word processing, and communications functions. What is the rationale behind this approach to integration?

Kapor: Our view of the universe is that there's clearly a need for a single product that you can stay inside of, that lets you do word processing, if that's your primary application, but gives you a spreadsheet if you need it and a database if you want that. The integration is convenient.

Let's say you're using a spreadsheet to do a report. You can include the spreadsheet in your document with the HotView command, and if you go back and change the spreadsheet, your report updates itself.

Jazz will probably distinguish itself as the product of choice because of its five functions, which are the most common business tasks. Even people who may not need all five functions will probably buy *Jazz* because the functions they do need offer so much that they get enough value out of the whole package. But if at the far extreme someone uses only one function, say a writer who's writing a book and doesn't use the computer for anything else, then quite possibly there's an argument to be made for buying another product. We're really targeting *Jazz* at the businessperson or professional, from the first-time user on up, who needs a product that is extremely straightforward but isn't short on power.

***Macworld: What do you think of combining several stand-alone applications, such as* Microsoft Multiplan, Chart, *and* Word, *with the Switcher as an alternative to* Jazz?**

Kapor: For capturing files directly from communications into word processing, for example, the Switcher is great, but you have to go through the Clipboard to move data from one application to another. The Clipboard is good at what it does, but there are other kinds of meaningful interapplication integration such as the HotView feature. We really think we have that integration right, which can make a difference to a lot of people. Plus, the Switcher has its limitations. You probably run out of memory faster than you would with *Jazz*, but—fine—I think the Switcher will find a place.

Macworld: Many people have been waiting for the arrival of* Jazz *to establish the Macintosh in Fortune 1000 companies. Do you think the Mac will succeed in business?

Kapor: I certainly hope so. But it's up to more than Lotus to make that happen. It's up to Apple Computer, Apple dealers, and the whole software community. The Mac really has the potential for business, and *Jazz* is one of the first in the crop of software designed explicitly for the Fortune 1000 companies.

The software, the AppleTalk network, and the LaserWriter have all come out just this year, so the fair test of the Mac in business is this year and next. But there is more to business and business computing than the Fortune 1000, in which Lotus is doing extremely well, of course. The vast middle market of smaller firms is not being outstandingly well served in all cases. We see the greatest opportunity for Apple and others where IBM doesn't have a lock.

Macworld: In what directions do you plan to take* Jazz *in the future?

Kapor: We see *Jazz* as the first in a family of products, but it's much too soon to know where we might go in terms of functionality and architecture. We have firm plans at this point to carry on *Jazz* in new projects, but first we're taking a vacation. □

***Macworld: What was the philosophy behind the decision not to make* Excel *an all-in-one program as Lotus did with* Jazz?**

Gates: Lotus is a great software company that we cooperate with in many ways. Lotus and Microsoft—surprisingly—have taken different philosophies of integration on the Mac. We both believe in the graphic user interface, and we each put a real investment into developing a great product for the Macintosh—but it just so happens we think they took the wrong philosophy and we took the right one. We'll see how that works out in the end.

When we announced *Excel,* we announced our entire philosophy for applications software. We said we'd go for depth products that really do the job the full way. We believe that we should offer such a product in each of three areas: numbers, words, and data. On the Mac, Microsoft's products are *Excel, Word,* and *File.* We should also offer the operating environment, whether it be *Windows* or the Mac, to tie those products together through simultaneous execution, data interchange, and a common user interface. In addition to giving you depth in the individual areas, part of our philosophy is to let you buy the pieces when you want them, or someone else's piece for one of the other functions if you want it.

Although *1-2-3* may have been developed under the rallying cry of integration, in fact the reason for its incredible success is not that integrating anything with anything else is a good idea but that *1-2-3* appropriately integrates the functions that people who work with numbers want to have, namely charts and an on-sheet database.

Macworld: One of* Jazz*'s most talked-about features is HotView, the ability to make a change in one document and have that change reflected in another document. Does* Excel *have a similar feature?

Gates: You can create formulas in *Excel* that dynamically link all its numbers activities, like between spreadsheets, between databases, between database and spreadsheet, and between chart and spreadsheet—as long as you're working with numbers.

But if you're writing a memo and you're switching back and forth between document and spreadsheet, then using the Switcher with *Excel* and *Word* would be a little more cumbersome than HotView. But in fact you'd do it differently. You'd do your numbers analysis and say, okay, I want to put it in a memo. In *Excel* you have to cut and paste your numbers analysis into your memo, which we don't think is a barrier at all. *Jazz* has hot links that let you edit the spreadsheet, and immediately the document changes.

But if you want to change a font or anything in *Jazz,* then you're in exactly the same situation as with a *Word* document. You have to break the link and edit the text. Then if you want to update the numbers, you have to get the numbers again and paste them in, like you would with *Excel* and the Switcher.

When somebody integrates functions so you can make this bold, make that italic, change the numbers, and have your changes carried over to another application—that's very impressive. Some tough technical issues get in the way of having that level of integration. That's one of the toughest problems of integrated programming, which there'll be some solutions to.

***Macworld: How will the availability of more memory on the Macintosh affect the future direction of* Excel?**

Gates: Memory is so cheap nowadays that there's no reason for Apple and others not to offer more than 512K in the Mac. Current versions of all Mac applications could take advantage of as many megabytes as you install in the machine because the 68000 architecture has a clean, large linear address space.

Macworld: The business world has been anxiously awaiting the arrival of so-called serious business software for the Mac. To what extent do you think* Excel *and* Jazz *will help the Macintosh gain popularity among the Fortune 1000?

Gates: The Mac has been viewed as a wimp's machine. It's easy to use, so people immediately get the idea that there must be some trade-offs. We've got to break this false impression that this machine has some lack of power, that ease of use equals simple. And *Excel* will go further to break that than anything.

I think the Mac will have a significant presence as the number-two machine in the Fortune 1000, no question. But that's really something. The graphic user interface is very compelling. The only reason I don't sit here and expound—hey, it'll really be dominant— is that windows and graphics are coming into the fore on the IBM PC. As a graphic-interface generation of applications is developed for the PC, then its position in business will remain dominant because while the PC will never be quite as good a graphics performer as the Mac, there are benefits from its upward compatibility. Over time Apple will have to continue to do other innovative things to capture a very large share of that marketplace. □

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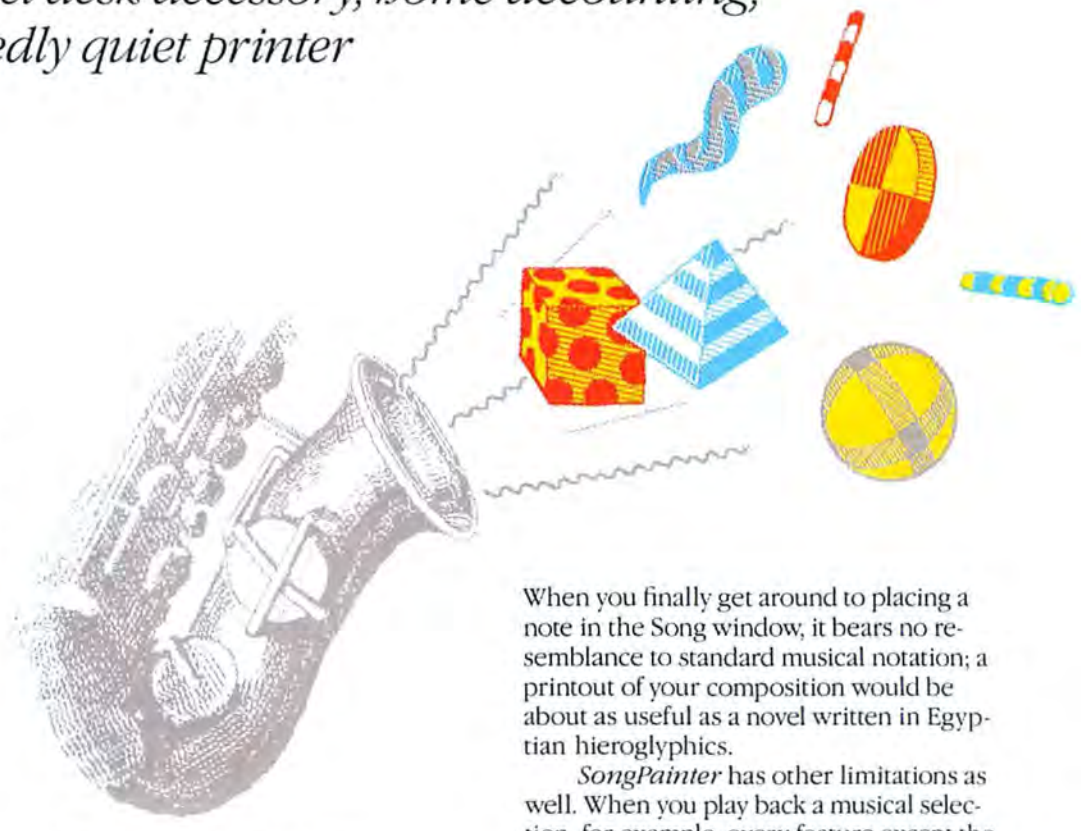
Macware Reviews

Visual music, a game with digitized sound, a spreadsheet desk accessory, home accounting, and a blessedly quiet printer

Edited by Erfert Nielson



Playing It by Eye

As I used ***SongPainter,*** I was reminded of *synesthesia,* a psychological phenomenon involving a perceptual crossover, in which stimulation of one sense produces experiences in another. The most common example of synesthesia is the phenomenon of "color hearing," in which particular musical notes consistently evoke the experience of particular colors. In one study, a subject reported the sensation of red on hearing the note C, violet on hearing D, pink on hearing F, and blue on hearing G, with identical results when the experiment was repeated seven years later.

One wonders if the programmers at Starcor, the company that created *SongPainter,* were thinking in terms of synesthesia when they developed this program. While it does not translate notes into colors, *SongPainter* uses visual images in the form of patterns and icons to represent tonal frequencies and waveforms. The note B is represented by a polka-dot pattern, the note A by checks, the note G by vertical stripes, and so on (see "Musical Windows"). In addition a note's waveform, or timbre–the quality that gives each instrument its unique sound–is represented graphically by a musical instrument group, such as strings or woodwinds. Each group is broken down into individual instruments to represent a specific octave range for the waveform. The top left window in the figure "Musical Windows," for example, shows four of the eight instrument groups and the four tonal ranges within each group. The other four groups appear when you click the More Instruments box.

Composing by Clicking

SongPainter's main window is the Song window–the large window on the right in "Musical Windows"–and is the closest thing *SongPainter* has to a musical score. You use a paintbrush-shaped pointer to select each note's characteristics, such as tonal range, timbre, and duration. Then you click a cell in the Song window, which deposits a pattern and an icon into that cell. You select tonal characteristics by clicking the appropriate boxes in the left-hand windows, timbre and tonal range by clicking a musical instrument icon, and pitch by clicking one of the note boxes. Likewise, you can select a note's duration and loudness by clicking the relevant boxes in the middle left window.

If all this sounds cumbersome, that's because it is. By the time you place a note in the Song window, you have clicked as many as five boxes, counting the More Instruments box, time enough for your muse to develop a headache and leave. And that's just the beginning of your problems. When you finally get around to placing a note in the Song window, it bears no resemblance to standard musical notation; a printout of your composition would be about as useful as a novel written in Egyptian hieroglyphics.

SongPainter has other limitations as well. When you play back a musical selection, for example, every feature except the stop button is disabled. That means you can't pull down any menus, scroll through the Song window, or even turn the repeat function on or off. And the stop button doesn't just stop the music; it also rewinds the selection, so that when you restart, the music starts again from the beginning. Thus *SongPainter* doesn't let you stop the music and restart it where you left off, a useful feature in any musical playback device, be it tape deck, turntable, or computer.

A Positive Note

Nevertheless, *SongPainter* has a number of redeeming features. One of those is its collection of ready-made chords, which you can enter into the Song window instead of single tones. The chords are all there: the major and minor chords, the diminished and augmented chords,

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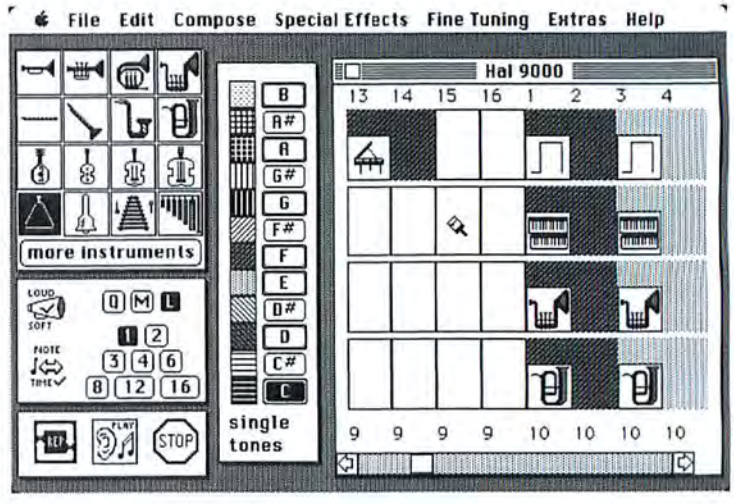
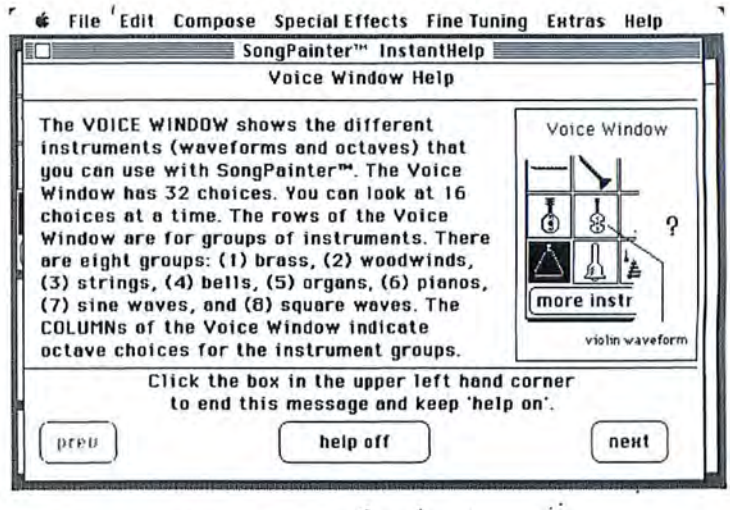
and all the seventh chords. In addition *SongPainter* has 12 built-in scales for playback–a useful educational device–or for entry into the Song window. Finally, the program's InstantHelp feature can be useful when you are trying to find your way through the maze of instruments, tonal ranges, and windows. When you select Help On from the Help menu, the paintbrush pointer changes into a question mark, and a magic wand of information. Clicking on any of *SongPainter*'s windows, menus, or menu items with the question mark produces a screenful of information about the queried item, an effective way of finding out about the software without reading the manual (see "InstantHelp").

SongPainter's sound quality is as good as that of any other Macintosh music processor, and its range of features is adequate for most applications; for example, you can create your own waveforms and modify each note's rate of onset and offset However, its user interface could have been designed to provide greater convenience. As it stands, the program is cumbersome. And if *SongPainter* were a true song painter, the Song window would scroll in sync with the music, and the individual notes would flash or highlight as they played, making it possible to "see" the music as you hear it.–*Nicholas Lavroff*

SongPainter
Rubicon Publishing
La Costa Centre
6300 La Calma Dr.
Austin, TX 78752
512/454-5004
List price: $59.95



Musical Windows
SongPainter's *main screen shows the Song window on the right. The Voice window is at top left, and the loudness, duration, and playback controls at bottom left. The center window shows the range of tones, with each tone's corresponding pattern.*



InstantHelp
SongPainter's *help screens make it easy to learn about the software without reading the manual. Here the help screen sounds off about the Voice window.*

The Sounds of Battle

Countless explosions and the sound of gunfire ring out as a lone defender, armed with only a small-caliber antiaircraft gun and a mortar, valiantly attempts to stave off an onslaught of clattering helicopters. Wave after wave of helicopters approach, disgorging a payload of paratroopers who land on the desert plain below. There they mass in preparation for an assault against the gunner's enclave. The drone of military cargo planes signals the imminent airdrop of a tank. As the tank rumbles nearer, the earsplitting roar of a jet fighter suddenly sears the air. A guided missile inexorably zeros in on the gunner's position.

Shortly after *Macworld*'s editors received a new arcade game called ***Airborne!,*** visitors to the office must have been puzzled by the din. *Airborne!* incorporates digitized sound effects to make an otherwise playable but mundane game truly fascinating. The game begins with a brief rendition of Wagner's "Ride of the Valkyries," which was probably inspired by the use of the theme during the helicopter assault in Francis Ford Coppola's movie *Apocalypse Now.* The introductory theme plays for 8 seconds on a 128K Mac and 20 seconds on a 512K Mac. When you hear Wagner's rousing music, it's hard to believe the sound is coming from the Mac.

Survival

The object of the game is to survive while scoring as many points as possible by destroying enemy aircraft and troops (see "Air Assault"). You hold off enemy aircraft and paratroopers by firing an antiaircraft gun and a mortar. You control the weapons' trajectory and rate of fire with the mouse and switch between weapons by pressing the space bar. Helicopters and cargo planes don't attack directly but drop paratroopers and tanks. Once enough ground troops land, they attack, at which point your only defense is the mortar. It's best to stave off a ground attack as long as possible by destroying the enemy in the air.

Other than the eventual threat of a ground assault, the greatest danger to continued play is the jet fighter, which crosses the screen so quickly that it's difficult to shoot down. The fighter launches an air-to-ground missile that never misses. Here's a tip: jets enter the screen in a pattern; by learning the pattern you can predict the jet's altitude and set up a field of fire to destroy each jet as it enters the screen.

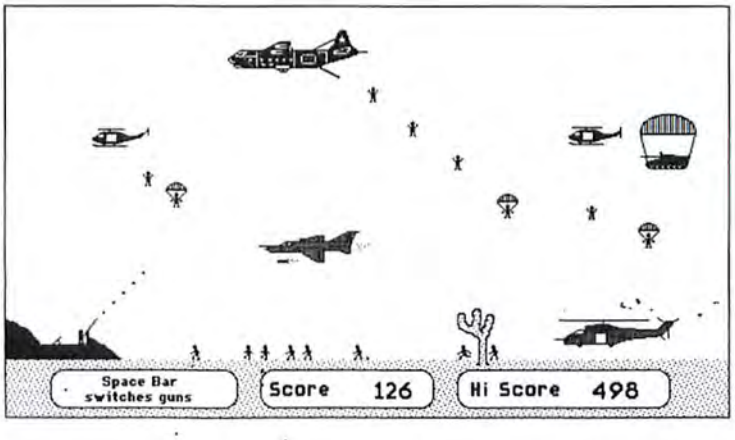
Effective Sound

As military shoot-'em-up games go, *Airborne!* is nicely balanced between playability and challenge. The graphics are adequate though uninspiring. The game's chief interest comes from the digitized sound effects, which include helicopters, air transports, tanks, and jets. It's amazing how much texture a few sounds can add to a game. The first time I heard the jet, I was petrified. When I first got the game, I often found myself playing it just to hear the sound effects. In fact, the worst thing about *Airborne!* is the potential embarrassment you may suffer when you can't stop yourself from playing the game at the office.

To create the sound effects, *Airborne*'s designers recorded sounds of planes, tanks, helicopters, and explosions with a cassette tape recorder. Then they used a VAX minicomputer to transform the recorded sounds into a digital format that the Mac could interpret. They had difficulty getting all the sounds on disk because digitized sound requires large portions of disk space. The jet roar alone takes up 17K, and the Wagner theme requires a whopping 156K.

Another Opinion

Some young readers will undoubtedly suspect my qualifications as a game reviewer due to my adult status, so I decided



Air Assault
Airborne's *beleaguered gunner attempts to ward off an onslaught of enemy paratroopers and aircraft.*

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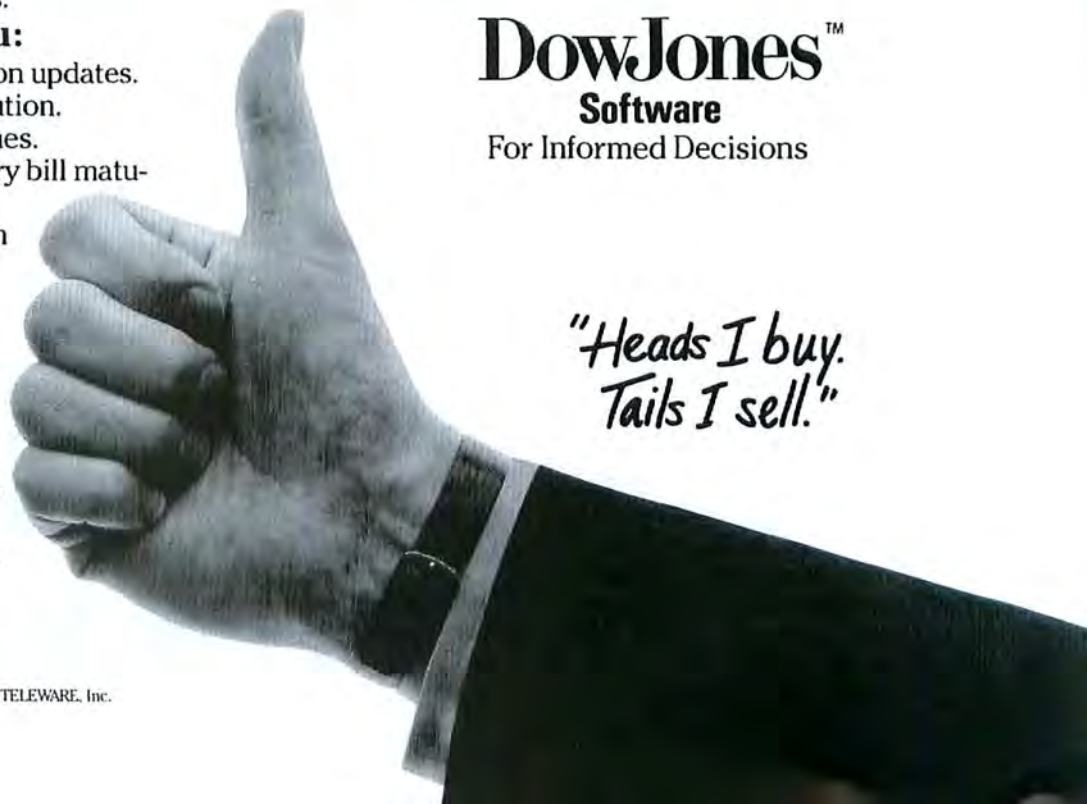

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to get a couple of expert opinions. I asked 11-year-old Matthew Rhoades and 10-year-old Andrew Rhoades to play the game and tell me what they thought. They reported: "We liked the sound in the introduction, which plays like a full orchestration, not just bleeps. We also liked being able to erase high scores, which we did several times [as the top ten scores get higher, the game becomes more difficult].

"However, *Airborne!* is for hard-core game players who have the time and patience to play for a long time. With only one gunner the game may last only a short time, which is frustrating. We were amused by the paratrooper landing in the cactus, but the game was too difficult to play, even at the beginner's level."

It appears that the experts and I disagree. I found the game easy to play but challenging enough to hold my interest. At any rate, believe who you will, *Airborne!* is a fun game worth investigating for the sound effects alone.—*Adrian Mello*

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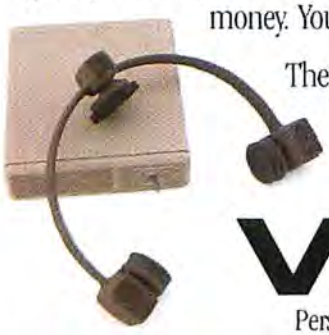

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size the window. The window has no scroll bars and can't be split. Instead, you bring outlying sections of the spreadsheet into view by "folding" a part that's out of view over a section that's in view. Folding a spreadsheet may sound odd if you're accustomed to using scroll bars, but it works effectively.

Formulas and Functions

So-called "power users," who create mammoth, complex spreadsheets, will find ClickOn Worksheet lean on features, but it has enough meat for an average spreadsheet. For example, you can put a cell reference into a formula by typing or by pointing at the cell and clicking. Either way, you can make the cell references relative or absolute, but you can't name cells and refer to them by name.

In addition to cell references, formulas can contain the usual arithmetic and comparison operators plus a surprisingly rich set of built-in functions. You can choose from seven financial, three depreciation, twelve mathematical and statistical, two value-not-available, one conditional, one table-lookup, and two date-aging functions.

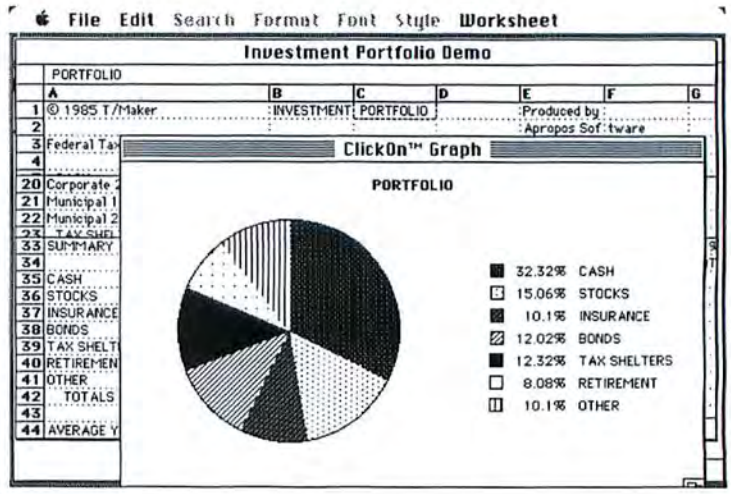
ClickOn Worksheet is somewhat sparsely endowed with cell-formatting options. Text is always aligned at the left edge of a cell, and only what fits between the cell walls appears on the spreadsheet. Numbers are always aligned at the right edge of a cell. Values of 1000 and over are punctuated with commas; this feature cannot be suppressed, say for years calculated from formulas. However, a value too large for its cell always appears in scientific notation, without commas. All numbers observe those rules, and you can impose additional format rules, such as dollars, dollars and cents, or percent, on any cell. There is no way to specify a number of decimal places or to eliminate them altogether.

Cell contents can be duplicated, or replicated, to other cells with the Paste command. Relative cell references in replicated formulas are adjusted automatically. This ingenious approach to fill and replicate can cause you to fill more or fewer cells than you intended if done improperly. The manual shows how to do it right but doesn't mention what can go wrong.

Graphics

ClickOn Worksheet can draw a bar graph, a stacked bar graph, a line graph, or a pie chart using data from the spreadsheet (see "Apple Menu Pie"). Up to four series of values can appear on one graph. A pie chart handles just one series. You can select cells to use as labels on a graph's horizontal axis or as a legend for a pie chart or a multiple-series graph. The graphs look decent, but the ClickOn Worksheet has no provision for customizing or editing them.

Cutting and pasting to and from other documents via the Clipboard works, with some limitations. The commas in numbers make the numbers look like text to applications such as *Microsoft Chart,* rendering them virtually useless. However, the ability to compute a table or draw a graph for a report without leaving a word processor is invaluable. Unless you print a screen with ⌘-Shift-4, spreadsheets and graphs must be pasted into word processing or other documents for printing.



Apple Menu Pie
ClickOn Worksheet lets you display spreadsheet calculations as bar graphs, line graphs, or pie charts.

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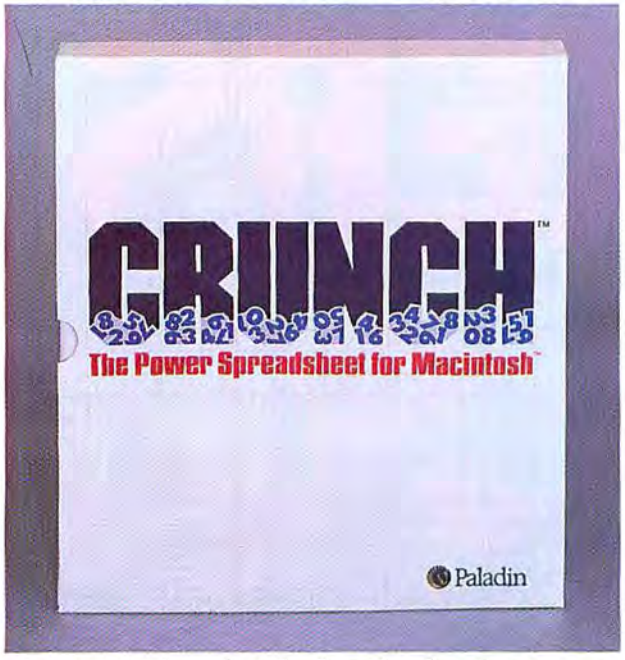

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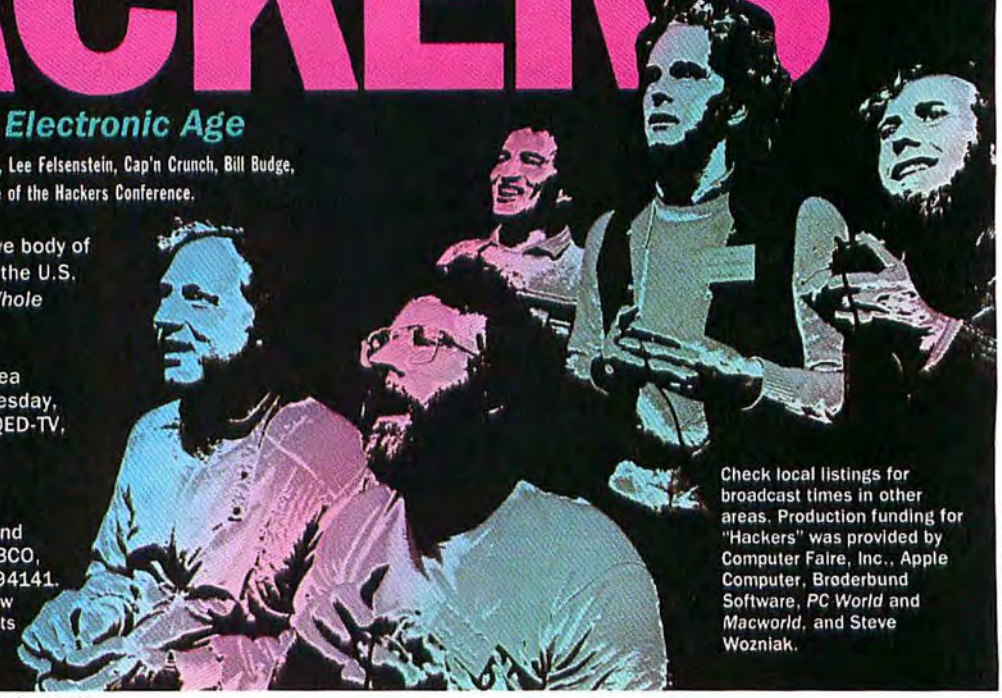

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All it takes is your Mac, your imagination, and *Macworld* as your guide. And, of course, the tip of your finger. Experts have called the Macintosh the only "whole-brain" computer. So here's a chance for you to use your entire cerebral creativity with push-button ease.

With more than $20,000 being awarded to winners of the Macworld Art Contest for your Macintosh graphics published in this magazine, you could profit considerably from your subscription to *Macworld*.

Which brings us to the next point. Right now, unleash your fingertips and remove the postpaid card facing this page. Complete. Mail. Compute! Let your fingers do the talking.

MACWORLD

DATA-PAK SOFTWARE SUPRISES INDUSTRY WITH LOW PRICED QUALITY SOFTWARE SUCCESS

LOS ANGELES:

GRASS ROOTS END USER POPULARITY DEEMED REASON FOR SUCCESS OF "SLEEPER" IN THE SOFTWARE MARKETPLACE.

The term **"sleeper"** is usually used in the motion picture industry to describe a box office success in spite of a small advertising budget due to its grass roots popularity and word of mouth advertising.

The word **"sleeper"** was also chosen to describe DataPak Software's new product "My Office" because it almost takes the Macintosh concept to the edge of calling it a motion picture.

One paragraph in an article published by "ICON REVIEW" described it in this way:

"The clever animation of the file drawers as they open and display the folders within is the most highly developed desktop metaphor we've seen anywhere..."

The review goes on to say more about "My Office's" simplicity of operation, how it wouldn't intimidate your secretary or grandmother, and describes it as **"...the office information management solution."**

But one review does not make a winner. It takes product strength and the popularity that results when end-users have booted it up, used it, tested it, gone on "bug" hunts, and have come away with sincere admiration for the software which they then tell others about.

This results in testimonials like this one from the director of "Micro Age Companion":

"My Office packs quite a bit of power and versatility into the simple desktop environment. It is very intuitive and is deceptive in its hidden power."

Following that comes recognition from MUGS (Mac Users Group) where My Office has been chosen as **""Best Software Program of the Year"** by a 1,000 member "MUG", headquartered in Oregon.

Its president, Jerry Koszut, states *"It's the one program that does everything for everybody up to and including the small business."*

Koszut has also recommended "My Office" and its automatic math calculation capability combined with clip art spreadsheets to many of the members instead of "JAZZ".

According to Koszut, unless an individual needs **heavy** accounting capability, they would lose too much by choosing another program.

The two biggest barriers which DataPak had to overcome in its underfinanced marketing campaign was the Mac public's apprehension toward "another software package" and, strangely enough, the **low price.**

"My Office" was initially offered to the public at an introductory price of only $79.95 and was then raised to $129.95. But even at $129.95 "My Office" is priced far below its technically inferior competition.

The effect of this low price is typified in this testimonial from user "Tom Larson" from Fresno, California:

I almost didn't buy "My Office" because I thought the price was too low for a program that would do all the things I wanted to do. "My Office" does everything all my other programs combined can't do."

Even with all the end-user talk about wanting low cost, quality software, it took the tough technical quality of "My Office" coupled with a tough marketing strategy which consisted of an unconditional inspection guarantee to get them over the last hurdle.

I don't think many software manufacturers would be willing to put their products to that kind of test, but DataPak's attitude can be seen in some of their promotional literature, where they state:

"You wouldn't buy a car without a test drive — so why would you want to buy software that way?"

For those of you who still feel you're not quite ready to jump in for that test-drive just yet, perhaps the old Chinese saying about one picture...or should I say..**"one dump is worth a thousand words"** is true, and I suggest that you request DataPak to send you their free catalog containing 40 screen dumps which illustrate what "My Office" and its new "clip art" companion product "CompuForm" can do.

To get the catalog and receive more information on DataPak's no risk inspection guarantee, simply call (818) 905-6419 or circle the bingo card number listed below.

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Make Sure There's Room

ClickOn Worksheet's documentation is good overall. No on-screen help is available, but the well-written manual explains procedures and features clearly and concisely. The manual also covers the 12 sample spreadsheets included on the disk. An installation program adds the 35K ClickOn Worksheet program to your System files. Before you buy this desk accessory, make sure the application disks on which you want to use the spreadsheet have enough space available. A few programs, such as *The Home Accountant,* simply don't have enough room for ClickOn Worksheet. Others, such as *Microsoft Word,* require considerable finagling to use with the worksheet installed.

ClickOn Worksheet works on both 512K and 128K Macs. However, being an unusually large desk accessory, it may run out of memory while you're using it on a 128K Mac.

ClickOn Worksheet is easy to use and accurate, and it has enough features to handle average spreadsheets and simple graphing. If you can live with restricted cell formatting and your disks have 35K to spare, this desk accessory is worth adding to your Apple menu.–*Lon Poole*

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415/962-0195
List price: $79.95

Accounting Gets Personal

"How am I doin'?" is the well-known cry of New York's mayor Ed Koch. That same question should be asked by anyone who wants a good picture of his or her finances. Softsync's ***Personal Accountant*** is an excellent program that can help Macintosh users do just that.

Personal Accountant tells you where you are spending your money, the sources and amount of your income, and how much you owe and to whom. And come tax time, the program lists all your tax-deductible expenses. I like the program because it is designed for nonaccountants. It doesn't

make you work through unnecessary steps to record your finances yet lets you make changes easily.

One reason the program works so well is that you can have an unlimited number of accounts of any type. When your disk is full, you can forward all balances to another disk. Accounts are divided into five categories: deposits (assets), loans (liabilities), expenses, income, and equity (existing assets, liabilities, expenses, and income to date). The program suggests entries for each category, which you can easily delete.

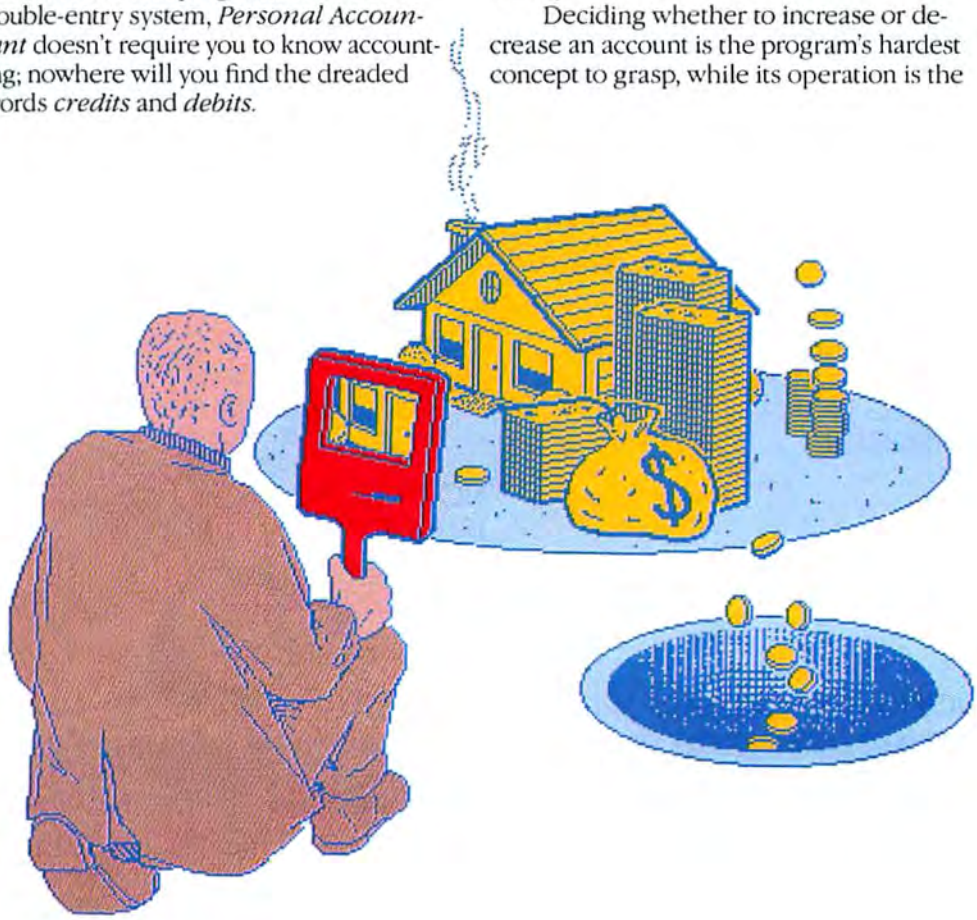
Entering Transactions: More or Less?

Personal Accountant uses the double-entry accounting system, which means that each transaction must be recorded in two of the five account categories. However, unlike some programs that use the double-entry system, *Personal Accountant* doesn't require you to know accounting; nowhere will you find the dreaded words *credits* and *debits*.

You enter transactions in the Make Entries window (see "Entering Transactions"). You indicate for each transaction whether you are increasing or decreasing one account. Then you enter the name of the second account, and the program knows whether to increase or decrease it. For instance, if you write a check at the supermarket, you tell the program to decrease the amount in checking. When you indicate that you spent the money on food, the program automatically increases that expense category.

Despite the program's automatic operation, you still have to be alert because whether you increase or decrease a category depends on the transaction. If you made the same food purchase with your credit card, for example, you would have to indicate that you were increasing the credit card account because you are borrowing money.

Deciding whether to increase or decrease an account is the program's hardest concept to grasp, while its operation is the



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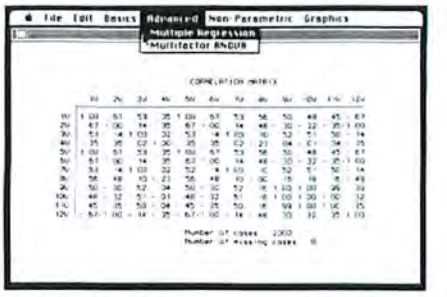

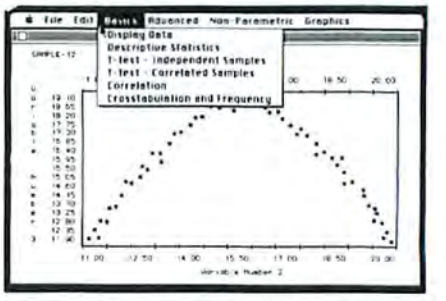

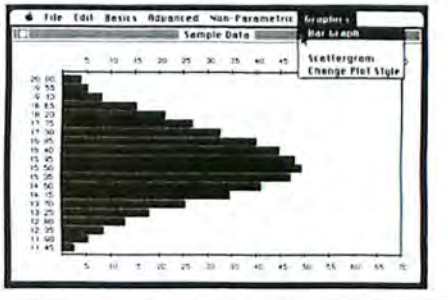

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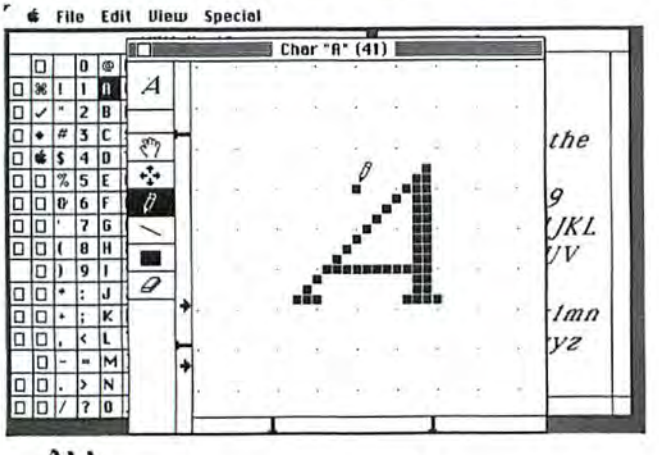

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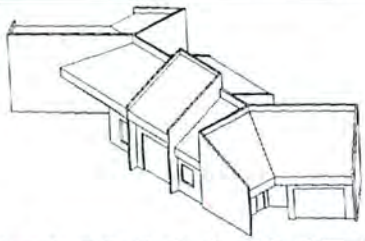

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simplest. The manual does a good job of explaining how to enter transactions and gives clear and specific examples of when to increase or decrease an account. The program and the 31-page manual are designed for the nonaccountant, and only rarely does a technical term intrude.

If a transaction results in a tax-deductible expense, type *Y* in the box marked Tax Deductible. When you type *Y*, the entire amount of the transaction is listed automatically in the box labeled Deductible Amount. If only part of the transaction is tax deductible, you must change the amount.

Making Changes

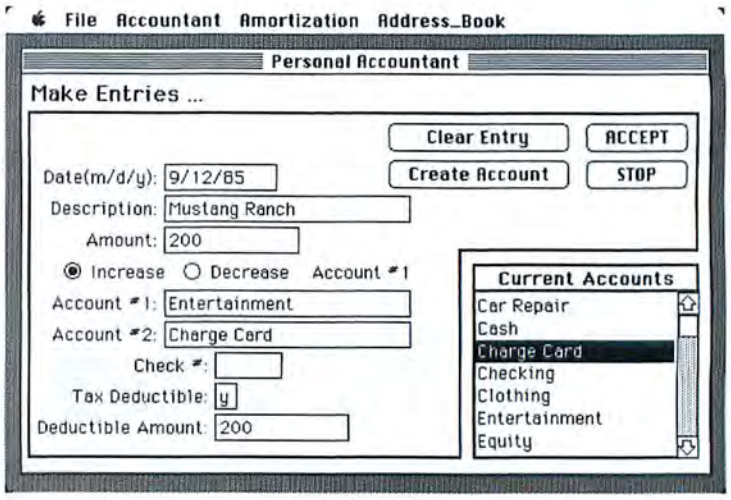
Most personal accounting programs are designed as if you have a clear picture of how you want to structure your finances from the outset. This is frequently not the case, however, so *Personal Accountant* makes it easy to restructure your accounts. The program shows its flexibility when you create a new account category. If you type in a category that is not in the Current Accounts list, a dialog box appears that lets you create a new category (see "Creating a New Account"). After you enter this account, it automatically appears in the Current Accounts list, and you can continue entering the transaction.

Correcting transactions is a breeze; you scroll through a list of current accounts and choose a category. Click the category, and all transactions are listed. Click the transaction you want to correct, and it instantly appears, letting you reenter just the information you need.

While the data entry process is excellent overall, it does have two deficiencies. If you write a check for two purposes, you have to enter each expense category as a

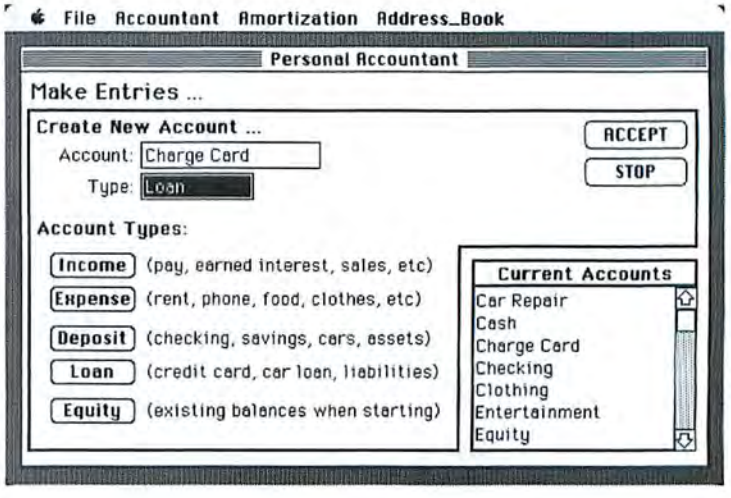
Entering Transactions

For each transaction, you decide whether to increase or decrease two accounts. In the example shown, payment is made with a credit card, so you increase the account because you are adding to the amount you owe.



Creating a New Account

When you enter transactions, you can create a new account by clicking the Create Account button in the Make Entries window. To create a new account, you decide on one of the five account types, choose an account name, and click the Accept button.



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separate transaction. Also, while the program automatically numbers consecutive checks during a session, it doesn't store the number of the last check you wrote when you leave the program.

Reports

Personal Accountant offers three types of reports to help you get a handle on your finances. You can learn how much money you spent in each of your expense categories, view your current assets and liabilities, and compare your income against your expenses. Although a printer is not necessary to view the reports, it is extremely helpful. Reports can be shown in two forms: tables or pie charts. The pie charts would be more useful if they told you what percentage of the whole each segment represented.

Personal Accountant has a few extra features that aren't essential to tracking your finances but add to the program's value. You can prepare amortization tables for loan payments and growth tables for savings account interest. The program also includes an address book that is actually a mini-database, with search, select, and sorting capabilities. In addition, *Personal Accountant* lets you design and print out mailing labels. Although these extra features make *Personal Accountant* more versatile than most home accounting programs, I disagree with Softsync's claim that the program can also be used by businesses. While the program's simplicity is a virtue for individuals, businesses generally require a more complex program.

If you want to use the Macintosh to learn more about the state of your personal exchequer, you must be willing to invest the time and effort to conscientiously enter your financial transactions. Once this decision is made, you should strongly consider purchasing *Personal Accountant*–a program well worth its price.–*Saul D. Feldman*

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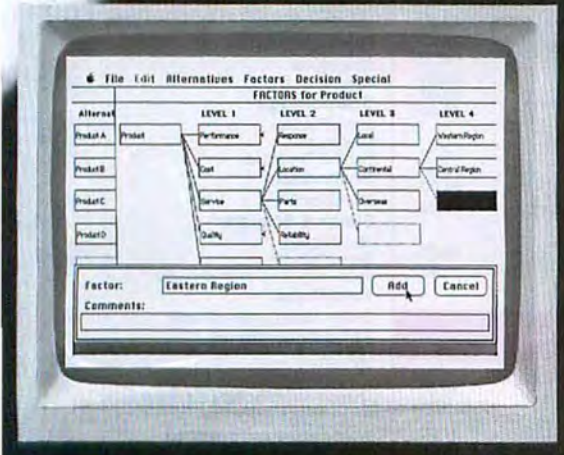

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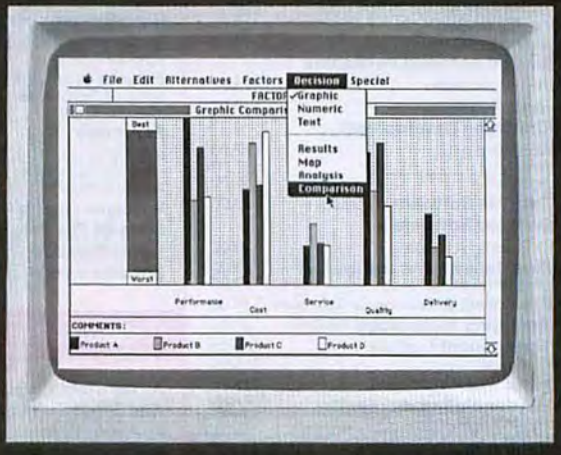

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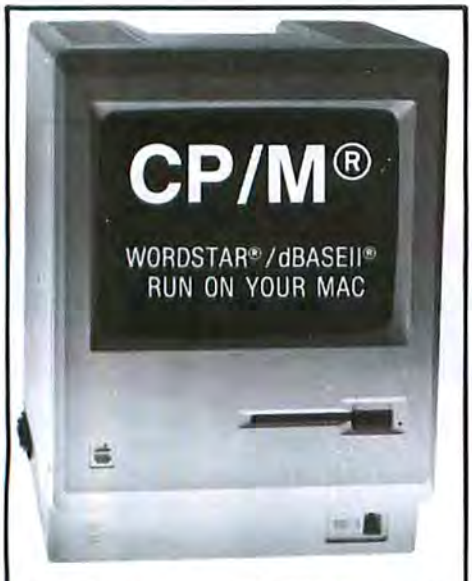

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Silent Printing

If you are looking for a compact, quiet alternative to the Imagewriter, Hewlett-Packard's ***ThinkJet*** printer is an ideal candidate. Tipping the scales at a trim 7 pounds, the ThinkJet is about the size of two external disk drives side by side. You can print both text and graphics with the ThinkJet, and the quality of the output is equal to if not better than that produced by the Imagewriter. In addition, the only noise you'll hear from the printer is the gentle whirring of the motor—no high-frequency, machine-gun sound effects like those of the Imagewriter.

Ink Jets

The ThinkJet is relatively silent because it is an ink jet, or nonimpact, dot matrix printer. Unlike the Imagewriter, which has a print head consisting of nine pins that are hammered against a ribbon to form images on the paper, the ThinkJet has a cartridge that sprays ink onto the paper through a series of 12 tiny channels. The ThinkJet's sprayed dots are slightly smaller than the Imagewriter's impact dots; as a result, the characters produced by the ThinkJet look more refined (see "ThinkJet versus Imagewriter").

One advantage of ink jet printing is that the image produced by the printer is uniformly dark, whereas a ribbon pro-

ThinkJet
Hewlett-Packard's ThinkJet offers a quiet, portable alternative to the Imagewriter.

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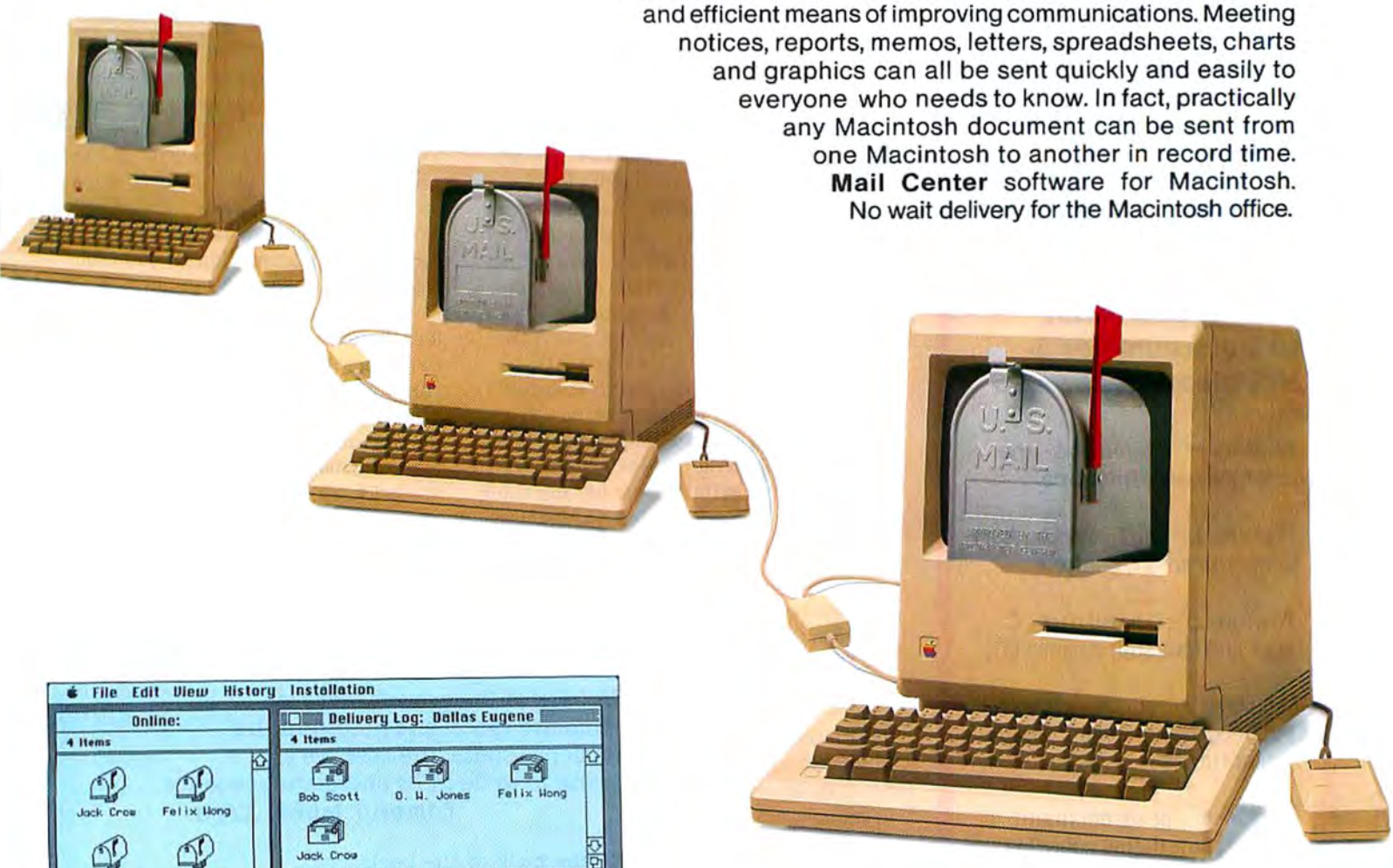

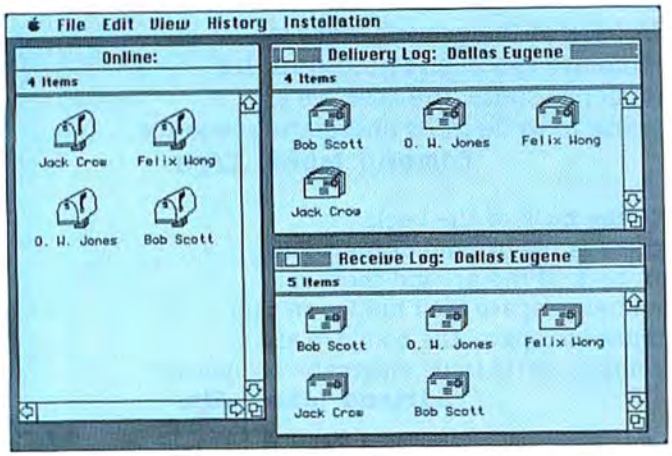

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Circle 187 on reader service card

duces increasingly lighter images as it is used. Rather than replacing a worn ribbon, as on the Imagewriter, you replace the InkJet's entire cartridge, including the print head, when the ink reservoir runs dry. The life span of a cartridge is about 500 pages of text; if you print graphics with large areas of black or dense patterns, the cartridge's life span will be considerably shorter.

Paper quality is important because the ink tends to bleed on paper that is too absorbent. You should use paper designed specifically for ink jet printers.

Jetstart

To use the ThinkJet with a Macintosh, you need to replace the Imagewriter printer driver in the System Folder with SoftStyle's *Jetstart* printer driver. *Jetstart* can't be properly installed if the Imagewriter file is not in the System Folder. To switch drivers, you start up the *Jetstart* program, specify that the ThinkJet printer is to replace the Imagewriter, choose either the printer or modem port for the cable, eject the *Jetstart* disk, and insert the disk to be modified. After about 30 seconds the disk pops out, ready to be used with the ThinkJet. You can use the same program to replace the ThinkJet driver with the Imagewriter driver. Having both printer drivers in the System file and using the Choose Printer desk accessory would have been more efficient.

Compact Printing

Like the Imagewriter, the ThinkJet lets you print in draft, standard, or high resolution and use single-sheet or continuous-form paper. But when you start printing, be prepared for a surprise. The ThinkJet significantly reduces the size of both text and graphics. The length of a line of text in a *MacWrite* document is reduced by about 17 percent, and screen fonts are reduced by about 25 percent during printing; for example, a document displayed in a 12-point font on the screen is printed in 9-point type. *MacPaint* and *MacDraw* graphics are reduced by about 30 percent when printed.

The reduction occurs because the ThinkJet adds an extra inch to the left margin to allow the print head to accelerate to its optimal speed. As a result, both text and graphics must be scaled down to accommodate the smaller space. A larger platen would solve the reduction problem, but then the ThinkJet wouldn't fit in a briefcase.

You can overcome some of the ThinkJet's limitations by reformatting your documents before printing. If you want to print 11-point text (you can't get 12-point on the ThinkJet), for instance, you need to format the document in 14-point on the screen. Since the margins are also reduced when you print documents on the ThinkJet, you

ThinkJet versus Imagewriter
The ThinkJet sample (bottom) was set in 12-point New York text so that it would print out in a size closer to 10-point, like the Imagewriter sample. Note the difference in character definition between the two samples.

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there is the ground of the book.
In back of the ground there is
immense space, and hidden in this
immense space, the book we are
going to write in its enigmatic sequence."
Edmond Jabès, *Elya*

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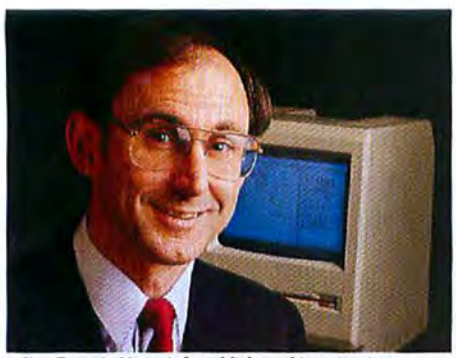

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can extend the margin marker to the full width of the *MacWrite* or *Microsoft Word* ruler so the left and right margins are not so large.

The ThinkJet uses its own monospaced font in draft mode. Unlike the Imagewriter's draft mode, this font doesn't leave large gaps between words. But the ThinkJet's monospaced font may cause characters to extend beyond the right margin, pushing them to a separate line. Adjusting the left and right margins of the document alleviates the problem.

Silent but Slower

Even though the ThinkJet reduces the size of text and graphics, it prints more slowly than the Imagewriter in standard or high resolution. When I ran sample pages of *MacWrite* and *Microsoft Word* text through both printers, the Imagewriter was about 20 percent faster than the ThinkJet in standard resolution and about 10 percent faster in high resolution. In draft mode, however, the ThinkJet printed significantly faster than the Imagewriter.

If you want to be able to talk on the phone while your printer is humming in the background, and you need a dependable, portable printer that provides high-quality, albeit reduced, output from the Macintosh, the ThinkJet is a clear choice. But if you want to maintain a close approximation of the text and graphics you see on the screen, you'll need the Imagewriter or another printer with similar capabilities.
– Daniel Farber

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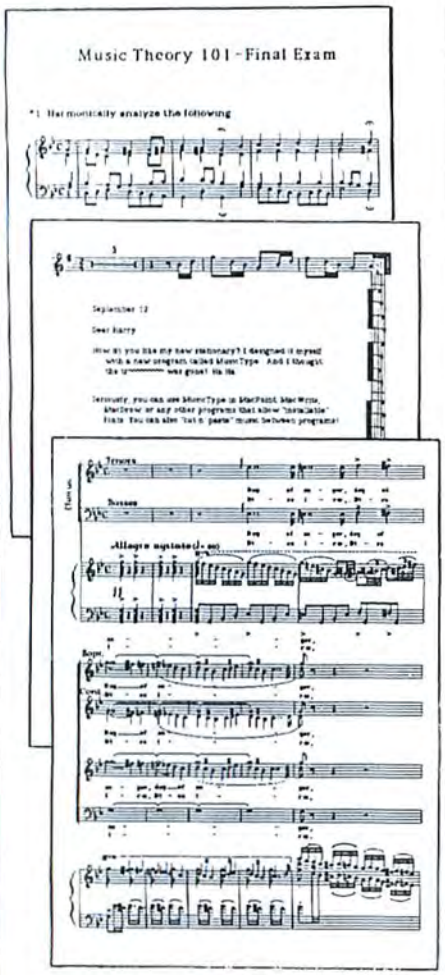

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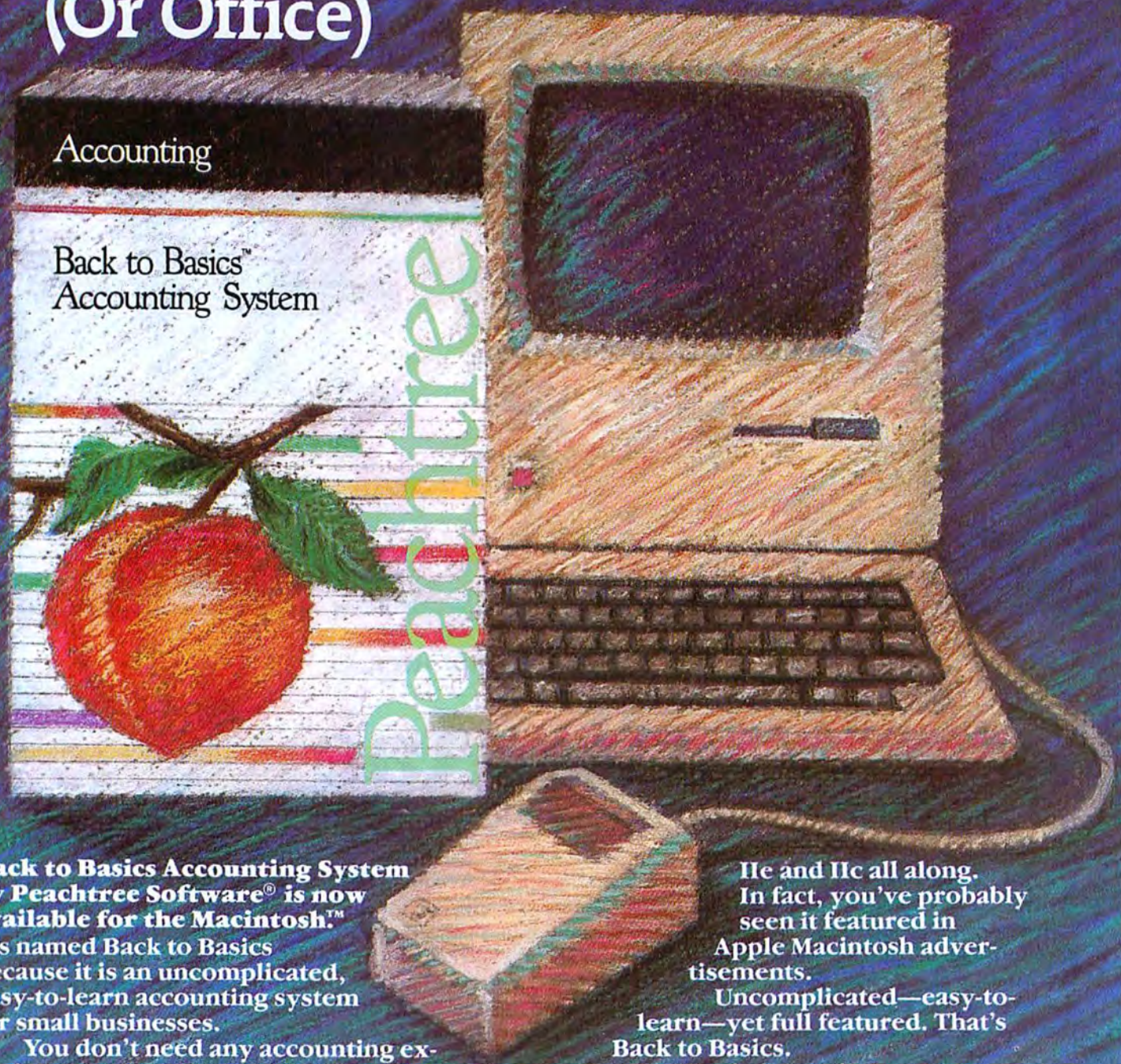

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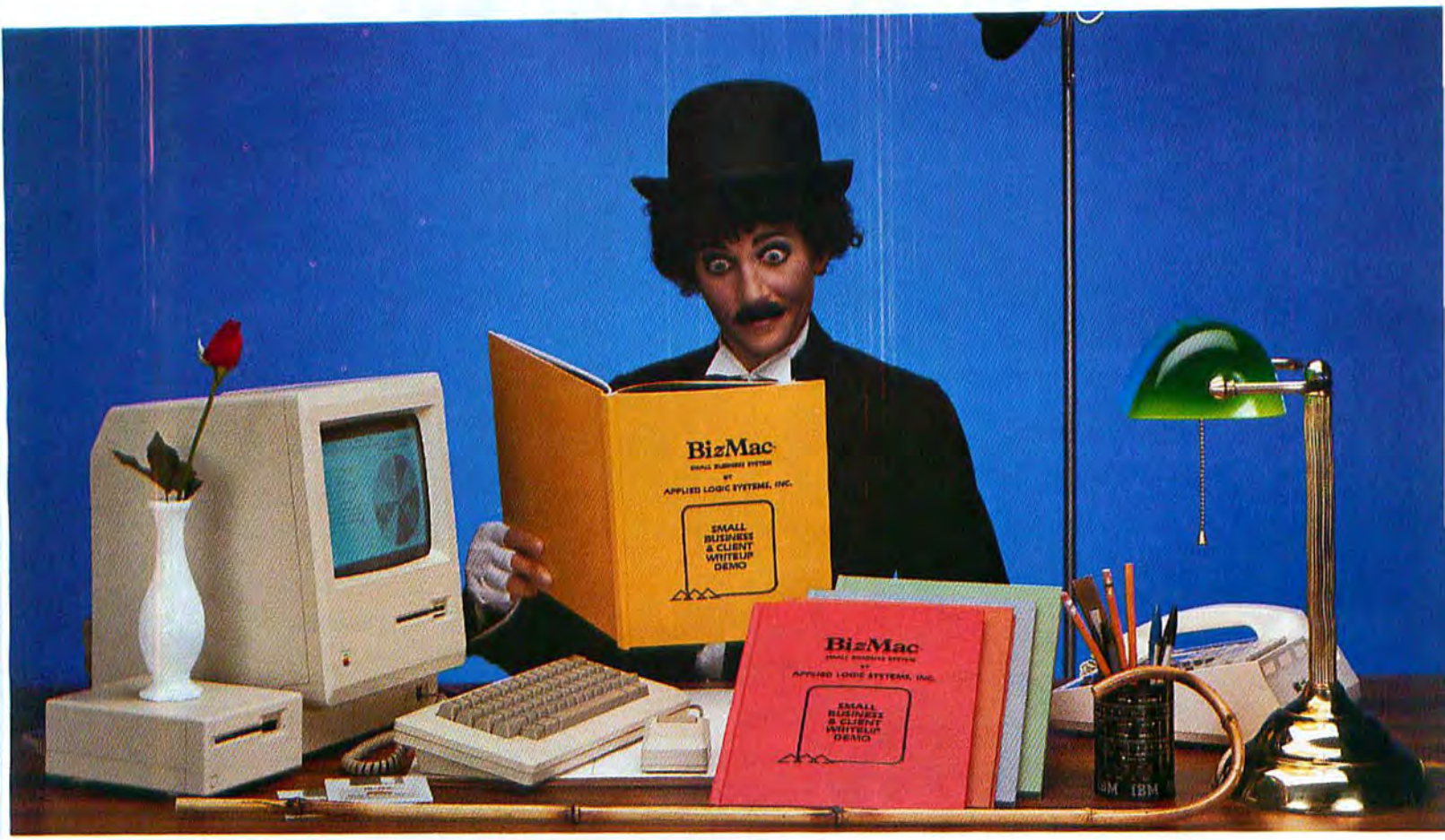

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They Love It...

Levels One and Two

MacFORTH (Level 1) lets you do amazing things on the Macintosh... CSI has done an excellent job... The documentation is easy to read and use... I can now create my own windows, graphics and pull down menus, and the "fun quotient" of my Mac has taken a quantum leap.

Bruce Webster, ***BYTE***

It gives programmers full and easy access to the treasures of the Mac's 64K ROM and produces code so tight and fast that 128K of memory is more than enough for most useful programs...CSI went to extraordinary lengths in making their system fast and their work paid off...because MacFORTH enables you to get closer to the machine's hardware and software than any other language now available, it is an ideal language for enthusiastic Mac programmers who want to squeeze extra power from their computers...

Richard Sprague, ***MacWORLD***

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Greg Williams, ***BYTE***

Level Three

I must praise CSI for the very fine job they did right from the beginning. MacFORTH was a real language and I could do real programming with it. Meanwhile the BASIC and Pascal bunch were left with toy languages or the need for a Lisa. As I learned how to control the Mac I felt lucky to be pulling away from the crowd who were itching to do great deeds on the Mac. The more I used MacFORTH the more I was impressed at how they had put the features of the Mac into the programmers hands.

Chipwits Developer, Doug Sharp, ***Macazine***

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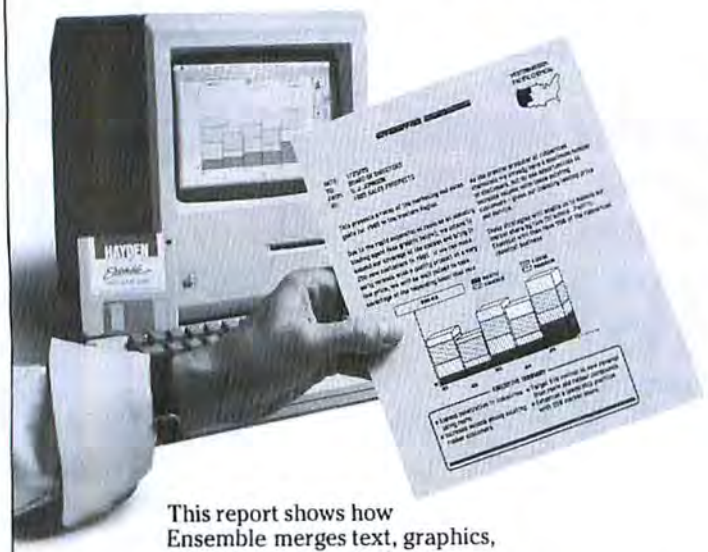


This report shows how Ensemble merges text, graphics, and pictures on a single page.

improved Ensemble. The integrated information management system for the Macintosh.™

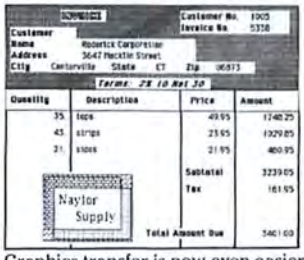
Runs in 512K.

Ensemble 2.0 is Hayden Software's new and improved version of Ensemble – a very flexible data base manager integrated with business graphics.

Like the original Ensemble, version 2.0 is virtually an unlimited data management resource. Create a data base composed of text, numbers, graphics, or a combination of all three. Perform sorts, selections, retrievals, and generate custom reports with ease. And, with Ensemble's on-screen decoration patterns, you can generate forms for business and personal use that have a high-quality, professional appearance.

New Features

- Ensemble 2.0 is 3 to 5 times faster than its predecessor, because we've optimized the data manipulation routines, making sorts, selections, and retrievals much faster than before.
- Ensemble provides full support of the LaserWriter,™ and is an ideal tool for synthesizing information onto a page as a preliminary to LaserWriter printing.
- A utility program that allows you to create sub-files from existing files, chain files together, and pack your data on your disk is now available.
- Form Design enhancements have been added. You can now import a MacPaint™ image into a data base, and either preserve its original scale or re-size it to a new picture area of your choosing.
- Art Grabber,™ the picture-import device by MacroMind, Inc. is provided as an already-installed desk accessory. Art Grabber allows you to pull images from disk and paste them into Ensemble documents without any disk swapping or opening and closing files.

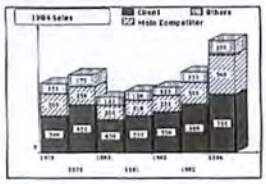


Graphics transfer is now even easier. You can preserve the original scale of a transferred MacPaint image and the proportions will be the same as when they were originally created.

Ensemble Keeps Getting Better

The enhanced Ensemble version 2.0 means that it is even faster and offers more utility for anyone who needs to manage multiple data bases; develop financial, manufacturing, or marketing applications; and produce presentation-quality reports in numeric, textual, or graphic formats.

Ensemble's graphics are high-impact, high-quality images in your choice of two or three dimensions. It is the right data base choice if you have a need to transform your data into compelling graphic formats. You have your choice of ten different charts, including pie, bar, line, gantt, and scatter diagrams.



Ensemble's graphics convert your data into striking 3D images.

Ensemble is compatible with MacWrite,™ MacPaint,™ Switcher,™ and the LaserWriter.™

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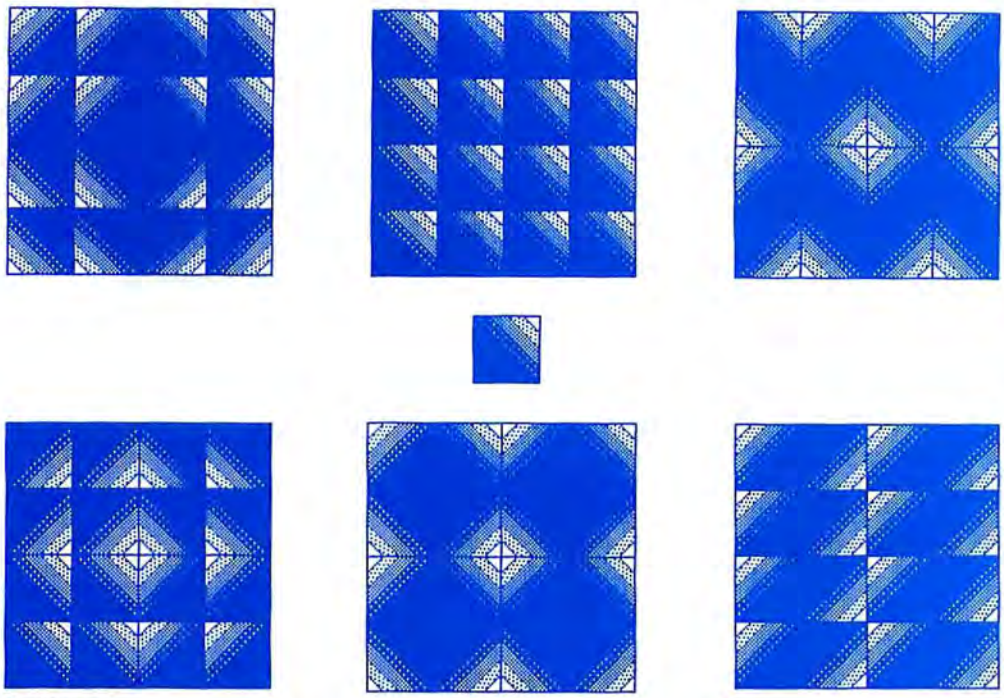
Open Window

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 documentation.*

This month's column tells of a quirk in the Finder's Get Info command and outlines instructions for creating quilt designs with *MacPaint*. We also include a reminder of how *Multiplan* stores and computes values and one reader's solution to electrical power problems. For *Word* smiths we report on some undocumented editing features, and for the curious–or the desperate–we look at a program that lets you examine the technical details of disks.



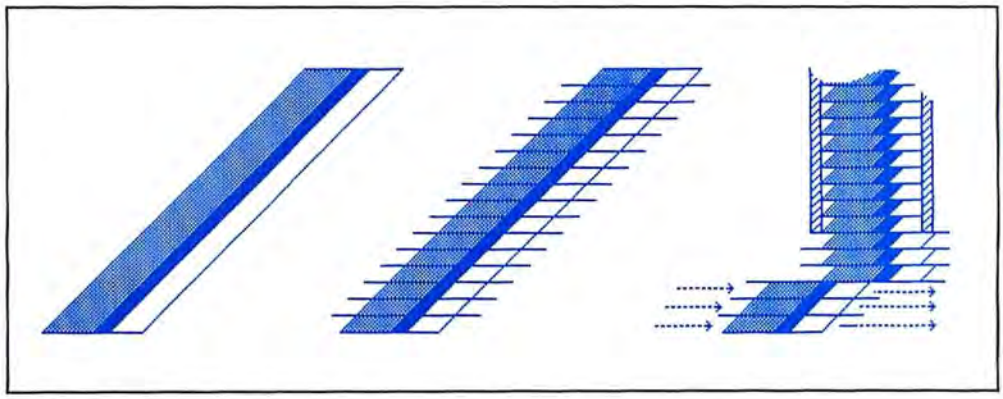
Quilting I

All the quilt patterns shown here were produced by flipping, rotating, and copying the single square at the center. Use MacPaint*'s Grid feature to keep the squares lined up properly.*

Mac Quilt

As a quilter I find the Macintosh a perfect way to try out designs for the quilts I'd like to make. Using *MacPaint*, you can quickly multiply one quilt square into many to make intriguing designs [see "Quilting I"]. Similarly, you can design patterns for Seminole patchwork, a procedure devised by Seminole native American women, in which strips of material are sewn together, cut, and rearranged to make a geometric border [see "Quilting II"].

Sue Knopf
La Crosse, Wisconsin



Quilting II

To simulate Seminole patchwork with MacPaint*, activate the grid, then press the Shift key and use the line tool to create a 45-degree parallelogram containing any design you like. Next, use the line tool to make horizontal cuts. Finally, use the marquee to select and shift to the right successive slices.*

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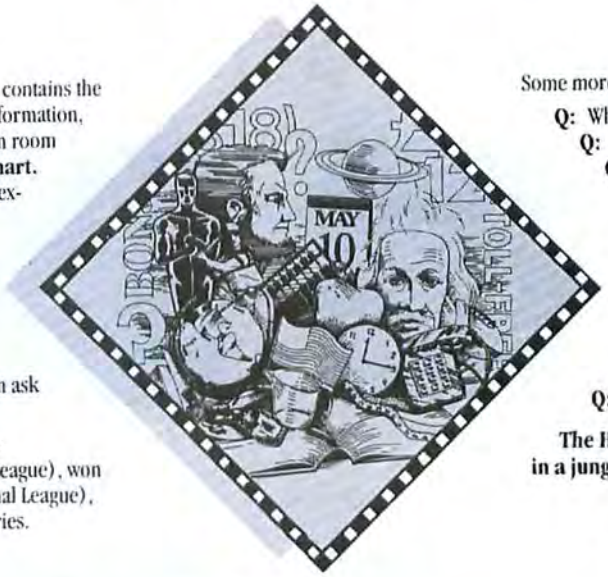

Some more sample questions:

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Multiplan Sums

Recently, while using *Multiplan* to track hours and wages at a job site, I gained some insight into how the program stores numbers. In my report the Earnings + Overhead column was calculated by adding an overhead charge to the Total Earnings column. Much to my embarrassment, the sum of all the cells in the Earnings + Overhead column was off by 3 cents.

The problem arose because, even though I specified Dollar formatting for the columns, *Multiplan* was still storing in memory the fractional portions of the calculated amounts. While the display showed the figures rounded to the nearest even cent, the summation used the entire number as it was stored.

I solved the problem by using *Multiplan*'s ROUND function [see "Multiplan Sums"]. As shown in the formula bar, the revised formula uses ROUND to limit the number of decimal places to two.

The moral? Be aware that simply choosing Dollar from the Format menu does not limit a stored number to two decimal places.

Richard A. Shuren
Boardman, Oregon

Indeed, the Multiplan *documentation states, "What you enter, what* Multiplan *stores to use in calculation, and what you see in a cell are not always the same." For more information on how the program stores numbers, refer to page 38 of the* Multiplan *documentation.—Ed.*

Getting the Wrong Info

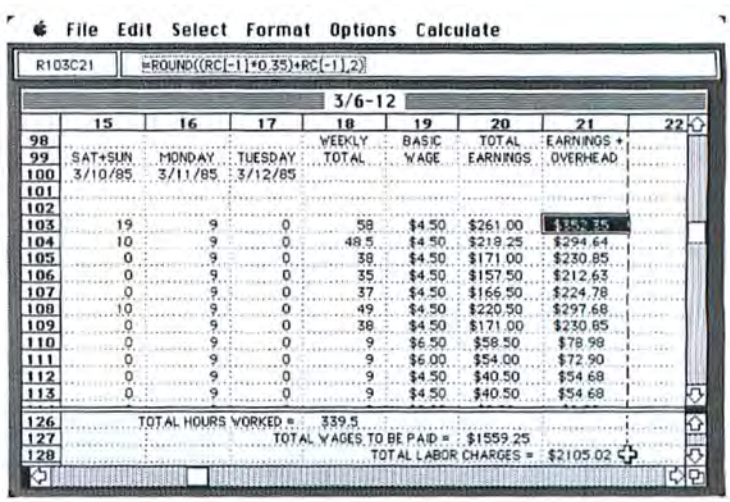
I've found an unusual quirk in the Macintosh's Finder version 1.1g. Occasionally, if you type text in the comment box of one document's Get Info window and then open a Get Info window for another document, the text you just entered will also appear in the comment box of the new window. And if you change the text in the comment box of one window, the text in the comment box of the other window changes, too.

If you want to try this for yourself, create two documents; I used *MacWrite* documents named NaDa and NvrBnd. Open a Get Info window for one, type in some comments, and close the window. Now open a Get Info window for the other document, and you'll see that the text is identical in both comment boxes. If two Get Info windows are open when you enter the text, the text in the window you close last will be duplicated in the command box of the other window.

Mike Norton
Boston, Massachusetts

According to Finder programmer Steve Capps, the problem occurs because of the method the Finder uses to store the text in the comment box of the Get Info window. The problem occurs in version 4.1 of the Finder as well. Each document's name is processed by a hashing, or scrambling, algorithm that outputs what should be a unique number. Then the Get Info comments are stored in an area of the Desk-

(continues on page 152)



Multiplan Sums
Multiplan *calculates values using numbers as they're stored in memory, not as they're displayed. A value formatted with the Dollar option may be displayed as $45.46 but stored as 45.45944. To prevent errors caused by this discrepancy, use the ROUND function shown here to round dollar values off to two decimal places.*

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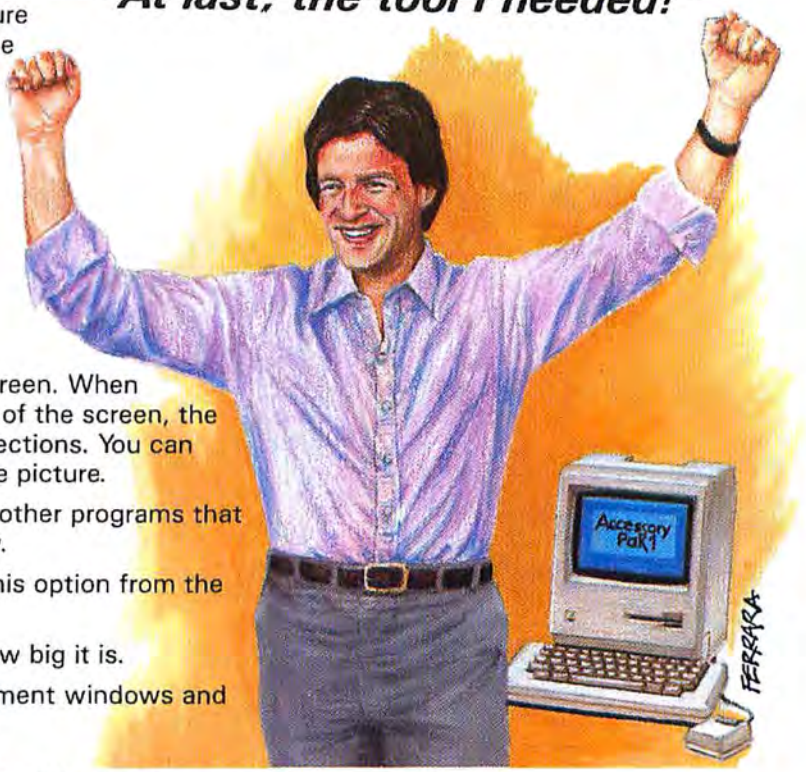

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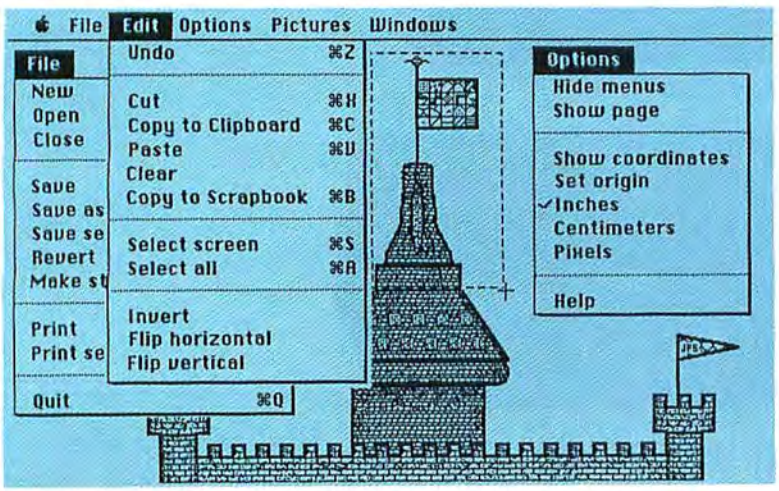

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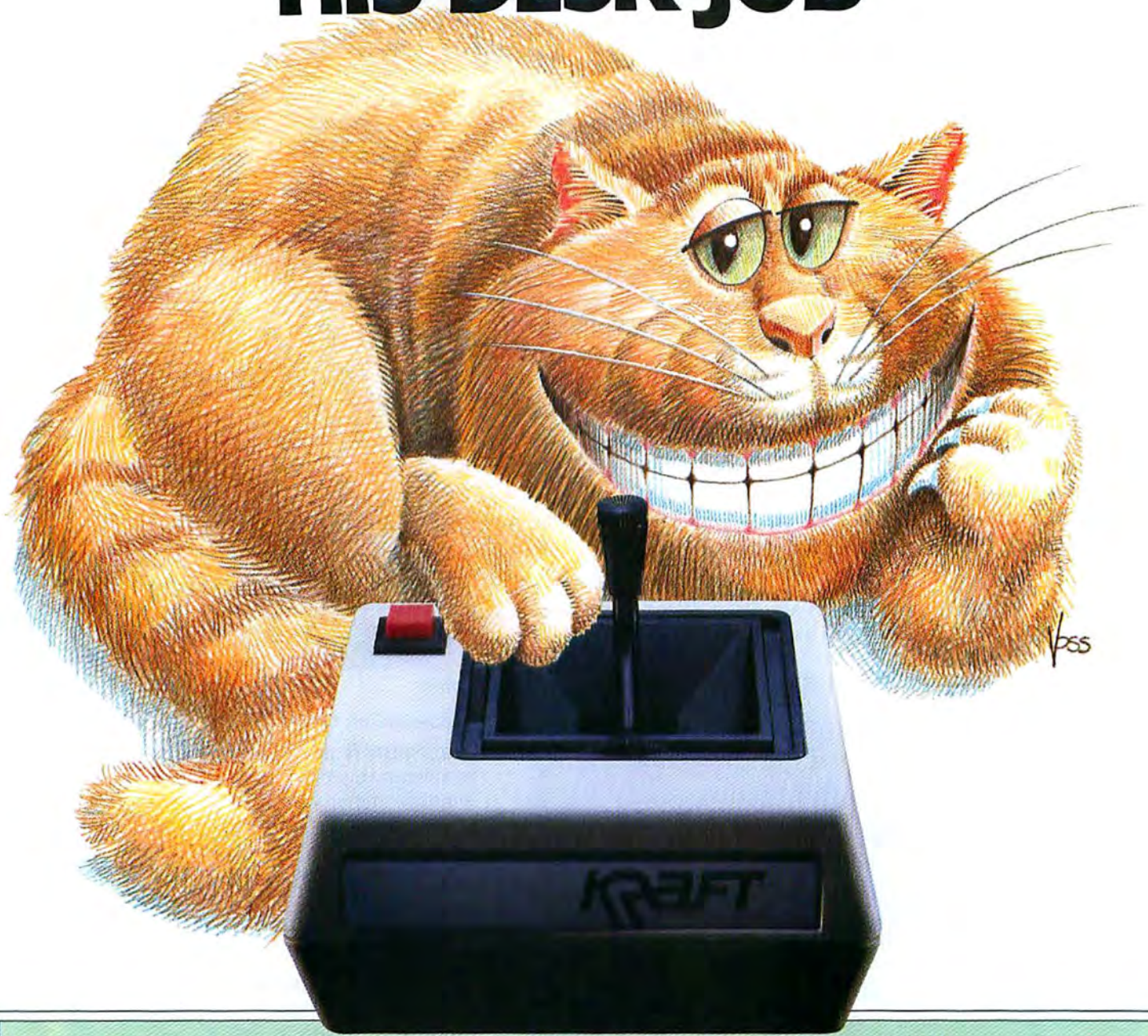
THE MOUSE JUST LOST HIS DESK JOB



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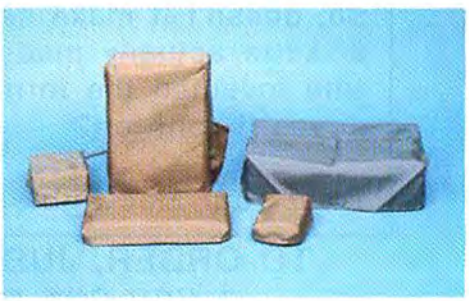

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3 to choose from: 1) vinyl leather, 2) clear, 3) polyurethane backed nylon with ***anti-static*** polymers ***built*** in. 12 colors to choose from. 3pc. and 5pc. sets with covers for all computers, printers and accessories.

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Carriers, Packs and Covers for the Macintosh®

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Circle 28 on reader service card

(continued from page 148)

top file labeled with that number. Under unusual circumstances, such as when you use cryptic document names, two names will result in the same number, causing what's called a collision: the Finder stores the Get Info text for both documents in the same area. You can usually avoid the problem by using longer document names.—Ed.

Not Enough Juice

Surge suppressors help protect a computer system from damage due to excess line voltage. However, they address only one of the hazards of commercial power. The other problem is low or fluctuating voltages.

Not long after I bought my Macintosh, it developed a disk drive problem. My dealer replaced the drive, but within 4 hours my Mac was again experiencing disk errors. This time the dealer concluded that the digital board was faulty and replaced it. Again, the repair was quick but didn't last.

I began to suspect that the problem wasn't the Mac's hardware but rather my power line. I called the local power company and requested that they come to my house and set up a recording voltmeter, a device that measures all voltage changes that occur on the power line. It measured my house's power for three days and recorded power fluctuations on a chart.

When the power company technician returned to read the chart, he told me he was not surprised by my problems. Although the power was within the limits required by the Illinois Commerce Commission, the charts indicated that the pole transformer that supplied my house and those of my neighbors was inadequate for the task. Within two weeks the power company installed a pole transformer with a much higher load rating. My problems disappeared.

The technician told me he had seen similar problems in other homes. To prevent problems, he suggested requesting a measurement of the line voltage before installing a computer system.

(continues on page 154)

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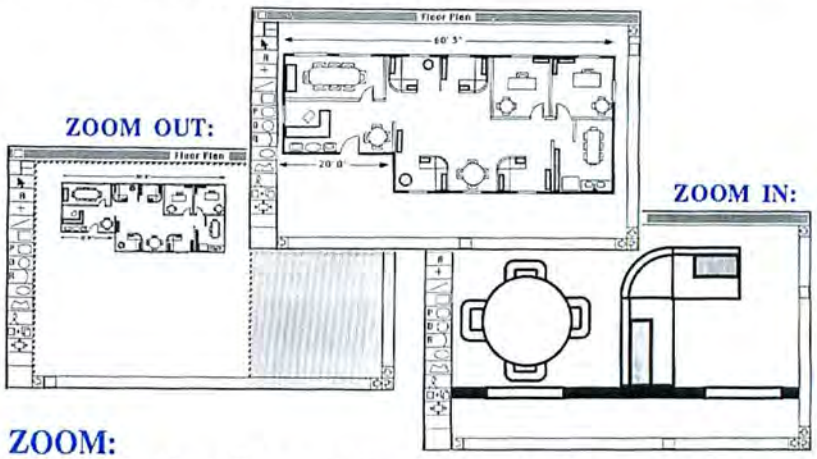
MacDraft™

is the most powerful object oriented drawing tool available for the Macintosh™ today. Its ease of use, combined with its powerful capabilities, allows even the most casual user to produce professional looking drawings. The versatility of MacDraft™ makes it ideal for the beginner, as well as the professional.

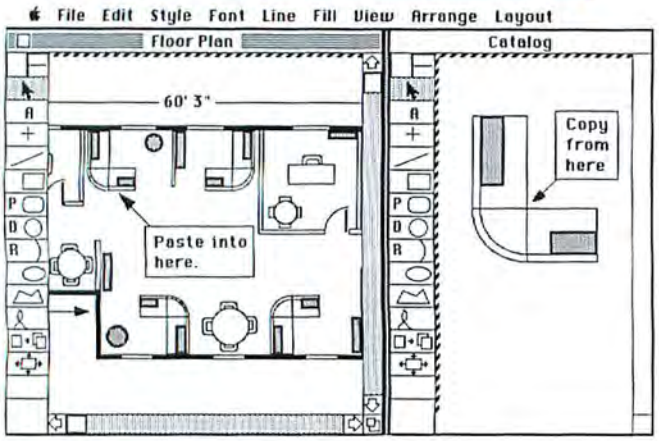
Features

- Continuous drawing mode.
- 16 Different scales.
- Zoom In and Zoom Out.
- Automatic dimension lines.
- Circles by radius or diameter.
- Arcs by radius or 3-points.
- Distribute objects along a line.
- Rotate objects in 1 degree increments.
- Create objects by inside or outside diameter.
- 4 Separate documents on the screen at the same time.
- Paste illustrations to and from other documents.
- Paste pictures and objects from MacPaint™ & MacDraw™.
- 64 Patterns for Fill & Ink.
- Flip objects.



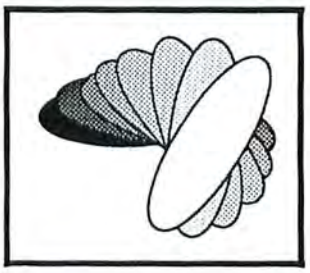
ZOOM:

The Zoom functions allow you to see either a reduced or magnified view of a drawing, while still enabling you to have full access to all of the drawing capabilities of MacDraft™. You can Zoom Out from the normal viewing window, until you can see an entire drawing, regardless of its size. While at a zoomed out view, you can easily add large objects or lines to your drawing that may actually extend beyond the viewing window. Or, you can Zoom In to magnify your drawing, and add fine details that may not be convenient to create at a normal view. You can zoom in on any part of your drawing up to eight times its normal magnification.



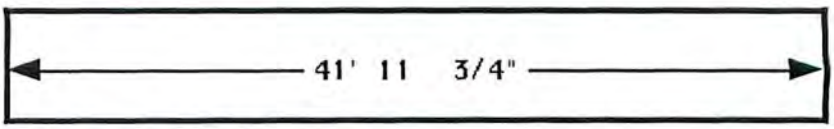
DRAWING SCALE:

MacDraft™ offers 16 different Feet & Inch scales, as well as 12 Metric scales for your use. This versatility allows you to create a drawing at one scale, and then if you wish, have it automatically converted to a different scale. You can also have several drawings, all at different scales, displayed on the screen at the same time, and can copy and paste between them. When you paste an object into a drawing with a different scale, the object will automatically adjust in size to conform to the scale of the new drawing.



ROTATION:

MacDraft™ allows you to rotate single or grouped objects in as little as one degree increments. You can also rotate multiple objects about their individual centers, or group them, and rotate them about the center of the group.



AUTO DIMENSIONING:

This feature allows you to automatically add dimension lines to your drawing, so you can display the sizes of various lines and objects. The dimension lines display the proper size of the object, regardless of the scale of the drawing.

Suggested Retail Price $239.00

idd inc.

Innovative Data Design, Inc.
1975 Willow Pass Road, Suite 8, Concord, California 94520, (415) 680-6818

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Circle 324 on reader service card

Open Window

(continued from page 152)

While I'm sure each power company has its own policies regarding line voltage measurements, my company performed the service and upgraded the power transfer at no cost. Now my Mac works properly, and I can rest assured that other appliances in my home are getting enough voltage, too.

Thomas R. Fernandez
Rockford, Illinois

The Mac's power supply can operate on line voltages ranging from 105 to 130 volts. Problems attributable to voltage fluctuations should, therefore, rarely occur. If, however, your Mac is acting up and your dealer's attempts to repair it are unsuccessful, check to see whether the lights in your house dim from time to time or the image on your TV set flickers. If so, the problem might be caused by a power-hungry appliance such as a refrigerator or an electric dryer turning on. If that's the case, you might be able to fix the problem by plugging the Mac into a circuit different from the one used by the appliance. If that doesn't work, check with your local power company about measuring the line voltage.–Ed.

Word Selecting Keys

I've found another undocumented feature in *Microsoft Word:* instant highlighting. Hold a Shift key down while pressing the Backspace key to select the previous word. To select more than one word, hold both keys down and release them when you have highlighted the desired text. Using this technique is often faster and more convenient than using the mouse because you don't have to take your hands off the keyboard.

Shel Horowitz
Northampton, Massachusetts

Here's another time-saving discovery: pressing Option-Backspace selects and erases the previous word, allowing you to delete words faster than backspacing one character at a time.–Ed.

(continues on page 158)

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Unleash the Musical capabilities of your Macintosh. Enhancements include:
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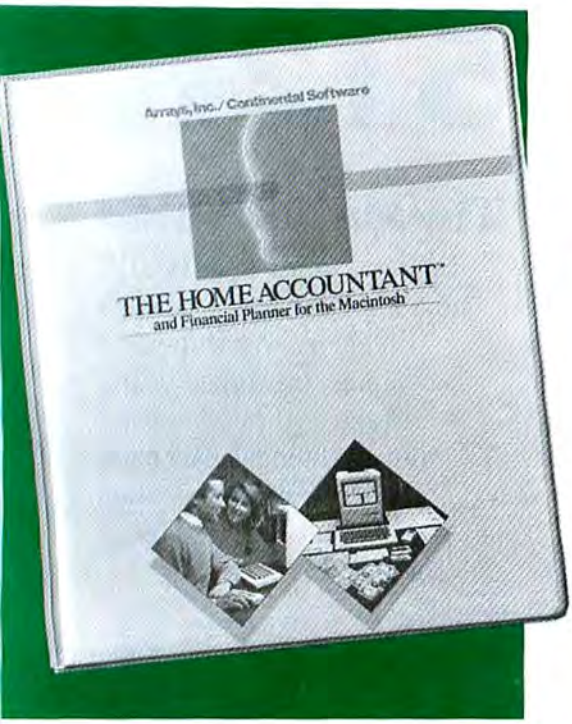
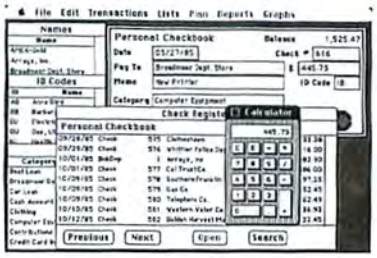
The Home Accountant and the Macintosh. All you need to:

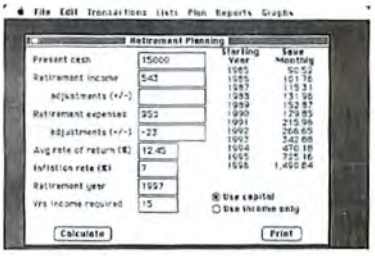


Master your personal finances



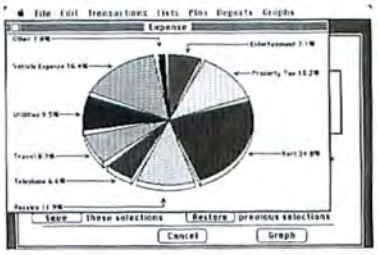
▷ Sure, The Home Accountant will keep your records and write your checks. Now discover how easy it is to take full control of your finances. Find out what you're worth, where your money goes, and how to put some away for tomorrow—all with The Home Accountant and Financial Planner.

Plan your financial future.



▷ The Home Accountant will show you what you can afford to pay for a new home. Or how to plan your kids' educational costs. It will even tell you when you'll be able to retire and how much money you'll need. Once you start using The Home Accountant, you'll wonder how you ever got along without it.

Organize your small business.



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Arrays, Inc./ Continental Software

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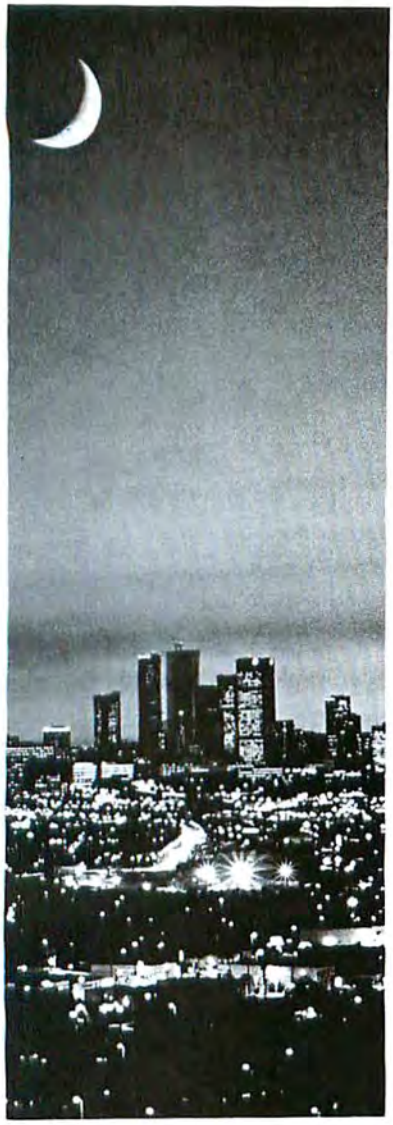

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"Mimics UNIX ... library handling is very flexible ... documentation is excellent ... SHELL is a pleasure ... blows away the competition for pure compile speed ... an excellent effort."
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Circle 271 on reader service card

(continued from page 154)

Examining Your Disks

It happened about an hour before the overnight courier was due to arrive. I was putting the finishing touches on an article when my Macintosh crashed, taking the entire article's file with it. The culprit was an untested public-domain desk accessory, but it didn't matter; my article was gone, and so was my will to live.

Then I remembered I had recently received a program called *Fedit,* short for *File Editor,* by John Mitchell. *Fedit* lets you examine and alter any area of a floppy disk, whether it's used by a file or not. When I started *Fedit* and opened my damaged file, I found that only a small portion of my article's file was damaged, just enough that *Microsoft Word* refused to open it. By scrolling through the *Fedit* display (see "Spying on Sectors") and printing it using ⌘-Shift-4, I was able to get a hard copy of my article, from which I could retype the *Word* file.

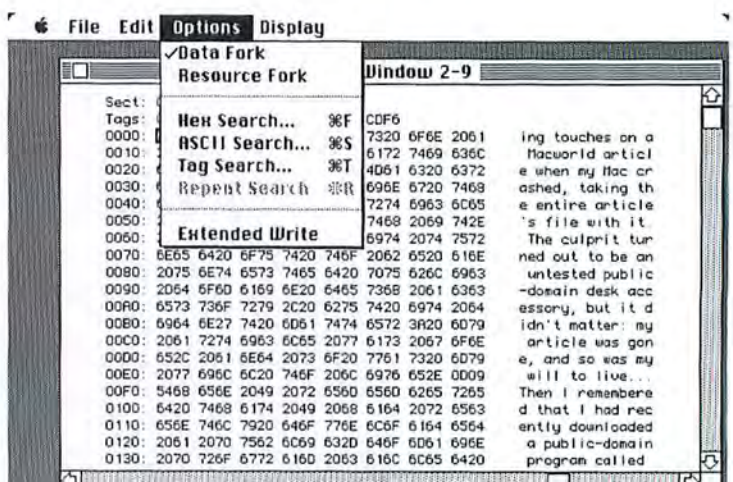
Not only does *Fedit* make it possible to salvage information from damaged files, but it's also fascinating to experiment with. You can study the structure of Mac files and learn more about how they work. You can also learn how copy-protection schemes work and how the Mac's file directories are structured.

One word of advice: perform examinations on a copy of the original disk, in case something goes wrong. In the hands of the careless, this safety net can damage disks, too.

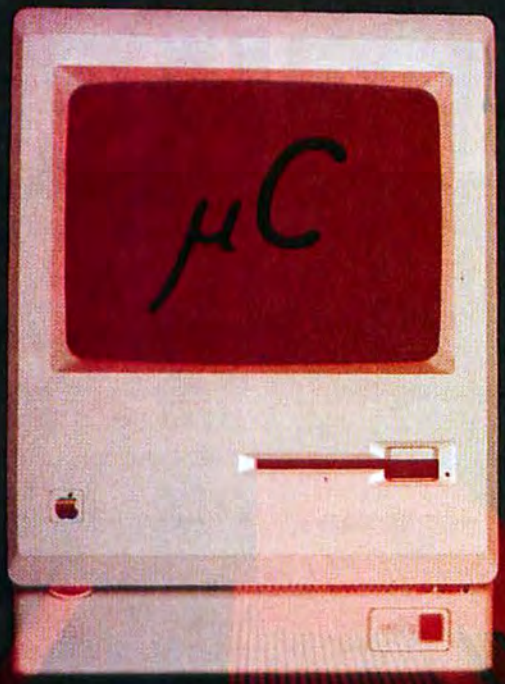
Fedit is available from CompuServe's MAUG and from user groups. It's distributed on the "shareware" basis: copy and use the program, and if you like it, send a contribution to the author. I certainly did. After all, how many applications can renew your will to live?

Jim Heid
Peterborough, New Hampshire

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) along with a brief hard copy description to* Open Window, Macworld, *555 De Haro St., San Francisco, CA 94107, or electronically to CompuServe 70370,702 or The Source BCW440. All published submissions become the property of* Macworld. □



Spying on Sectors
John Mitchell's Fedit, *available through MAUG and user groups, lets you examine and alter any area of a Macintosh disk. You can use* Fedit *to read and salvage a damaged document that cannot be opened by the application that created it.* Fedit *displays the hexadecimal (base 16) values corresponding to a file's contents on the left portion of the screen and their ASCII equivalents on the right side.*



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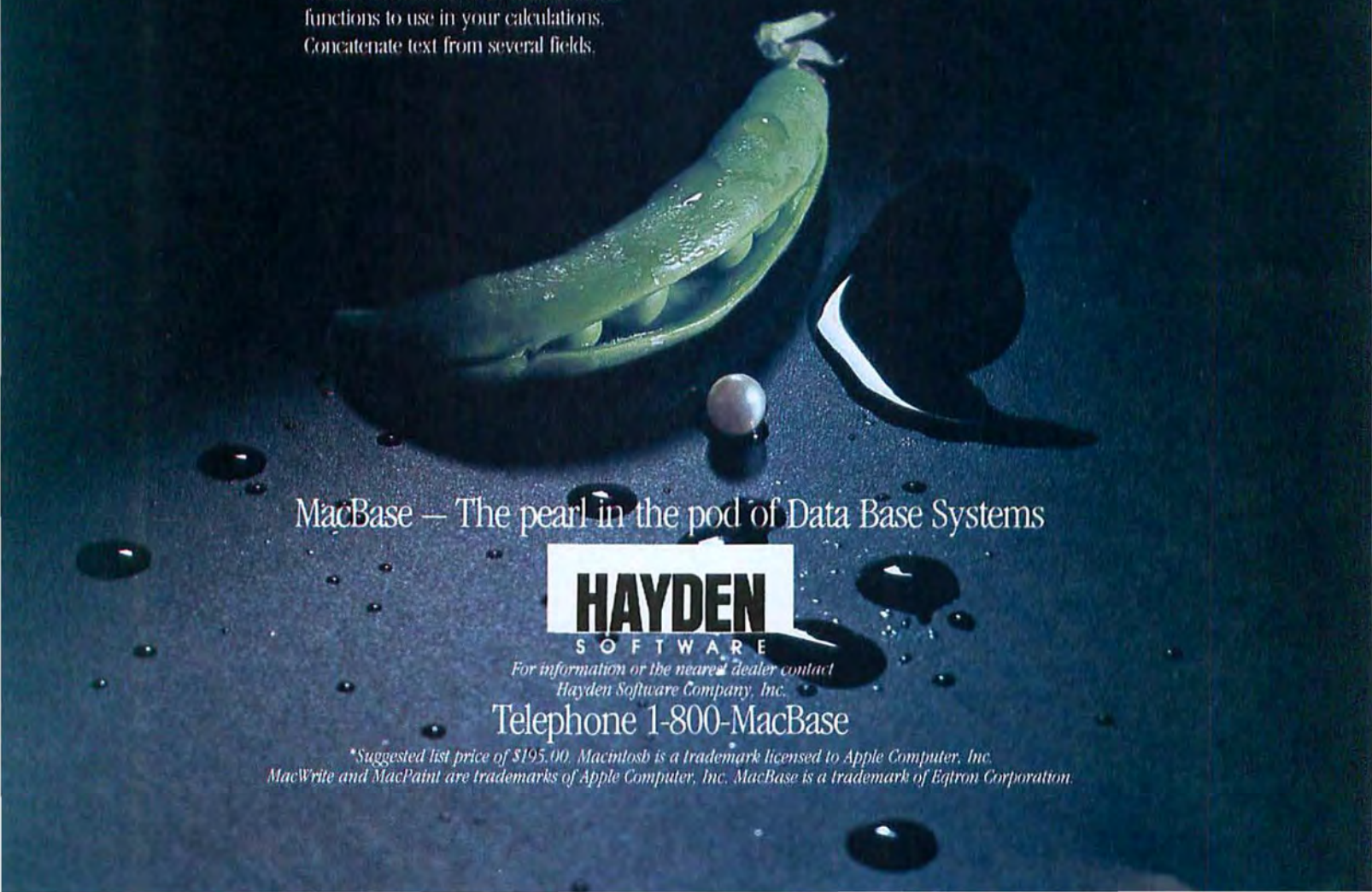

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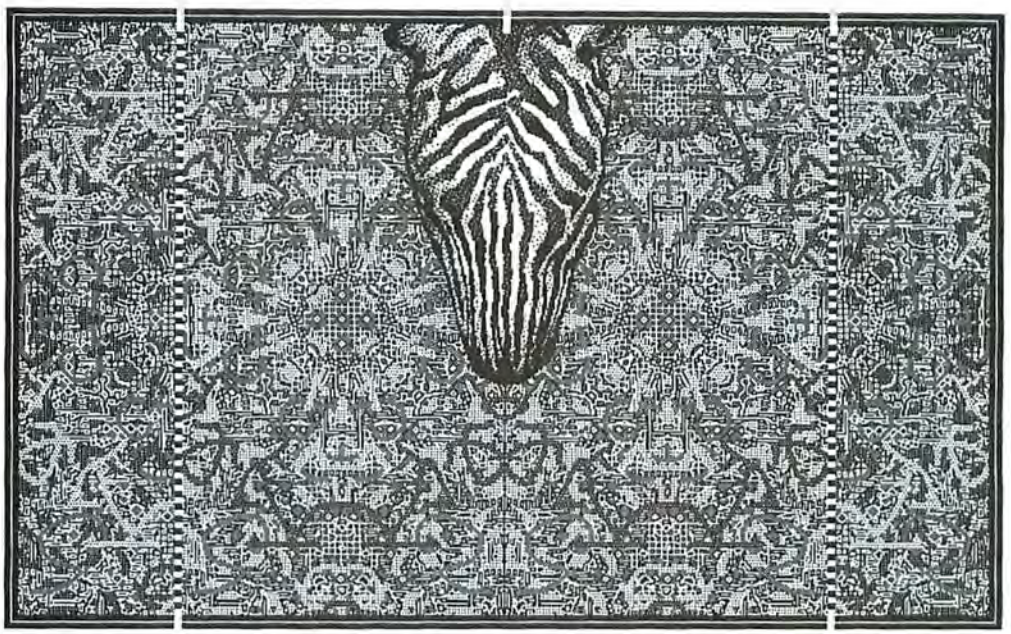
Macworld Gallery

An exhibition of Macintosh graphics

Edited by Erfert Nielson

Each month Macworld Gallery *displays the winners of the Macworld Art Contest, as wel. as several other drawings. To enter the contest send a paper copy of your artwork to* Macworld Gallery, *555 De Haro St., San Francisco, CA 94107. Fives judges award a first prize of $500 and a Summagraphics MacTablet and two second prizes of $250. If your drawing is exhibited in the regular* Gallery *section, you will receive $25. In November 1985 a grand prize of $5000 and two $2500 second prizes will be awarded. Winners will be notified upon acceptance; we are unable to acknowledge all entries. Prize-winning drawings become the property of Apple Computer.*



Zebra Icon

■ *$500–First Prize*

Zebra Icon

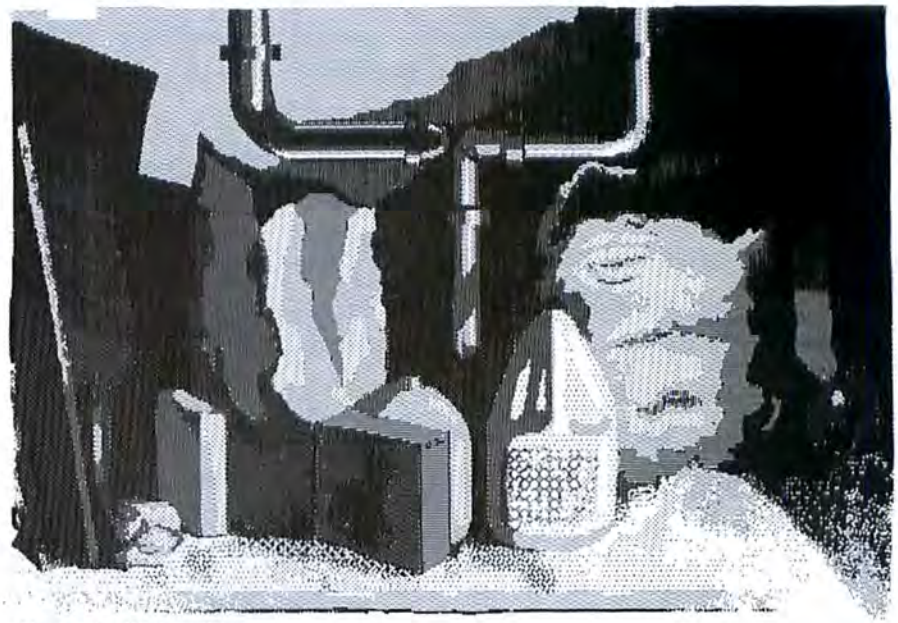
Rather than using *MacPaint*'s tools to create an illustration that could have been done with traditional artist's tools, I tried to take advantage of *MacPaint*'s unique qualities. I used Brush Mirrors with various patterns to make the background panels, then selected Trace Edges from the Edit menu. I drew the zebra head in a separate document, then cut it to the Clipboard and pasted it in over the background.

Michael Tidmus
Los Angeles, California

$250–Second Prize

Under the Kitchen Sink
In order to make a drawing that was placed horizontally on an entire 8½- by 11-inch page, I had to draw the items sideways. This proved surprisingly easy to do. I began by blocking out the major shapes with the straight line tool. I then used the pencil to modify those shapes and finally used the paintbrush to add shading and texture.

Terry Reynolds
Glendale, Arizona

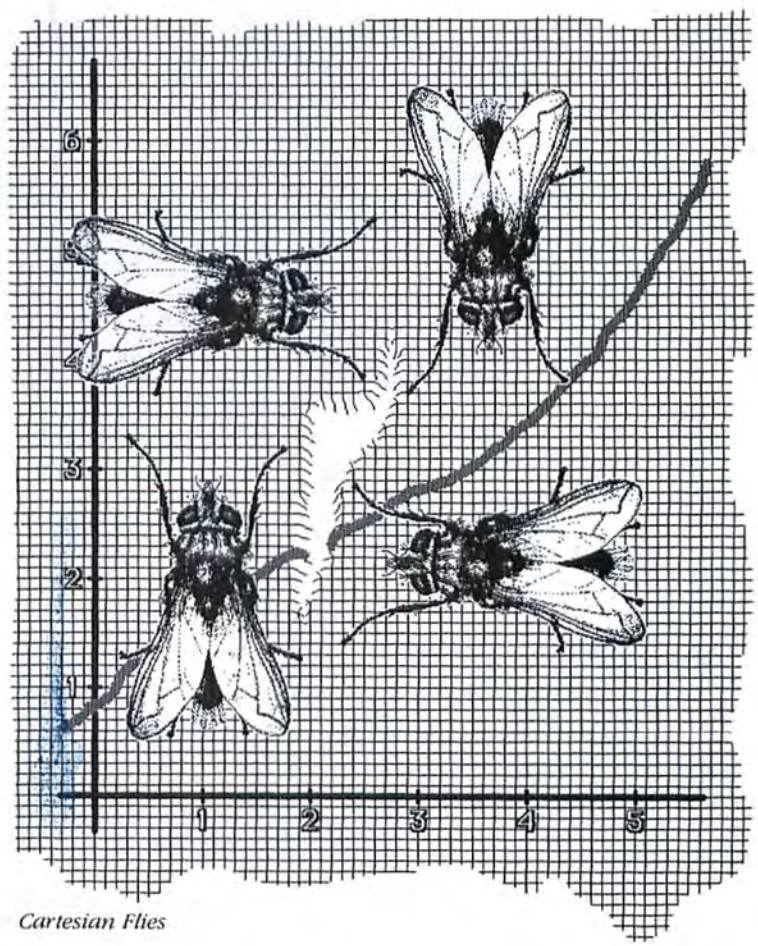


Under the Kitchen Sink

$250–Second Prize

Cartesian Flies
This image came to mind when I filled the *MacPaint* window with the grid pattern. The grid simultaneously reminded me of graph paper and of a wire window screen. I drew a single fly and then made three copies and rotated them, saving each in the Scrapbook. I pasted the flies onto the grid and added details to complete the drawing.

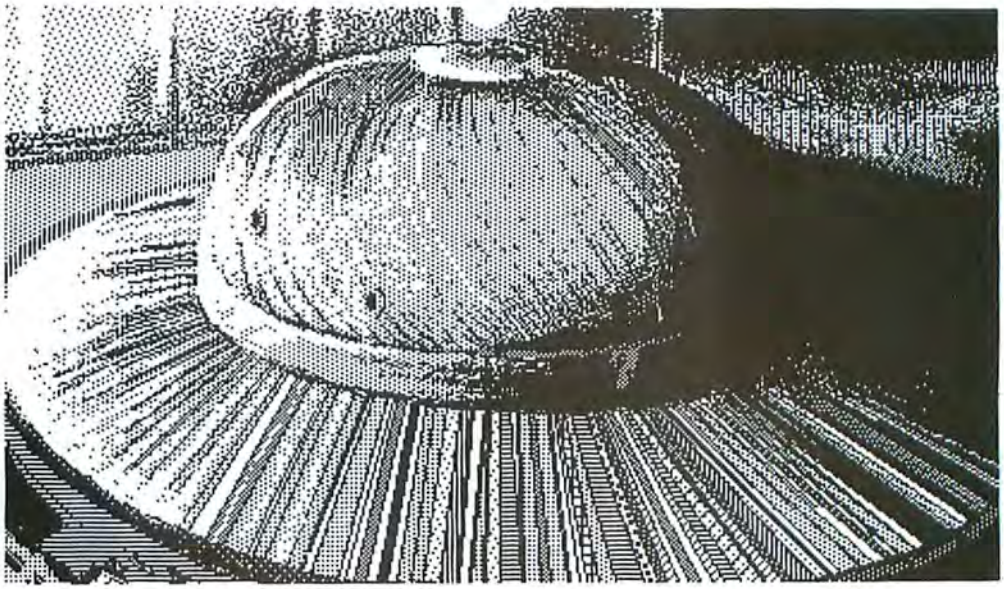
Robert Ishi
Oakland, California



Cartesian Flies

J. P.'s Hat
I set up this still life near my Macintosh. I used a lamp as a light source to produce highlights and a strong shadow. After completing a rough freehand drawing of the hat, I filled the entire screen with a medium gray tone with the paint bucket. I placed a variety of patterns on the hat's brim and finished the drawing by adding white highlights.

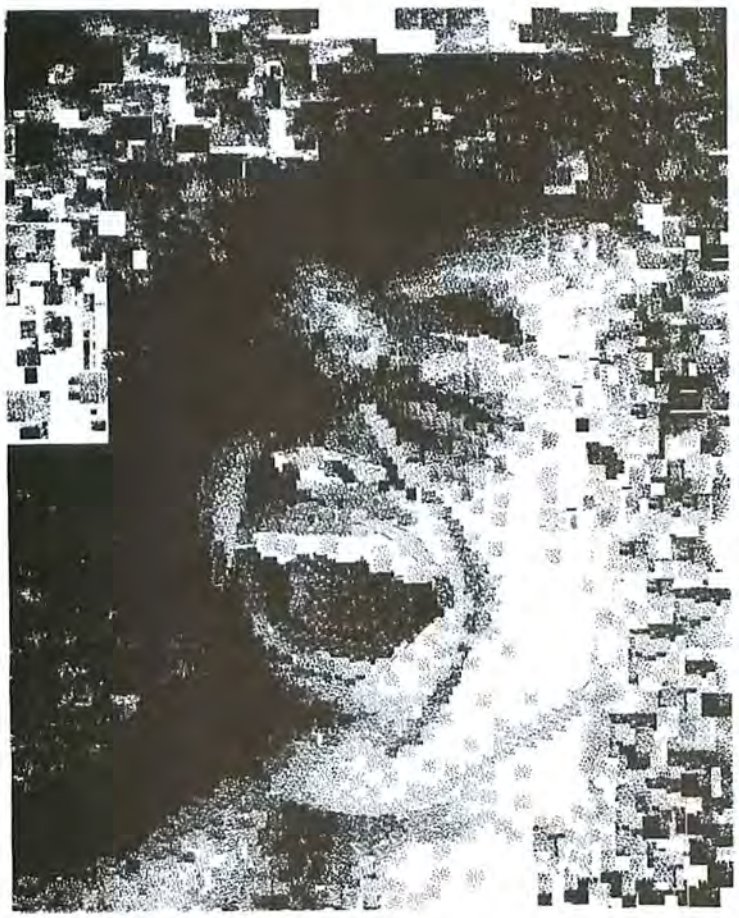
Carol C. Meyers
Fort Meyers, Florida



J. P.'s Hat

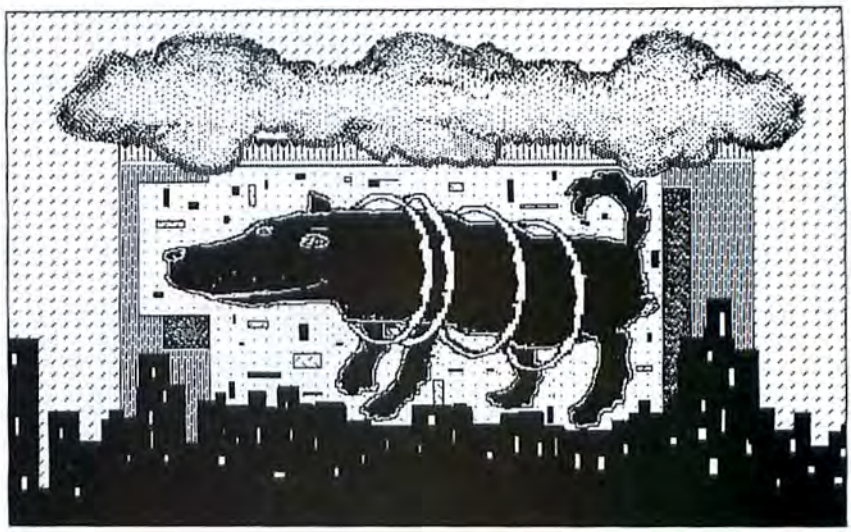
Don't Laugh
To create this image I first painted a dark-to-light streak with the spray can. Then, using the marquee, I cut out small squares ranging from light gray to black. I built the face from the small squares, duplicating them with the Option key. I feel the picture makes good use of the Mac's features; it would have been extremely difficult to draw a picture like this using pen and ink.

Robyn C. Miller
Henderson, Texas



Don't Laugh

Big Dog
I drew the dog with the pencil, selected Trace Edges, and then filled him in using the paint bucket. The city skyline and the other background shapes are filled rectangles of various sizes. I used the spray can to make the cloud, and a standard pattern to fill in the sky.
John Stephen Gratz
Reston, Virginia



Big Dog

Electrical Memory
I started by roughing in the figures with a small paintbrush and gray paint, then added outlines in black. After that, I cleaned up the drawing using white paint, the pencil, and FatBits. I used the straight line tool and the single-dot brush to make the background.
John Parker
St. Louis, Missouri

Electrical Memory

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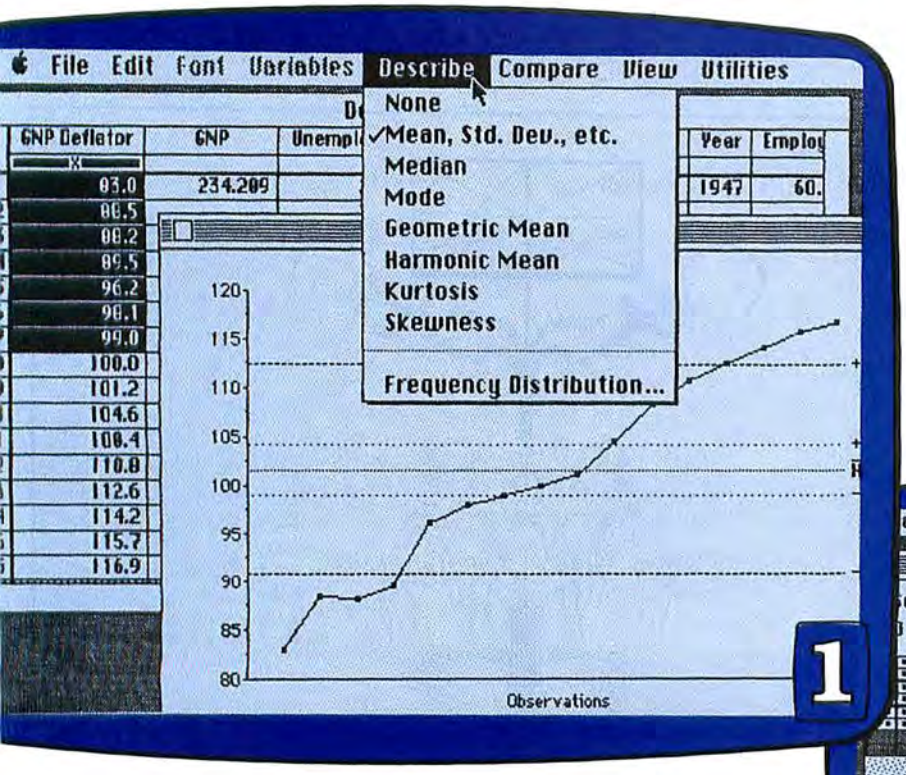

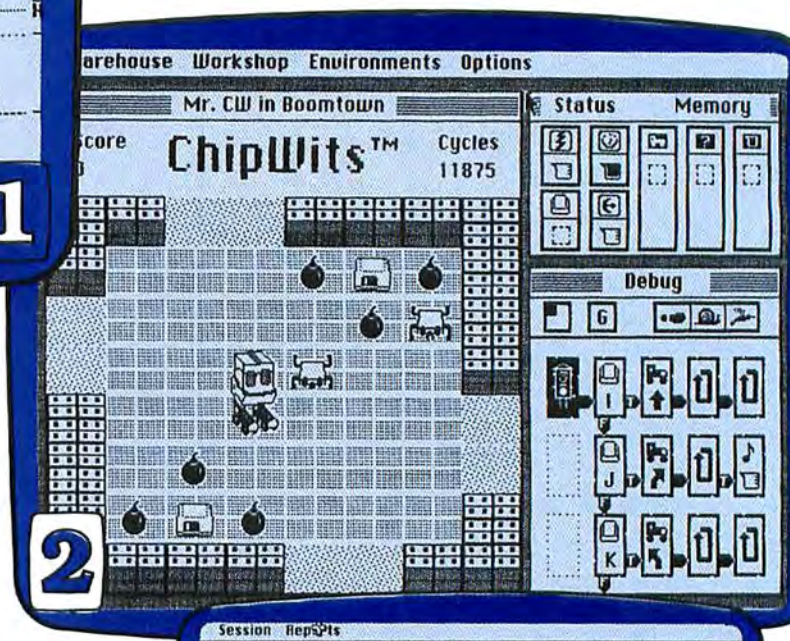

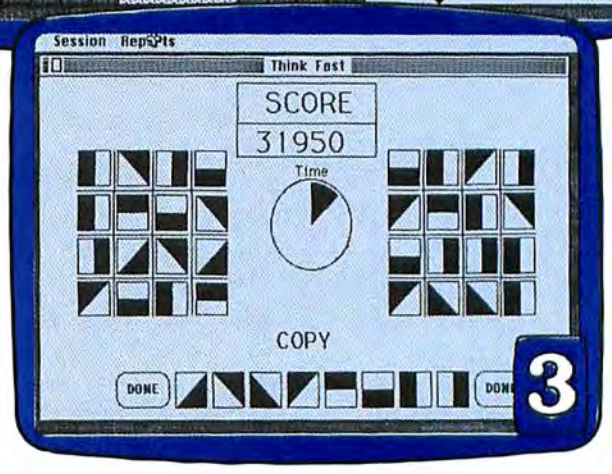

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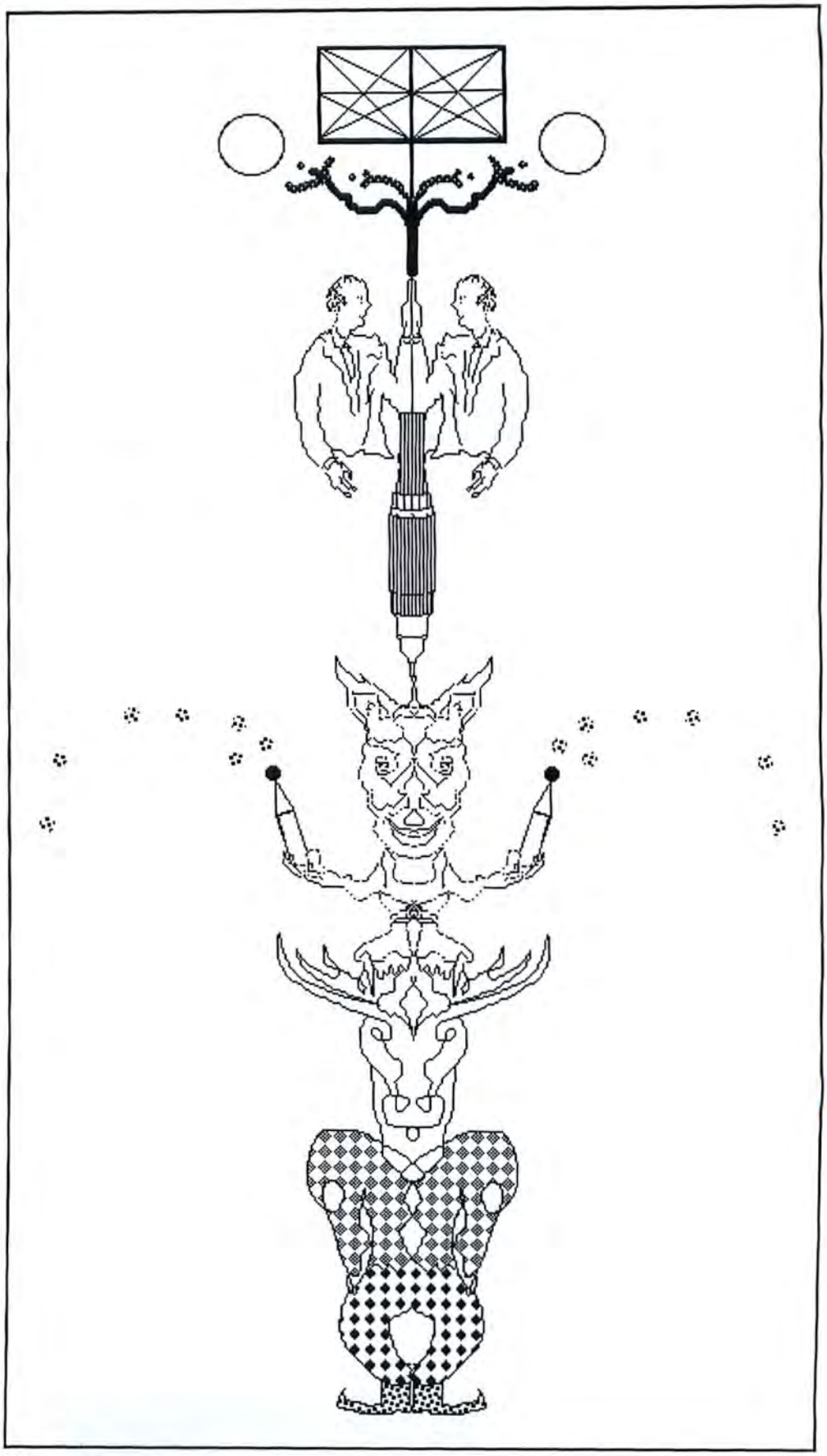
Mirror Totem
I'm a graphic designer and a painter, and I love working on the Mac. To create this drawing I used Brush Mirrors, with only the vertical mirror selected. I started drawing and watched as several creatures developed on their own.

Lawrie Kaplan
New York, New York □



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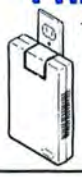

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Infrastructure Software, 701 Devonshire Dr. C-18, Champaign, IL 61820, 217/351-0066

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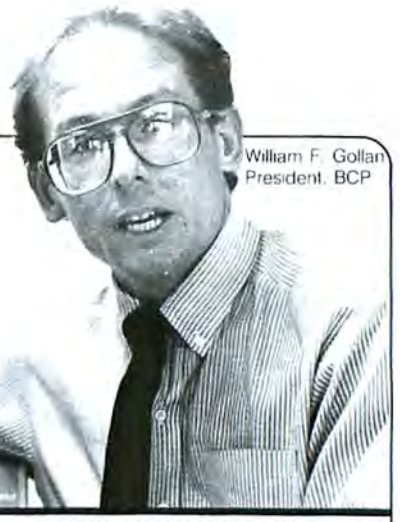

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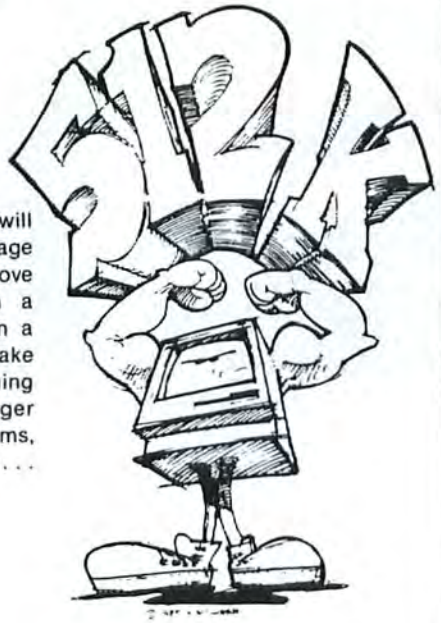

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227	Altsys Corp., 125	4	MacConnection, 68-71
204	Ann Arbor Softworks, 180	337	MacMemory Electronics, 132
240	Applied Logic Systems, 140	28	MacPacks, 151
7	Arrays, Inc/Continental Software, 155	16	MacStore, 174
		2	Manhattan Graphics, 112-113
265	Assimilation, Inc., 59, 61, 63	261	MassTech, 176
345	Automation Facilities Corp., 120	109	Megamax, Inc., 132
335	B.P. Products, 170	97	Mesa Graphics, 126
38	Blyth Software Corp., 167	219	Micro Analyst, Inc., 146
—	Business Computers of Peterborough, 175	174	Micro Conversions, Inc., 159
		—	Microsoft Corp., 10-11
298	C Ware Corp., 156	37	Miles Computing, 13
329	CLEO Software, 31	338	Model Office Co, The, 44-45
326	CAMDE Corp., 124	327	Nevins Microsystems, Inc., 6-7
165	Casady Company, 148	90	New Image Technology, Inc., 178
312	Centa Systems, Inc., 179	215	Northeastern Software, 48-51
175	Central Point Software, Inc. 35	245	Ohm/Electronics, 96
332	Clear Lake Research, 170	279	Opus Computer Products, 115
134	Comark, Inc., 156	273	Organization Development Software, Inc., 128
330	CompuServe, 16		
340	Computer Friends, 110	4	PC Connection, 68-71
271	Computer Friends, 158	45	PC Network, 168-169
220	Conroy-LaPointe, Inc., 65	262	PC's Limited, 178
206	Corvus Systems Corp., 38	331	Paladin Software, 119
313	Creative Computer, 128	74	Palantir Software, 8
129	Creative Solutions, 142	—	Paradise Systems, Inc., 14-15
159	DataPak Software, Inc., 122	115	PDS Technology, Inc., 176
281	DataViz, Inc., 178	124	Peachtree Software, 139
319	Davidson & Associates, Inc., 123	223	Personal Computer Peripherals Corp., 1
232	Dayna Communications, 36-37		
190	Digital, Etc., 46	85	Personics Corp., 116-117
—	Disk World, Inc., 152	77	ProVUE Development Corp., IFC
164	Diversions, Inc., 179	216	Programs Plus, 130-131
288	Doss Industries, 138	239	Prometheus Products, 5
236	Dreams of the Phoenix, 170	334	Public Domain Exchange, The, 170
193	Echo Data Services, Inc. 179	26	Rio Grande Software, 12
83	Ergotron, Inc., 30	—	Satori Software, 20
318	Execucom Systems Corp., 24-25	35	Shaherazam, 138
56	ExperTelligence, 54	266	Silicon Beach Software, 149
290	Flashware, 60	247	Sof-Ware Tools, 179
289	Forethought, Inc., 26	343	SoftStyle, Inc., 129
114	Forethought, Inc., 97	339	SoftStyle, Inc., 35
23	Foundation Systems, 34	260	Softstyle, Inc. 34
169	Future Design Software, 124	—	Software Publishing, 108
323	GTCO Corp., 118	225	StatSoft, 125
176	General Computer Company, 56-57	302	StatSoft, 22
333	Genesis Micro Software, 170	132	Sunol Systems, 127
166	Great Wave Software, 154	303	Symmetry Corp., 141
231	H & E Computronics, Inc. 62	177	Systems Control, 20
—	Hayden Software, 66, 144, 160	29	T/Maker Graphics, 19, 21, 23
341	Hewlett-Packard, 53	187	Tardis Software, 134
342	Hewlett-Packard, 55	14	Tecmar, BC
336	Hi-Tech Products, 174	55	Telasoft/Telemart, 147
40	Hippopotamus Software, 146	167	Thunderware, Inc., 64
272	Icon Review, 136-137	51	Tri-Data, 58
208	Ideaform, Inc., 170	42	Videx, Inc., 133
249	Infosphere, Inc., 22	6	Voad Systems, 156
308	Innovative Data Design, 153		
324	Innovative Data Design, 154		
171	Iomega, 18		
222	Island Software, 132		
283	Juki Office Machine Corp., 135		
11	Kensington Microware, 28-29		
346	Kraft Systems, 150		
246	Kriya Systems, Inc., 33		
230	Logicsoft, 143		

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- ☐ (4) 10 or more

7. How much do you plan to spend in the next 12 months for peripherals and other add-ons for the Macintosh(es)?

- ☐ Less than $250
- ☐ $250-$499
- ☐ $500-$999
- ☐ $1000 or more

8. How much do you plan to spend in the next 12 months on software for the Macintosh(es)?

- ☐ Less than $250
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September 85

1	2	3	4	5	6	7	8	9	10	11	12	97	98	99	100	101	102	103	104	105	106	107	108	193	194	195	196	197	198	199	200	201	202	203	204
13	14	15	16	17	18	19	20	21	22	23	24	109	110	111	112	113	114	115	116	117	118	119	120	205	206	207	208	209	210	211	212	213	214	215	216
25	26	27	28	29	30	31	32	33	34	35	36	121	122	123	124	125	126	127	128	129	130	131	132	217	218	219	220	221	222	223	224	225	226	227	228
37	38	39	40	41	42	43	44	45	46	47	48	133	134	135	136	137	138	139	140	141	142	143	144	229	230	231	232	233	234	235	236	237	238	239	240
49	50	51	52	53	54	55	56	57	58	59	60	145	146	147	148	149	150	151	152	153	154	155	156	241	242	243	244	245	246	247	248	249	250	251	252
61	62	63	64	65	66	67	68	69	70	71	72	157	158	159	160	161	162	163	164	165	166	167	168	253	254	255	256	257	258	259	260	261	262	263	264
73	74	75	76	77	78	79	80	81	82	83	84	169	170	171	172	173	174	175	176	177	178	179	180	265	266	267	268	269	270	271	272	273	274	275	276
85	86	87	88	89	90	91	92	93	94	95	96	181	182	183	184	185	186	187	188	189	190	191	192	277	278	279	280	281	282	283	284	285	286	287	288
289	290	291	292	293	294	295	296	297	298	299	300	385	386	387	388	389	390	391	392	393	394	395	396	481	482	483	484	485	486	487	488	489	490	491	492
301	302	303	304	305	306	307	308	309	310	311	312	397	398	399	400	401	402	403	404	405	406	407	408	493	494	495	496	497	498	499	500	501	502	503	504
313	314	315	316	317	318	319	320	321	322	323	324	409	410	411	412	413	414	415	416	417	418	419	420	505	506	507	508	509	510	511	512	513	514	515	516
325	326	327	328	329	330	331	332	333	334	335	336	421	422	423	424	425	426	427	428	429	430	431	432	517	518	519	520	521	522	523	524	525	526	527	528
337	338	339	340	341	342	343	344	345	346	347	348	433	434	435	436	437	438	439	440	441	442	443	444	529	530	531	532	533	534	535	536	537	538	539	540
349	350	351	352	353	354	355	356	357	358	359	360	445	446	447	448	449	450	451	452	453	454	455	456	541	542	543	544	545	546	547	548	549	550	551	552
361	362	363	364	365	366	367	368	369	370	371	372	457	458	459	460	461	462	463	464	465	466	467	468	553	554	555	556	557	558	559	560	561	562	563	564
373	374	375	376	377	378	379	380	381	382	383	384	469	470	471	472	473	474	475	476	477	478	479	480	565	566	567	568	569	570	571	572	573	574	575	576

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Product Index

Reader Service Number

Software

Business

240 Applied Logic Systems, 140
7 Arrays Inc./Continental Software, 155
329 CLEO Software, 31
159 DataPak Software, Inc., 122
281 DataViz, Inc., 178
190 Digital, Etc., 46
344 Dow Jones Software, 114
249 Infosphere, Inc., 22
338 Model Office Co., The, 44-45
273 Organization Development Software, 128
331 Paladin Software, 119
74 Palantir Software, 8
— Satori Software, 20
247 Sof-Ware Tools, 179
343 SoftStyle, Inc., 129
— Software Publishing, 108
225 StatSoft, 125
42 Videx, Inc., 133

Communications

329 CLEO Software, 31
281 DataViz, Inc., 178
236 Dreams of the Phoenix, 170
249 Infosphere, Inc., 22
97 Mesa Graphics, 126

Data Management

38 Blyth Software Corp., 167
289 Forethought, Inc., 26
114 Forethought, Inc., 97
— Hayden Software Company, Inc., 144, 160
331 Paladin Software, 119
77 ProVUE Development, IFC
26 Rio Grande Software, 12
247 Sof-Ware Tools, 179
— Software Publishing, 108
302 StatSoft, 22

Educational

276 BrainPower, Inc., 165
319 Davidson & Associates, Inc., 123
273 Organization Development Software, 128
225 StatSoft, 125

Entertainment/Strategy

317 Aegis Development, Inc., IBC
204 Ann Arbor Softworks, 180
— Hayden Software Company, Inc., 66
37 Miles Computing, 13
35 Shaherazam, 138

Financial

318 Execucom Systems Corp., 24-25
169 Future Design Software, 124
331 Paladin Software, 119
124 Peachtree Software, 139
343 SoftStyle, Inc., 129
29 T/Maker Graphics, 23

Graphics

227 Altsys Corp., 125
165 Casady Company, 148
23 Foundation Systems, 34

Reader Service Number

— Hayden Software Company, Inc., 144
308 Innovative Data Design, 153
324 Innovative Data Design, 154
2 Manhattan Graphics, 112-113
97 Mesa Graphics, 126
266 Silicon Beach Software, 149
247 Sof-Ware Tools, 179
29 T/Maker Graphics, 19, 21, 23

Languages/Development Systems

298 CWare Corporation, 156
129 Creative Solutions, 142
56 ExperTelligence, 54
246 Kriya Systems, Inc., 33
109 Megamax, Inc., 132
187 Tardis Software, 134

Miscellaneous

265 Assimilation, Inc., 63
175 Central Point Software, Inc., 35
332 Clear Lake Research, 170
281 DataViz, Inc., 178
23 Foundation Systems, 34
333 Genesis Micro Software, 170
166 Great Wave Software, 154
208 Ideaform, 170
222 Island Software, Inc., 132
219 Micro Analyst, Inc., 146
327 Nevins Microsystems, Inc., 6-7
334 Public Domain Exchange, The, 170
— Satori Software, 20
35 Shaherazam, 138
260 SoftStyle, Inc., 34
339 SoftStyle, Inc., 35
303 Symmetry Corp., 141

Personal Business/Home

326 CAMDE Corp., 124
166 Great Wave Software, 154
40 Hippopotamus Software, 146

Word Processing/Spelling

23 Foundation Systems, 34
— Microsoft Corp., 10-11
338 Model Office Co., The, 44-45

Hardware

Digitizers

323 GTCO Corp., 118
90 New Image Technology, Inc., 178
167 Thunderware, Inc., 64

Hard Disks

206 Corvus Systems Corp., 38
176 General Computer Company, 56-57
171 Iomega, 18
— Paradise Systems, Inc., 14-15
223 Personal Computer Peripherals Corp., 1
132 Sunol Systems, 127
14 Tecmar, BC

Miscellaneous

265 Assimilation, Inc., 59, 61
271 Computer Friends, 158
232 Dayna Communications, 36-37
288 Doss Industries, 138
222 Island Software, 132
346 Kraft Systems, 150
295 MACohm Projects, 178
337 MacMemory Electronics, 132
261 MassTech, 176
174 Micro Conversions, Inc., 159
338 Model Office Co., The, 44-45

Reader Service Number

245 Ohm/Electronics, 96
115 PDS Technology, Inc., 176
177 Systems Control, 20
51 Tri-Data, 58
6 Voad Systems, 156

Modems

340 Computer Friends, 110
239 Prometheus Products, 5

Printers/Printer Accessories

271 Computer Friends, 158
164 Diversions, Inc., 179
341 Hewlett-Packard, 53
342 Hewlett-Packard, 55
283 Juki Office Machine Corp., 135

Accessories

Carrying Cases

28 MacPacks, 151

Disks

134 Comark, Inc., 156
193 Echo Data Services, Inc., 179
279 Opus Computer Products, 115

Miscellaneous

345 Automation Facilities Corp., 120
335 B.P. Products, 170
83 Ergotron, Inc., 30
336 Hi-Tech Products, 174
11 Kensington Microware, 28-29
85 Personics Corporation, 116-117

Reader Service Number

Mail Order

— Business Computers of Peterborough, 175
134 Comark, Inc., 156
220 Conroy-LaPointe, Inc., 65
313 Creative Computer, 128
— Disk World, Inc., 152
290 Flashware, 60
231 H & E Computronics, 62
272 Icon Review, 136-137
230 Logicsoft, 143
4 MacConnection, 68-71
16 MacStore, 174
215 Northeastern Software, 48-51
4 PC Connection, 68-71
45 PC Network, 168-169
262 PC's Limited, 178
216 Programs Plus, 130-131
55 Telasoft/Telemart, 147

Services

312 Centa Systems, Inc., 179
330 CompuServe, 16

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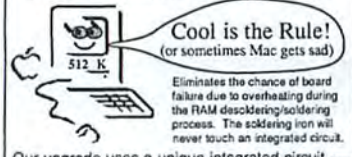

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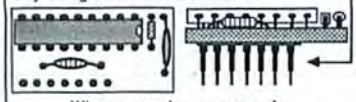

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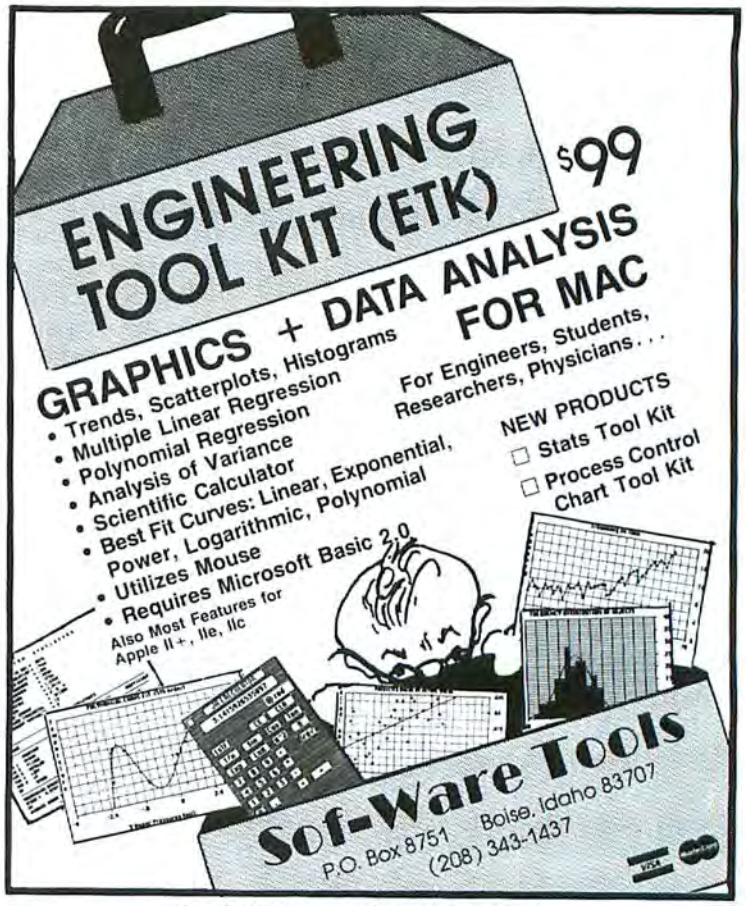

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